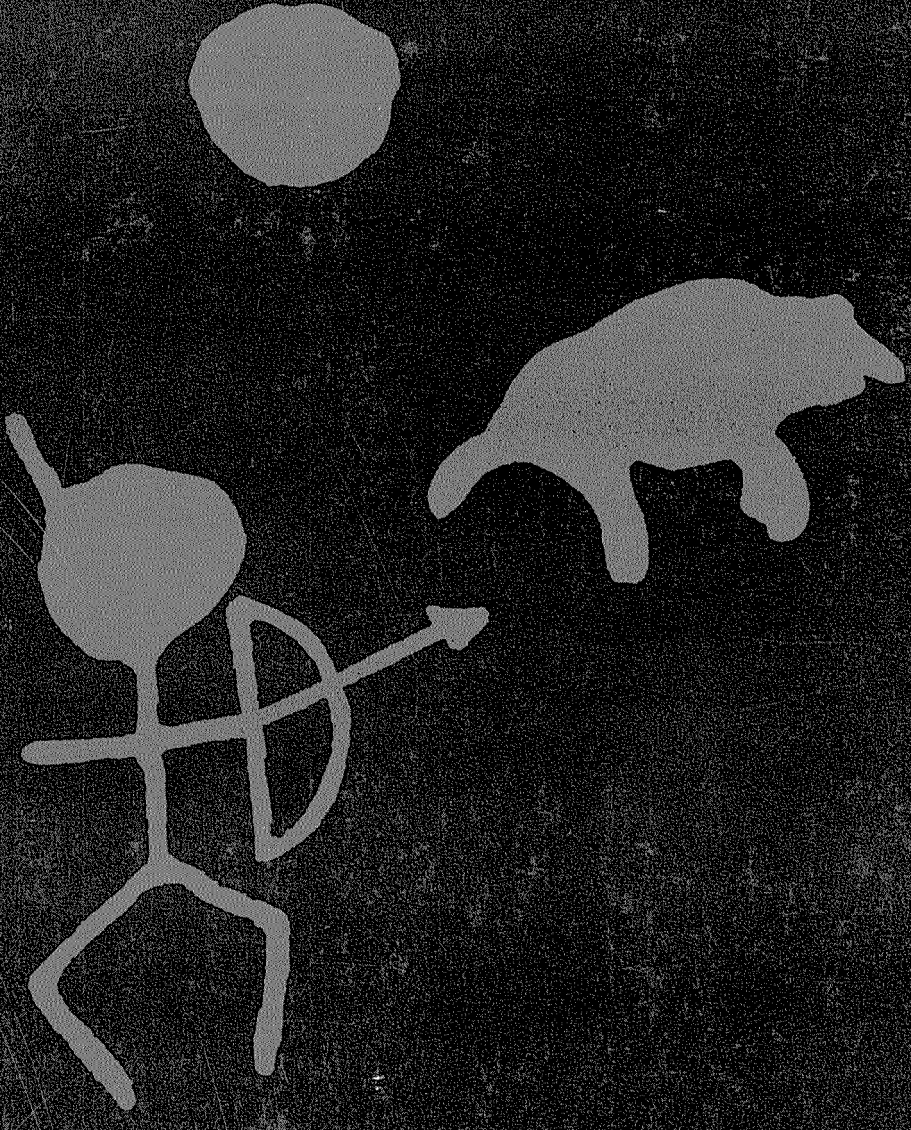
Bulletin of the TEXAS ARCHEOLOGICAL SOCIETY

Volume 55/1984



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TEXAS ARCHEOLOGICAL SOCIETY

The Society was organized and chartered in pursuit of a literary and scientific undertaking: the study of man's past in Texas and contiguous areas. The *Bulletin* offers an outlet for the publication of serious research on history, prehistory, and archeological theory. In line with the goals of the Society, it encourages scientific collection, study, and publication of archeological data.

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Bulletin of the TEXAS ARCHEOLOGICAL SOCIETY

Volume 55/1984

Wayne R. Roberson, Editor
Beth O. Davis, Associate Editor

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1986 (for 1984)

My gratitude to Beth O. Davis can hardly be expressed fully. She has spent much time on this volume of the *Bulletin,* and it would have been delayed further were it not for her effort.

A special note of thanks goes to William E. Moore and Ronald W. Ralph. They volunteered to serve as assistant editors, but circumstances prevented me from fully using their talents. They both reviewed and offered editorial advice on several articles.

Some traditions of editing the *Bulletin* have been changed in this volume. The main change is that of setting bibliographic references in roman rather than italic type, a custom already established in many scientific journals. Also, reviewers were identified in all cases to the authors, who received a complete copy of the reviewers' comments.

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Archeological Investigations at the Little Campus Restoration Project, Austin, Texas

Jack M. Jackson

ABSTRACT

The oldest building of the former Texas State Asylum for the Blind in Austin, built in 1858 and 1859, was investigated archeologically in 1982. The building was briefly home and headquarters to General George Armstrong Custer, who in 1865 was commander of federal occupation troops in Texas.

Mrs. Custer's written account of her life in Austin is examined together with other nineteenth century documentation of the site.

Artifacts deposited from 1859 to 1872 in a kitchen area are described and offered for comparison with artifacts from other Civil War and Reconstruction sites of this type.

The photographic mapping of the original (1859) kitchen floor, the sampling by excavation of a large nineteenth century cistern, and other aspects of the investigation are described.

INTRODUCTION

This paper presents results of an archeological investigation at the Little Campus, 41TV611, part of The University of Texas at Austin. The investigation was unusual because the excavation took place inside a well-dated standing historic structure that was at the time undergoing restoration.

The Little Campus, a collection of buildings that were the original home of the Texas State Asylum for the Blind, has been part of the main campus of The University of Texas at Austin since the 1920s. The complex was placed on the National Register of Historic Places in August 1974 and was designated a State Archeological Landmark in May 1981. The oldest building in the complex has often been referred to as the Custer House. This two-story limestone masonry structure with brick trim was erected in 1858 and 1859 (Tillotson 1977:18) by Abner Cook, the master builder who built the Governor's Mansion, the John Hancock house, and the Neill-Cochran house, all National Register properties in Austin. Built to house the Texas State Asylum for the Blind, it did so for 60 years. Although it was only briefly, during the winter of 1865, home and headquarters to General George Armstrong Custer, commander of the federal occupation troops in Austin, this is the era that has surrounded the building with popular lore.

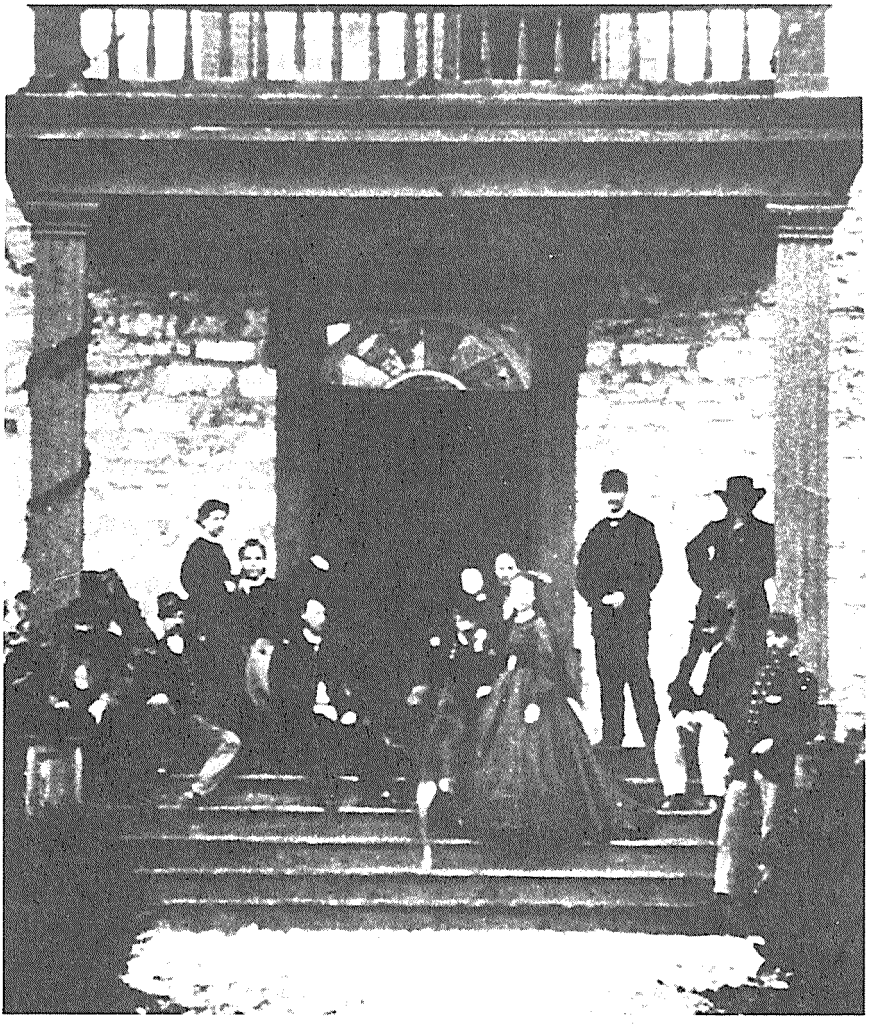

Figure 1. Photograph taken in 1865 showing General Armstrong Custer with members of his staff and family gathered on the front porch of his quarters (now the Arno Nowotny Building of The University of Texas) at the Texas State Asylum for the Blind. Seated at left side of door frame is Custer's father; seated at right side of door is Custer with left hand at chin; in front of Custer on the steps is Mrs. Elizabeth Custer. Photograph from the Barker Texas History Center, University of Texas at Austin.

Construction of the Custer House was begun in the spring or early summer of 1858 and completed in March 1859 (Trustees Report, 1860, quoted in Tillotson 1977:18). The Board of Trustees closed the school in the summer of 1862 because of the distressed financial condition of the Confederate States, but was overruled by Governor Lubbock, who ordered it reopened. At this time (during

the Civil War) there were ten students. In March 1864 the trustees "directed that tallow, wicking and moulds should be purchased so that candles could be made at the institution, for none could be purchased in the Confederate States." Exigencies of the war finally closed the school on January 7, 1865, when the Board declared that "owing to the worthlessness of Treasury warrants the wants of the pupils can not be supplied" (Tillotson 1977:18).

The building remained vacant until November 4, 1865, when General Custer arrived in Austin. He brought not only 4000 federal troops, but also his father, brother Tom, and wife Elizabeth Bacon Custer (Figure 1), who has left us an account of their arrival.

> Before we reached Austin, several citizens sent out invitations for us to come to their houses; but I knew the General would not accept, and, cold as the nights were, I felt unwilling to lose a day of camp life. We pitched our tents on rolling ground in the vicinity of Austin, where we overlooked a pretty town of stuccoed houses that appeared summery in the midst of live-oak's perennial green. The State House, Land Office, and Governor's Mansion looked regal to us, so long bivouacking in the forest and on uncultivated prairies. The Governor offered for our headquarters the Blind Asylum, which had been closed during the war. This possessed one advantage that we were glad to improve; there was room enough for all the staff, and a long saloon parlor and dining-room for our hops during the winter.
>
> There were three windows in our room, which we opened at night; but, notwithstanding the air that circulated, the feeling, after having been so long out of doors, was suffocating. The ceiling seemed descending to smother us. There was one joy: reveille could ring out on the dawning day, and there was no longer imperative necessity to spring from a warm bed and make ablutions in ice-water. There is a good deal of that sort of mental snapping of the fingers on the part of campaigners when they are again stationary, and need not prepare for a march. Civilization and a looking-glass must now be assumed, as it would no longer do to rough it and ignore appearances, after we had moved into a house, and were to live like "folks." Besides, we soon began to be invited by the townspeople to visit them [Custer 1971:216–217].

Custer lived in the building for only a brief time; he left Austin on February 4, 1866, barely three months after he arrived. The letters and later writings of Elizabeth Custer left a lively record of their stay.

After the war, efforts to reopen the Blind Asylum were initiated by Governor J. W. Throckmorton, who appointed a new board in August 1866. The new Board, "finding the Legislature disinclined to do anything for the institution, resolved to resign" (Trustees Report 1869, quoted by Tillotson 1977:29). The institution was reopened during the winter of 1866 and had 15 students by the following spring. The succession of boards and staffs dismissed and appointed during the Reconstruction years are detailed by Tillotson (1977:31–35). During these turbulent years the building remained largely as it was before the war, and although some frame buildings were added to those already on the grounds, no significant remodeling of the main building occurred until 1872.

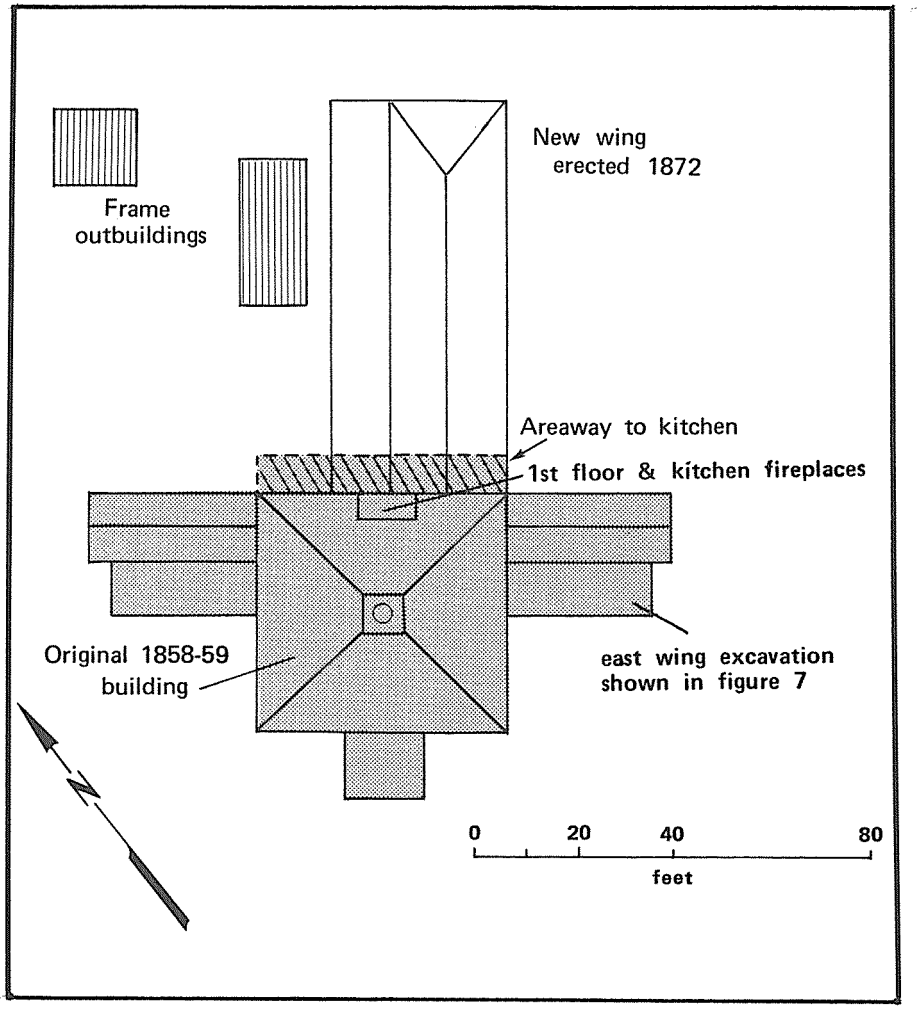

Figure 2. Plan of the building at the Texas State Asylum for the Blind as of 1872. There were more frame buildings to the west of this building. The area that is shaded but not crosshatched is the part of the building that has been restored and now known as the Arno Nowotny Building. See Figure 3. After Tillotson (1977, plate 30).

In the summer of 1872 the first of many modifications to Abner Cook's original building was undertaken, at least partially under his direction (Cook was then a member of the Board of Trustees). Two wings, each 24 by 60 feet and two stories high, were planned, but construction was delayed until the arrival of the railroad in Austin, which was expected to lower significantly the cost of lumber and other materials. When the expansion was undertaken, a large, two-story wing was added to the north side (Figure 2); classrooms on the first floor and five girls' dormitory rooms on the second all opened onto a west-facing gallery (Trustees' Report, 1872).

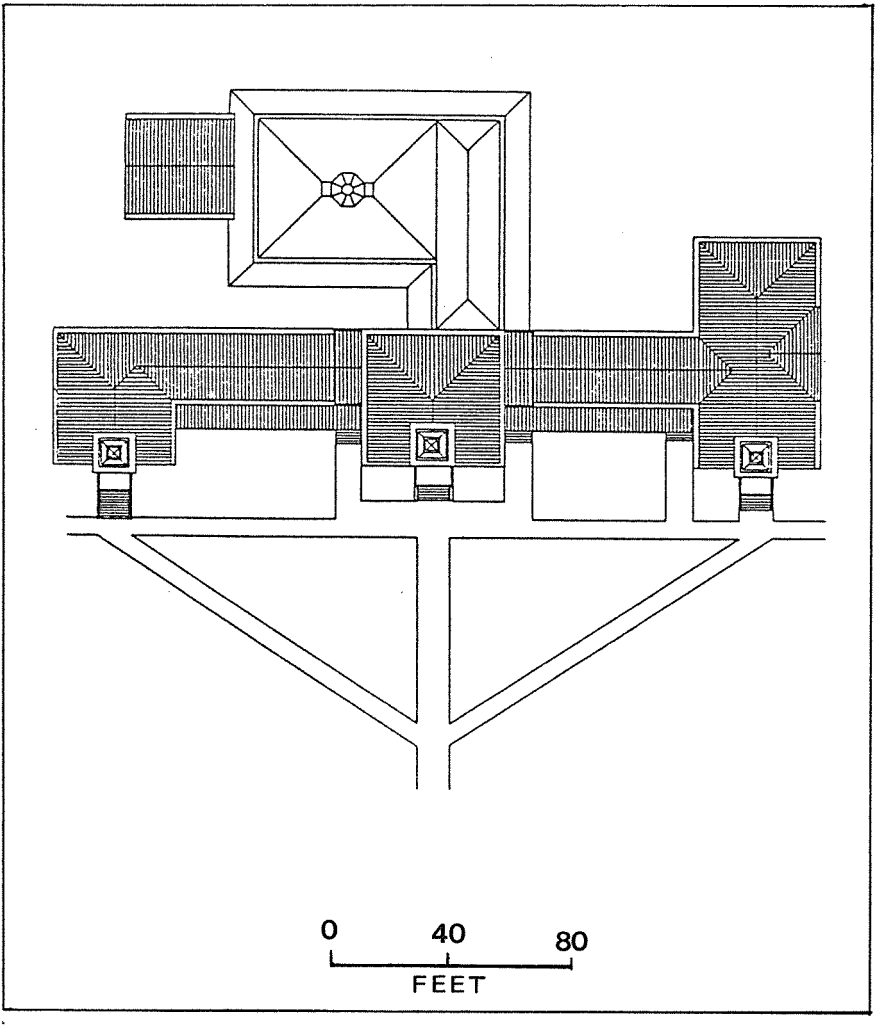

Figure 3. Plan of the building at the Texas State Asylum for the Blind as of 1881. From Tillotson (1977).

The site plan (Figure 2) shows that the new north wing covered most of the areaway that let light into the kitchen area and probably blocked the flue that served the kitchen fireplace on the north wall and the first-floor fireplace just above it. We cannot be certain that the addition of this wing rendered the kitchen obsolete, but it certainly made it a dark and airless place after 1872. Archeological data on this addition were destroyed when the wing was demolished in the 1880s to make way for more elaborate improvements.

The 1880 project, completed in October 1881 (Tillotson 1977:53), affected the entire main building and greatly changed its exterior appearance. The origi-

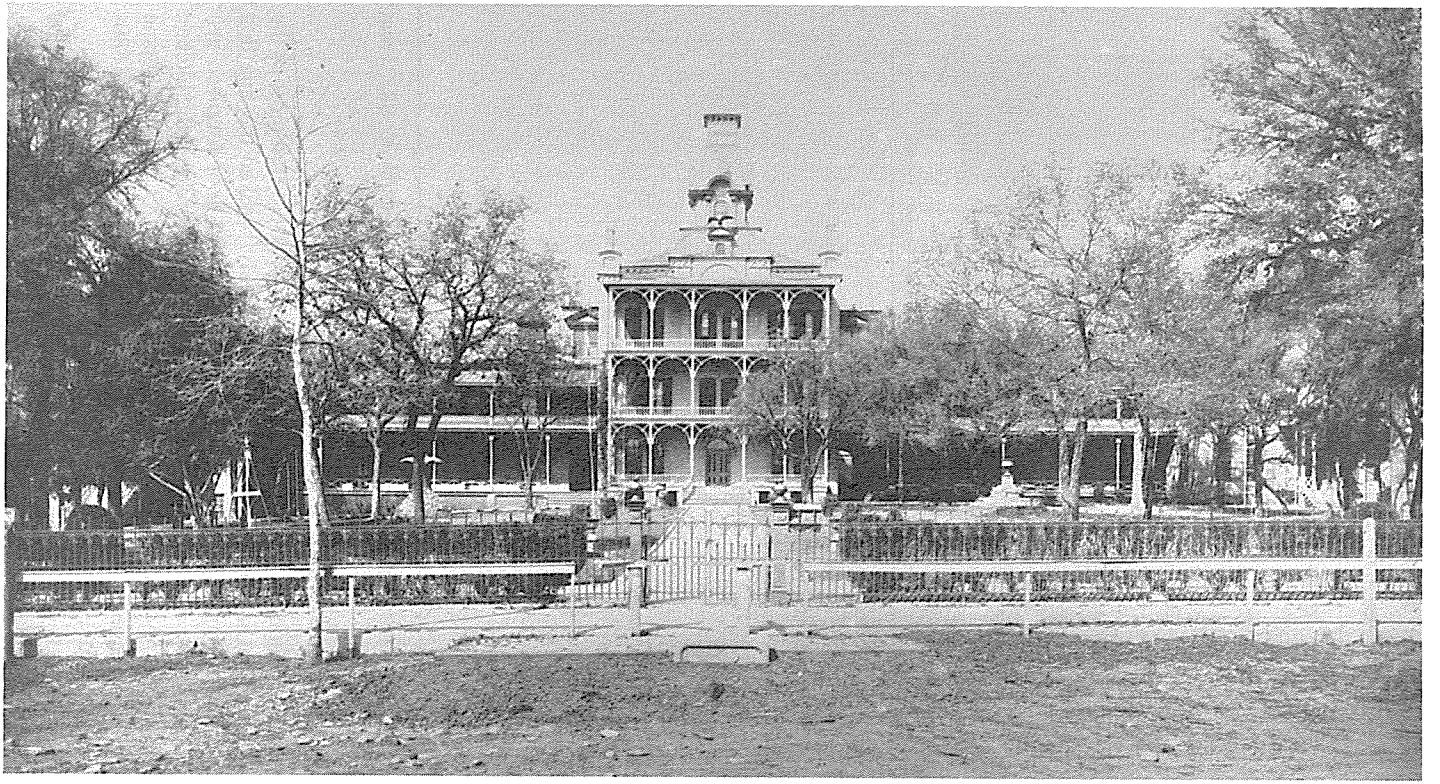

Figure 4. Photograph showing the Texas State Asylum for the Blind as it appeared at the turn of the century (probably sometime between 1905 and 1915). The architectural features of the original building (front door, fanlight, and first and second story windows) can be seen behind the iron balconies of the central part of the building. From the Austin History Center, Austin Public Library.

nal roof and cupola were removed, and a brick third floor was added. The east and west wings were extended (Figures 3 and 4) and given second floors; the north wing was razed and replaced with a larger structure.

Building continued at the site to provide for an ever-expanding student body. Whole complexes of classrooms, dormitories, and other facilities were built, and by the early part of the twentieth century the site had become a warren of courtyards, hallways, and connected buildings. Although they now appear to be a single structure, three of the high Victorian brick buildings that have been preserved and restored on the site—known for many years as Building H, now the Employment Center of the University of Texas—were built in 1888, 1891, and 1900.

When World War I began, the institution, which had been renamed in 1905 the Blind Institute and in 1915 the Blind School, had begun to move its operation from this site to its present location, a new and larger campus on 45th Street. The move was hastened when the original buildings of the Blind School were given to the newly founded School of Military Aviation (SMA) at The University of Texas in July 1917. Wholesale remodeling was undertaken to adapt the buildings to wartime military usage. The Trustees of the School complained that the orderly move to their new campus was hampered by the SMA's "tearing the buildings apart" (Tillotson 1977:171). During this era alphabetical designations were given to the buildings: the old main building became Building C, and the combination of three Victorian buildings became Building H. These designations persisted until the University Board of Regents in 1982 renamed Building C the Arno Nowotny Building.

After World War I, the buildings remained officially under control of the University, although their use between February 1919 and October 1922 is unclear (Tillotson 1977:189). In 1922 the legislature transferred the buildings to the State Lunatic Asylum as an annex called the Institution for the Senile for housing senile persons who had become wards of the State. This usage was almost as short lived as was the use of the site by the Central Texas State Fair, held there in 1922.

Several legal actions concerning the buildings were brought against the State Board of Control, and on July 1, 1925 the Institution for the Senile was finally closed, and all patients were transferred to the State Hospital in Wichita Falls. In anticipation of this move, the legislature in March 1925 had transferred all the buildings to The University of Texas, where they became known as the Little Campus. After some renovation, the Little Campus became a men's dormitory. Occupancy of the buildings has changed several times since 1925, but ownership has remained with the University.

Since restoration was completed, the Arno Nowotny Building (Building C) (Figure 5) has housed the University Visitors' Center, and Building H, the University admissions and employment offices. The exteriors of both buildings have been restored as nearly as possible to their original (1888–1900) appearance (Figure 6). The interiors have been modified to accommodate modern heating

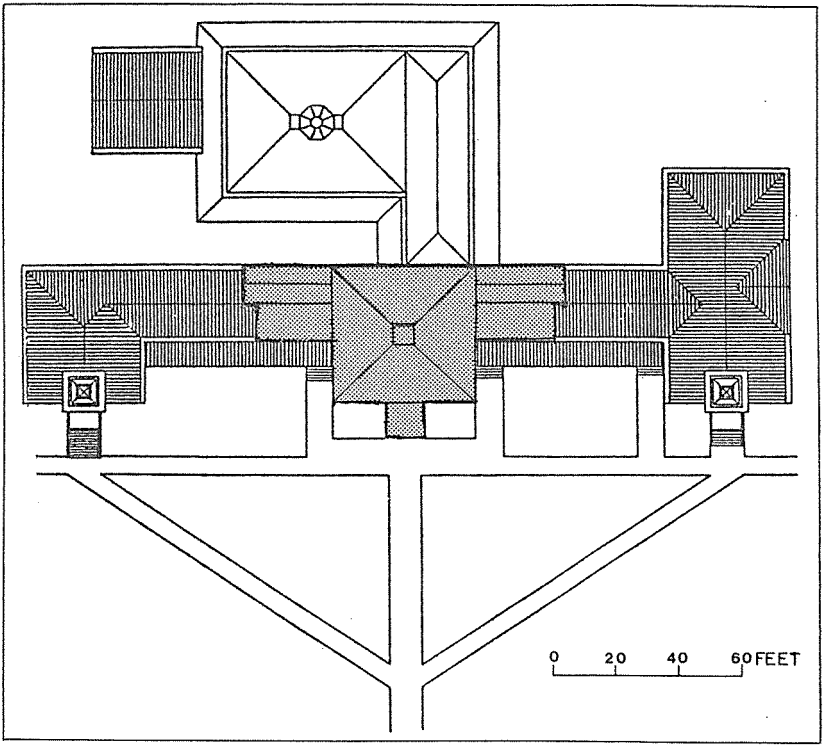

Figure 5. Plan of the main building at the Texas Asylum for the Blind with the Arno Nowotny Building, which is all that remains today, superimposed.

and cooling equipment as well as safety and fire-protection features not required when the buildings were erected. The interior of the Arno Nowotny Building has been restored to conform to the historic period compatible with its exterior design.

RESEARCH DESIGN

One of the conditions of the Antiquities Permit for restoration of the Nowotny Building virtually dictated the role of the archeologist in the project, requiring that "demolition should be monitored by the architect and a qualified historic archeologist. If historic fabric is uncovered then appropriate steps should be taken to investigate, incorporate, record, or protect as required."

Tillotson's (1977) excellent history of the site, the architect's plans, and the files of the Texas Antiquities Committee were studied to identify problems and areas of good archeological potential. Three questions were posed to be answered by excavation: (1) what was the size of the original east and west wings of the Nowotny Building, (2) could intact nineteenth-century cisterns be found, and

Figure 6. Photograph showing restored building at the Little Campus, University of Texas. Now named the Arno Nowotny Building. Photograph by Rosanne Henna, Austin.

(3) what could be discovered about a basement kitchen that had been located under the north side of the main block of the Nowotny Building (Figures 2, 3C).

PRELIMINARY INVESTIGATIONS

Excavation began at the Nowotny Building during the University's 1982 Christmas break, to avoid interference with the restoration work. The first project was to uncover whatever remnants could be found of the foundations for the east wing of the building, in order to determine its original (1859) size, for the original wings has been extensively expanded and remodeled in 1880 (Figure 5). The renovation architect's estimates of the size of the original wings were derived entirely from drawings and photographs.

East Wing

It took almost a week to clear and map the foundations, which were fortunately found intact. First, we explored with a steel-rod probe to find the outline of the foundation, in order to determine what areas should be cleared of soil and building debris. Then we removed the hard-packed clay from the remains of the walls with picks, shovels, and trowels. No power equipment was used. Once cleared, the courses of masonry that were uncovered were swept clean to facilitate accurate mapping and photographing (Figure 7). Much to the relief of all concerned, the foundations we uncovered proved the architect's estimates to be correct.

Cistern

Our second objective was to sample the contents of a large cistern that had been fortuitously uncovered when its concrete cover was dislodged during the clearing of demolition debris. The cistern was 17 feet deep and 10 feet in diameter, with a capacity of about 1100 cubic feet when filled to the 14-foot level. Location of the cistern 20 feet north of the original west wing of the building suggests that it was part of the original site rather than a later addition.

We sampled the contents of the cistern by quartering the deposit as if it were a pie and excavating the southwest quadrant, waterscreening the soil through quarter-inch mesh. Though we hoped for a significant artifact deposit, the result was disappointing. The complete inventory of artifacts from the cistern follows:

1	iron sash pulley	5	badly rusted nails
1	two-piece sash pulley cover	1	rodent skull
1	fragment of ornamental iron	1	black-on-gray historic ceramic sherd
23	clear glass window sherds	10	white ironstone ceramic sherds
1	brown/amber bottle sherd	1	fragment of white plastic
1	1978-D U.S. copper penny		

The plastic and the 1978 penny immediately destroyed our hope for an undisturbed nineteenth century deposit. After consultation with members of the

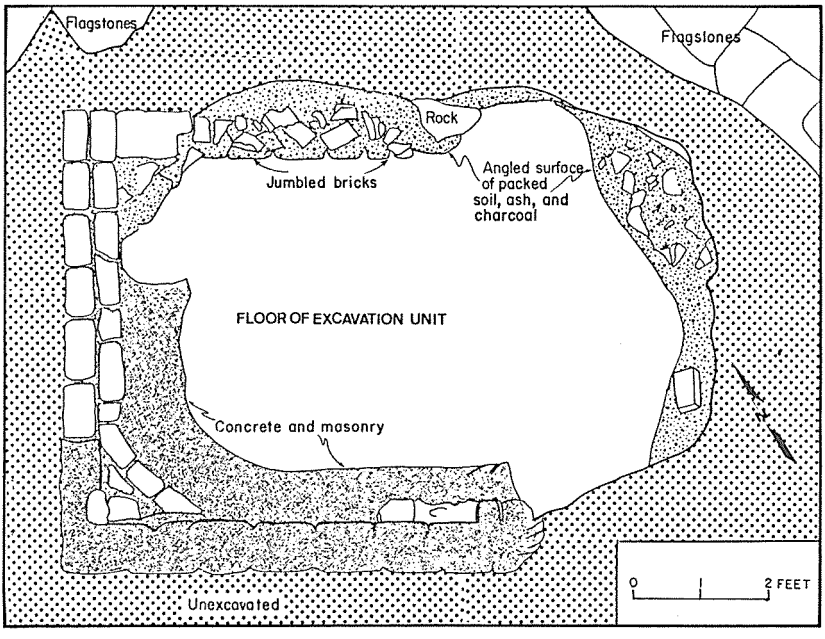

Figure 7. Plan of the excavation of the foundations of the former east wing of what is now the Nowotny Building, December 1982. Drawing by David G. Robinson.

Texas Antiquities Committee staff, further investigation of the cistern deposit was abandoned. The cover was replaced, and the cistern is preserved intact beneath the landscaped grounds.

THE KITCHEN

Testing

When the kitchen wall at the west end of the central part of the Nowotny Building was opened during demolition of the old added-on west wing (Figure 2), we gained access to the presumed basement kitchen and found the space partially filled with dirt and cultural debris.

A 1-by-1-meter test pit was dug in the northwest corner of the area to determine the depth and nature of the cultural fill. That and other test pits showed that the upper part of this fill contained caliche and ash, mixed throughout with mainly post-1920 building debris: fragments of electrical wire, discarded plumbing scraps and fixtures, nails, etc., but a sherd of a stoneware wine bottle led us to believe that at least the lower part of the fill had been in place since the late nineteenth century. At a depth of 7 feet 8 inches below the joists supporting the first floor we encountered what appeared to be an intact flagstone floor.

Preparation for Digging

Several delays prevented an early start on excavating the kitchen: the forest of piping and wiring had to be removed, but the structural engineer did not wish the fill removed until certain deteriorated sections of the below-grade stone foundation wall had been repaired. It was also desirable that we wait until the building contractor had excavated the areaway on the north side of the kitchen so we could open the original windows into the kitchen to allow both daylight to work by and access for our equipment.

The kitchen was 12 feet wide and slightly more than 44 feet long, and the fill varied in depth from 2 to 3 feet. Therefore, since the upper part of the fill contained mainly post-1920 building debris, we chose, with the concurrence of the Antiquities Committee staff, to remove the overburden with a small front-end loader. Only the final 6 inches of the fill covering the flagstone floor would be excavated by hand.

Surface Collecting

Some artifacts had been noted on the surface in a low crawl space that bordered the kitchen on the south. Two original access vents, each about 25 inches square, led from the kitchen into this area. Because of plans for duct work and other utilities, this space was to be excavated by the building contractor to a depth of 4 feet below the supporting timbers.

Before the construction workers started excavating this area, we collected all of the cultural material that lay on the surface. This crawl space evidently had been a favored place for disposal of broken dishes, bottles, and glassware. Sherds of white ironstone serving pieces had been thrown into the area from the kitchen, and a quantity of bones suggested that pets had been fed kitchen scraps and leftover meat here.

Excavation

Once the construction workers started to dig, they were asked to save all artifacts for the archeologists. Daily monitoring visits were made, and an archeologist screened every tenth wheelbarrow load of soil removed from the space. The fairly low rate of recovery from these sample loads suggested that the construction workers were indeed spotting most of the material and saving it for us.

We began the hand excavation of the final 6 inches of fill from the kitchen area along the west wall and worked toward the east. We did not use grid units because the artifacts could be plotted exactly from their locations relative to the walls. After the floor was exposed, a grid system of 2-foot intervals was laid out for use in photographic recording.

As we began uncovering the flagstone floor, the material turning up on our screen suggested that the room had not been a kitchen when the first layer of fill was deposited on the flagstones. Bits of anthracite coal, cinders, and badly rusted pipes and fittings of the type once used in steam heating systems began to appear. Most of these lay on or in a 1-inch layer of white caliche that covered the flagstones; the fill above the caliche was darker soil containing more debris and some ash.

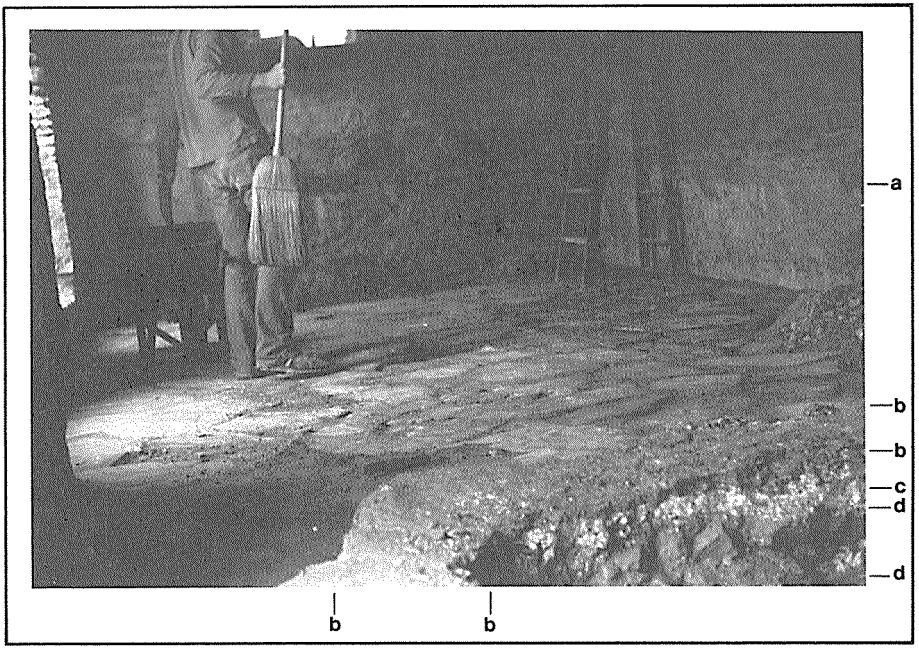

Figure 8. Photograph showing the east half of the kitchen during the final stages of excavation; a, upper limit of the overburden; b-b', top of the standing balk of fill left at the east end of Feature 1; c, the sealing layer of clean white caliche; d-d', the brick and coal-slag debris of the boilerhole fill.

Twelve feet from the west end of the kitchen we encountered a break in the flagstone pavement and a distinct line of brick masonry, which we designated Feature 1 (Figure 8). Investigation of his feature revealed the foundation of a large, about 8-by-10-foot coal-fired boiler. Feature 1 was about 1 foot below the level of the flagstone floor, and the sides had been lined with brick. A section of the flagstone floor about 12 feet square had been removed to permit the installation of the boiler in this centrally located pit dug into the undisturbed caliche beneath the site. The fill of Feature 1 was rich in coal, slag, lumps of cinders, and fire-blackened bricks. Here too we encountered many iron pipe fittings.

Oddly, the plaster on the walls below the fill line was quite well preserved, but no plaster remained on the exposed walls; even the limestone blocks were badly eroded by spalling above the upper surface of the fill.

Stratigraphy

The dark soil of the rather uniform overburden in the kitchen gave way to the distinct layer of white caliche that lay on the flagstones (Figure 8). Below the flagstone floor was the dark fill with burned brick of Feature 1, which was excavated into bedrock caliche.

Chronological Interpretation

We know from Mrs. Custer's account (1971:230) that the kitchen was functioning as such in 1865 and that the building was still heated by wood-burning fireplaces at that time (1971:238–239). We also know that after the central boiler plant for the Asylum was completed in 1888, the separate furnace (Feature 1) would have been unnecessary. So the room ceased to be used as a kitchen at some time during the 23 years between 1865 and 1888, when the separate furnace was installed.

Because we found anthracite coal in Feature 1, we can infer that the furnace was designed to use this fuel and that it was installed after 1872 when the railroad came to Austin. (Hauling hard coal by ox wagon would not have been economic.) The records show that a planned expansion of the building was delayed for two years in anticipation of a fall in lumber prices expected when the railroad arrived (Tillotson 1977:35). This expansion, which was the two-story stone wing built in 1872 onto the north side of the central part of the building (Figure 2), blocked the areaway that let light and air into the kitchen.

It seems apparent from these facts that the kitchen was not used as such after the summer of 1872, and that the flagstone floor was pierced at about that time for installation of the furnace. It should be noted that subsequent construction projects further damaged the floor, but when it was fully exposed, more than 50 percent was intact.

A Preservation Problem

Although a substantial part of the original kitchen floor was intact, plans for the restoration called for a concrete floor with drains and supports for heavy air conditioning equipment at a level 6 inches below the flagstone floor. The cost and delay of redesigning these installations would be prohibitive, but we were contractually obligated to preserve all historic fabric.

In May 1983, University of Texas officials met with the staff of the Texas Antiquities Committee to decide the disposition of the flagstone floor. They decided:

1. That in-place preservation of the floor over concrete and under air-conditioning equipment was not justified in a room to which the public would not have access.
2. That the flagstones should be salvaged and reused, with appropriate interpretive markers, in a patio outside the building.
3. That a systematic photographic record should be made of the floor as it was found and before the flagstones were removed.

Photographic Techniques

Because the joists supporting the first floor were only 7 feet 8 inches from the floor, that was our maximum camera distance. At this distance a 120-mm-format reflex camera framed an area about 36 by 40 inches in sharp focus. We therefore set up a series of tracks at 2-foot intervals down the length of the room.

Each track was simply two wires that were sufficiently far apart that they supported the body of the camera but allowed the lens to protrude down between them. By exposing a frame every 3 feet along these tracks, we were able to construct a complete photomosaic of the floor surface.

We directed a hand-held floodlight at a low angle to create sharp shadows between the individual stones and to augment the sometimes weak natural light in the kitchen. A light-meter reading was taken before every fifth exposure, and shutter speeds were adjusted accordingly. This photomapping operation consumed the efforts of three persons for most of a day, but was quite successful. Although some of the film was not ideally exposed, the images obtained were of sufficiently good quality that we were able to record the exact position of every stone in the floor.

A string grid laid out at 2-foot intervals—each intersection was labeled with a small tag—was the primary ground reference for the photomosaic. One of the lessons we learned while cataloging the photographs was that larger tags with numbers perhaps an inch high or larger would have been better than our discreet little tags with numbers so small that on contact prints they could hardly be read even with a microscope.

THE ARTIFACTS

The most interesting finds made by the construction workers were a reasonably well preserved fragment of a man's pleated-front shirt that was completely buried in the loose, dry soil, and an effigy tobacco pipe (Figure 17, a).

Since the provenience of some of the artifacts from the site is rather vague, we will discuss in detail only the contents of the kitchen and the crawl space that bordered it on the south, where the excavation was carefully controlled. This artifact assemblage does not so much lend further proof to the dates of the use of the kitchen as it provides, from a limited context, a series of chronological markers that can be used in dating other Reconstruction-era sites in Texas. The true value of Custer's kitchen lies in the fact that it was used so briefly; the space served as a kitchen from 1859 to 1872, a total of only 13 years of the Civil War and Reconstruction period. Some of the domestic artifacts from this kitchen that are described here may become additions to the list of diagnostic artifacts for this period.

Stoneware

Several sherds of a stoneware wine bottle (Figure 9) with part of the seal of the Duchy of Nassau, which ceased to exist as a political entity in 1871, were found in the lower part of the kitchen fill.

White Ironside China

Several patterns and makers were represented in the assemblage of white ironstone dinnerware fragments. A passage from Elizabeth Custer's writing helps to explain the surprising variety of patterns.

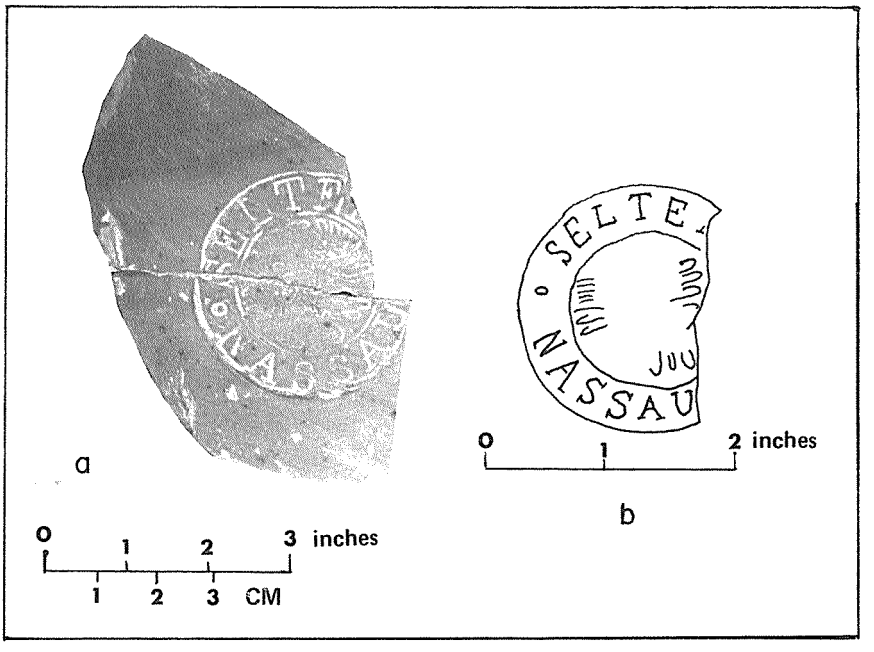

Figure 9. Photograph of sherds from stoneware wine bottle, a; drawing of impressed seal from shoulder of bottle, b.

> Occasionally we attempted a dinner, and, as we wanted to invite our own ladies as well as some from the regular regiments, the table was a subject of study; for when twenty came the dishes gave out. The staff dined early so we could have theirs, and the southern woman who occupied two rooms in the building lent everything she had [Custer 1971:230]. . . . and that on that table were the united contents of all our mess chests, and there were not [more] saucers or dessert plates nearer than town. We were aware that our stay in the south was limited, and made no effort to keep enough crockery for dinners of twenty [Custer 1971:232].

A large baker or serving dish (Figure 10) was made by T&R Boote Co., of Burslem, Staffordshire, England. The registry mark indicates that the pattern (octagon shape) was registered for a three-year period beginning September 10, 1851 (Wetherbee 1980:27, 49).

A 10-inch dinner plate (Figure 11) was made by Livesley and Powell & Co., of Hanley, Staffordshire, England. The shape was registered in 1855. The company was in business from 1851 to 1866 (Wetherbee 1980:28).

Another 10-inch dinner plate (Figure 12) was made by T. J. and J. Mayer, of Longport, Staffordshire, England. This firm operated from 1855 to 1858 (Wetherbee 1980:29). The shape seems to be a variant of the Memnon pattern registered by John Meir and Co. in 1857 (Wetherbee 1980:65).

A plain-bordered white ironstone 10-inch dinner plate (Figure 13) was made

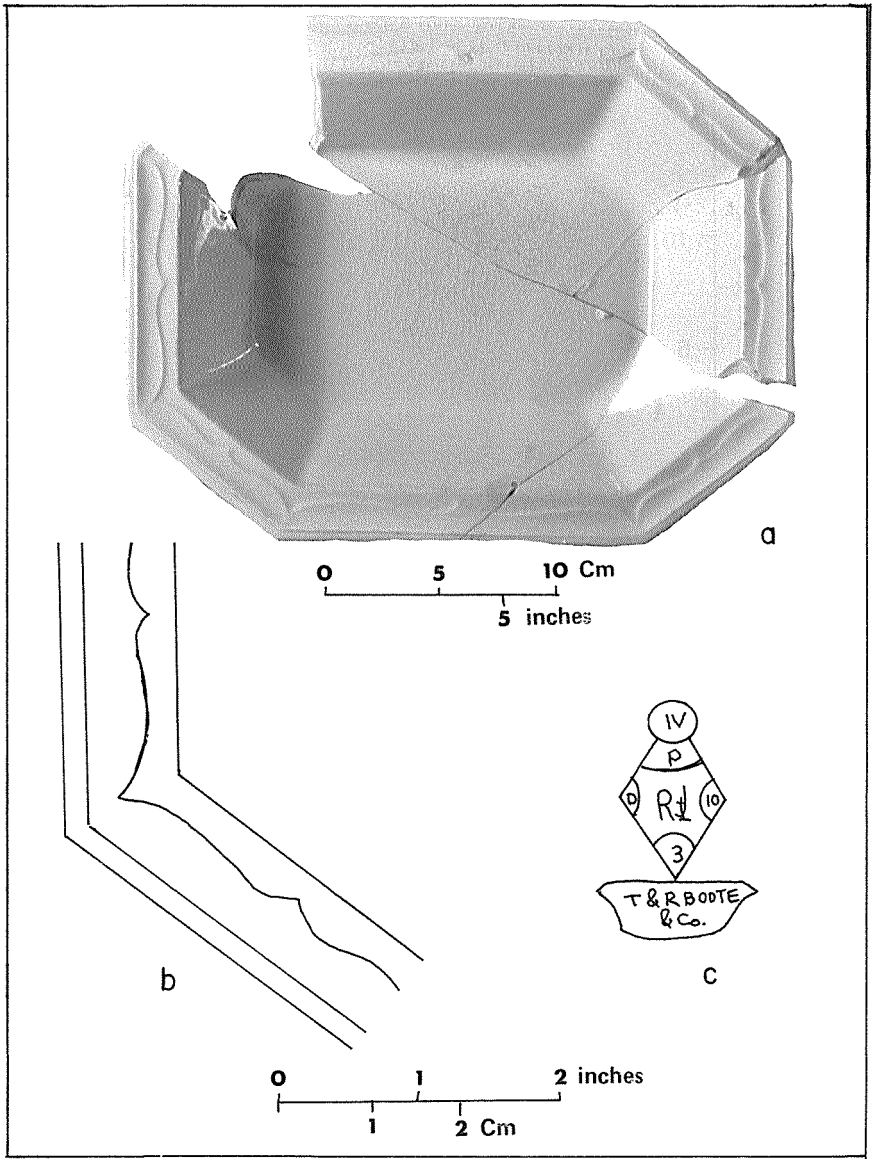

Figure 10. Large reconstructed baker or serving dish made by T&R Boote Co., of Burslem, Staffordshire, England; a, photograph; b, enlargement of part of border design; c, drawing of impressed registry mark.

by James Edwards, of Burslem, Staffordshire, England about 1850. The firm went by this name from 1841 to 1851 and used a registry mark like the one on this plate (Figure 13, c) on some later pieces (Wetherbee 1980:28, 40). The term felspar opaque china, rather than ironstone, is used on this mark.

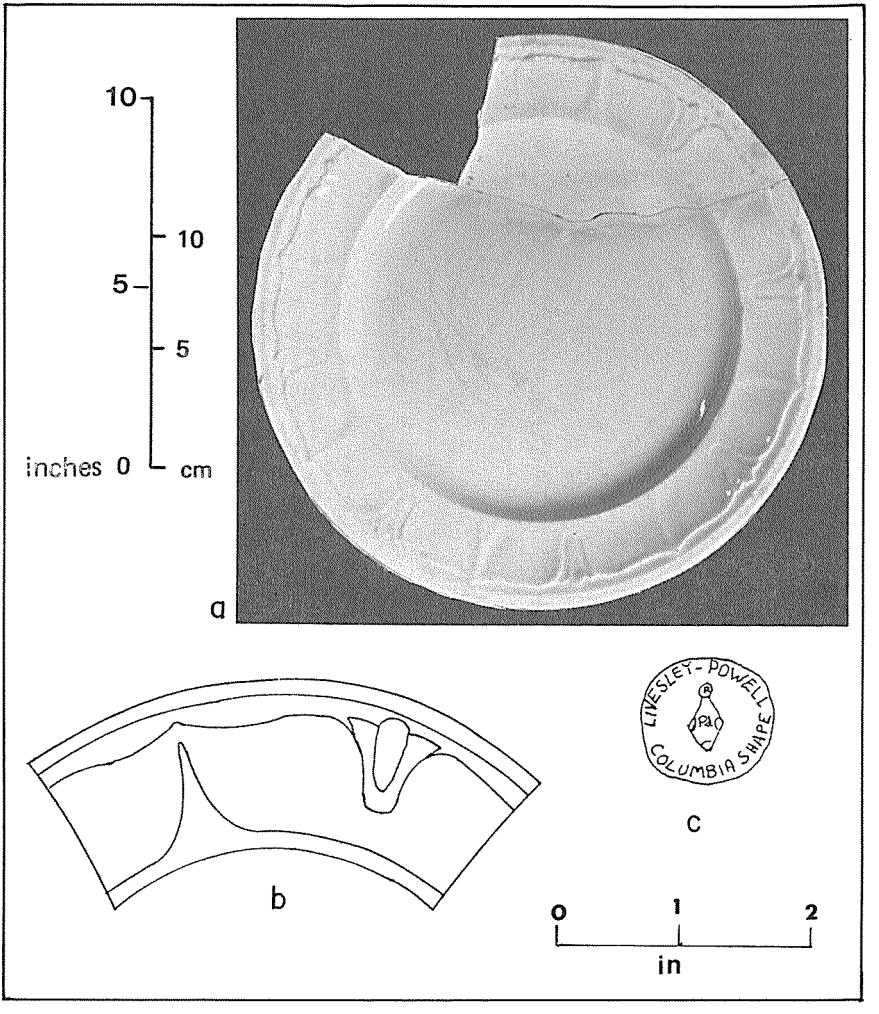

Figure 11. Ten-inch dinner plate made by Livesley and Powell & Co., of Hanley, Staffordshire, England; a, photograph; b, enlargement of part of border design; c, drawing of impressed registry mark.

Potter's marks (Figure 14, a, b) show that a 10-inch dinner plate of unidentified pattern was made by John Maddock, of Burslem, Staffordshire, England, who operated from 1842 to 1855 (Wetherbee 1980:28). The potter's mark (Figure 14, c) from a nearly complete plain white ironstone 5.5-inch saucer shows that it was made by James Edwards, the same potter who made the plain-bordered dinner plate noted above (Figure 13). The marks differ, but the two pieces appear to be from the same set, made between 1842 and 1851.

The printed maker's mark (Figure 15) on a large sherd from a 10-inch dinner plate has the same variant of the Memnon shape (as an edge design) as the plate

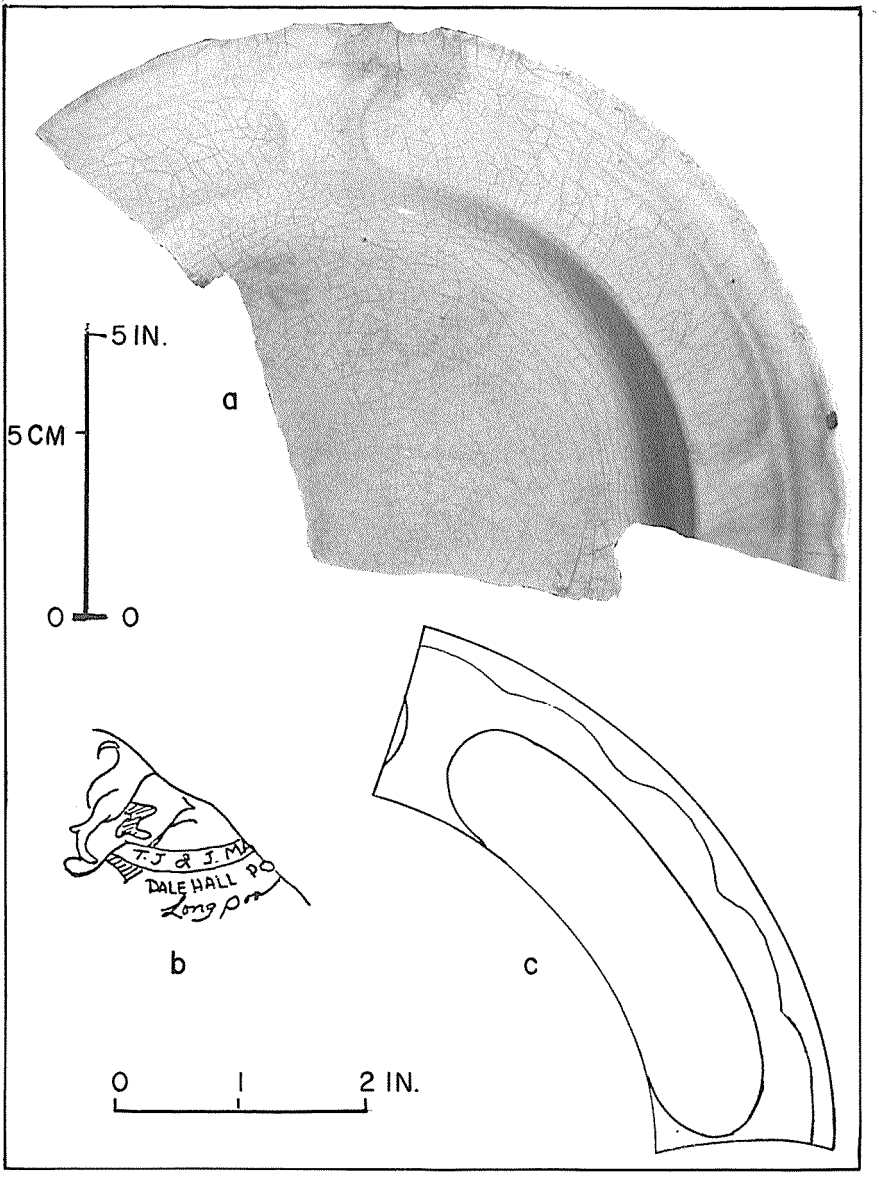

Figure 12. Fragment of a 10-inch dinner plate made by T. J. and J. Mayer, of Longport, Staffordshire, England; a, photograph; b, drawing of part of the printed registry mark; c, enlargement of part of the border design.

shown in Figure 12, but although this piece is apparently of U.S. origin, the other is from Staffordshire. The style of the edge decoration is 1850s.

A heavy white ironstone dinner plate (Figure 16) bears the mark of the Prospect Hill Pottery Works, of Trenton, New Jersey, which, according to some au-

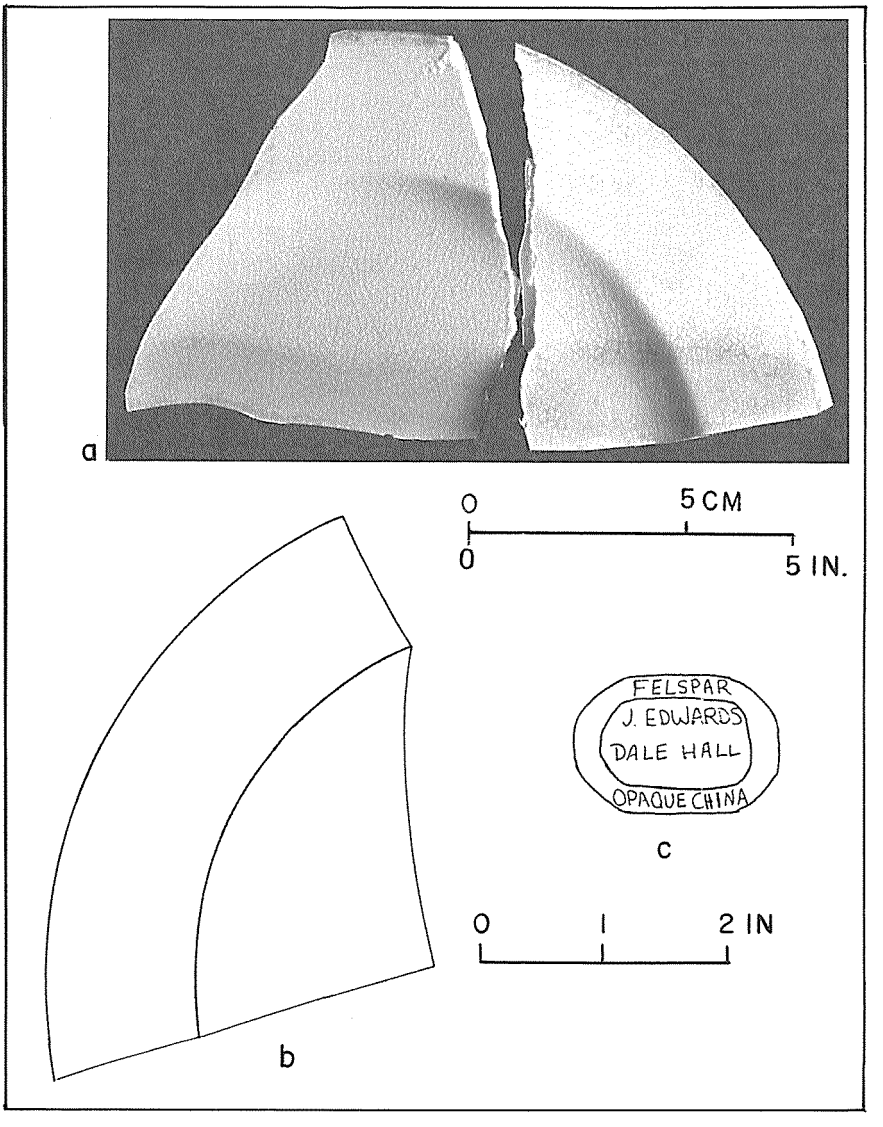

Figure 13. Part of a plain-bordered white ironstone 10-inch dinner plate made by James Edwards, of Burslem, Staffordshire, England about 1850; a, photograph; b, enlargement of border; c, drawing of registry mark, which is impressed under the glaze.

thorities, was founded in 1880 (Kovel and Kovel 1953:34, 154, 156, 241; Barber 1976:305). However, Lehner (1980:1224) mentions that Dale and Davis, the partnership that first operated the Prospect Hill Pottery, exhibited products in Philadelphia in 1876. Because of the distinctly 1850–1860 style of the edge decoration (Figure 16, c), it appears that they may have been in business earlier. If that is not true, the piece is intrusive.

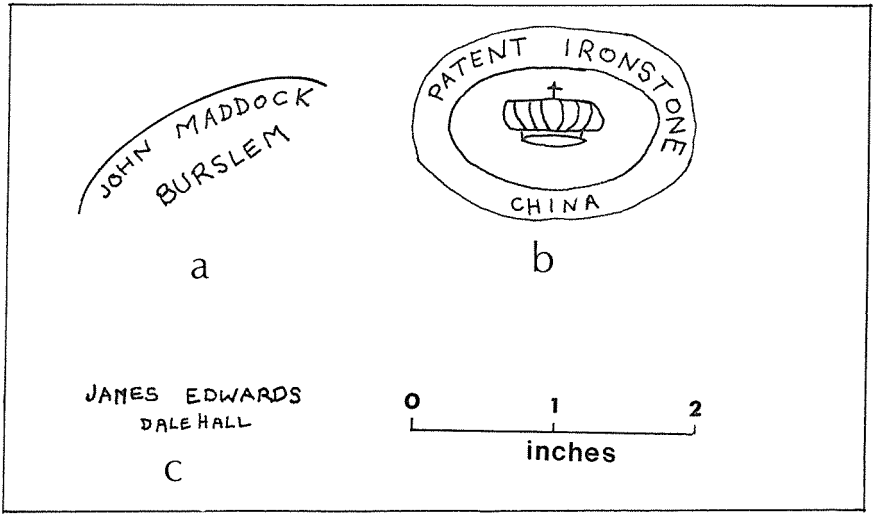

Figure 14. Drawings of potters' marks: a and b, from a 10-inch dinner plate of unidentified pattern; c, drawing of trademark from a nearly complete plain white ironstone 5.5-inch saucer.

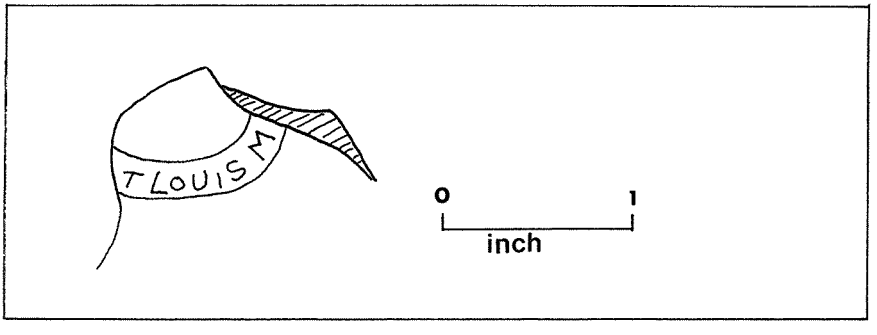

Figure 15. Drawing of fragment of printed maker's mark on a large sherd from a 10-inch dinner plate. The mark probably read St. Louis, Missouri.

The variety of patterns and marks suggests that some of the assemblage came from mess chests of the Custer party. The decorations typical of British-made white ironstone during the 1860s and 1870s were generally elaborate, with ears of corn, sheaves of wheat, and vine leaves arranged in symmetrical decorative profusion. But the plainer, more formal designs were characteristic of the white earthenware production of the Staffordshire potteries in the late 1840s and the 1850s. The one piece of pottery that may have been made at the Prospect Hill Pottery works (Figure 16) was perhaps intrusive in the fill, but its heavy symmetrical edge patterns were already 20 years out of fashion in 1880. It seems more likely that the Prospect Hill Pottery was in operation as early as the mid-1860s and that this particular item made its way south, possibly in a Union officer's mess chest.

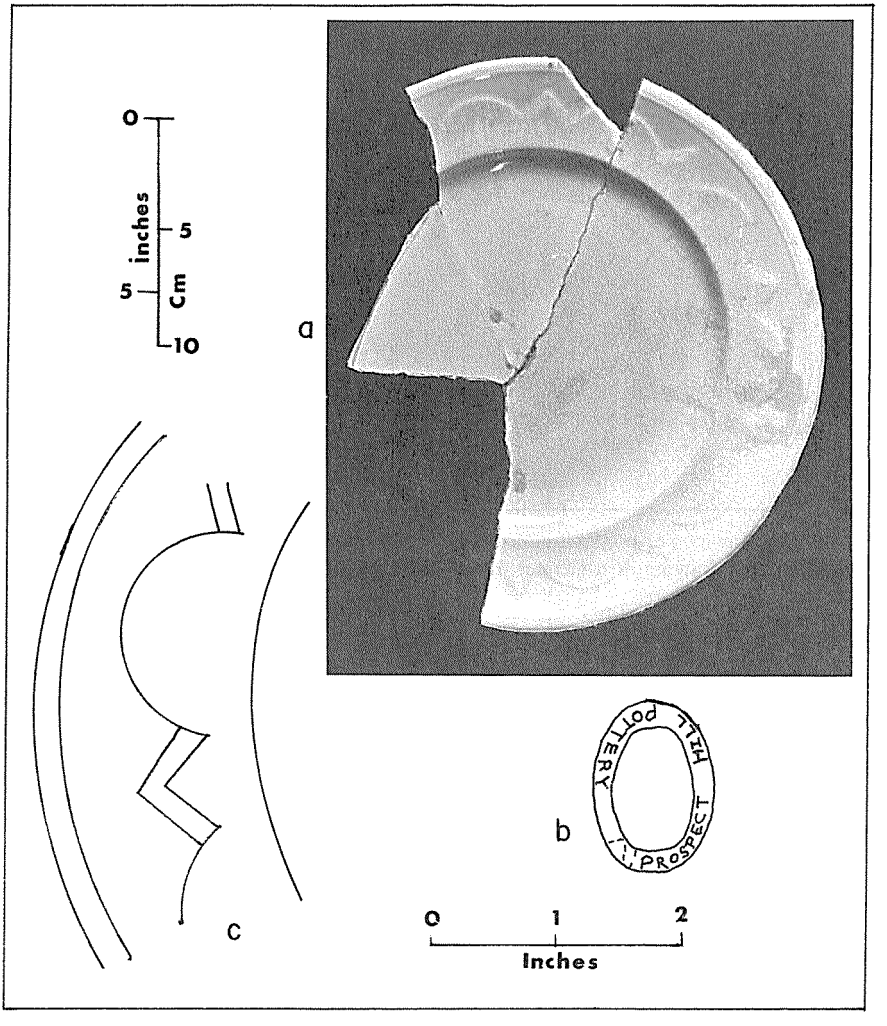

Figure 16. Part of a heavy white ironstone 10-inch dinner plate (three large sherds); a, photograph; b, drawing of maker's mark; c, enlargement of edge decoration.

Ceramic Tobacco Pipes

Three ceramic tobacco pipes were recovered. One is a slightly damaged effigy (Figure 17, a) of President Franklin Pierce, who served from 1853 to 1857, and because the title President appears on the molded label, the pipe probably was made after 1853. This pipe, which was found in the crawl space adjacent to the kitchen, was glazed with a glossy red-orange (terra cotta) slip that has been noted on other effigy pipes (Pfeiffer 1981).

Another complete pipe (Figure 17, b) and a stem fragment (Figure 17, c) are unglazed yellowish bisque-fired. Both were found in the caliche fill on the

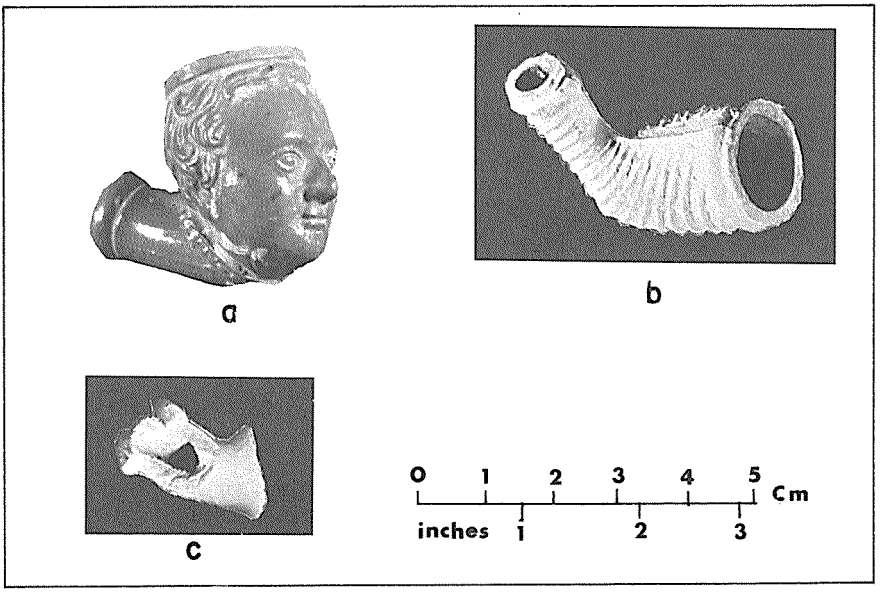

Figure 17. Photographs of three clay tobacco pipes. Effigy pipe, a: complete pipe, b; stem fragment, c.

kitchen floor, but the stem fragment was found during screening and came from the far east end of the kitchen.

These pipes may be evidence of a problem that plagued the administration of the Blind School. The trustees' report for 1874 noted that "addiction to tobacco" was a problem among the boys and that "this habit, so injurious to all who have not attained maturity, is especially pernicious, and unclean in the case of the blind . . . no evil habit is . . . more difficult to reform or eradicate. . . ." (quoted by Tillotson 1977:36). We might speculate that the boiler room was a favorite haunt of those who wished to practice the evil habit.

Glass Bottles

Certain diagnostic features of the glass bottles may be useful for dating other Civil War and Reconstruction-era sites in Texas. A *pontil scar* is a circular glass ring on the base of a hand-blown bottle. After a bottle is blown, it is gripped with a pincers or pliers while being cut at the neck to separate it from the blowpipe. The blowpipe, with the tubular remnant of neck glass still adhering to its tip, then is stuck against the bottle's base, and the blowpipe is held while the neck is finished. Rather than using the blowpipe with the remnant tubular piece of glass, a simple iron rod (pontil), with a glob of hot glass on its tip, can be pushed against the bottle base until it adheres, and the pontil supports the bottle while it is being finished. After the finish (i.e., the mouth) is applied, the bottle is gripped with the pincers while the piece of glass between the blowpipe (or pontil)

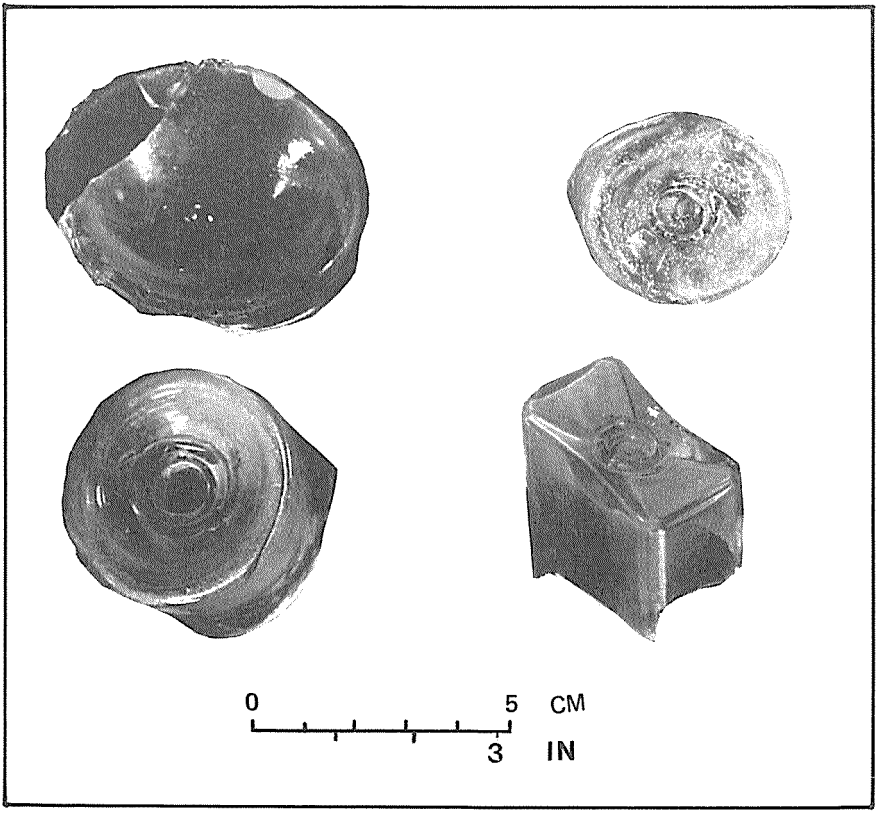

Figure 18. Photographs of bases of several bottles recovered from the crawl space, showing rough pontil scars. All of these bottles have a faint aquamarine tint.

and the bottle base is severed (Blake and Colne 1880:358–359, 384). The resultant scar, a raised circle of tubular glass (or a simple spot, from the glob on the pontil's tip) is the pontil scar characteristic of hand-made mouth-blown bottles such as made in the United States before 1857.

An iron rod pontil can be pushed against the bottle base until it adheres temporarily. After the bottle finish is applied, the rod is detached by a sharp blow on the pontil rod. The resultant circular indention, called a bare-iron pontil scar (Baugher-Perlin 1982), is seen on some bottles found at Texas sites of the Civil War era (see Figure 18).

The *snap case* was being used in the United States by about 1857 (Encyclopaedia Britannica 1959). By 1878 its use had nearly supplanted the method—described above—that produced pontil scars (Blake and Colne 1880:358–359). The snap-case is a pliers with curved jaws that grips the bottle when the blowpipe is detached and then holds the bottle as its finish is applied.

The exteriors of bottles blown into iron molds that are too hot sometimes appear as if they have been whittle marked or rough hammered. The use of whole

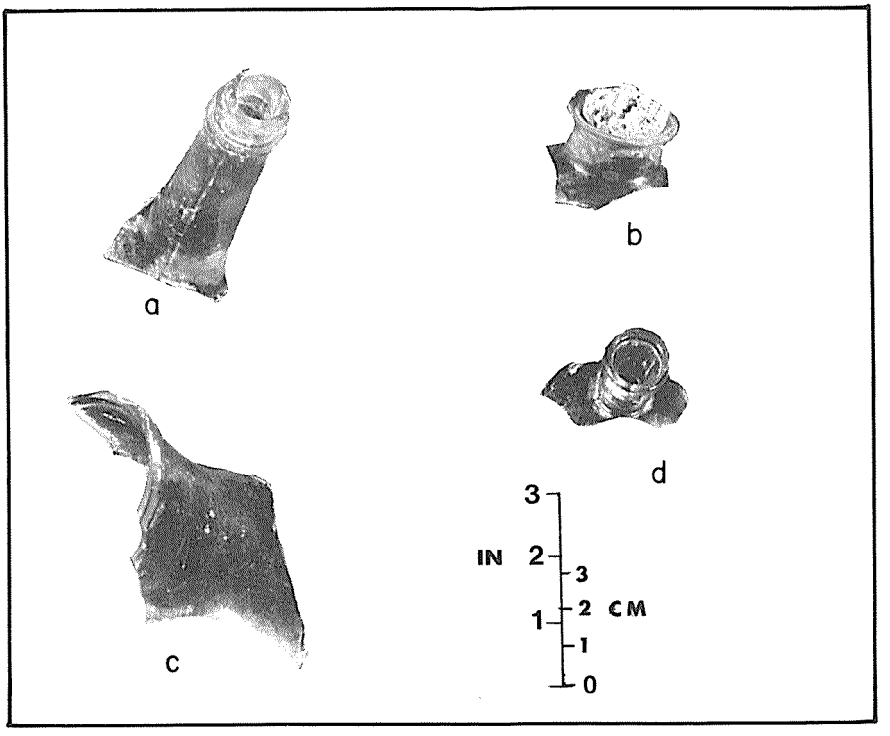

Figure 19. Photographs of applied bottle necks from the crawl space behind the kitchen. All but b have the rough-textured surface, and all but d have faint aquamarine tint. The applied lip on specimen a was put on with a lipping tool and may be from a free-blown bottle. Specimens c and d apparently have hand-finished lips.

iron molds was common in United States glass manufacturing by 1878; wooden molds (water-soaked to prevent burning) were still preferred by many European manufacturers because a smoother exterior finish could be obtained (Blake and Colne 1880:358–359, 366). The use of iron molds allows the imprinting of a variety of symbols on the sides and bases of bottles.

Minerals or elements, including manganese, have been used since ancient times to make new glass appear clear or to tint the glass certain colors (Brill 1963). By the 1870s it was common knowledge among glass manufacturers that glass containing manganese turned purple with exposure to sunlight (Blake and Colne 1880:317), but the use of manganese to make clear glass persisted until World War I, when German-controlled manganese supplies were not readily available to United States manufacturers.

It can be assumed that bottles of standardized shapes and neck finishes and with mold seams and/or symbols on the bases are post-Civil War and usually of United States manufacture. Bottles with pontil scars, whittle marks, uneven side seams, varying thickness, irregular (hand-finished) mouths, and without subtle horizontal striations below the necks (often a sign that they were spun in the iron molds in order to obliterate the side seams) *may be* of pre-Civil War manufac-

ture. Applied necks (Figure 19) made without benefit of lipping tools are seen on most bottles made before about 1870.

Other Artifacts

The complete inventory of recovered artifacts is not given here because it would not be of general interest. Most are in the permanent collection of the Texas Archeological Research Laboratory in Austin and are available for examination. Some specimens, such as plumbing fittings and pieces of pipe, have been sketched, inventoried, and discarded. Badly rusted nails were counted and discarded, as were sherds of window glass, fragments of furnace slag, and lumps of coal.

SUMMARY AND CONCLUSIONS

The investigations at the Arno Nowotny Building (41TV611) were of the type that actively support and aid restoration projects. Our aims were not to illuminate the lifeways of nineteenth-century military men or blind children, but to establish a few facts about a specific building. We were able to determine that the architect's estimates from photographs of the original sizes of the east and west wings were accurate, we found the flagstone floor of the original kitchen and recorded it before it was removed and before the flagstones began their new life as a patio, and we evaluated the deposit at the bottom of the cistern.

The artifact assemblage was from the former cellar kitchen—which, according to documentary evidence, was used between 1859 and 1872—and from the directly adjacent crawl space.

White ironstone sherds like the ones found here are common at many Texas sites of the last half of the nineteenth century, but these specimens are especially well dated archeologically because of the unusually discrete temporal context. In addition, research into the makers' marks and patterns of edge decoration has shown them to be consistent with that context. So this artifact sample is presented not as support for dating the deposits excavated from the crawl space and kitchen, but as a catalog of diagnostic types that may be useful for future reference. For this reason, several artifacts that are interesting, but of types not commonly encountered (such as the fragment of a man's pleated-front shirt—noted earlier—and a collection of pre-Braille raised letters), have not been discussed or illustrated.

ACKNOWLEDGEMENTS

The restoration of the Little Campus was authorized under a permit issued by the Texas Antiquities Committee to The University of Texas at Austin.

The writer thanks all the people who participated in the excavations at Little Campus. These include field workers Kevin Jolly, Don Lloyd, David Robinson, Leland Bement, Bruce Nightengale, and Deborah Smith. I also extend my appreciation to Harry S. Hansson, the University's on-site construction inspector, for his cooperation throughout the project.

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BIOGRAPHICAL SKETCH

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A Historic Indian Site in Wharton County, Texas

Joe D. Hudgins

ABSTRACT

Late Prehistoric and Historic Indian cultural materials were found by the writer in 1969 at the Shanklin site in Wharton County, Texas. This paper describes the artifacts and faunal remains that were collected from the plowed surface of the site.

INTRODUCTION

The Shanklin site (41WH8) is on the north bank of Peach Creek, a tributary of the Colorado River, about 5 km (3 miles) west-southwest of Hungerford, Wharton County, Texas (Figure 1). The creek divides the prairie region to the north from the heavily timbered Colorado River valley to the south. Before it was cleared and cultivated, the site area was lightly timbered with oak and elm trees.

Cultivation—mainly corn and milo in the past 10 years—has disturbed the surface, resulting in furrows 16 to 18 cm deep. All of the artifacts and faunal material was collected from the surface of an area about 35 by 50 meters in the cultivated field.

Indian History of Wharton County

The earliest recorded historic aborigines in Wharton County were the Karankawa-affiliated Coco Indians (Campbell 1976:181). They were first encountered by Cabeza de Vaca in the 1530s and later by Frenchmen of La Salle's expedition in the 1680s. The Coco Indians were most frequently associated with the lower Colorado River in an area now covered by Colorado, Wharton, and Matagorda Counties.

The most recent sighting of Indians in the site area was in the early 1870s, according to J. D. Hudgins, of Hungerford (Hudgins 1969). He recalled a small group of Indians who visited his ranch during the summer and stayed for a few days begging food. This band of Indians was known by the local inhabitants as *fish-eaters,* because they lived on the creeks and rivers, depending for food almost entirely on fish and shellfish.

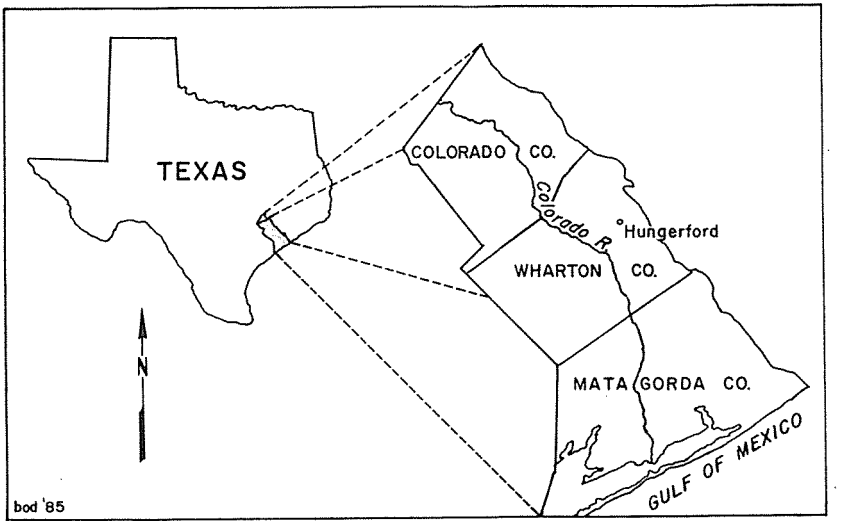

Figure 1. Map showing the location of Wharton, Colorado, and Matagorda Counties.

LITHIC ARTIFACTS

Utilized Flakes

In all, 1,260 flint flakes were recovered. Most are 5 to 6 mm long; six are very small flakes recovered by screening a random sample from the furrow through eighth-inch hardware cloth.

Analysis of all of the flakes revealed that 70 percent are tertiary flakes (flakes from within cores, with no remnants of cortex), 25 percent are secondary flakes (flakes with some cortex), and 5 percent are primary flakes (flakes with cortex covering one side or most of one side).

Cores

Ten flint cores (four are shown in Figure 2) were collected. Eight had been worked bifacially, and one (Figure 2, a) is a chopperlike implement.

Bifaces

Other lithic artifacts from the site include 10 large bifaces (Figure 3). They are 7 to 10 cm long and 4 to 5 cm wide and are either oval or leaf shaped. These bifaces were found only in the southwestern and northeastern areas of the site.

End Scrapers

There are 150 unifacial end scrapers, varying from 3 to 7 cm in length and 2 to 3.5 cm in width (Figure 4). Only about 15 percent have remnant cortex. Most of the scrapers have one end worked into a rounded or humped shape. All were recovered from the southwestern and northeastern areas of the site.

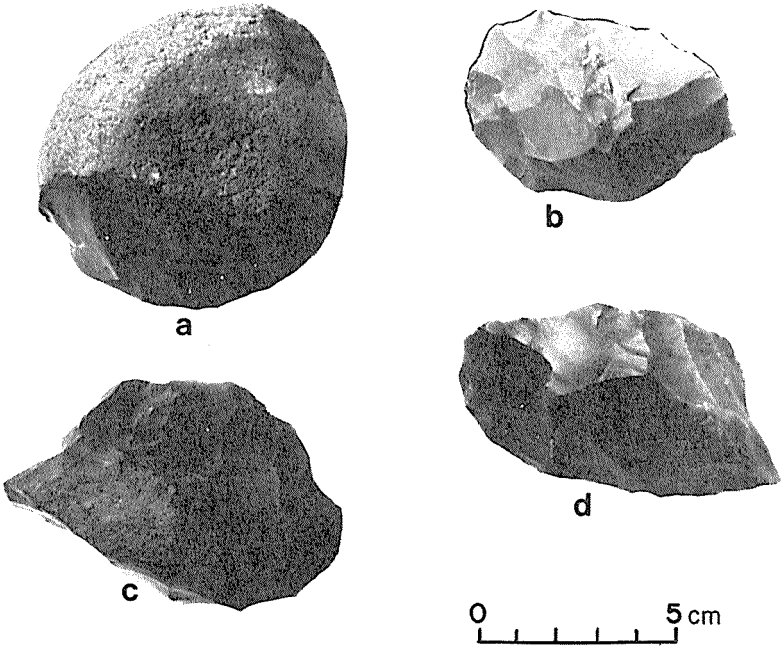

Figure 2. Photograph, four flint cores from the Shanklin site.

Drills and Gravers

Twenty-three flint drills and four gravers were recovered (Figure 5). The drills, 2.5 to 5 cm long, have unifacial base and bifacial stems; the gravers, 2 to 4 cm long, are all unifacial.

Arrowpoints

The collection includes 110 arrowpoints and 7 larger projectile points. The arrowpoints are Fresno, Guerrero, Cuney, and Bulbar Stemmed types (Hester 1980:104).

Fresno Points (Figure 6)

Thirty Fresno points were found, 17 bifacial and 13 unifacial. They are triangular with flat bases and range in length between 2 and 4 cm.

Guerrero Points (Figure 7)

Thirty-five Guerrero points were recovered, 21 bifacial and 14 unifacial. Guerrero points are sometimes triangular, but they have concave bases. Guerrero points have been described as Historic; specimens have been found at Spanish missions in Coahuila and Texas (Hester 1980:106) and at Spanish Colonial missions in San Antonio (Fox 1979:25–26).

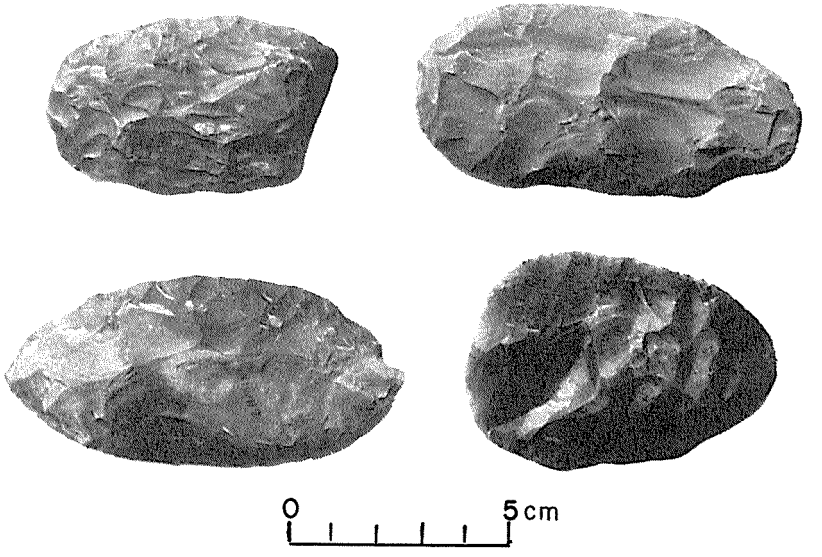

Figure 3. Photograph, four flint bifaces from the Shanklin site.

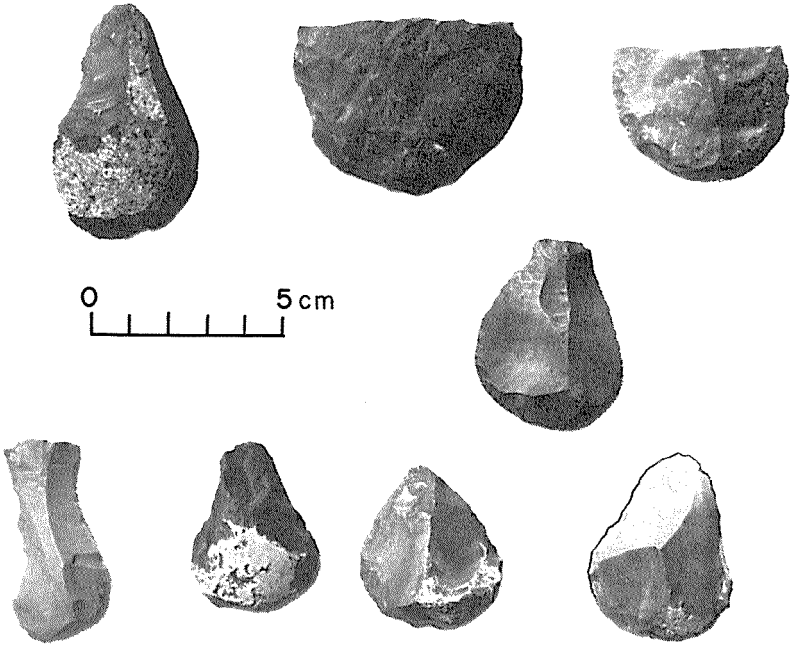

Figure 4. Photograph, end scrapers from the Shanklin site.

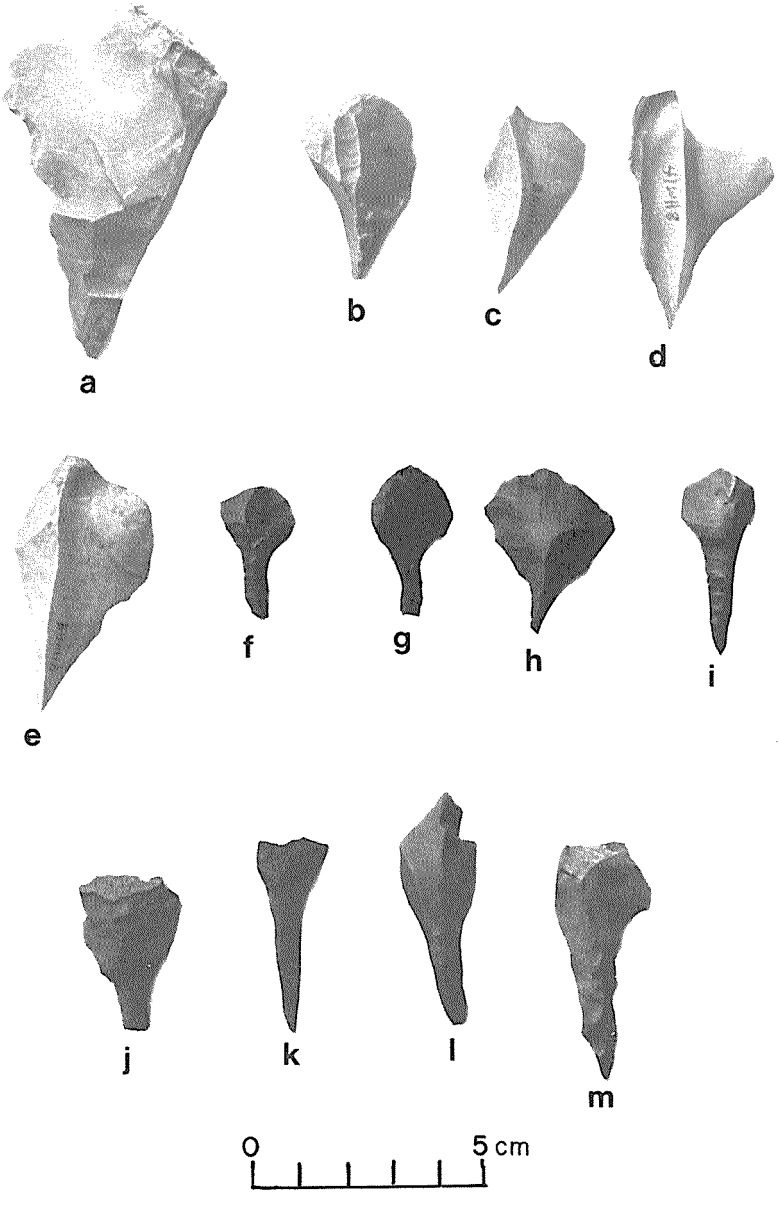

Figure 5. Photograph, gravers (a-e) and drills (f-m) from the Shanklin site.

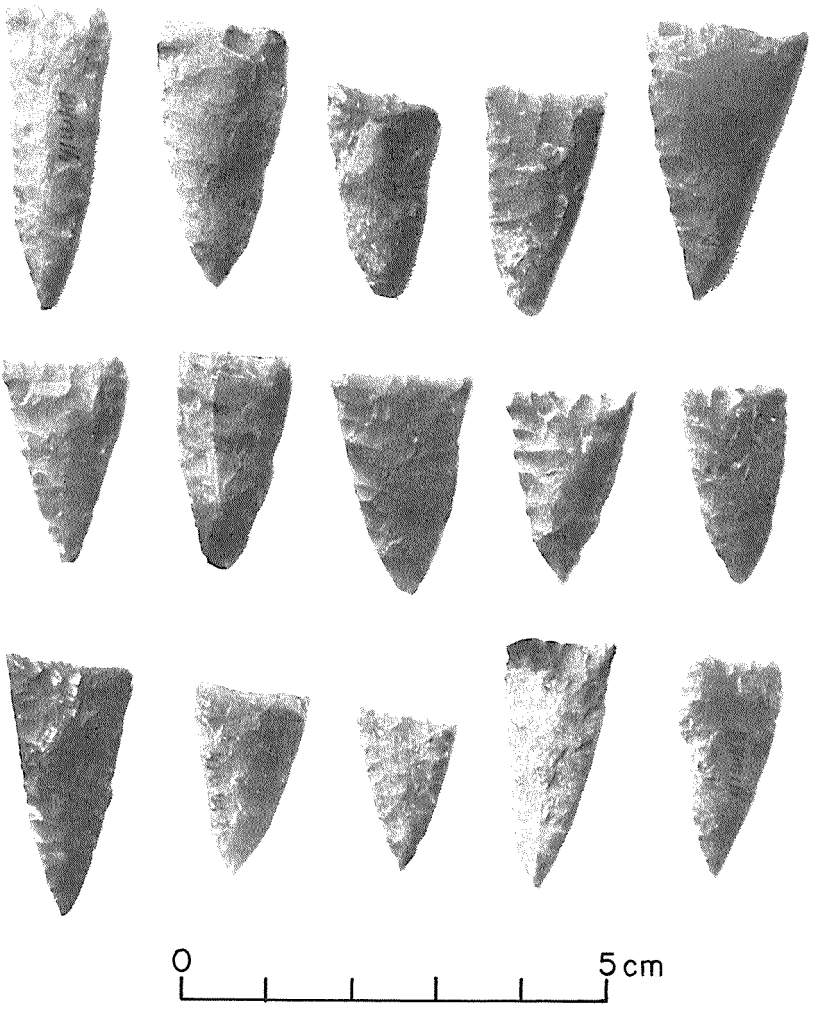

Figure 6. Photograph, 15 Fresno points from the Shanklin site.

Cuney Points (Figure 8)

Twenty-eight Cuney points were recovered, 12 bifacial and 16 unifacial. They vary in length from 2.5 to 4 cm.

Bulbar Stemmed (Figure 9, a-e)

Nine bulbar-stemmed points were recovered, six bifacial and three unifacial. Two of these points (Figure 9, f, g) are generally triangular, each with a small notch centered in the base. They are similar in length to Cuney points.

Other Point Types (Figure 10)

Four of the points recovered may fall into types other than those described above. These points have small concave bases and pronouncedly convex sides. A point of this type was found at Mission Conception in San Antonio (Cook 1980:11, D).

Larger Projectile Points

Seven large bifacial projectile points were recovered. Four (Figure 11, a-d) are generally triangular and seem to be made from the same material as the arrowpoints. Two (Figure 11, e, f) have stemmed bases.

CERAMICS

Sherds

More than 8,000 ceramic sherds were collected from the surface of site 41WH8; they were about evenly distributed over the entire site. Most have hard, smooth, thin walls and have fine, sandy, black paste. About 30 percent are bone tempered. Colors of the exterior surfaces include buff (10 percent), light orange (30 percent), and dark brown to black (60 percent). About 40 percent are decorated with straight or painted wavy black lines (Figure 12). The interior walls of about 30 percent of the sherds are coated with asphaltum. Most of the sherds from the Shanklin site appear to be of Rockport ware (Hester 1980:128).

Two styles of rim sherds were found: smooth, slightly rounded rims (Figure 13) and notched rims (Figure 14). Two incised sherds (Figure 15) and a few fragments of clay handles (Figure 16) also were collected.

Figurines

A ceramic anthropomorphic figurine, 6.5 cm long and 2.5 cm in diameter (Figure 17) is medium brown with a dark gray interior. On the back (Figure 17, a) are three vertical rows of semicircular parallel indentations resembling fingernail marks and one horizontal row of similar indentations that crosses the middle of the vertical rows. Similar indentations are on the front of the figurine but do not appear to follow a pattern. On the front the head has two eye holes and three small incised marks above and beside the right eye (Figure 17, b). On the back the head has no markings, but here a broken area exposes the dark gray interior (Figure 17, a). From the side, the head is tapered toward the top. At the bottom front of the figurine are two parallel vertical incised lines.

Smoking Pipe Fragments

A bowl fragment (Figure 18, a) and a stem fragment (Figure 18, b) from different smoking pipes indicate European influence. The bowl fragment is light brown and has parallel lines extending from the seam. The stem fragment is gray and has raised parallel lines extending from the seam.

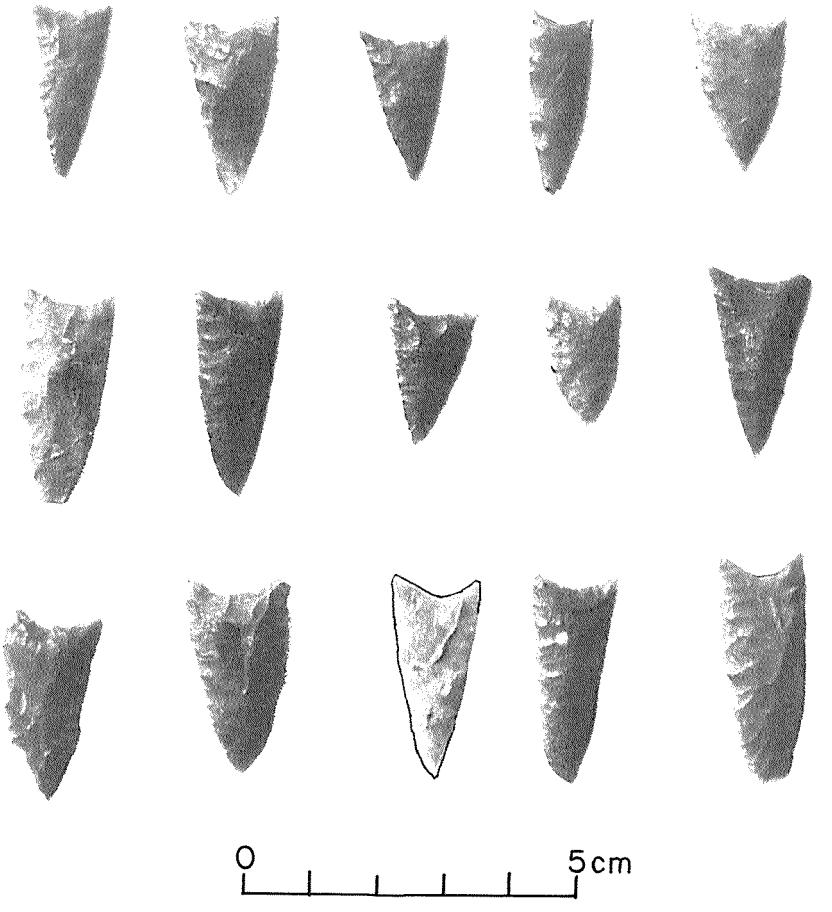

Figure 7. Photograph, 15 Guerrero points from Shanklin site.

HISTORIC EUROPEAN ARTIFACTS

Glass Artifacts

Seventeen fragments of heavily patinated glass were collected (Figure 19). Most are dark green or blue green. One specimen (Figure 19, a) had been unifacially worked into an end scraper similar to the flint unifacial scrapers shown in Figure 4. Three other fragments (Figure 19, b-d) had been bifacially worked into round or oval shapes.

Coins

A single silver piece-of-eight was recovered (Figure 20) in excellent condition, showing little or no wear. The coin has a Mexican mint mark and the date 1738.

Iron Artifacts

An iron artifact resembling a projectile point was recovered from the site (Figure 21). By microscopic examination, Harry Shafer, of Texas A&M University, found that the edges of the artifact had striations from filing and that its base had been deliberately blunted (Shafer 1982). The artifact is apparently a keyhole escutcheon that has been made into a projectile point.

Other iron artifacts include the midsection of a knife blade 8 cm long and 3 cm wide; a square iron spike 9 cm long, with the pointed end bent around to form a hook; and a triangular piece of iron 2.5 cm long and 5 mm thick, with one side heavily coated with an asphaltlike substance.

SHELLS AND SHELL ARTIFACTS

Freshwater Mussel Shell

About 30 percent of the freshwater mussel shell fragments on the site had been notched (Figure 22). The reason for the notching is not known.

Marine Shells

Oliva sayana

Specimens of the letter olive (*Oliva sayana*) mollusc were recovered (Figure 23). Specimen a had not been worked, specimen b has its top missing (whether purposely or naturally is unknown), and specimens c-f have V-shaped notches in the bottom ends. Specimen d is an artifact known as a tinkler; it has an especially interesting incised groove around the top, above which is a series of 10 notches. An *Oliva* shell similar to specimen d was found at site 41VT34 near Victoria (Janota 1980:41).

Other Marine Shells

The following shells were also found on the site:

Giant Atlantic cockle: *Laevicardium* (Dinocardium) *robustum*
Transverse ark: *Andara* (Clarkiuna) *transversa*
Plicate horn: *Cerithidea* (Cerithideopsis) *pliculosa*
Rangia: *Rangia cuneata*
Lightning whelk: *Busycon* (Perversium) *pulleyi*

The giant Atlantic cockle, transverse ark, and the plicate horn were identified by D. Gentry Steele, of Texas A&M University (Steele 1982). There is no evidence that these specimens were used as ornaments, but the site is 80 km (50 miles) from the Gulf of Mexico, so it is probable that they were ornaments or trade items.

BONE ARTIFACTS

Projectile Points

Four bone projectile points were found at the site (Figure 24). They were apparently shaped by using single slicing motions with sharp blades; there are no indications of grinding or smoothing.

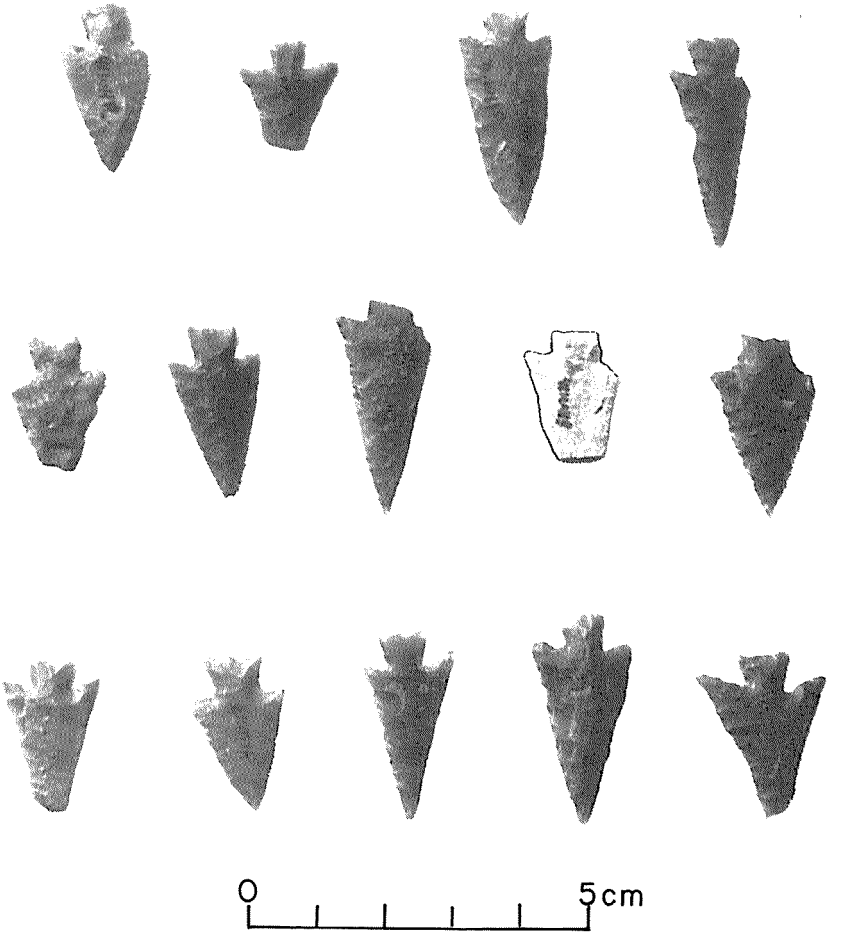

Figure 8. Photograph, 14 Cuney points from the Shanklin site.

Other Bone Artifacts

Other bone specimens found at the site had been drilled, smoothed, or notched on one or both ends (Figure 25). Four of these specimens (b-e) had been rounded and smoothed on both ends to make beads.

One bone fragment (Figure 25, f) has three painted black lines on the inner side resembling the black lines on the potsherds in Figures 12 and 14.

Five bone fragments (Figure 25, g-k) had been purposely rounded or pointed on one or both ends.

An alligator tooth (Figure 25, a) with a drilled hole through one end may have been a bead.

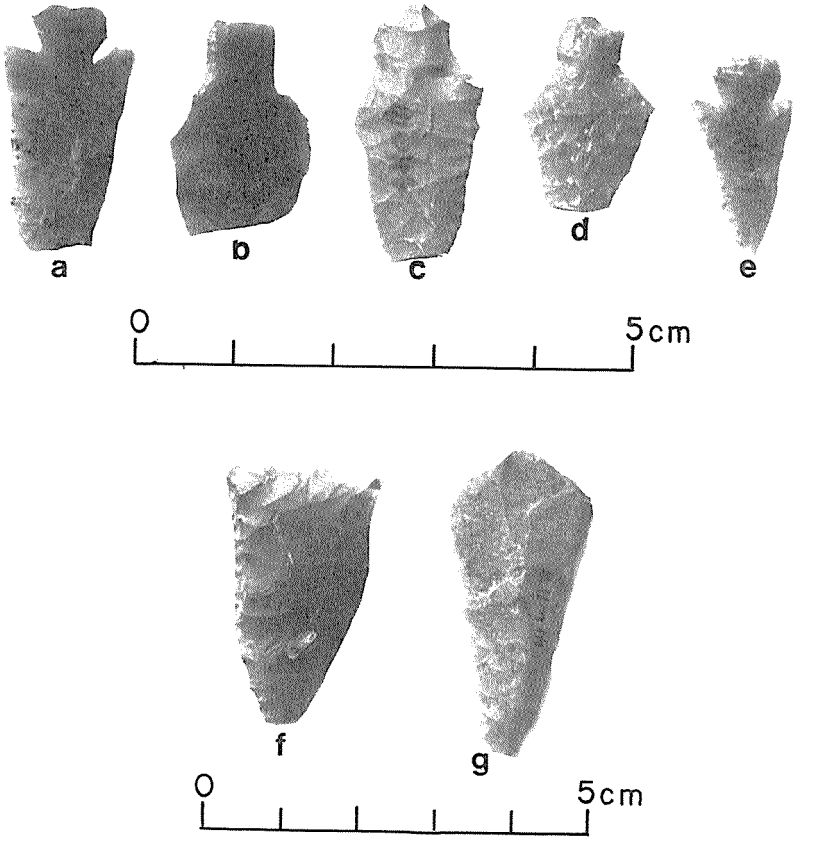

Figure 9. Photograph, 5 Bulbar stemmed points (a-e) and two basal notched triangular points (f-g).

FAUNA

More than 300 bone fragments were collected, representing the following animals: cow or bison, modern horse, whitetail deer, black bear, cougar, opossum, eastern cottontail, red-eared turtle, box turtle, soft-shell turtle, alligator, and gar.

The specimens representing black bear, cougar, eastern cottontail, and opossum were identified by William L. McClure, of Houston (McClure 1982). The species found at the site, together with the skeletal elements from which the bone fragments came, are listed in Table 1.

Because elements of bear, cougar, and horse were found, the faunal collection makes this site unique among the prehistoric sites in Wharton County. Remains of bear were found only in the north and northeastern parts of the site; remains of cow or bison were found only in the south and southwestern parts. No teeth from modern bison were available for comparison, but the cow or bison teeth are unusually large in comparison to those of a 2,000-lb. Brahman bull.

Table 1. Species and Skeletal Elements

Opossum—*Didelphis marsupialis*
- Maxillary fragment with 3 molars
- Mandible fragment with 2 premolars
- Vertebra

Black Bear—*Ursus americanus* (at least 2 individuals)
- Right mandible fragment with 3 molars
- 6 incisors
- 6 metatarsals, one each from digits 1, 2, 3, 4; two from 5

Cougar—*Felis concolor* (at least three individuals)
- 4 premolars
- 3 incisors
- 1 right mandible fragment with 2 premolars, 1 molar

Eastern Cottontail—*Sylvilagus floridanus*
- Mandible fragment with 5 teeth

Cow or Bison—*Bos* or *Bison*
- Maxillary with 3 premolars, 11 molars
- Mandible with 1 incisor, 1 premolar, 2 molars
- Radius, distal end
- Tibia, 2 distal ends
- 10 Phalanges
- Femur, proximal end
- 4 Tibial tarsal

Horse—*Equus sp.*
- Maxillary with 1 premolar

Whitetail Deer—*Odocoileus virginianus*
- Maxillary with 6 premolars, 9 molars
- Mandible with 14 molars, 3 premolars
- Humerus, distal end
- 2 Phalanges
- 3 Astragali
- Metacarpal, proximal end

Alligator—*Alligator mississippiensis*
- 7 teeth
- 36 scutes

Red Eared Turtle—*Pseudemys sp.*
- 2 nuchals
- 35 shell fragments

Box Turtle—*Terrepene sp.*
- 2 nuchals
- 6 shell fragments

Gar—*Lipisosteus sp.*
- 3 scales

Figure 10. Photograph, four points.

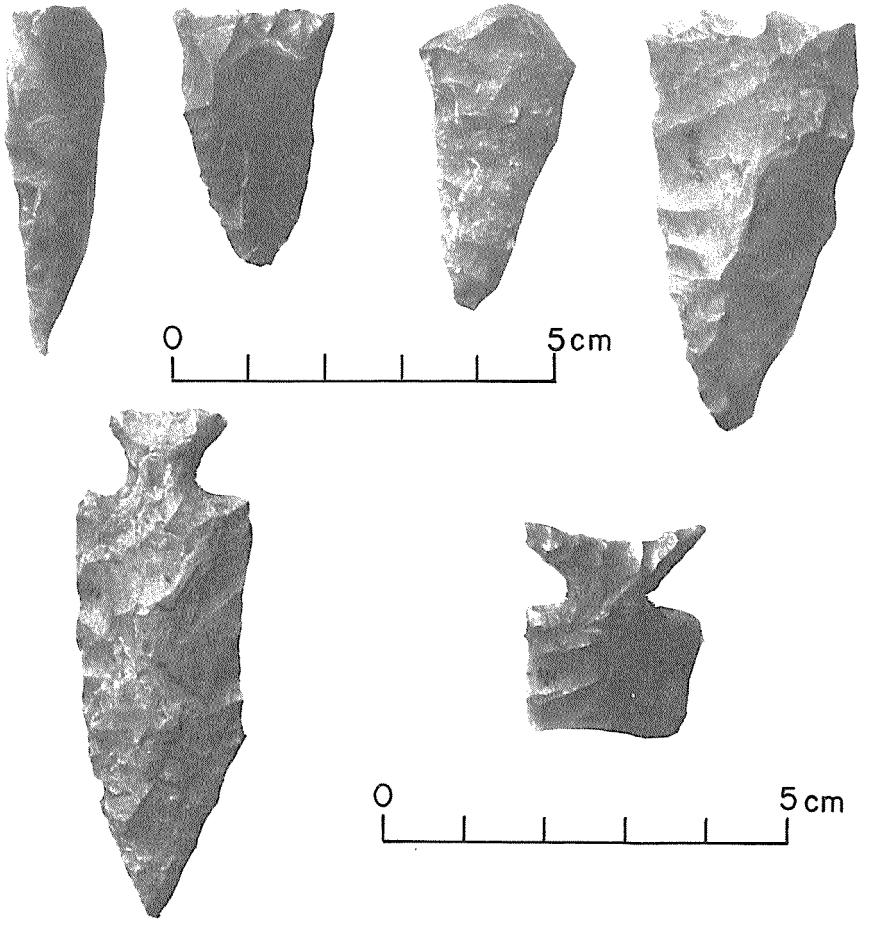

Figure 11. Photograph, four generally triangular large projectile points (a-d) and two large projectile points (e, f) with stemmed bases.

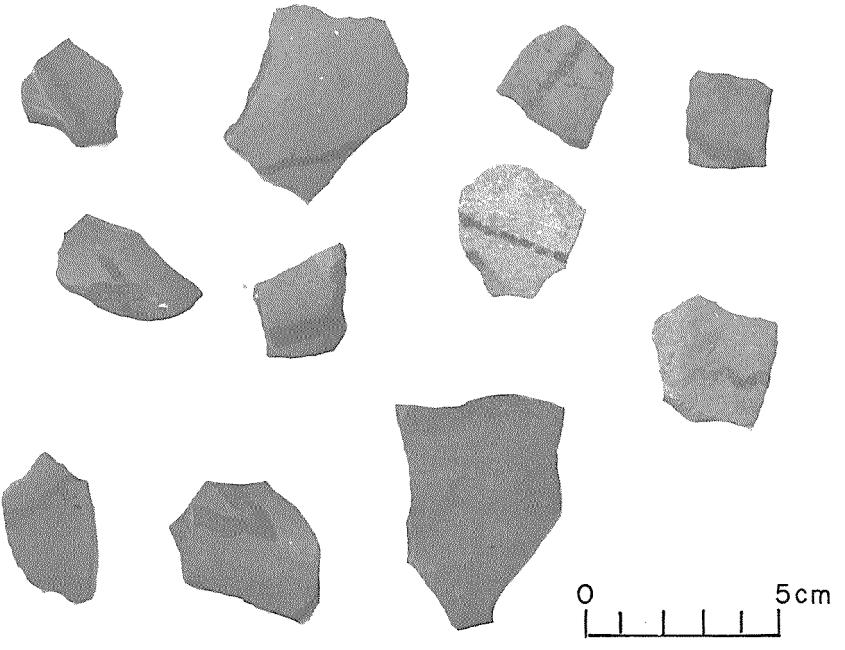

Figure 12. Photograph, sherds with asphaltum decoration from the Shanklin site.

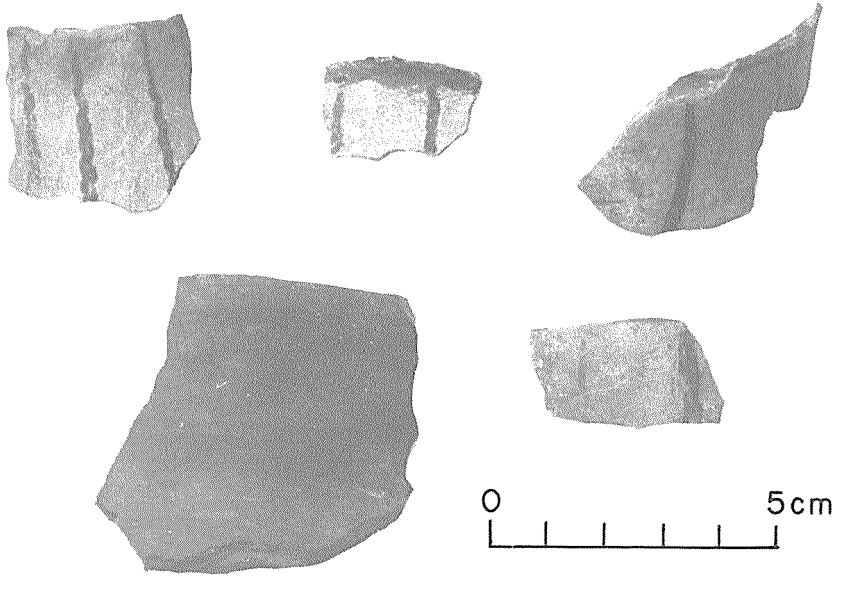

Figure 13. Photograph showing smooth, slightly rounded rim sherds from the Shanklin site.

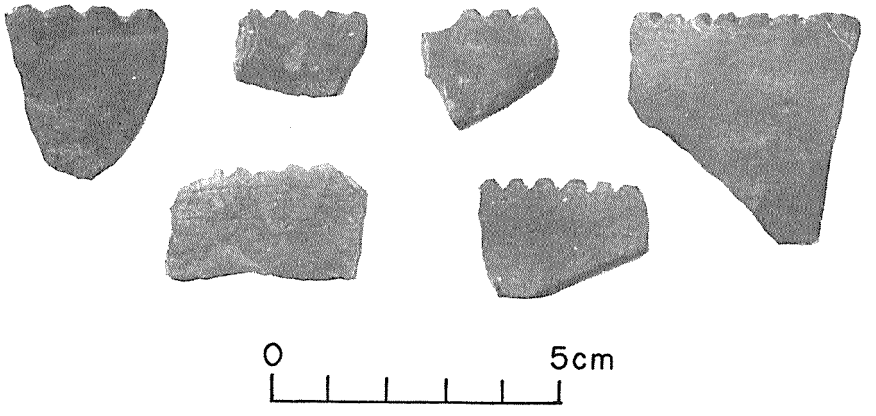

Figure 14. Photograph, notched rim sherds from the Shanklin site.

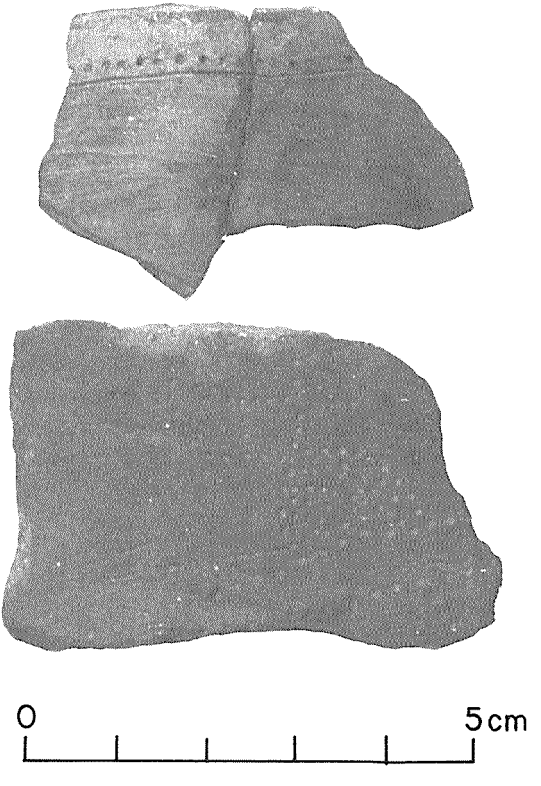

Figure 15. Photograph, incised sherds from the Shanklin site.

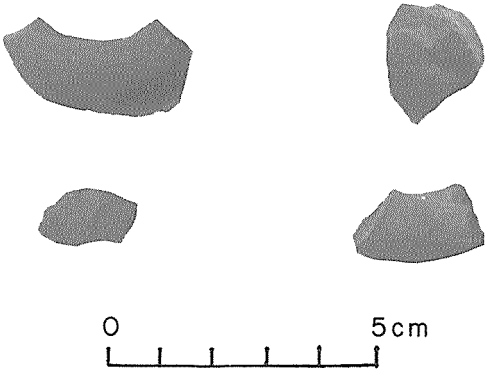

Figure 16. Photograph, fragments of clay handles from the Shanklin site.

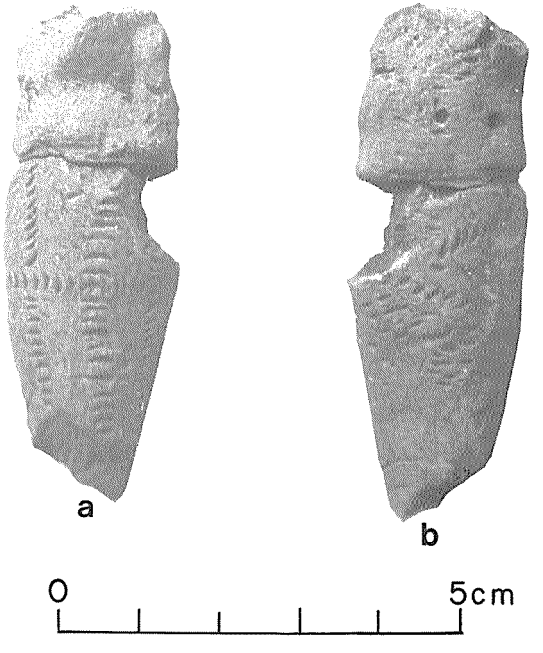

Figure 17. Photograph, front (b) and back (a) views of anthropomorphic ceramic figurine from the Shanklin site.

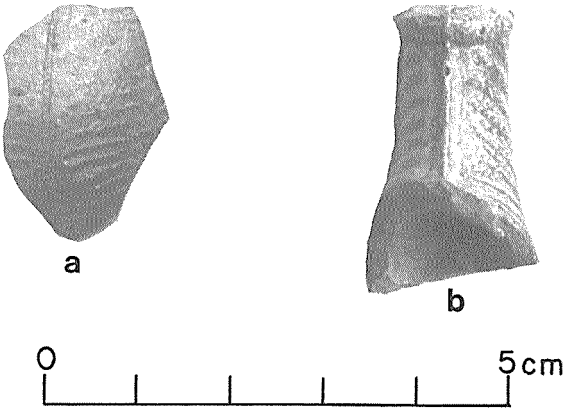

Figure 18. Photograph, bowl (a) and stem (b) fragments of smoking pipes.

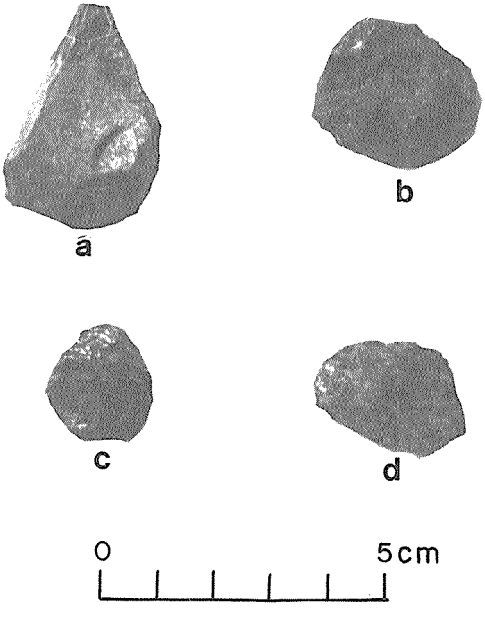

Figure 19. Photograph, glass fragment unifacially worked into an end scraper (a) and three fragments bifacially worked into rounded shapes (b-d).

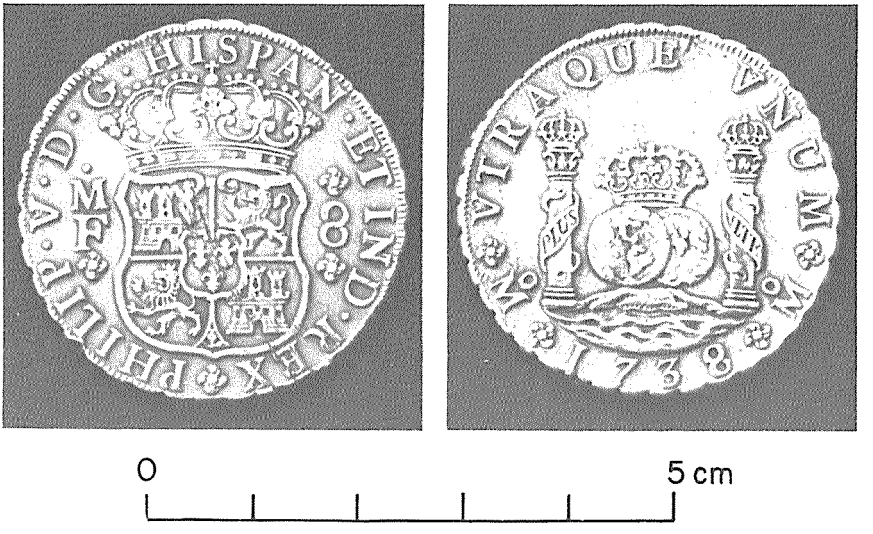

Figure 20. Photograph, Spanish silver piece-of-eight from the Shanklin site.

Figure 21. Photograph, iron keyhole escutcheon made into a projectile point.

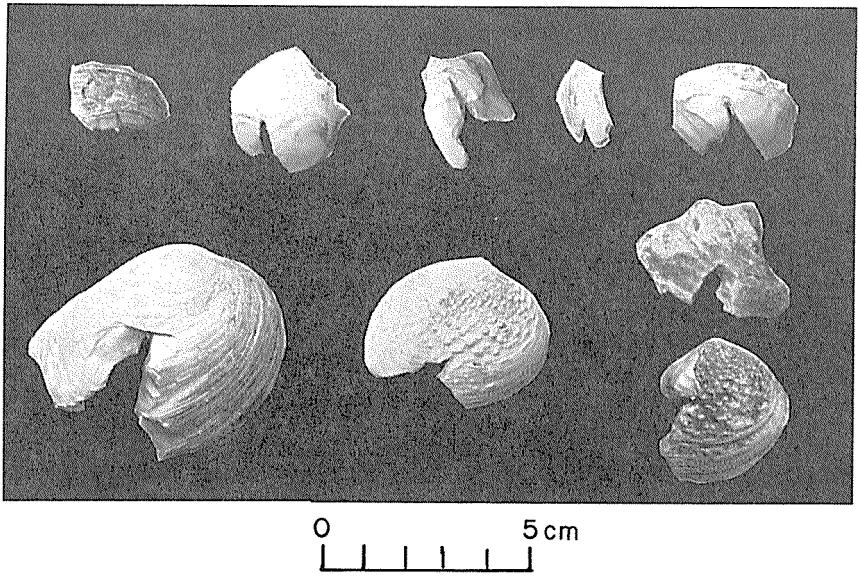

Figure 22. Photograph, notched freshwater mussel shells from the Shanklin site.

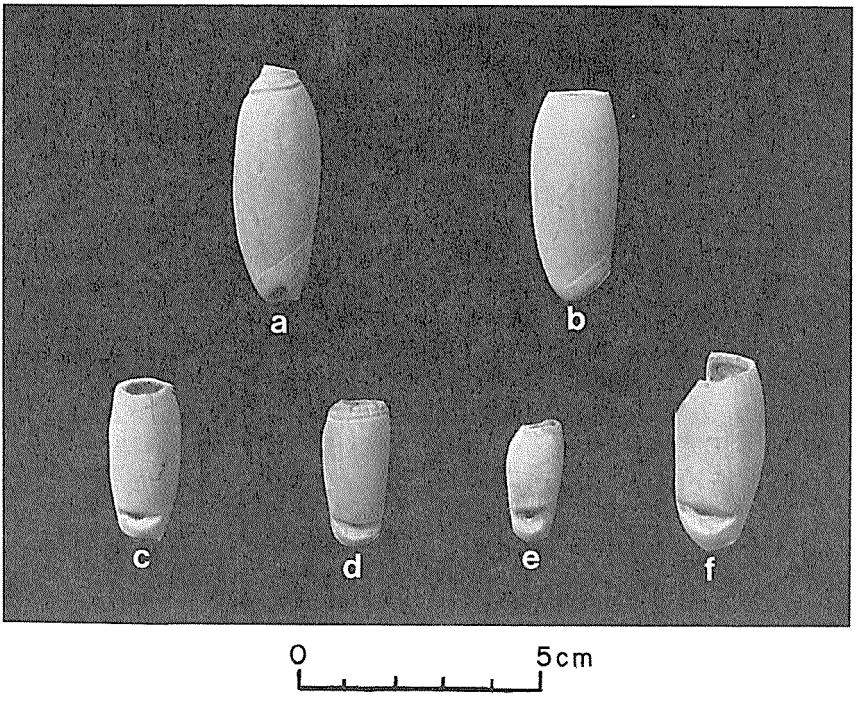

Figure 23. Photograph, specimens of the letter olive (*Oliva sayana*) mollusc from the Shanklin site: a is unworked; b may be worked; c-f are worked.

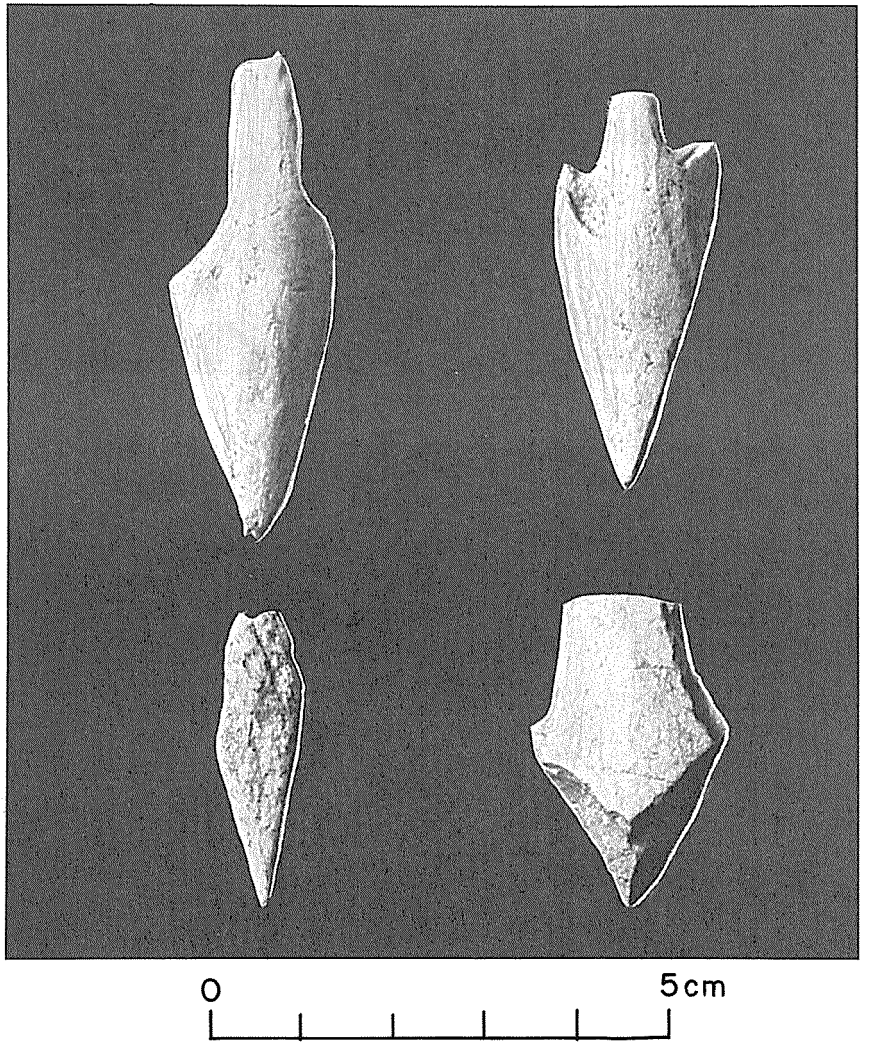

Figure 24. Photograph, bone projectile points from the Shanklin site.

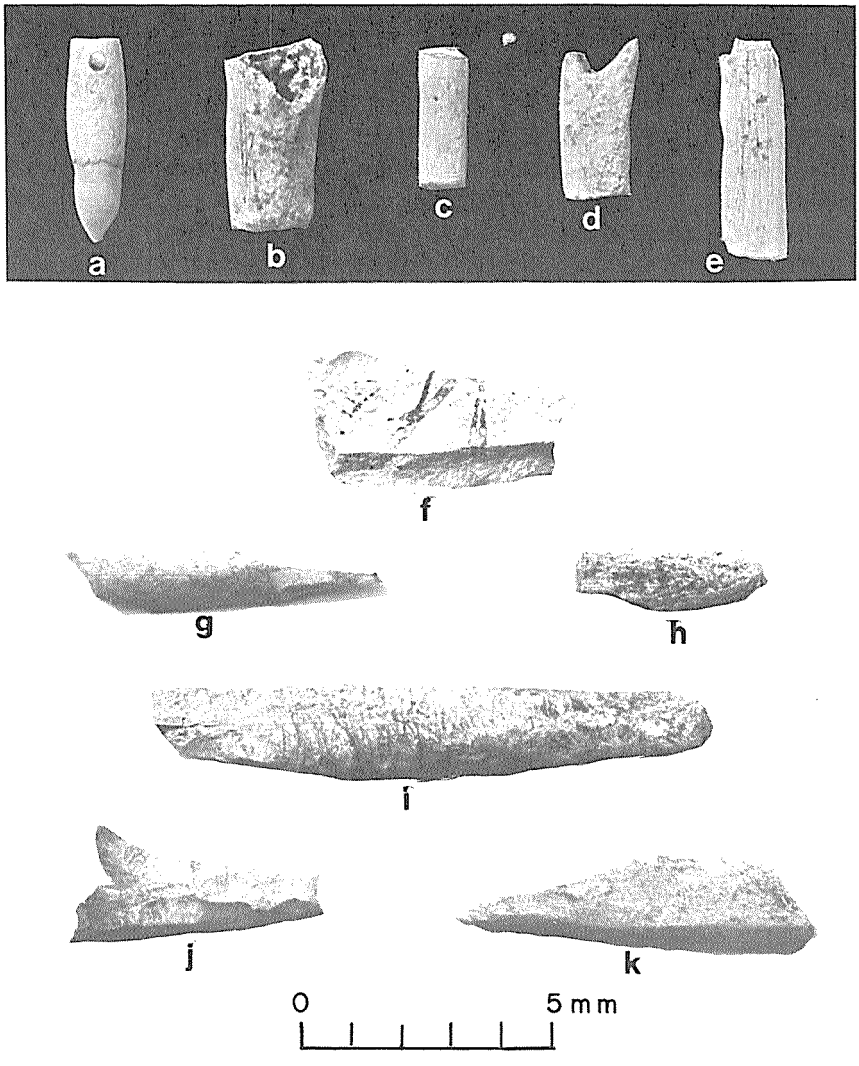

Figure 25. Photograph, bone specimens from the Shanklin site: a, drilled alligator tooth (possible bead); b-e, beads; f, painted specimen; g-k, rounded or pointed fragments.

Only a small percentage of the bone fragments had been burned, and no evidence was found of hearths or burned areas at the site, in contrast to the prehistoric sites in Wharton County that yielded many fired clay balls and high percentages of burned bone fragments. This variation may result from different cooking methods of the prehistoric and historic Indians in the area.

CONCLUSIONS

The artifacts recovered from the Shanklin site (41WH8) and described in this paper indicate a historic Indian site, occupied possibly during the eighteenth or early nineteenth century. Many of the recovered artifacts resemble those found in archeological contexts at Spanish missions in Texas.

The artifacts and faunal material from this historic Indian site are assumed to represent a single temporal component; they present a good opportunity for noting the differences between historic and prehistoric Indian occupation sites in the area.

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BIOGRAPHICAL SKETCH

Joe D. Hudgins is a 1960 graduate of Texas A&M University in animal husbandry. He is a lifelong resident of Hungerford, where he and his brothers operate their registered Brahman cattle ranch. His interest in archeology dates back to his childhood. He is a member of the Houston Archeological Society, the Texas Archeological Society, and the Wharton County Historical Commission. He has recorded more than 85 sites in Wharton County with the Texas Archeological Research Laboratory in Austin.

A Newly Discovered East Texas Log Courthouse

David H. Jurney

ABSTRACT

Dendrochronology (tree-ring dating) was used to determine the initial construction date for a post-oak log structure thought to be the original Navarro County Courthouse. The cutting dates of five specimens of logs indicate that the structure was built in late fall 1848 or before the 1849 growing season. The double-pen part of the structure probably is the original or part of the original courthouse.

INTRODUCTION

The Reverend Hampton McKinney and his family left Macoupin County, Illinois, in 1846 and established a temporary residence at Dresden in southwestern Navarro County, Texas (Figure 1). Later, while traveling along the Cow Head Trail, McKinney selected a tract of high, rolling prairie with scattered timber upon which to establish his land headright. (A headright is a grant of money or land given in 1839 in Texas to those who fulfilled certain conditions relating especially to settling and developing land.) McKinney moved two empty log cabins from what was known as Richardson's settlement and put them together to form his first residence.

According to Gammel's *Early Laws* (Shafer 1948), the Texas Legislature appointed commissioners on February 12, 1848 to select land at Corsicana for the county seat of Navarro County. The Reverend McKinney donated his residence for a temporary courthouse and sold his headright to the city of Corsicana.

Later in 1848, the Corsicana courthouse was described by Judge John L. Miller as having "cracks big enough to throw a wolf through . . . and was intended as a temporary structure," but we do not know whether this description referred to McKinney's former residence or to other court facilities in use at the time. The courthouse subsequently vanished into legend, together with other log buildings of the county.

All of the log buildings were thought to have been moved onto a local farm, but in December 1980, two log structures were discovered under the framing of an old house at 209 West First Avenue (Figure 2), on the same lot that had held the original Navarro County Courthouse. Older residents insisted that when they were children they knew this house was built from the old courthouse logs.

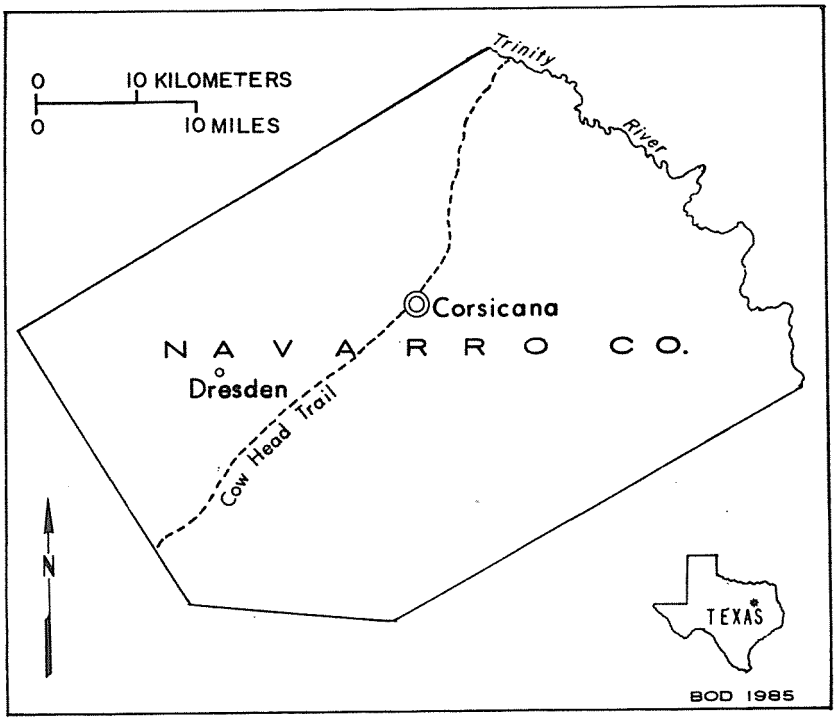

Figure 1. Map of Navarro County, Texas.

According to Jordan (1978:151), of the hundreds of early log courthouses that once dotted the Texas landscape, the only one that was still standing in 1978 was in Comanche County. The Navarro County Historical Commission, investigating the landmark status of the log structures in Corsicana, asked the writer to analyze their architecture and determine, if possible, the dates of their construction.

DESCRIPTION

The Corsicana structure is composed of what were originally two log buildings: a single-pen structure built primarily of red cedar and a double-pen structure built of post oak (Figure 3). Jordan (1978:107) describes a pen as a "unit of four log walls fastened together with corner notching. All full-sized ground-floor rooms subsequently added to the house, whether of log construction or not, are also called pens." A pen can be "subdivided by light partitions into two or more rooms."

The logs of the Corsicana structure had been coded with a numerical and alphabetical system often used when log buildings are dismantled and moved. The coding tabs have machine-cut "square" nails driven into them, indicating that the structures were dismantled and reassembled sometime in the nineteenth century. When the two log structures were subsequently reconstructed, they were

Figure 2. Photograph showing front view of the structure built from two log buildings at 209 West First Avenue, Corsicana, Texas.

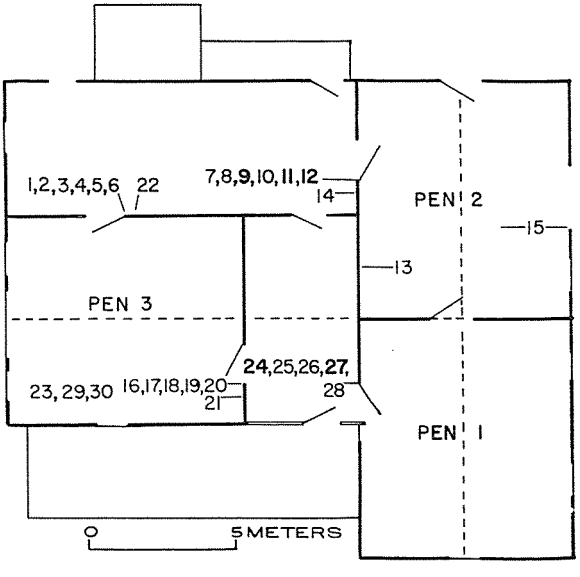

Figure 3. Plan of the building at 209 West First Avenue, Corsicana, showing the two original log structures (heavy lines) and subsequent additions (fine lines). Note the large doorway, later filled in by framing, that was originally between pens 1 and 2 of the double-pen structure. Plain numbers indicate sample locations; bold-face numbers indicate dated specimens (see Table 1).

joined together, forming a single T-shaped building that was covered with a frame of sawn lumber. More windows and doors and two chimneys were added at this time. Both parts of the building show evidence of rearrangement of wall logs and remodeling. The logs originally were chinked with split logs and covered by boards before they were whitewashed.

Dendrochronology (the tree-ring method of dating) was chosen as the method to determine if the log structures could have been the first courthouse. Long-term tree-ring chronologies have been clearly established in the eastern United States; 200-to-300-year chronologies are available for several hardwood and conifer species, and 39 modern chronologies have been established for pine, oak, cedar, spruce, hemlock, beech, bald cypress, ash, and maple (Dewitt and Ames 1978). David Stahle, research assistant in the Department of Geography at the University of Arkansas, has determined dates for the original construction and for isolated remodeling episodes of 24 historic log and frame buildings in Arkansas (Stahle 1979). This method also is being used by archeologists at Southern Methodist University to date buildings and reconstruct the settlement history of the Richland-Chambers Reservoir near Corsicana.

METHODOLOGY

In order to select the most suitable timbers and framing elements for tree-ring analysis, a detailed study was made of the entire structure. Since doorways were the only areas where the ends of the wall logs could be examined, door jambs were carefully removed from the two doors of the double pen that face the interior hall between this oak structure and the red cedar single pen (Figure 4). The exposed ends of the wall logs were then sampled by hand-cutting (with a cross-cut saw) thin transverse slices (Figure 3), and the door jambs were reattached.

In the laboratory the cross sections were sanded with progressively finer textured sandpaper, producing highly polished surfaces that allowed examination in minute detail of the cellular structure of each growth ring. Five red-cedar and five post-oak specimens were selected from the thirty samples because they had suitable numbers of rings for tree-ring analysis (Table 1).

The Douglass method of tree-ring dating (wherein the patterns of wide and narrow rings are recorded and correlated with cycles of wet and dry years) was employed to date the specimens (Douglass 1941; Stokes and Smiley 1968). The red-cedar specimens provide a 70-year floating chronology. (The writer is currently collaborating in an effort to construct a modern red-cedar chronology that will make it possible to date buildings in the area.)

The five post-oak specimens, all from the double-pen structure, span 114 years, the period from A.D. 1735 to 1848. All five dates are dates of cutting. The trees were cut in the late fall or winter of 1848, before the growing season of 1849. Since the builders of the structures used green wood—because green wood, especially oak, is much easier to work than seasoned wood—the cutting dates of these trees should closely reflect the construction date of the double-pen structure.

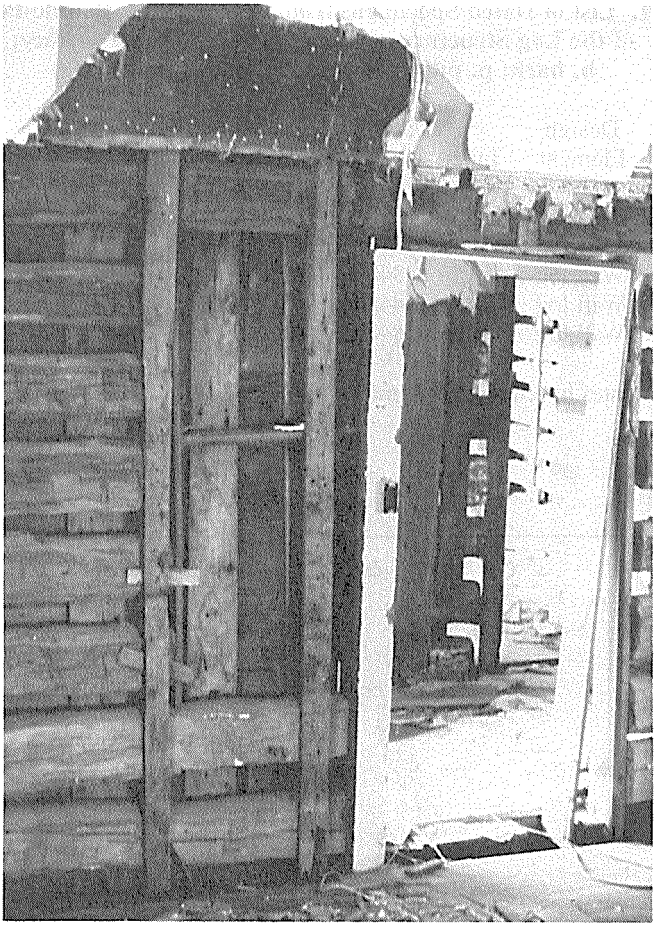

Figure 4. Photograph showing interior view of the post-oak double-pen structure. The red-cedar single-pen structure can be seen through the doorway. Tree-ring samples were taken from the logs at the right of the photograph.

Four master chronologies were used to date the Corsicana specimens, derived from living post-oak stands in Texas at Oak Park in Navarro County; the Fort Worth Nature Center in Tarrant County; and the Dwight Nichols Ranch in Throckmorton County; and in Oklahoma at Mud Creek in Jefferson County (Figure 5). No living chronologies have been established for red cedar in Texas. Samples for the Navarro County chronologies were collected by Cook and Harlan in 1974 (DeWitt and Ames 1978). The Throckmorton and Tarrant Counties, Texas and the Jefferson County, Oklahoma chronologies were collected by David Stahle under the auspices of the Climatological Divison of the National Science Foundation.

Table 1. List of Dated Specimens from the Post-Oak Double-Pen Part of the Log Structure at Corsicana (os, outside surface; b, bark; p, pith; comp, complete terminal ring)

Specimen Number	Design Element	Dating Inner	Dating Outer	Remarks
CC 9	Wall log	1735p	1848 comp os	In composite, good x-dating
CC 11	Wall log	1745p	1848 comp os	
CC 12	Wall log	1745p	1848 comp os	In composite, good x-dating
CC 24	Wall log	1749p	1848 comp os-b	Suppression, sapwood wormy
CC 27	Wall log	1750p	1848 comp os	In composite, good x-dating

NOTE: All dates have been confirmed by David W. Stahle.

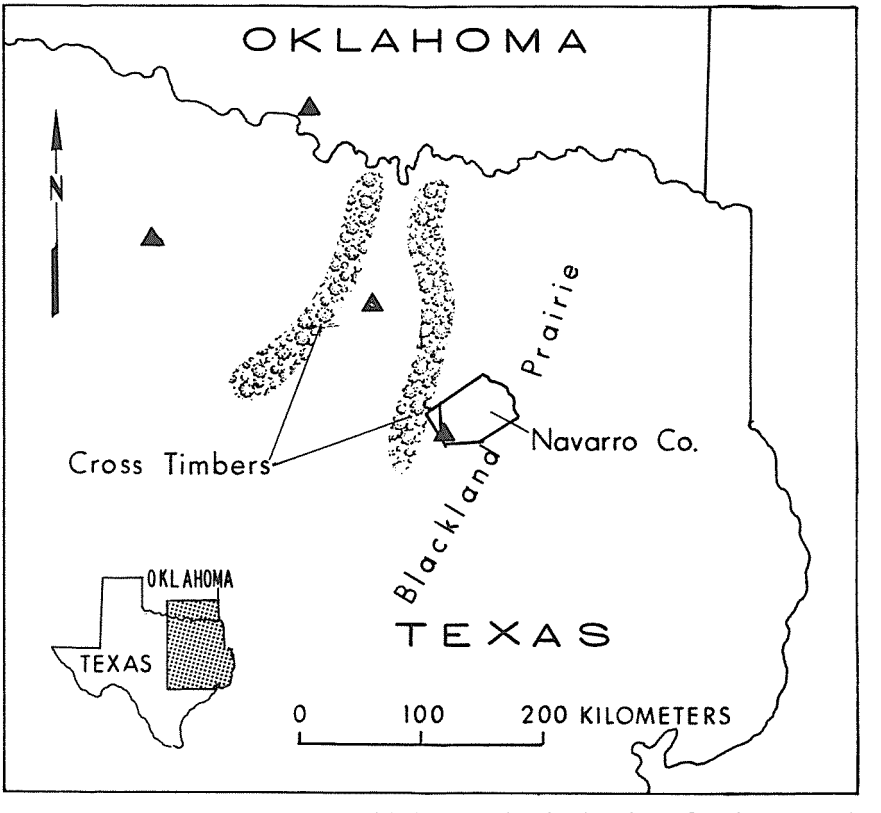

Figure 5. Map of East Texas and part of Oklahoma, showing locations of modern post-oak chronologies: (north to south) Jefferson County, Oklahoma; Throckmorton County, Fort Worth Nature Center, and Oak Park, Texas.

The post-oak tree-ring dates from the Corsicana double-pen samples compare very well with all of these master chronologies, reflecting 19 dry years and two wet years in common for all of the specimens. The Corsicana samples match most closely the Oak park chronology and somewhat less well the Throckmorton, Fort Worth, and Mud Creek chronologies. The dating area for post-oak covers at least 400 km^2 (200 square miles).

CONCLUSIONS

Tree-ring dating establishes that the post-oak wall logs in the double-pen part of the Corsicana structure were cut in 1848 and 1849, the time of construction of the courthouse. The large doorway in the partition between pens 1 and 2 has a parallel in many clerical offices where there are large doorways between public areas in one room and official files in another; the whitewashed outside walls would have made the building stand out against the surroundings as a public building should.

The Navarro County Historical Commission has proposed landmark status for these early log buildings, and the owner, Dennis Cooper, of Corsicana, has dismantled the structures in preparation for on-site renovation. Fragments of Texas history such as these are often swept away in the march of progress, but these buildings will soon grace the East Texas landscape again.

ACKNOWLEDGEMENTS

The writer thanks the Navarro County Historical Commission and members of the Navarro County Historical Society for their aid and support in this project. Particular thanks are due Verna Ann Bonner and Wyvonne Putnam for their archival research and encouragement. Randall Moir and James Bruseth, of Southern Methodist University, provided support in production of the report. David Stahle corroborated the tree-ring dating and criticized the report. Special thanks are due Sheila M. Jones for her aid in production of the final report.

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BIOGRAPHICAL SKETCH

David Jurney received his B.A. in anthropology from Appalachian State University in 1973 and his M.A. from the University of Arkansas in 1978. He is employed by the Archaeology Research Program of Southern Methodist University as a Project Archaeologist, supervising historic archeological investigations. He is enrolled in the S.M.U. doctoral program and is planning doctoral research on the use of dendrochronology in East Texas architectural studies.

La Salle's Fort St. Louis in Texas

Kathleen Gilmore

ABSTRACT

The location of La Salle's colony in Texas, established in 1685, has been in doubt. Comparisons with a model of topographic, physiographic, and geographic data, and physical cultural remains make it evident that the Keeran site on Garcitas Creek in Victoria County (41VT4) is the site of the colony. Part of the proof lies in the presence there of a ceramic ware made in Saintonge, France in the seventeenth and eighteenth centuries.

INTRODUCTION

The location of La Salle's colony in Texas, Fort St. Louis, long has been the subject of discussion. To commemorate the three hundredth anniversary (1985) of the establishment of the colony, this report seeks to resolve doubts about its location. Since the finding by the historian H. E. Bolton of a 1691 survey map that compared favorably with modern maps of the Matagorda Bay area, the location has been generally accepted to be somewhere in that area (Figure 1).

Bolton (1924), on July 3, 1914, boarded a train in Austin, Texas, traveled to Placedo, Texas, contacted the local people, and found a site that had on the surface "small fragments of antique blue and white porcelain." A wall 2½ feet thick enclosing an area 90 feet square was traced and, although Bolton knew and admitted that these remains probably belonged to the Spanish presidio established at La Salle's colony, he was convinced that this was the site of La Salle's colony too. This site, now known as the Keeran site, is in Victoria County on Garcitas Creek, a stream flowing into Lavaca Bay, which in turn flows into the larger Matagorda Bay (Figure 1).

Because Bolton could not prove that this was the site of La Salle's colony, other historians were not convinced of the validity of his claim. Some thought the colony probably was on Galveston Bay; some, on the Lavaca River about 8 km (5 miles) east of Garcitas Creek. Finally in 1950 excavations were carried out by the Texas Memorial Museum at the site on Garcitas Creek (Figure 2) and non-Indian artifacts were found. It is the analysis (Gilmore 1973) of the material from these excavations plus recent additional information from France, Canada, and elsewhere (Gusset 1984; Barton 1981) that makes it possible to put to rest doubts about the location of La Salle's Fort St. Louis.

In the study of the data two objectives were kept in mind: to accept or reject the hypothesis that this was the site of La Salle's Fort St. Louis, and to deter-

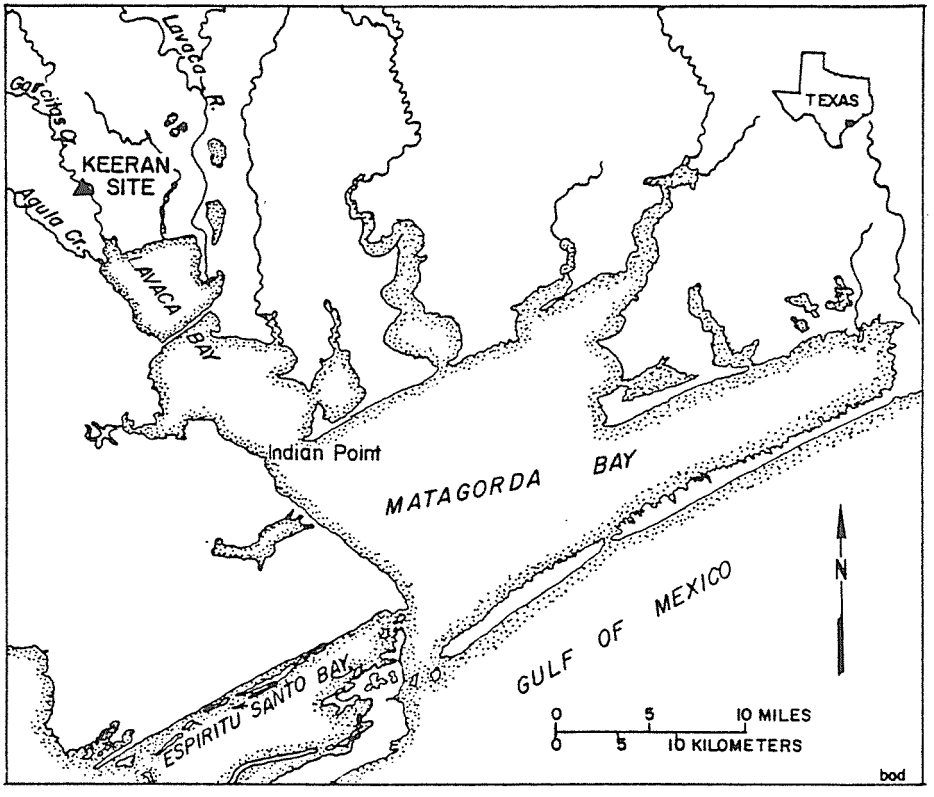

Figure 1. Map of the Matagorda Bay area of Texas showing location of the Keeran site (41VT4). Base map from AMS 1:250,000: Beeville, Bay City.

mine through study of the artifacts what materials were at the site and why they were there.

For the first and primary objective, the same method was used as had been employed in looking for the precise locations of other historical sites: the use of a conceptual model of what the site should look like in the field. To do this, four kinds of information (geographic, physiographic, topographic, and data about physical cultural remains) were gathered. For example, if La Salle's colony had indeed been on this site, what would be expected both in physical surroundings and in the ground. This information would come from research in historical documents and archeological material from sites of the same time period and cultural tradition; from a systematic analysis of each kind of information the conceptual model would be formed. Following is a historical sketch from which the conceptual model for this site was constructed.

HISTORY OF LA SALLE'S EXPEDITION

La Salle sailed from La Rochelle, France on July 24, 1684, with four ships and about two hundred people: soldiers, tradesmen, derelicts, and women, all

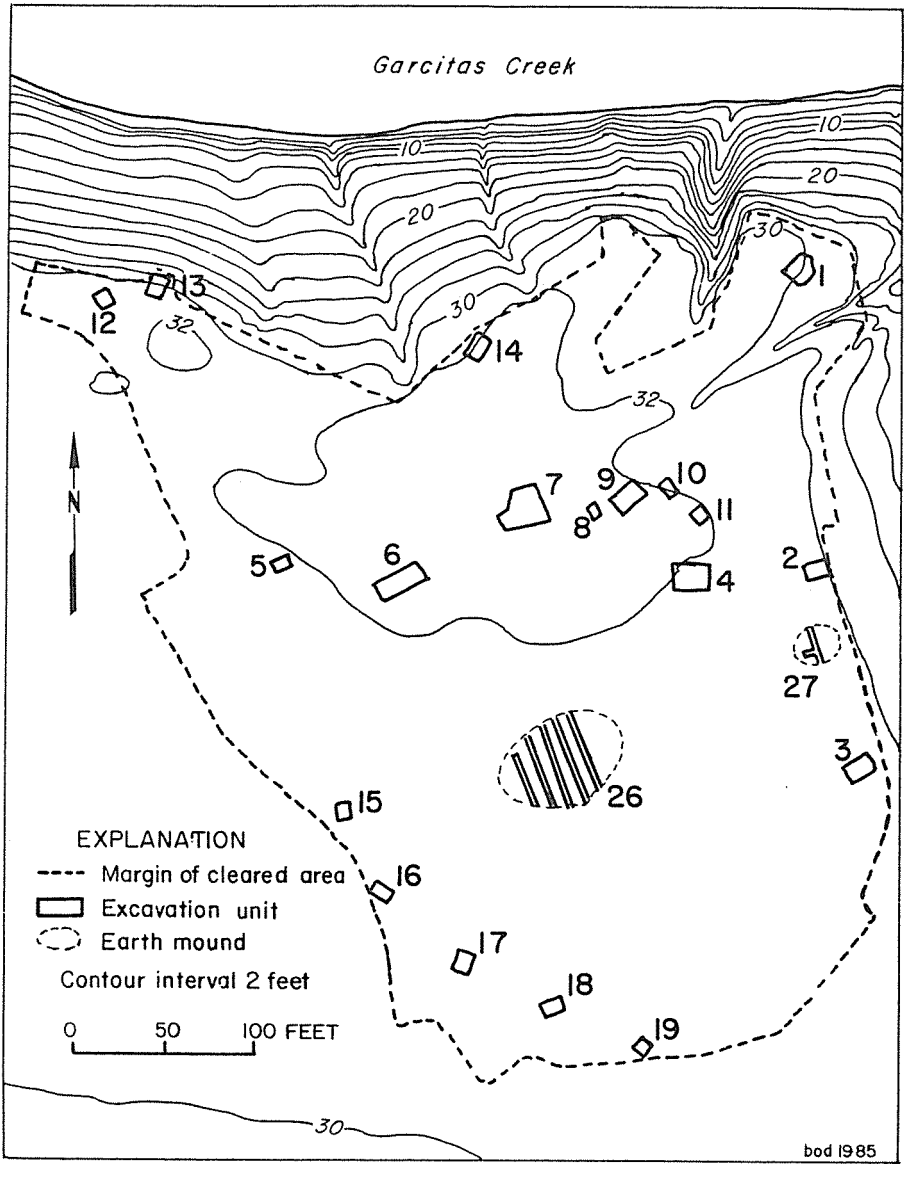

Figure 2. Topographic map showing the 1950 excavations by the Texas Memorial Museum at the Keeran site. Contour interval 2 ft. Map by Texas Memorial Museum.

sparked with enthusiasm by the romance and wealth of the exotic New World. This colony was to be established at the mouth of the Mississippi River, which, together with all the land drained by the river, had been claimed by La Salle for France when he explored the river down to its mouth in 1682. One of his supply ships, the St. Francis, was captured by privateers in the West Indies. After a stay in Hispaniola, the expedition, now three ships (a supply ship, a small frigate, and

an escort man-of-war), finally landed on February 20, 1685 at the mouth of a river that La Salle hoped was the Mississippi.

Upon entering the channel the supply ship ran aground and was wrecked. Some cannon had been removed to lighten the load and other material was salvaged, but this ship had contained most of the supplies for the colony: the forge, mill, colonists' possessions, cannon balls, and most of the medicines. The people, all of whom were saved, gathered with the salvaged material on the shore not far from the entrance to the bay (Joutel 1962:49). With both supply ships lost, a large supply of goods would not be expected at the settlement.

La Salle then set out to explore the area to find the mouth of the Mississippi River and a place for a settlement. He found a spot on a small hill, 2 leagues (about 8 km, or 5 miles, using 2.6 miles as equivalent to 1 league) up the smallest river that flowed into the bay from the northwest. La Salle's personal ship, the small frigate Belle, because of a sand bar, could not anchor near the settlement. A depot was set up opposite the bar so material could be carried in the Belle from the original camp to the depot camp, from which it was then transported to the settlement in canoes. (A memorial statue of La Salle now stands at Indian Point near the site of the depot camp at the entrance to Lavaca Bay.) Canoes were scarce; some were appropriated from the Indians to their great displeasure.

It has been confirmed that the settlement was on a rise, 2 leagues (ca. 8 km, or 5 miles) up the smallest river draining into the bay from the northwest.

One house at the settlement was built of timbers obtained—at great sacrifice—about a league (about 4 km, or 2.6 miles) upcountry. A house next to the first was built of salvaged ship timbers.

While La Salle was exploring the region in search of the Mississippi, the Belle, which was at anchor awaiting his return, was blown across the bay and grounded. According to La Salle's brother Jean Cavelier (Delanglez 1938), "all boxes, clothing, papers, utensils, linen, plates, and dishes" belonging to La Salle and the people of his company were on board. Most of La Salle's belongings were salvaged, together with some swivel guns and rigging.

Two more buildings were built: a chapel made of stakes driven into the ground and "a sort of separate building" of logs plastered with clay mixed with earth and thatched with reeds. A palisade around the settlement was started. Gardens were planted with chicory, melons, pumpkins, cotton, celery, and asparagus, but rabbits and rats ate the tender shoots, and an alligator devoured what remained (Joutel 1962:70).

Near the settlement was a marsh where fish and birds were found, among them turkeys, partridges, a bird they called the *great gullet* (pelican), and one with pale red feathers they called *spatula* because of the shape of its beak (undoubtedly a roseate spoonbill). Rattlesnakes were common, and there were large alligators in the rivers. Both live oak and deciduous trees grew there and also a plant whose leaves they described as *like rackets and full of prickles* (prickly pear cactus). Other plants, harsh and sharp pointed, with *leaves like gutters,* were probably Spanish daggers.

So it is clear that the site of La Salle's settlement should be found in an area where pelicans, roseate spoonbills, turkeys, partridges, rattlesnakes, and large alligators existed, and there were growing in the vicinity live oak trees, prickly pear cactus, and a plant similar to if not the Spanish dagger.

La Salle became convinced at last that he was not at the mouth of the Mississippi and, since the wreck of the Belle made communicating by sea impossible, the only alternative he had was to return to France for help, overland by way of the Illinois country and Canada. On January 12, 1687, almost two years after landing, only 37 of the 200 or more people who had landed were left; 17 people set out on the journey, leaving in the settlement 20 people, 70 or 75 swine, 18 or 20 hens, some casks of meal, powder, ball, and eight pieces of cannon without any bullets (Joutel 1962:84).

On March 20, 1687 La Salle and others were killed by members of their own party, leaving 15 survivors from the 17 who set out on January 12. Six of the 17 eventually returned to France and 9 were captured by the Spaniards (Wedel 1973).

From the time of the capture of the supply ship St. Francis in the West Indies, the Spaniards had known of plans for the French colony, and many expeditions had been sent by land and by sea to search for it. A land expedition headed by Alonso de León came upon the French settlement on April 22, 1689 (León 1909) and found it sacked. It was littered with broken chests, bottle cases, and furniture, about 200 torn and scattered books (in French), and gun stocks without locks or barrels. They found and buried three bodies; no living creatures were found. They counted six houses (Figure 3): nearest the arroyo (Garcitas Creek) at the north edge of the settlement was a house of four rooms built of ship's timbers; near this, a one-room house; toward the south, two more houses; and toward the west, two more. A small hut faced the arroyo. Eight iron cannon and three old swivel guns were there. They buried the cannon and one swivel gun and carried off two swivels, together with the other iron they found (Bolton 1959:398–399). They drew a plan of the site (Figure 3), and one of the soldiers composed a poem of lament (León 1909:336).

When de León learned that there were two Frenchmen living with the Indians some distance away, he sent for them, and they told about the destruction of Fort St. Louis. The two surviving Frenchmen had stayed with the Indians in East Texas after La Salle's murder and immediately after they heard that the Indians had raided the Garcita's Creek fort about three months previously, they had gone there and found it devastated. They buried 14 bodies and exploded about 100 barrels of powder.

De León himself was sent back the next year (1690) to burn the fort. While he and his men were exploring the area looking for further French activity, in the bay at the mouth of the river they saw two objects they suspected were buoys. This discovery caused consternation in Spanish colonial government circles, and a sea expedition with engineer Cárdenas aboard was sent to find and destroy the buoys, map the bay, and search for evidence of the French in the area (see

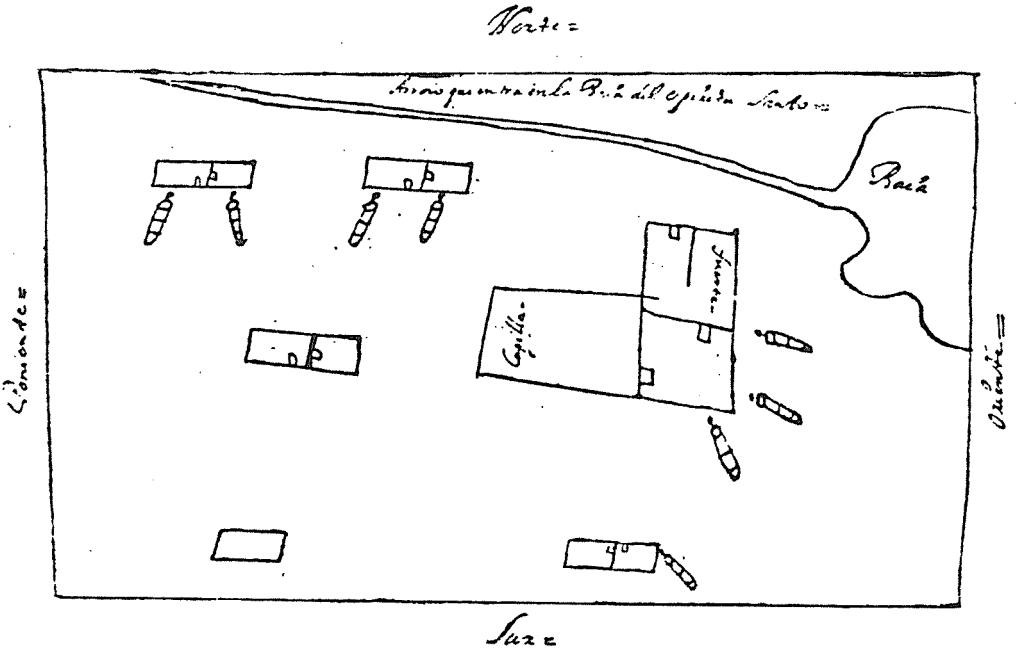

Figure 3. Sketch plan of the French settlement in 1689 (León 1909:330).

Gilmore 1973, Appendix III). The buoys proved to be logs grounded by high water, and no evidence of French activity was found.

The map made by this expedition (Figure 4) compares favorably with modern maps of the Matagorda Bay area; the route the expedition took around the bay can be traced with ease. According to the map, the river on which the Pueblo de los Franceses was located has an island at its mouth, and it enters the bay (Lavaca Bay) from slightly west of north. Another small river enters the bay to the south, and another larger river enters southeast of the Río de los Franceses.

The next spurt of Spanish activity was in response to French activity on the Red River, when the Aguayo Expedition was sent by Spanish authorities in 1722 to establish missions and presidios throughout the area. One presidio, Nuestra Señora de Loreto La Bahía, was built on the site of the French settlement. While ditches were being dug for these fortifications, "pieces of gun locks and fragments of other things used by the French were found," according to the diarist for the expedition. Lines for four bulwarks were drawn, each curtain to be 45 varas (38 meters, or 125 ft.) long. The place where the powder had been exploded in 1689 was enclosed within the lines of the fort (Peña 1935:63–64). A mission, Espíritu Santo, was established across the same river, three-quarters of a league (3 km, or 2 miles) distant. But Presidio Loreto did not prosper as expected, and four years later, in 1726, both the presidio and the mission were moved farther inland.

Figure 4. Map showing the route of the Cárdenas-Llanos Expedition of 1691. From the J. P. Bryan Collection (24a, 1691), The University of Texas at Austin.

The similarity of the Cárdenas map to modern maps of Matagorda Bay, and the fact that the route of this expedition can be traced accurately on a modern map, demonstrate that the French colony of St. Louis was located in the Matagorda Bay area. Therefore, the model to be considered for the location of La Salle's settlement will be in the Matagorda Bay area.

THE MODEL

Fort St. Louis was described as on a small hill 2 leagues (8 km, or 5 miles) up the smallest stream emptying into the bay that stretches northwestward. At the mouth of this river was said to be a small island. From the modern map (Figure 1) we can see that Agula Creek on the south may be smaller than Garcitas Creek but it has no island at its mouth, and the Lavaca River on the southeast has islands at its mouth, but it is the *largest* river flowing into this bay, and the Cárdenas map shows the French settlement on a river that comes into the bay at a more northerly point. Birds of many kinds, including pelicans and roseate spoonbills, inhabit the area; rattlesnakes abound and are held in great respect. The writer has seen no alligators there, but there are marshes southwest and northeast of the Keeran site. Live oaks, yucca, and prickly pears grow in the area. Therefore the topographic, geographic, and physiographic parts of the model coincide clearly with field data from the Keeran site.

Physical cultural remains, the fourth part of the model to be reconciled with the field data, are known not only from historical documents, but also from archeological information from sites of the same time period and same cultural traditions.

In this part of the model, structural remains and ceramic artifacts have been emphasized. Stylistically and technologically, ceramics are sensitive indicators of cultural traditions, and it seemed a good probability that French ceramics of the period could be isolated from those of the Spanish more effectively than could other artifacts. For the Spanish settlement there should be indications of the four bulwarks outlined by Aguayo, in addition to certain artifacts left by the Spaniards.

Majolica ware is Spanish-Mexican tin-enameled earthenware. *Tin-enameled earthenware* has a soft, absorbent, white to light red or buff paste, and is coated with a vitreous tin-bearing opaque glaze. The technique of manufacture was brought from Spain to Mexico soon after the conquest in the middle of the sixteenth century. Tin-enameled earthenware made in France is usually referred to as *faience,* and that made in Holland and England as *delft.* Majolica and faience can be differentiated usually by design style and technique of glaze application. Majolica potsherds serve as "index fossils" for Spanish Colonial sites, and a chronological sequence of design styles has been devised.

Majolica types for the occupation at the Keeran site should include some of those found at Spanish Colonial sites of the same period (e.g., the second location of Presidio Loreto, the Alamo, and certain sites in Florida), and among these

types would be Puebla Polychrome, San Agustin Polychrome, Puebla blue on white, and possibly Abo Polychromes. Sherds of San Luis Polychrome were found at the second location of this presidio (Loreto) and might be found here as well.

Of the 10,200 tin-enameled sherds examined, only 20 were polychrome. Some are Puebla Polychrome, and most of the blue on white majolica seem to be San Agustin plates, cups, and bowls. Although the type variety expected was not found, the types that were found do coincide with the model, confirming the Spanish occupation of this site during the first half of the eighteenth century.

For the French settlement we should find the outlines of six burned houses, five of which should contain fragments of burned daub or clay and possibly burned timbers or charcoal. These house outlines should fit the pattern on de León's map and his description, and associated artifacts should be of French origin, provided the construction and occupation of the Spanish presidio did not destroy them.

The fortress of Louisbourg in Nova Scotia was started about 1715 (Lunn 1973), Fort Michilimackinac in Michigan was occupied by the French at about the same time, and the French occupation at Santa Rosa Pensacola in Florida was in 1719 (Smith 1965). Since faience from France was found at these three sites, it would be expected at Fort St. Louis. At Louisbourg (Marwitt 1966; Barton 1981) and Michilimackinac (Miller and Stone 1970), many coarsewares or kitchenwares were found, and considering the nature of the pioneer settlement, more coarsewares than finewares probably would be found at Fort St. Louis.

As expected, in the Keeran site collection was one group of French sherds (Figure 5) of a type that, to the best of the writer's knowledge, does not occur at any other site in Texas. The interiors are covered with a white slip over which a green glaze was applied; this glaze varies from dull greenish yellow to deep grass green. The lips on these sherds have been rolled onto the exterior, making them much thicker than the bodies of the sherds. The paste is buff to pink, with red specks. At the time of the original analysis (Gilmore 1973), this ware was thought probably to have been made in France. Research carried out in both Canada and France since that time has shown definitely that the ware originated in Saintonge, France (Gusset 1984), not far from La Rochelle, which was the center of colonial trade and the port where La Salle embarked on his last adventure. Unmistakable clues to this origin are the paste, the glaze technique, and the rim treatment. A shallow bowl found at Louisbourg of similar ware, but decorated with brown dots and lines, has been dated from the late seventeenth century (Webster 1969:Figure 1), and a shallow undecorated bowl of this type is in the Tunica collection from Louisiana (Brain 1979:59). The Tunica Indians were early and long-time trading friends of the French. Examples have also been reported from Port Dauphin, Dauphin Island, Mobile Bay—primarily occupied from 1702 to 1717 (Brain 1979:59)—and Fort Michilimackinac (Miller and Stone 1970).

Great quantities of this inexpensive utility ware were exported to the New World in the seventeenth century and most of the eighteenth. Intense rivalry be-

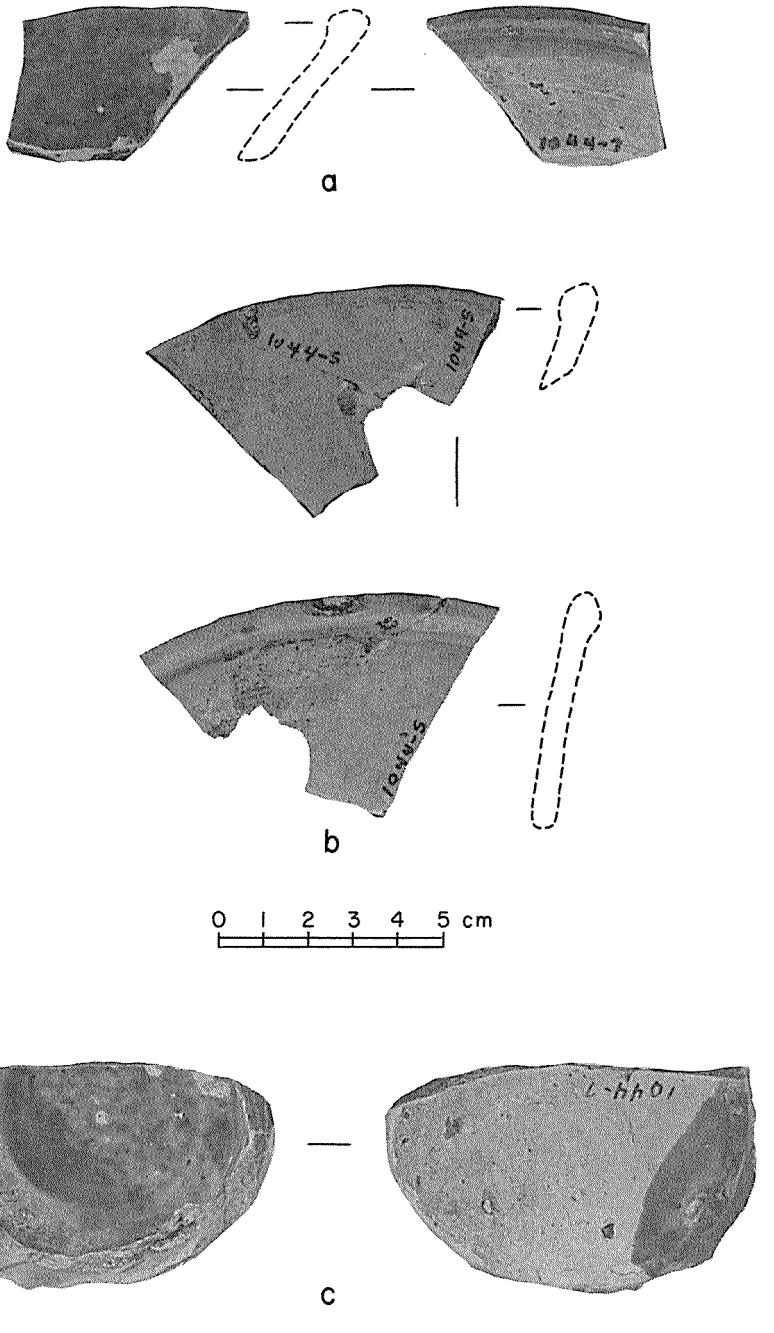

Figure 5. Photographs of green glaze ware from Fort St. Louis.

tween Spain and France would have precluded the bringing of this French ware to the site by the Spaniards. Furthermore, by 1722, when the Spanish presidio was established on this spot, both tin-enameled ware and utility wares were being produced in quantity in Mexico.

Other utility wares abound in the collection. Some undoubtedly are French, and some may have been made at the site. A scaffito sherd depicts an animal with an arrow sticking in or out (as the viewer prefers to see it), done in a technique similar to that of Louisbourg coarseware from the early eighteenth century (Webster 1969:Figure 5). A few tin-enameled sherds in the Keeran site collection may be French.

Further application of the model to the field data reveals that the 86 sherds of the green glaze ware were recovered only in excavation units 1, 5, 7, 12, 13, and 14 (Figure 2). Possible faience occurred only in units 4, 7, 12, and 13. Clay daubing in the collection in the greatest numbers came from units 1, 5, 7, and 19, and was also found at units 3, 4, 6, 12, and 26. The percentages are biased by what the excavator decided to bring in.

This clustering indicates that the French houses depicted by de León (Figure 3) were in these areas; the four-room house nearest the arroyo was in unit 14; the two houses toward the south were in units 5 and 7; the two houses toward the west, in units 13 and 12; and a small hut facing the arroyo was in unit 1.

All parts of the model are in agreement with the field data, and there are artifacts of French origin and of the time of La Salle's colony at the Keeran site on Garcitas Creek. These facts make it certain that the Keeran site was the scene of the tragic events that started 300 years ago on February 20, 1685, at the settlement at Fort St. Louis.

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BIOGRAPHICAL SKETCH

A past president of the Texas Archeological Society, Kathleen Gilmore graduated from the University of Oklahoma in geology and earned her Ph.D. in anthropology from Southern Methodist University in 1973. She is also a member of the Dallas Archeological Society. Her interests are Caddo archeology and historical archeology. Since 1975 she has been with the Institute of Applied Sciences at North Texas State University in Denton.

The Gregg Ranch Site (41HY131), Hays County, Texas

Howard D. Land

ABSTRACT

Excavations at the Gregg Ranch site (41HY131) revealed the presence of man on the Blanco River in Hays County, Texas, for a period that spans 10,000 years, from mid-Paleo-Indian to Late Prehistoric periods of the Central Texas Archaic. In addition to providing supplemental information on previously defined Archaic traditions, archeological data from site 41HY131 shows that relations existed between late Paleo-Indian and very early Archaic traditions long suspected of overlapping in both time and space. The site also yielded new variants of Early Archaic projectile points as well as evidence suggesting the existence of an early occupation shelter.

INTRODUCTION

The primary objective of this report is to supplement previous studies of early man in Texas and to corroborate certain ideas that recently have become evident in Texas archeology. This includes support of previously defined chronological sequences for Central Texas, with the addition of new information, the identification of specialized tools, and the formulation of a hypothesis for the settlement patterns at the Gregg Ranch site. Special emphasis has been placed on Late Paleo-Indian through Early Archaic data called San Geronimo (Weir 1976a).

The Gregg Ranch site (41HY131) is a multicomponent occupation site on a low terrace of the Blanco River, a tributary of the Guadalupe River in Hays County, Texas. The site is about 6.4 km (4 miles) west of Kyle on the land of A. W. Gregg (Figure 1). Limited excavations were carried out by the writer and Paul Duke, of Austin, on weekends and holidays from August 1976 through May 1977.

Description of the Site

The Gregg Ranch site is a single burned rock midden situated on a low alluvial terrace on the north side of the Blanco River (Figures 2, 3). The terrace is about 20 meters wide; it is bounded by a limestone bluff about 3 meters high (Figure 3, b) on the north and by the river's flood plain on the south (Figure 4). The river channel is about 60 meters south of the terrace, and about 60 meters east of the site is an intermittent creek. The midden is in front of the bluff (Figure 3, b) where limestone is readily available for cultural needs. The midden was

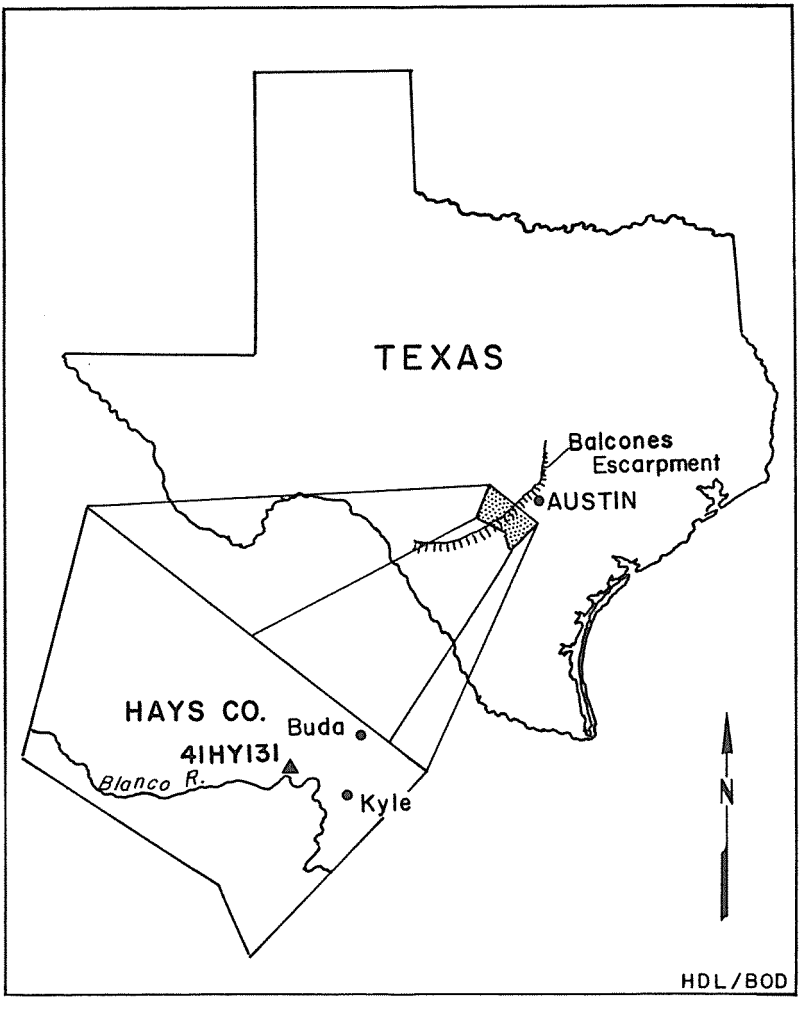

Figure 1. Map of Texas showing location of Hays County and the Gregg Ranch site.

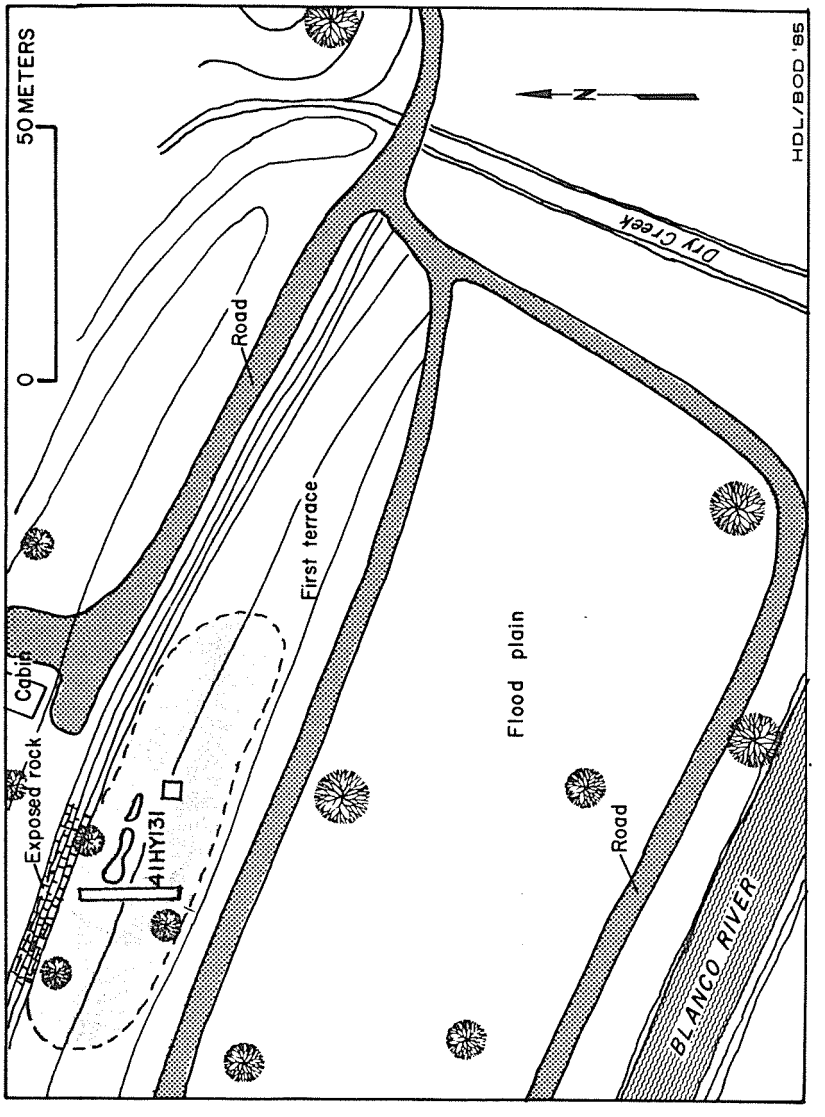

Figure 2. Topographic sketch map of the Gregg Ranch site.

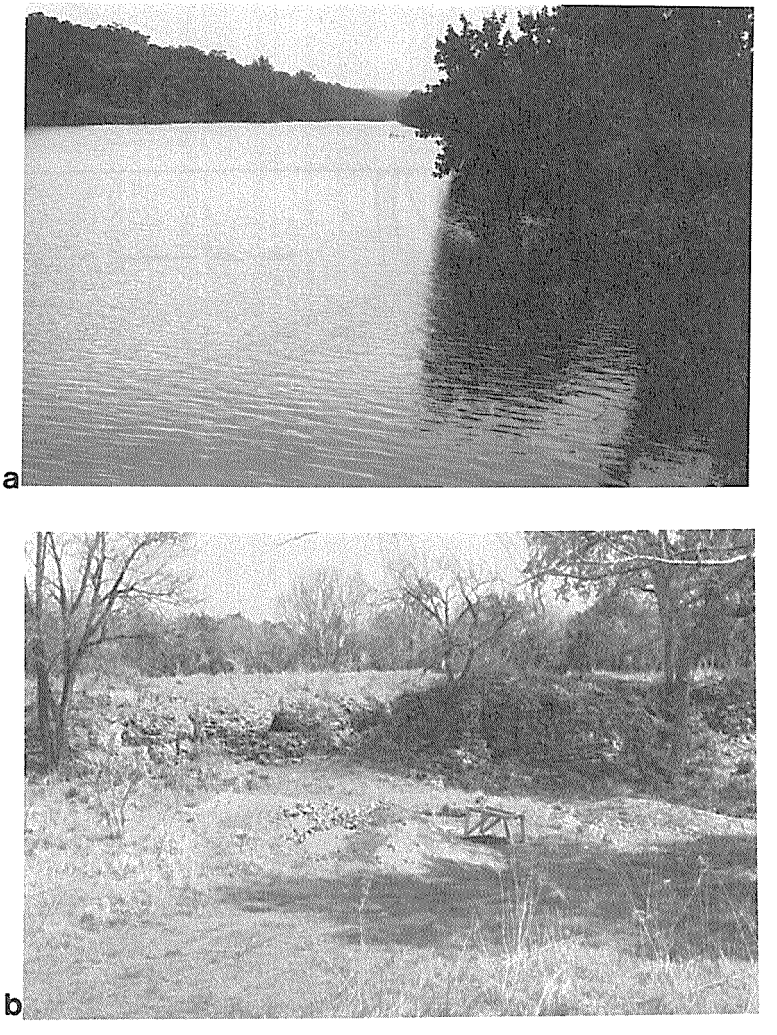

Figure 3. Photographs: a, northwest view of Blanco River near site; b, Area A, looking north, showing exposed limestone bluff.

easily identifiable by surface concentrations of burned rock, hearths, snail shells, lithic debris, and dark soil. Artifacts and surface lithic scatters are sparsely distributed in the vicinity of the site, particularly on the higher terrace that overlooks the site. From surface indications, the midden was judged to be about 20 meters wide and 50 meters long (Figure 5).

Previous Investigations

Limited excavations have been carried out in the area by several universities in conjunction with surveys in the San Marcos and Blanco drainages. Excava-

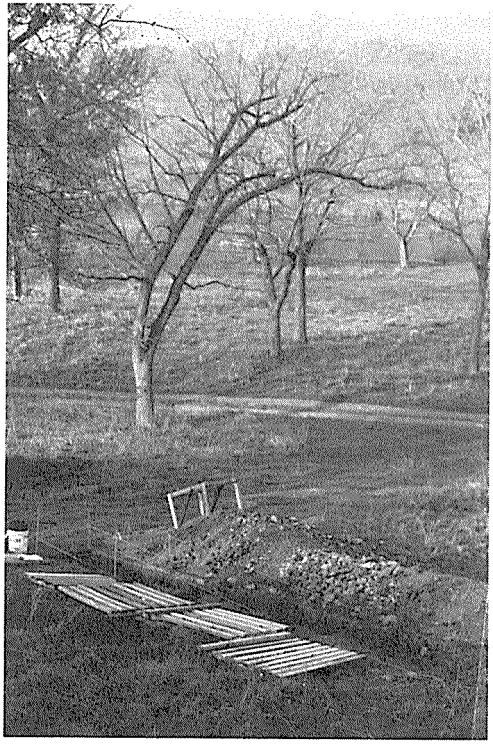

Figure 4. Photograph: view of Area A looking south across flood plain and Blanco River.

tions were carried out at the Greenhaw site (41HY29) by Frank Weir from 1974 to 1976 (Weir 1979), but no previous excavations or surveys are known to have been made in the Gregg Ranch area.

Environment

The character and location of the Gregg Ranch site, situated directly on the Balcones escarpment at the eastern rim of the Edwards Plateau offered many advantages to aboriginal peoples. From it the faunal and floral resources of both the Edwards Plateau and the Blackland Prairies, directly to the east, were easily accessible. A sheltered southern exposure provided more protection and warmer average temperatures than are found on adjacent uplands. The large limestone outcrop (Figures 5 and 3, b) also provided a readily available source of raw materials for hearths, ovens, shelter hold-down, and other uses. The presence nearby of permanent water and a source of stone for making tools (Figures 2 and 3, a) were especially favorable to settlement. Possibly in former times there was an abundance of plants and both large and small game. By following the drainages of nearby major streams, the inhabitants could traverse several biotic zones, a situation that offered significant advantages for food procurement. The avail-

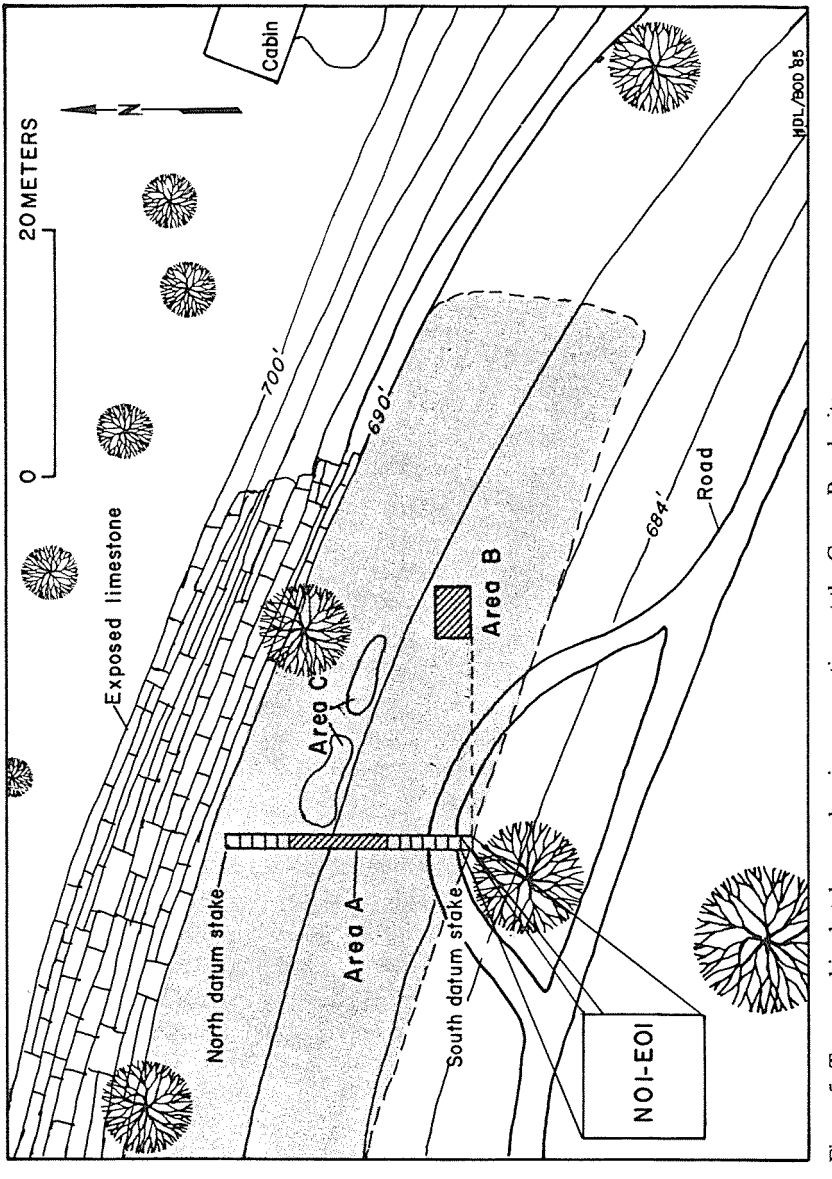

Figure 5. Topographic sketch map showing excavations at the Gregg Ranch site.

ability of vegetable foods was probably optimal and very suitable to the early hunter-gatherer populations (Butzer 1971:151). Exploitation of molluscs and fish is evidenced archeologically in late Paleo-Indian times as well as during the Early and Middle Archaic. As the result of Pleistocene alluviation, it is apparent that an old flood plain was stranded on the north bank of the Blanco River due to down-cutting during drier periods. On the bench formed by the stranded flood plain is the Gregg Ranch site, where the early inhabitants made their temporary camps, starting about 10,000 years ago and lasting to Historic times. As time passed and groups continued to use this favorable location, midden material and occasional flood deposits accumulated until the site grew to a thickness of more than 2 meters in some places. Climate undoubtedly played a major role in occupation and deposition at the site, affecting interrelations of soils, plants, animals, and man (cf. Butzer 1971:49–78). If the scenery and climate of the past were similar to those of the present, the site area must have been a beautiful place to live. The existence of a site at the Gregg Ranch was predictable because there are so many favorable indicators in the vicinity today.

Excavation

To begin excavations at the Gregg Ranch site, a 20-meter north-south baseline was established between two datum reference points, bisecting the site. Excavations along this baseline were designated Area A, and an area 18 meters east of the south datum point was designated Area B (Figures 5, 6). The writer was responsible for Area A, and Paul Duke for Area B. We set an arbitrary elevation of 210 meters (690 feet) for the north datum stake (the top of the stake was level with the midden surface). Using reference data from U.S.G.S. 7.5 minute quadrangle San Marcos North, we constructed a grid system along the north datum line and established the horizontal control point at the south datum stake, which was designated N00-E00. All points on the site were measured from this datum. Within squares, measurements were taken in centimeters starting at the southwest stake, moving to the east, then to the north. Vertical measurements were taken from an established plane that was maintained throughout the excavation. Measurements were recorded in field notes, and artifacts were recorded by provenience. These records made it possible to reconstruct excavated profiles and features (Figures 7, 8). Excavation was by arbitrary 10-centimeter levels, and material was screened through quarter-inch hardware cloth. All cultural material was saved, except for burned rock and snail shells. All materials were separately bagged, recorded, washed, and analyzed. More than 500 man-hours were spent on 18 squares that ranged in depth between 90 and 200 cm.

AREA A

Internal Structure

Excavation revealed five primary strata (Figures 7, 8).

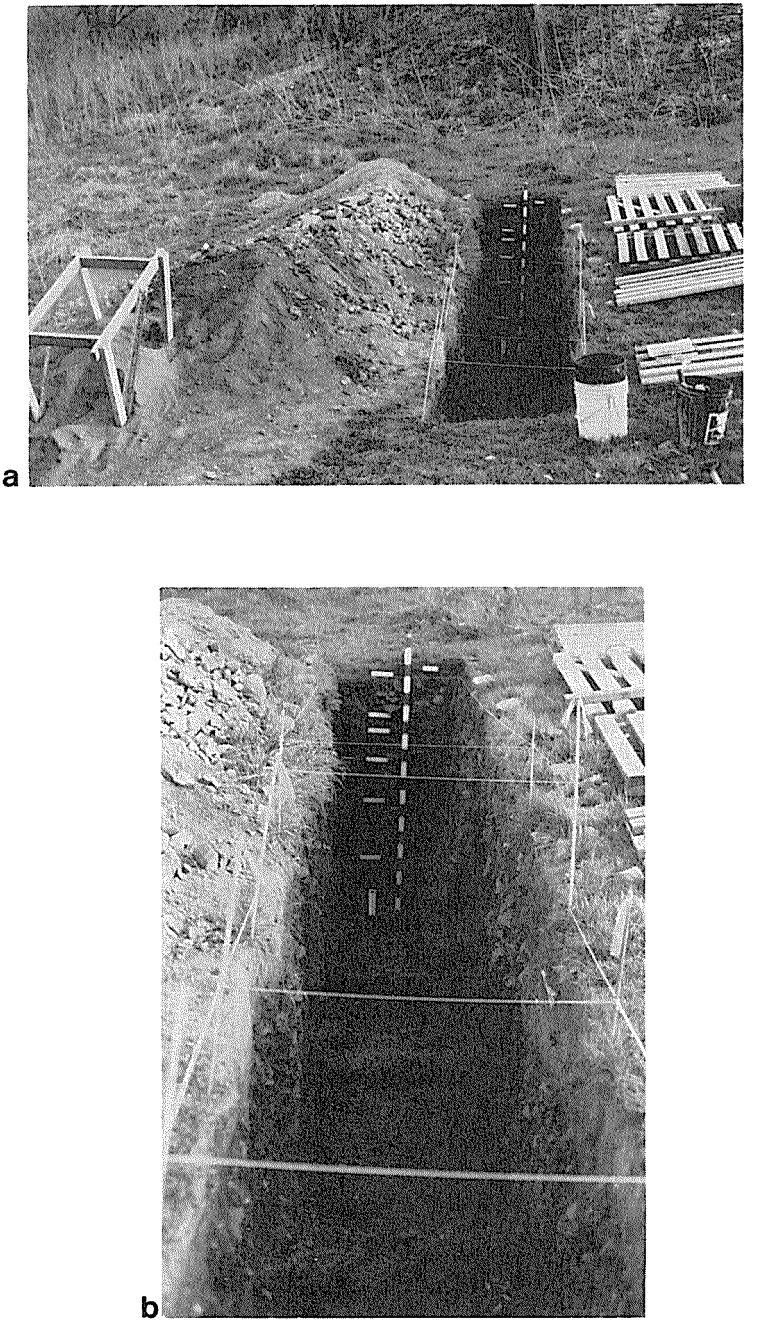

Figure 6. Photographs: a, Area A excavation; b, north view of Area A showing it excavated to the Paleo-Indian level.

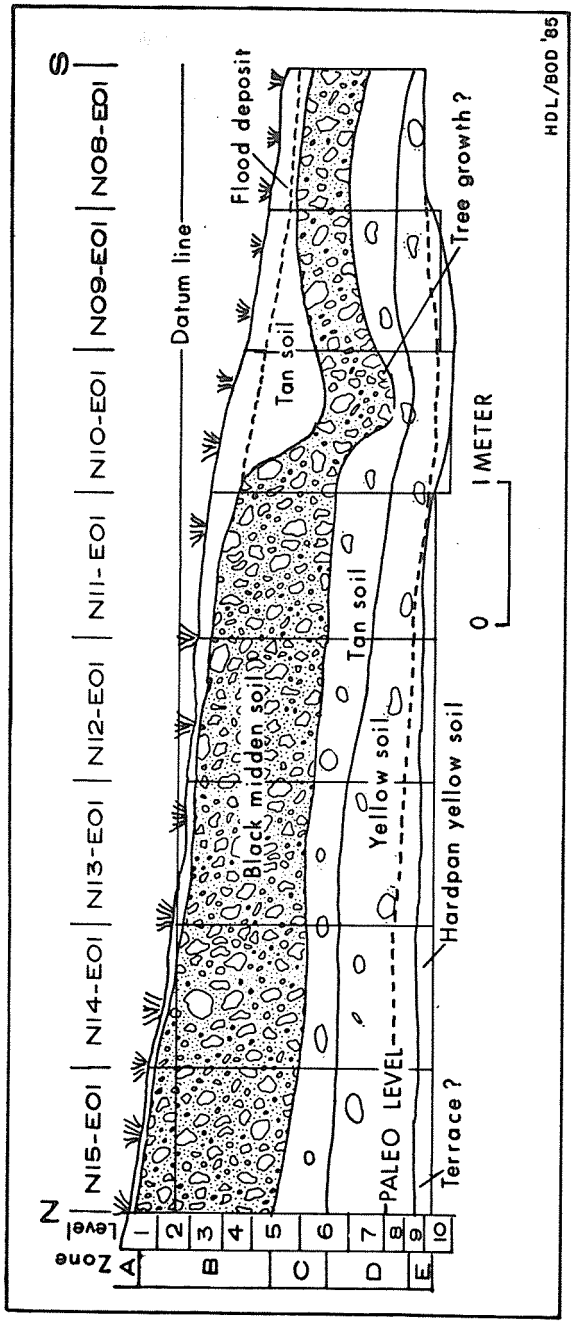

Figure 7. Diagrammatic sketch of the east (N-S) profile of excavation Area A, Gregg Ranch site.

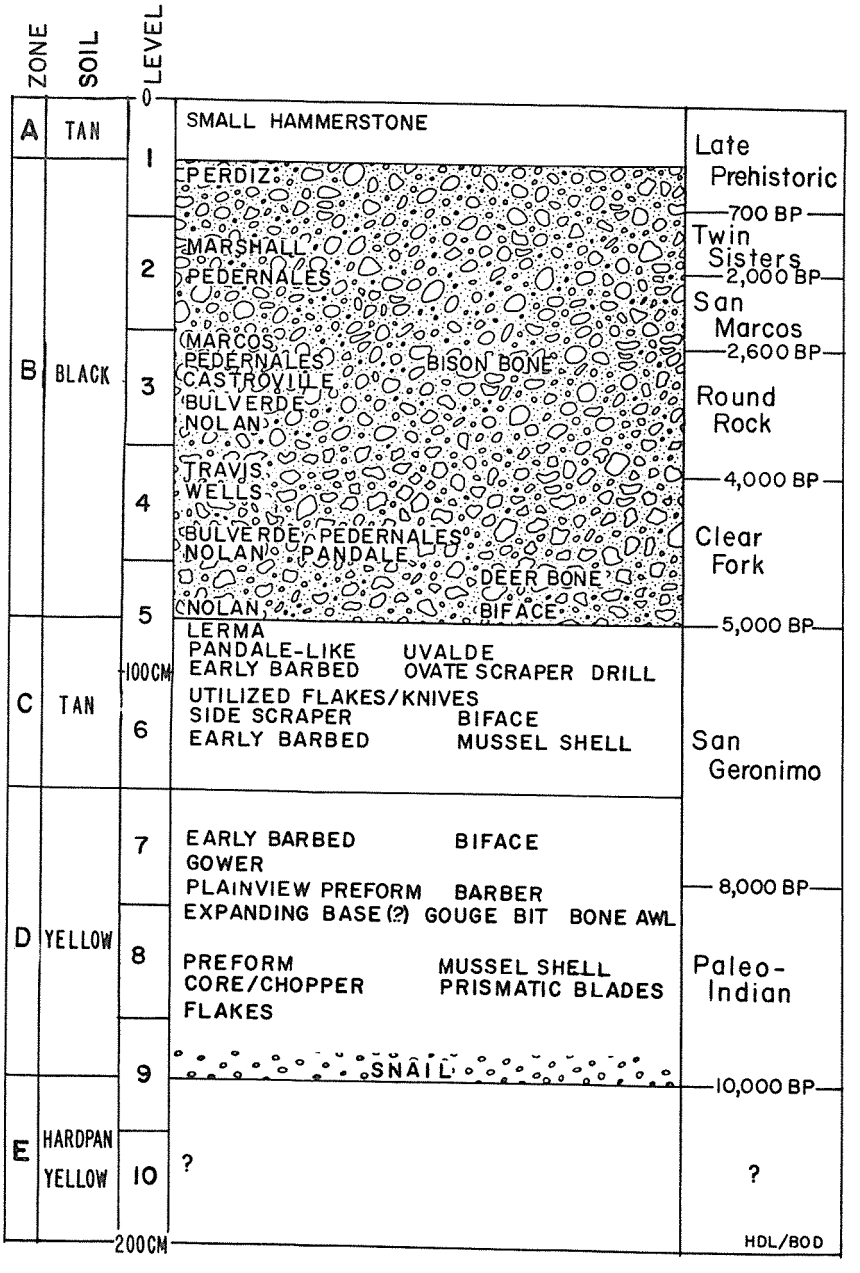

Figure 8. Idealized profile in Area A, Gregg Ranch site.

Zone A (Surface Zone)

Consists, in the northern half of the site, of a dark brown compact midden soil and, in the southern half of the site, a compact tan alluvial clay, probably deposited by heavy flooding. This zone contains much burned rock (including hearths), snail shells, bone, artifacts, and lithic debris. The tan soil is generally sterile. The average thickness of Zone A is 10 cm.

Zone B (Main Occupation Zone)

Contains an abundance of dark gray to black midden soil, burned limestone fragments, hearth stones, bone, snail shells, lithic debris, and artifacts. The average thickness of Zone B is 80 cm (thinning out toward the edges), and the zone is at an average depth of 10 cm below the surface, extending over about half of the site.

Zone C

A zone of loose, tan, sandy soil that contains much cultural debris, including diagnostic tools, mussel shell, snail shells, bone, and burned rock fragments. The average thickness is 30 cm; the top of Zone C averages 90 cm below the surface.

Zone D

Composed of loose, yellow, claylike soil that contains a small amount of burned rock, snail shells, and cultural material. The average thickness of this zone, encountered at an average depth of 110 cm below the surface, is 50 cm.

Zone E

A soil of light yellow compact clay that contains very little cultural material. This soil was encountered at an average depth of 160 cm below the surface and extends to an undetermined depth.

Dating

No radiocarbon dates have been established for the Gregg Ranch site, so the archeological sequence is in temporal limbo. Using previously established sequences from other sites in Central Texas, and closely adhering to the detailed chronological framework established by Weir (1976a), the site can be dated with the help of new data with a fair degree of confidence. The new data from the Gregg Ranch site have not radically altered the picture of the cultural history of Central Texas presented by Weir (1976a), but have corroborated his phases, especially the San Geronimo phase. The finding of Plainview, Barber, Scottsbluff(?), Angostura, Early Triangular, Gower, Hell Gap(?), and early barbed projectile points and the remains of a possible shelter—all stratigraphically below Early Archaic materials—was fortuitous, and can be exploited scientifically. Using approximations of Weir's phase sequence for Central Texas, as well as Paleo-Indian sequence data from the Devils Mouth site (Sorrow 1968:45–50) and Baker Cave (Word 1970:98–105), the following time periods can be estimated for the Gregg Ranch site (Figure 8).

Period 1—Paleo-Indian

Levels: 7, 8, and 9
Soil Zone: D
Time Period: 10,000–8,500 years BP
Diagnostic Artifacts: Plainview preform, Barber, expanding-base dart point (posible Scottsbluff), choppers, utilized flakes, prismatic blades, gouge, and other preforms and bifaces
Bone Artifacts: Awl
Shell: Mussel and snail
Burned Rock: Minimal amount

Period 2—San Geronimo Phase

Levels: 5, 6, and 7
Soil Zones: C and D
Time Period: 9,000–5,000 BP
Diagnostic Artifacts: Early barbed, Lerma, Gower, ovate scrapers, drills, utilized flakes, flake knives, side scrapers, choppers, and other bifaces
Bone: Small animals, including deer, and bison
Shell: Mussel and snail
Burned Rock: Minimal amount

Period 3—Clear Fork Phase

Levels: 4 and 5
Soil Zone: B
Time Period: 5,000–4,000 years BP
Diagnostic Artifacts: Travis, Nolan, Pandale, Bulverde, Pedernales, Uvalde, Wells, other bifaces, and utilized flakes
Bone: Small animals, including deer
Shell: Snail
Burned Rock: Much accumulated and compacted rock with dark soil

Period 4—Round Rock Phase

Levels: 3 and 4
Soil Zone: B
Time Period: 4,000–3,000 years BP
Diagnostic Artifacts: Bulverde, Nolan, Castroville, Pedernales, and other bifaces
Bone: Bison and deer
Shell: Snail
Burned Rock: Much compacted rock

Period 5—San Marcos Phase

Levels: 2 and 3
Soil Zone: B
Time Period: 2,800–1,900 years BP
Diagnostic Artifacts: Marcos, Pedernales
Bones: Bison
Shell: Snail
Burned Rock: Much compacted rock

Period 6—Twin Sisters Phase

Levels: 1 and 2
Soil Zone: B
Time Period: 1,700–700 years BP
Diagnostic Artifact: Marshall
Bone: None
Shell: Snail
Burned Rock: Much compacted rock

Period 7—Late Prehistoric

Level: 1
Soil Zones: A and B
Time Period: 700 years BP or more recent
Diagnostic Artifacts: Perdiz, small hammer stone
Bone: None
Shell: Minimal snail
Burned Rock: Surface hearths

Provenience of the Artifacts

If each excavation unit at the Gregg Ranch site had been stratigraphically level and uniform in thickness, it would have been ideal to list individual 10-cm levels chronologically for each of the eight squares, but the site had about a 15-percent slope, and the thickness of the stratigraphic units varied.

During excavation, all vertical measurements were plotted on a profile chart showing the east profile of all eight squares (Figure 7). Stratigraphic changes and major features (burned rock, tan soil, yellow soil) were plotted from the field measurements. Multiple occurrences of special cultural material (mainly the recognized projectile point types) were used to make inferences about time spans of specific levels. Cultural phases proposed by Weir were the basis for establishing time markers for Gregg Ranch site (Weir 1976a), as follows: Late Prehistoric (400–1,500 BP); Twin Sisters (700–2,000 BP); San Marcos (1,800–2,800 BP);

Round Rock (2,600–4,200 BP); Clear Fork (4,000–5,000 BP); San Geronimo (4,500–8,000 BP); and Paleo-Indian (7,000–12,000 BP). For postulating chronological relations among artifacts, the Area A profile was divided arbitrarily into ten 20-cm levels (Table 1). These 10 levels are correlated with temporal phases (Weir 1976a) postulated from artifact types by various researchers (Johnson 1964, 1967; Sorrow et al. 1967; Word and Douglas 1970; Hester 1971) (Figure 8).

The occurrence of Nolan points (Clear Fork phase) consistently at the very bottom of the primary burned rock midden suggests the start of a new life-style about 5,000 years ago. Below this depth a different group of people (San Geronimo phase) is indicated, represented by early corner-notched points, early barbed, and Uvalde-like points as described by Hester (1971:71) and others (Johnson 1964, 1967; Sorrow et al. 1967; Word and Douglas 1970). Below the San Geronimo phase (cf. Weir 1976a:121–124) Paleo-Indian points are found together with other material thought to represent a life-style slightly different from that of the later, Archaic hunter-gatherers. Probably there was an overlap of the late Paleo-Indian with the Early Archaic in Central Texas (Prewitt n.d.). There are instances of Gower and Early Triangular points occurring stratigraphically with or below Plainview and Barber at the Gregg Ranch site (Table 1; Figure 8).

Artifacts of the Clear Fork Phase and Earlier

In the descriptions below, emphasis is placed on artifacts found in the Clear Fork, San Geronimo, and Paleo-Indian levels. Additional data and field notes are on file at the Texas Archeological Research Laboratory in Austin.

Projectile Points

Early Barbed Points

10 Specimens (Figure 9)

Description: Triangular with deeply cut corner notches and expanded stems; base is usually inverted V-shaped with straight lines as opposed to the slightly curved lines of the Martindale point, but sometimes rounded instead of V-shaped. Workmanship good. Stone is usually a variety of homogeneous, dark Edwards Plateau flint. Figure 9, i, often called Bandy, is typical of these points.

Dimensions: Length 32–57 mm; width across shoulders 30–40 mm; length of stem 7–17 mm; depth of notches 6–10 mm; width of base 19–26 mm; thickness 4–7 mm.

Provenience: Area A, squares N08, N09, N11, N12, N14-E01, levels 5, 6, and 7; most specimens came from level 6.

Remarks: These projectile points are of an unnamed type, similar in most respects to Martindale (Suhm and Jelks 1962:213). However, barbed specimens are found consistently well below Early Archaic projectile points (Nolan, Bulverde, and Travis) and just above types of the Paleo-Indian tradition (Angostura, Barber, Plainview). Similar types have been found in like context at La

Jita (Hester 1971:71–73), Baker Cave (Word and Douglas 1970:21–25), Devils Mouth (Johnson 1964:2, 3), Stillhouse Hollow (Sorrow et al. 1967:16–24), Jetta Court (Wesolowsky et al. 1976:46), San Geronimo, and Wilson-Leonard (Weir, personal communication). Weir includes this type in the San Geronimo phase of the Central Texas Archaic (Weir 1976a:52, Figure 9, F and G). Several varieties may become evident after additional work at Gregg Ranch or other early occupation sites in the region. There also appears to be some connection with the Uvalde type, and a lanceolate variety (Figure 12, b).

Plainview Preform

1 Specimen (Figure 10, a)

Description: Percussion-flaked, parallel-sided, lanceolate biface with slightly indented base and broken end; base is beveled as if preparation was being made for final basal thinning. Flake scars create slighly irregular edges along both margins; has minimal retouch and no evidence of grinding on the lowest edge or base. Stone is opaque tan flint. Specimen probably was discarded after breakage occurred at the distal end.

Dimensions: Extrapolated length 80 mm; width across shoulders 20 mm; thickness 7 mm.

Provenience: Square N10-E01, 149 cm below datum; assigned to level 7.

Remarks: Unlike most Archaic artifacts at the Gregg Ranch site, which often have crusts, this specimen has a slight patina on one side; classed as a Plainview preform because of its stratigraphic position in the site, workmanship, shape, and probable stage in production.

Possible Lange

1 Specimen (Figure 10, b)

Description: Triangular with prominent shoulders resulting from deep corner notches and an expanding stem; base is straight and shows no evidence of grinding; basal thinning by removal of short flakes. Stone is light tan flint. Good workmanship; mainly percussion flaking with minor pressure retouch. Apparently an unfinished point that was broken during manufacture.

Dimensions: Extrapolated length 63 mm; extrapolated width across shoulders 35 mm; length of stem 10 mm; basal width 22 mm; thickness 6 mm.

Provenience: Square N12-E01, Area A, 147 cm below level 7 datum.

Remarks: In general this specimen fits within the range defined by Suhm and Jelks (1962:203). The point was lying on edge below the Golondrina point (level 7). If it is a Lange, it is considerably out of context. When found it was believed to be in good context due to the compact soil that surrounded it and because it had the encrustation that is typical on lithic debitage at this depth. But there could have been some mixing resulting from soil cracking during dry periods or burrowing by rodents, although no evidence of burrows was noted. Assuming good context (10 cm below and near the Barber point), one can speculate on its morphological relation to Paleo-Indian projectile points.

Table 1. Provenience of the Artifacts, Gregg Ranch Site (41HY31), Areas A and C

Artifact	Level										Total
	1	2	3	4	5	6	7	8	9	10	
Projectile points											
Perdiz	1										1
Bulverde		1	1	3	1						6
Castroville				1							1
Early barbed (4 Bandy)					1	8	1				10
Fairland				1							1
Barber							1				1
Gower							1				1
Lerma					1						1
Marcos			1								1
Marshall			1								1
Nolan			1	2	7						10
Pandale				2	1						3
Pedernales		1	5	3	2						11
Plainview preform							1				1
Travis				1							1
Unknown	1			2	5		1	1			10
Wells				1							1
Biface-lenticular	2	3	3	8	11	6	1	1			35
Biface-prismatic					1						1
Prismatic flake/blade				1		1	2	1			5

Table 1. Provenience of the Artifacts, Gregg Ranch Site (41HY31), Areas A and C (continued)

Artifact	Level										Total
	1	2	3	4	5	6	7	8	9	10	
Chopper					1	1		1			3
Core			1		1						2
Corner-tanged knife				1							1
Drill		1			1						2
Gouge				1		1		2			4
Hammerstone	1	1									2
Knife	1	1	2		2						6
Mano		1									1
Net sinker			1								1
Pebble, red				1							1
Perforator				1							1
Preform		1			2	3		1			7
Scraper, ovate					1						1
Scraper, side					1	4					5
Uniface							1				1
Utilized flake		1			1	3	1	1			7
Bone awl				1			1				2
Bone	1	1		3	3	2		1			11
Snail shell	+	+	+	+	+	+	+	+	+	+	+[a]
Mussel shell					1	3		1			5

[a] Snail shells present in all levels, but not counted

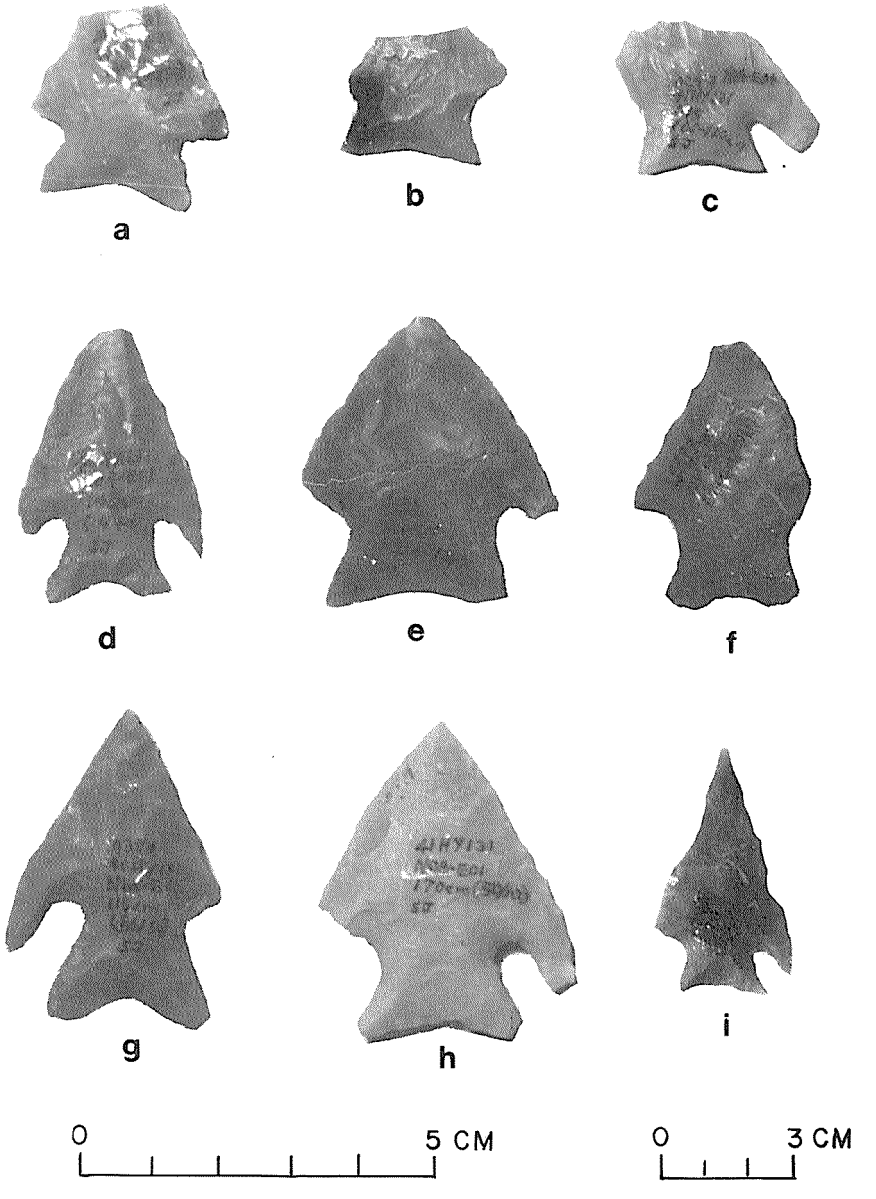

Figure 9. Early barbed projectile points from Area A, Gregg Ranch site; a, b, c, and i are Bandy points.

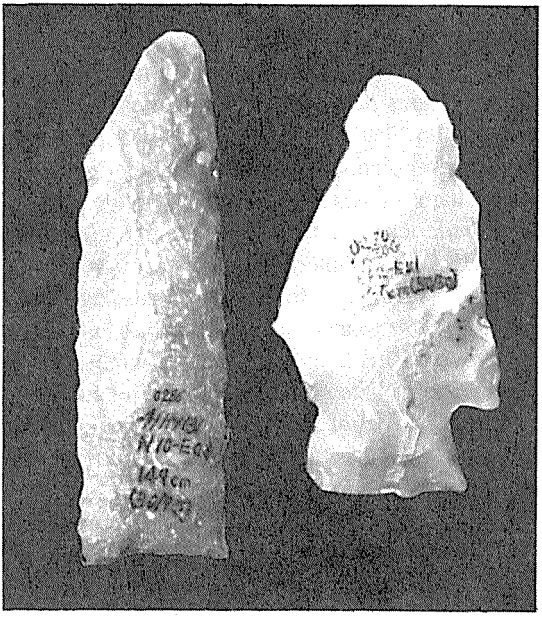

Figure 10. Plainview preform, a, from Area A; possible Lange point, b, from Area A.

Barber

1 Specimen (Figure 11)

Description: Biface lanceolate point with deep concave base, smoothed (by grinding) lateral edges, and slightly flared basal corner with recurved edge. Flake removal was by either heavy pressure or a technique of closely controlled percussion, resulting in oblique-parallel flaking. Good workmanship; minimal amount of marginal retouch is probably the result of edge straightening; basal thinning is of the crescent variety. Stone is opaque, gray flint. Cross section is plano-convex, suggesting that a prismatic blade was the initial stage in the manufacturing process. Distal end, one edge, and one basal ear have been damaged; it appears that an attempt was made to remove a flake at the distal end with a burin stroke after breakage during manufacture. The resulting fractured tip may have been used for cutting.

Dimensions: Extrapolated length 95 mm; maximum width 23 mm; basal depth 7 mm; thickness 7 mm.

Provenience: Square N15-E01, Area A, 134 cm below level 7 datum.

Remarks: Except for the well-executed oblique-parallel flaking and the plano-convex cross section, this point is similar to the Golondrina type from the

Devils Mouth site (Johnson 1964:46–52), but its oblique flaking and deep basal concavity identify it as a Barber point (Kelly 1983; Turner and Hester 1985:70).

The occurrence of these well-made points in Central Texas suggests an affiliation with Paleo-Indian cultures of the High Plains; the Jimmy Allen site readily comes to mind (Wormington 1957:145). Additional work done at Hell Gap places the Gregg Ranch specimen potentially within the Frederick or Lusk complexes as defined by Irwin-Williams et al. (1973:50–52). Note also that Irwin's spatial representation for the Frederick complex, although not totally defined because of lack of evidence, extends from southern Montana through the Great Plains and into Central Texas (Irwin 1971:Figure 6). The writer also agrees with Irwin's reservations about assigning a site to a complex on the basis of morphology of specific artifacts rather than considering the entire tool assemblage (Irwin 1971:54). In the case of the Gregg Ranch site (Area A), an additional item that favors the Frederick complex is a bone awl at the same stratigraphic level as the Barber point. An oval of large rocks—possibly the remains of a temporary light-weight shelter—in the Plainview level in Area B, comparable to a feature found at Hell Gap (Irwin-Williams et al. 1973:45), also indicates temporal affiliation with the Frederick complex. Much comparative analysis between Central Texas assemblages is needed before we can establish relations among Paleo-Indian occupations. A possible Hell Gap point was also found in Area B at the Gregg Ranch site (see below). Because the Gregg Ranch Barber specimen was stratigraphically below early barbed points, but contemporaneous with Gower points (San Geronimo), possibly there is an overlap of Archaic and Paleo-Indian traditions in Central Texas. This has long been suspected by Prewitt (n.d.), Weir (1976a), Agogino (n.d.), Johnson (1964:92), and Sorrow (1968:48). Willey (1966:62–64) cites several instances of mixed contexts found in eastern North America, the Great Plains, and Texas, including the Jake Martin site (Davis and Davis 1960:22).

Additional evidence for this hypothesis was found at Gregg Ranch, Areas B and C, where Early Triangular, Plainview, and (possible) Hell Gap points were found in the same levels and where Gower and early barbed points have been reported by relic hunters below Plainview and Angostura in Area C. There is, of course, the possibility of mixing between the late Paleo-Indian occupation and the succeeding San Geronimo phase (Archaic) during the Altithermal climatic period (7,000 years BP approximate starting date). Mixing might be the result of very little deposition during a dry period or of heavy erosion during wet periods (Hester 1982).

Tree-root growth, animal burrowing, soil cracking, and the treading of men and animals also may account for the mixing of artifacts. Special attention was given to this problem during the excavation at the Gregg Ranch site, where animal burrowing was noted; some specimens obviously were out of place. Also found in the same level as the Barber specimen were several large prismatic blades and many thinning flakes that were very similar in color, texture, and composition, implying a good context. Fortunately, artifacts assigned to the San

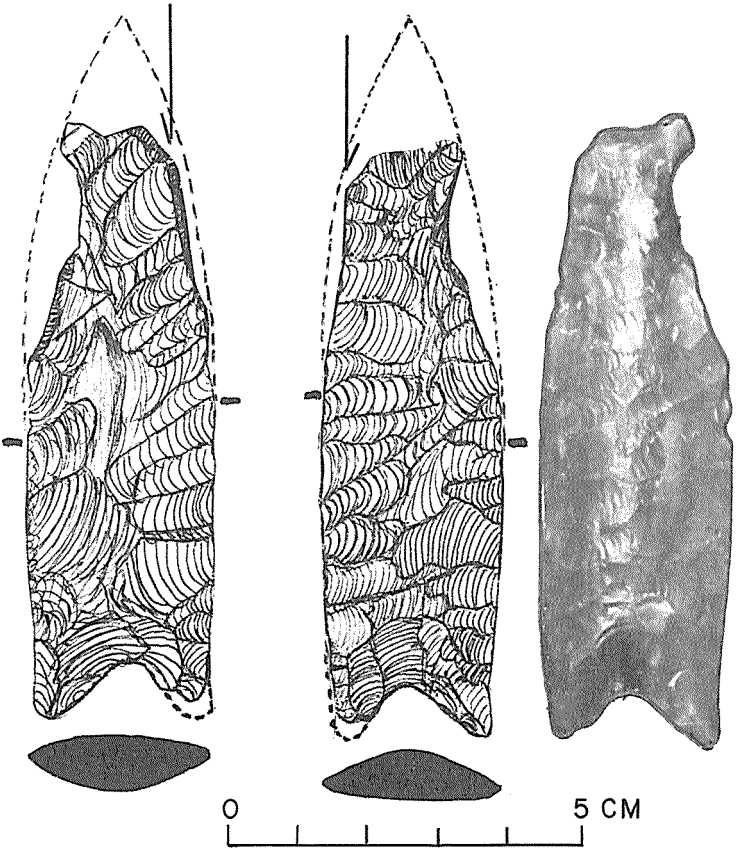

Figure 11. Barber point from Area A.

Geronimo phase were plentiful, particularly in levels 6 and 7 (Figure 8). In addition to the Plainview preform and the Barber specimen, the San Geronimo materials aided in determining the Paleo-Indian level, which is thought to lie on a hard terrace surface (Figures 7, 8). An additional argument for the contemporaneity of Paleo-Indian and Archaic traditions is the occurrence of Archaic corner-notched points in eastern North America 8,000 to 11,000 years ago (Coe 1964: 12; Broyles 1971:49; Peck and Painter 1984:23); similar Archaic points could have been in Central Texas at the same time. The relations between climate, flora, fauna, and man suggest that even the Paleo-Indian peoples as big game hunters occasionally may have exploited geographical areas other than the High Plains and eventually may have been drawn to a different way of life—the Archaic. The flaking pattern on this specimen differs from most Paleo-Indian points of this type, suggesting that it may have been manufactured by a left-handed individual, judging from the writer's experiments with preform holding and flake removal.

Unclassified

5 Specimens (Figure 12, a-e)

Description: Triangular to leaf shaped with straight or convex edges; prominent shoulders with rounded or barbed corners; strongly expanding stems; base has slight concavity and is sometimes similar to Martindale. Some specimens have stem and basal smoothing.

Provenience: Squares N08-E01, N11-E01, N12-E01, and N15-E01, Area A, level 5.

Remarks: Except for 9, a, these specimens apparently are variants of Travis or Nolan types. Specimen 12, c is well made, has serrated edges, and may be a Travis point. Specimens 12, a and b have slight to moderate smoothing along the base and stem edges. Figure 12, b has a base similar to those of the early barbed points shown in Figure 9 or to the Martindales. These specimens compare favorably with ones assigned to the San Geronimo phase of the Central Archaic as defined by Weir (1976a:52, Figure 9, D and E).

Nolan

10 Specimens (Figure 12, f-k)

Description: Triangular to leaf shaped; stems (except for Figure 12,g) alternately beveled and rectangular to slightly expanding in cross section; stem edges on most specimens lightly smoothed. Workmanship varies from fair to good; percussion is the predominant flaking technique. Preferred material is an opaque flint. Some specimens show evidence of heat treatment.

Dimensions: Length 50–95 mm; width across shoulders 20–32 mm; length of stem 12–27 mm; width of base 12–20 mm; thickness 5–9 mm.

Provenience: Squares N09, N09, N11, N13, N14, and N15, levels 3, 4, and 5; most specimens were near the bottom of the primary burned rock midden, on level 5.

Remarks: Both edges of the stem of one specimen (Figure 12, g) were beveled on the same face. Called Zorra by some, the writer believes this to be only a variant of Nolan. Two Pandale points were recovered very near several Nolan points in Square N15-E01 (Figure 7). These are thought to be Nolan, although they have expanding bases and well-pronounced bevels on the stems. Some Nolan points also closely resemble Travis. These similarities suggest cultural affiliations among the three types.

At Gregg Ranch there was evidence that the people who produced the Nolan type specimens (Clear Fork phase), though not the earliest, were the first to use burned rock middens intensively. Whether the vast accumulations of burned rock at this site represent many hearths, a system of ovens, or some other cultural feature is not known. Nolan specimens from Gregg Ranch conform to the type described by Suhm and Jelks (1962:225). Weir considers Nolan diagnostic of the Clear Fork phase of the Texas Archaic (1976a:29, Table 1).

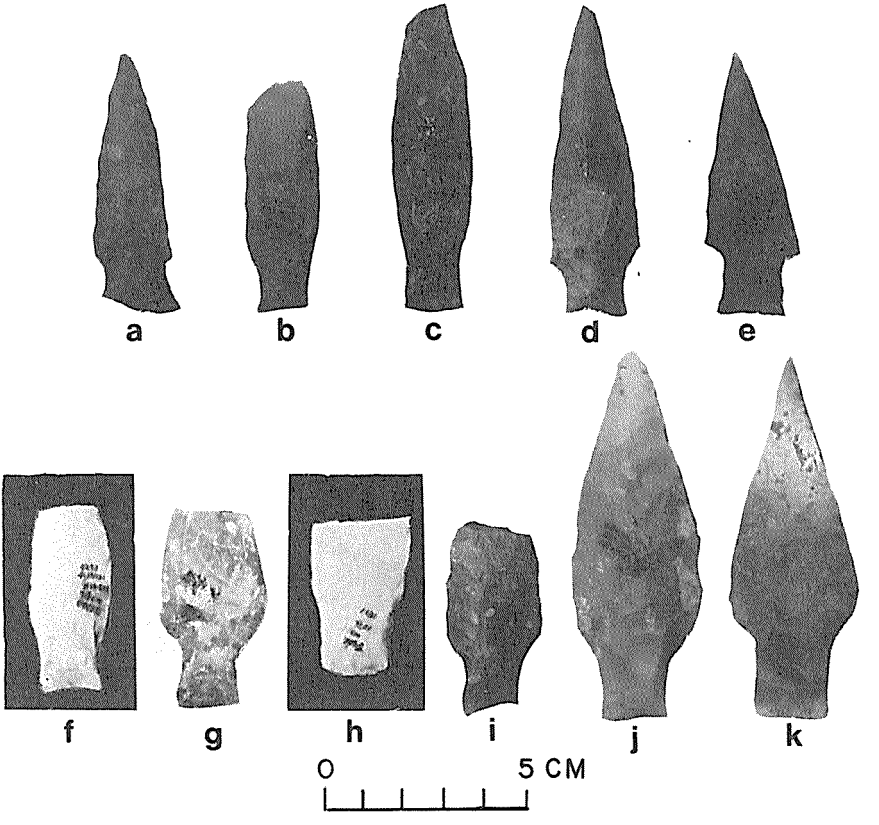

Figure 12. Unclassified points from Area A, a-e (b-e may be variants of Travis or Nolan); Nolan points from Area A, f-k.

Pandale

2 Specimens (Figure 13, a, b)

Description: Leaf shaped; convex edges beveled to such an extent that the specimens are slighly twisted; slightly beveled shoulders narrow into recurved base. Stone is opaque tan flint and chocolate-brown chert. Workmanship good; percussion used for finishing.

Dimensions: Length 65–70 mm; width across shoulders 24–26 mm; maximum width of base 17–19 mm; thickness 8 mm.

Provenience: Square N14-E01, level 4, Area A.

Remarks: These specimens resemble Nolan closely and are affiliated with Nolan materials near the lower part of the primary burned rock midden. They conform to the type described by Suhm and Jelks (1962:231). Weir considers this type diagnostic of the Clear Fork phase of the Texas Archaic (1976a:29, Table 1).

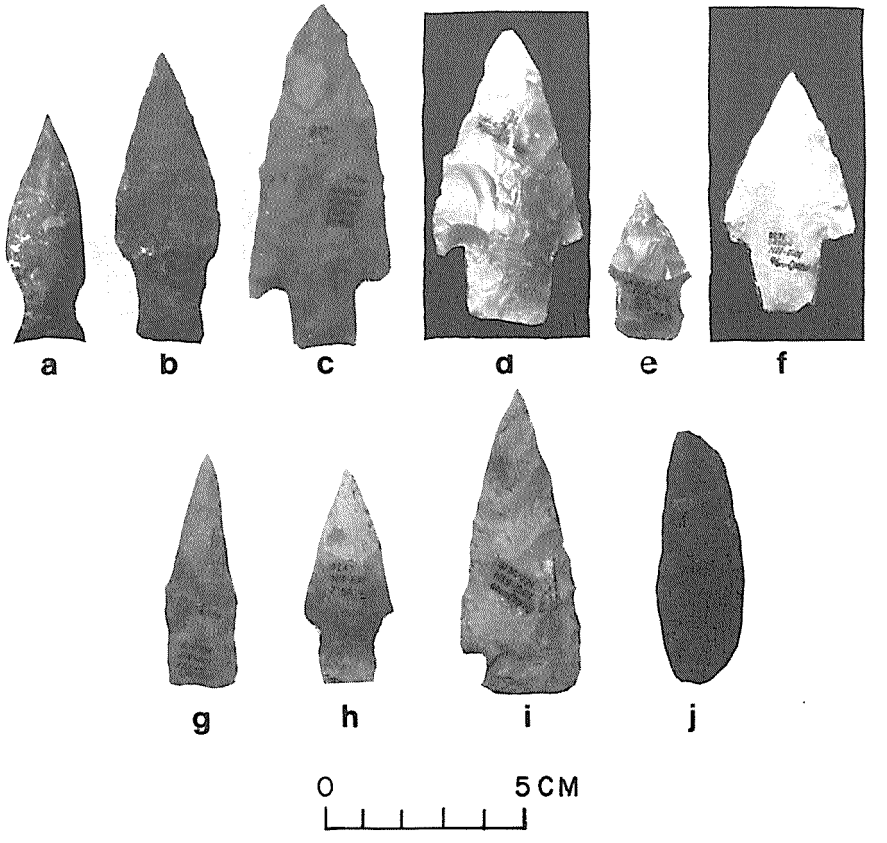

Figure 13. Projectile points from Areas A and C: a, b, Pandale; c-h, Bulverde; i, Castroville; j, Lerma.

Bulverde

6 Specimens (Figure 13, c-h)

Description: Large and small triangular specimens; characteristic rectangular or slightly contracting stems and straight to slightly concave bases thinned to wedge shape (Suhm and Jelks 1962:169). Specimens e, g and h appear to have been reworked.

Dimensions: Length 35–90 mm; width across shoulders 20–40 mm; length of stem 8–20 mm; basal width 15–22 mm; thickness 7–11 mm.

Provenience: Squares N10, 11, 12, 13, and 15-E01, Area A; three specimens assigned to level 4 and one each to levels 2, 3, and 5.

Remarks: The specimens were found in the lower levels of the primary burned rock midden and probably represent stages of the Round Rock and Clear Fork phases of the Texas Archaic. Weir considers the Bulverde type diagnostic of the Clear Fork phase (1976a:53, Figure 10A, B).

Castroville

1 Specimen (Figure 13, i)

Description: Triangular with slightly convex edges; corner notched with straight base and wide stem. Specimen apparently was unfinished due to a hinge fracture that terminated at the completed corner notch and created a thicker cross section near one corner. Stone is a light tan, opaque flint. Workmanship very good; percussion flaking primary means of final thinning.

Dimensions: Length 78 mm; width across shoulders 31 mm; length of stem 9 mm; extrapolated basal width 18 mm; thickness 8 mm.

Provenience: Square N13-E01, level 3, Area A.

Remarks: Similar to Lange; conforms to the type described by Suhm and Jelks (1962:173). Weir considers this type diagnostic of the San Marcos phase of the Texas Archaic (1976a:29, Table 1).

Lerma

1 Specimen (Figure 13, j)

Description: Leaf-shaped biface with impact fracture on distal end. Stone is brown flint. Workmanship good; both percussion and pressure employed for final thinning and shaping; no basal or edge smoothing evident.

Dimensions: Extrapolated length 70 mm; width 22 mm; thickness 7 mm.

Remarks: Conforms to the type described by Suhm and Jelks (1962:207). It came from the level just above Nolan and Bulverde (Figure 8). Lerma points are thought to occur early in the Archaic and may be associated with the San Geronimo phase.

Wells

1 Specimen (Figure 14, a)

Description: Triangular blade with convex edges, narrow shoulders, and long, rectangular stem that terminates in straight base that has cortex from the original core nodule; stem is slightly ground along one edge. Stone is opaque, mottled brown flint. Workmanship good; edge retouch by both percussion and pressure.

Dimensions: Length 51 mm; width across shoulders 23 mm; length of stem 21 mm; basal width 16 mm; thickness 7 mm.

Provenience: Square N13-E01, level 4, Area A.

Remarks: Except for the flat cortex base with remnant cortex, this specimen conforms to the type description by Suhm and Jelks (1962:257). Weir considers this type diagnostic of the Clear Fork phase of the Texas Archaic (1976a:53, Figure 10, G).

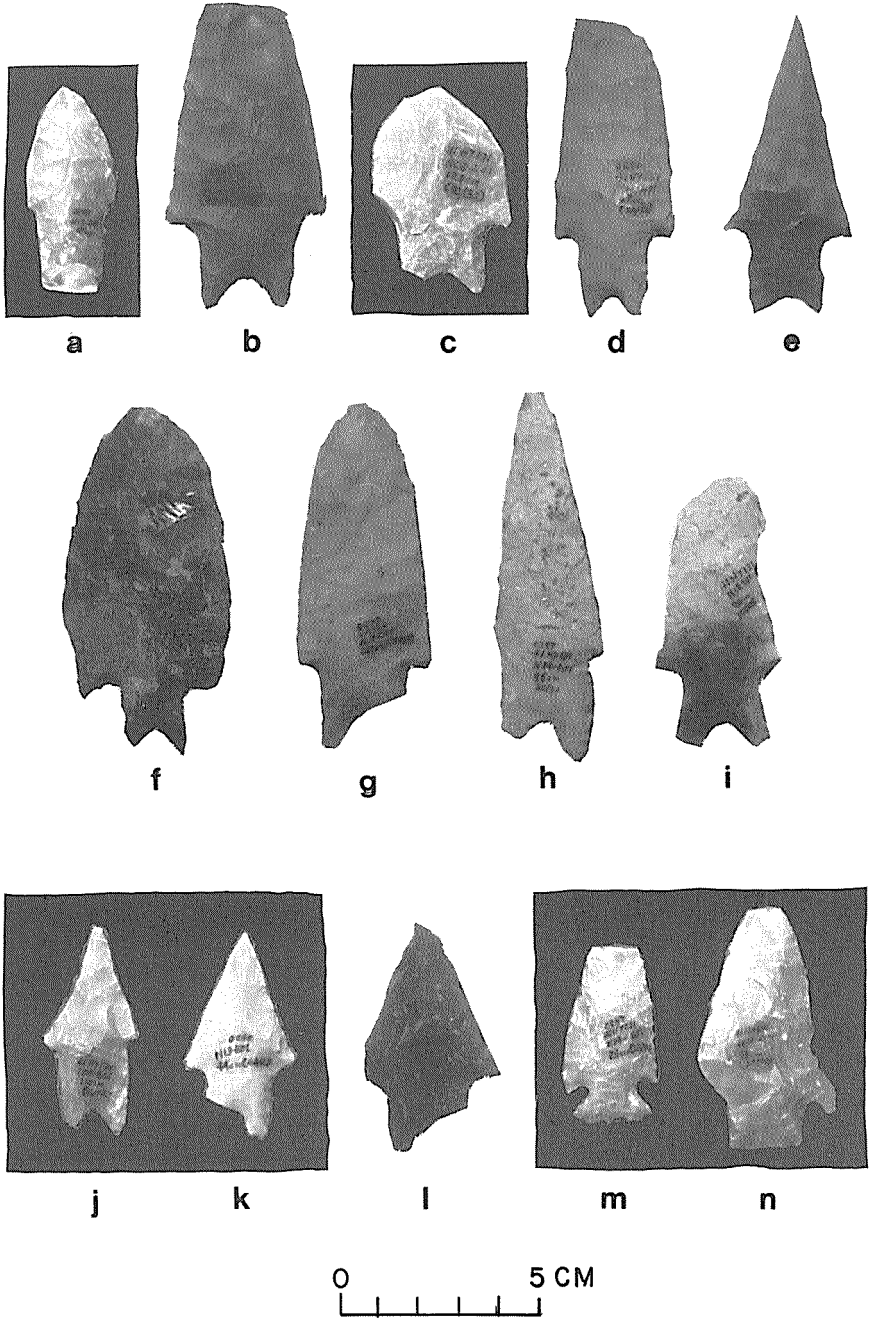

Figure 14. Projectile points from Area A: a, Wells; b-k, Pedernales; 1, Marcos; m, Marshall; n, Gower.

Pedernales

11 Specimens (Figure 14, b–k)

Description: Generally triangular with straight sides; shoulders prominent and stems generally rectangular with the typical indented base. Stone ranges from translucent tan chert to opaque, brown flint. One specimen has evidence of heat treating (Figure 14, g). Percussion was primary means of flake detachment, with pressure flaking for final shaping, edge straightening, and retouch. Resharpening also evident on some specimens. (Fine pressure flaking produced a sharp serrated edge on a single point found by a relic hunter in Area C.) Specimens found at the Gregg Ranch site conform closely to those described by Suhm and Jelks (1962:235–238). Workmanship generally good.

Dimensions: Length 50–95 mm; width across shoulders 23–38 mm; length of stem 17–24 mm; basal width 17–22 mm; thickness 5–9 mm.

Provenience: Squares N09-E01, N10-E01, N11-E01, N12-E01, N13-E01, and N14-E01; levels 2, 3, 4, and 5; most specimens recovered from levels 3 and 4.

Remarks: Several of the Pedernales specimens found at the Gregg Ranch site represent different phases of the manufacturing process. Figure 14, f is a biface (preform) that has only the base finished, obviously the first step in shaping this particular specimen. Figure 14, g represents the next stage of manufacture: final shaping, done by pressure flaking along the edges. The specimen illustrated in Figure 14, j, first thought to be a Gower point, is probably a Pedernales preform, primarily because of its provenience within the primary burned rock midden. Figure 14, c, j, and k may be reworked points. Figure 14, h was found out of context in a rodent burrow. Figure 14, b has an impact fracture on the distal end. Weir (1976a:29, Table 1) considers the Pedernales type diagnostic of the Round Rock phase of the Texas Archaic.

Marcos

1 Specimen (Figure 14, l)

Description: Long and triangular, slightly convex edges; deeply barbed on corners, with convex base, resulting in a strongly expanding stem. Stone is opaque tan flint. Workmanship good; percussion was the primary means of thinning; minor pressure retouch was employed along the edges, resulting in some serration. Has a broken distal end.

Dimensions: Extrapolated length 55 mm; width across shoulders 24 mm; length of stem 10 mm; basal width 20 mm; thickness 5 mm.

Provenience: Square N14-E01; level 3, Area A.

Remarks: Conforms to the type described by Suhm and Jelks (1962:209). Weir includes Marcos in the San Marcos phase of the Texas Archaic (1976a:29, Table 1).

Marshall

1 Specimen (Figure 14, m)

Description: Triangular with straight edges; shoulders strongly barbed, stem rectangular, base straight. Stone is translucent brown chert. Workmanship good, with percussion the primary means of final thinning. Has an impact fracture on one side at the distal end; one ear and one edge broken.

Dimensions: Extrapolated length 66 mm; extrapolated width across shoulders 35 mm; length of stem 10 mm; basal width 19 mm; thickness 4 mm.

Provenience: Square N10-E01, level 2, Area A.

Remarks: Conforms to type described by Suhm and Jelks (1962:211). Weir considers this type diagnostic of the San Marcos phase of the Texas Archaic (1976a:55, Figure 12).

Gower

1 Specimen (Figure 14, n)

Description: Triangular with straight edges and thick body; stem straight and deeply notched; lateral edges lightly smoothed; basal thinning by removal of crescent-shaped flakes. Stone is tan flint. Workmanship fair; primary manufacturing technique is percussion. One ear of stem is missing.

Dimensions: Length 60 mm; width across shoulders 37 mm; length of stem 17 mm; width of stem 22 mm; thickness 8 mm.

Provenience: Square N15-E01, Area A; 147 cm below level 7 datum.

Remarks: Specimen was slightly deeper than the Plainview-Golondrina specimens and may be out of context due to rodent activity in the midden. It is similar in outline to a Pedernales type found much higher in Area A at 47 cm (Figure 14, k) and to a Gower found at Youngsport (Shafer 1963: Figure 7-B) as well as several of those found at Granite Beach (Crawford 1965: Figure 3). Its context in the Gregg Ranch site, however, falls within or near the San Geronimo phase of the Archaic as defined by Weir (1976a:52, Figure 9, H, I).

Other Lithic Artifacts

Corner Tanged Knife

1 Specimen (Figure 15, a)

Description: Triangular biface with tang on one corner for hafting. Stone is light tan chert. Workmanship very good; primary means of final thinning was percussion; sharpened by pressure retouch.

Dimensions: Length 90 mm; width 38 mm; width of tang 20 mm; depth of notches 10 mm; thickness 7 mm.

Provenience: Level 4, Area C (Figure 5), 1 meter east of N12-E01 and 70 cm below the surface.

Remarks: Specimen was slightly deeper than the Plainview-Barber speci-

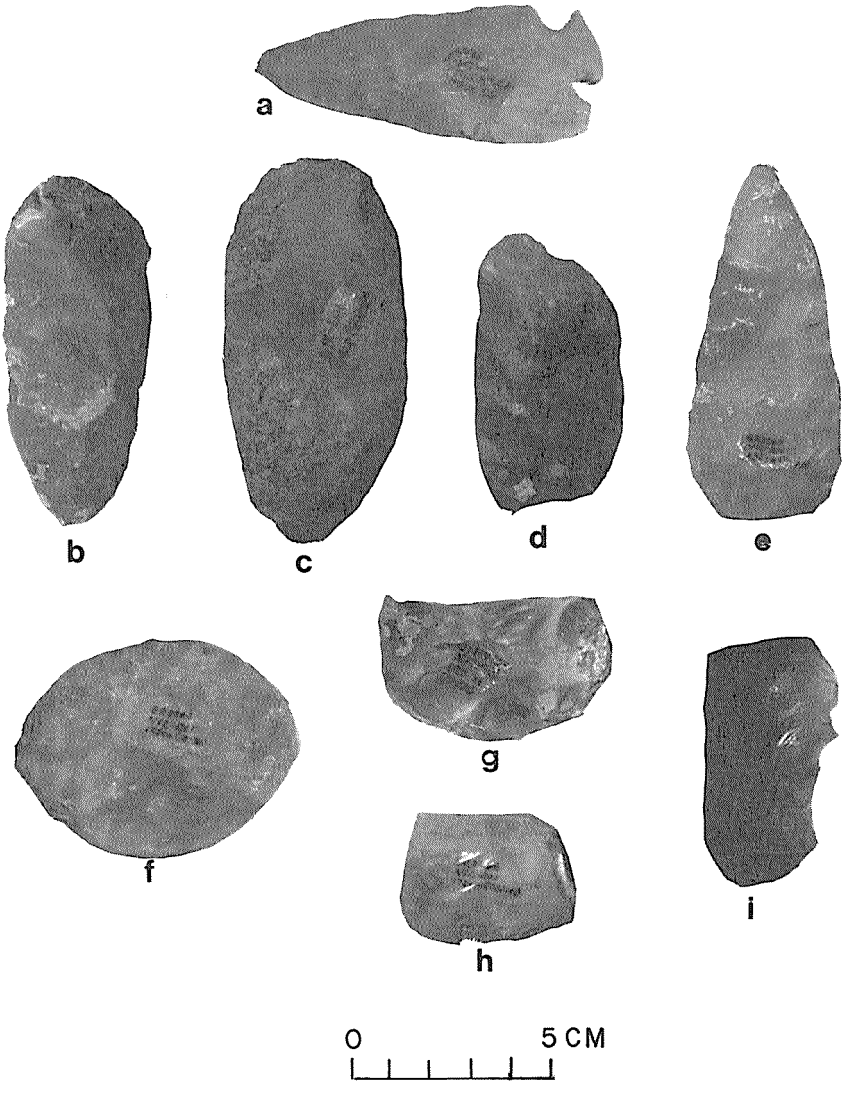

Figure 15. Corner-tanged knife, a, from Gregg Ranch site, Area C; ovate specimens, b-e, and side scrapers, f-i, from Area A.

mens and may be out of context due to rodent activity in the midden. It is similar in outline to a Pedernales type found much higher in Area A at 47 cm (Figure 14, k) and to a Gower found at Youngsport (Shafer 1963: Figure 7-B) as well as several of those found at Granite Beach (Crawford 1965: Figure 3). Its context in the Gregg Ranch site, however, falls within or near the San Geronimo phase of the Archaic as defined by Weir (1976a:52, Figure 9, H, I).

Miscellaneous Artifacts

Several ovate specimens and side scrapers were found in the San Geronimo occupation level of the Gregg Ranch site (Figure 15, b-e, i). Some appear to have been heat treated; some appear to have sustained use breakage. A possible preform (Figure 15, e) from the San Geronimo level was heat treated; it is a glossy pink. A probable ovate scraper (Figure 15, f), also was heat treated. A probable side scraper (Figure 15, b) came from N08-E01, level 6. Figure 15, d appears to be a uniface scraper, and Figure 15, b and c appear to be side scrapers. Figure 15, g and h appear to be broken scrapers that were heat treated.

Other lithic tools from the Gregg Ranch site include a probable Perdiz arrowpoint (Figure 16, b) and a preform (Figure 16, c) found in the upper 10 cm (level 1) of Square N13-E01). Although it was found just above a heavy layer of snail shells and hardpan soil (Figures 7, 8) deep in Square N15-E01, 147 cm below level 7 datum, Figure 14, f appears to be a Pedernales point, but based on its archeological context it is probably a Gower. A possible Pedernales point (Figure 16, a), broken, was found in Square N11-E01, and the broken and burned base of a Nolan point (Figure 16, d) came from Square N08-E01, level 5. An artifact from N09-E01, level 7, probably the bit end of a Guadalupe Gouge (Figure 17, h), appears to have been in context with Paleo-Indian materials. A preform (Figure 17, i) came from Square N08-E01, level 4, and a broken hammerstone (Figure 17, e) from Square N09-E01, level a. The hammerstone is of red quartzite and has use-wear along the edge. Utilized flakes (Figure 17, a–g) were recovered from various levels. One (Figure 17, e) has fine retouch on all edges in addition to use-wear. The blade is straight and has a strong lip at the platform, indicating soft-hammer removal while on an anvil. A possible scraper (Figure 17, f) also has fine retouch flaking along all edges. Two of the utilized flakes (Figure 17, a and b) were found near the Barber point (Figure 11). A possible gouge (Figure 17, a) may have come from the same flint nodule as the Barber point. Another flake (Figure 17, b) may have served as a graver. Several prismatic blades (Figure 18) were recovered from probable Paleo-Indian levels. Two prismatic blades (Figures 15, h and 17, a), one (Figure 15, h) apparently a preform that has had some flakes removed at the start of the thinning process, were also very close to the Barber point (Figure 11), and they to appear to have come from the same flint nodule.

Among the representative bifaces from the Gregg Ranch site (Figure 19) is one (Figure 19, e) from the San Geronimo level that appears from its pink color and glassy sheen to have been heat treated; and has an oblique transverse parallel flake-scar pattern that may be Paleo-Indian workmanship. Of particular interest too are pink bifaces with glassy sheen (Figure 15, b-h) from the San Geronimo level that apparently were heat treated. Figure 15, d is a prismatic blade from the San Geronimo level.

Several drills (Figure 20, a-d) came from the middle Archaic, a bone awl (Figure 20, e) came from the Clear Fork phase of the Central Texas Archaic, and a probable bone awl (Figure 20, f) came from the Paleo-Indian level. Three ap-

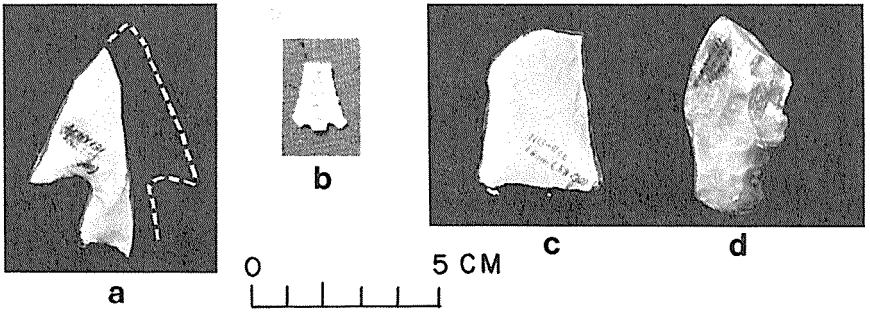

Figure 16. Lithic tools from the Gregg Ranch site, Area A: a, possible Pedernales point from N11-E01, level 2; b, probable Perdiz point from N13-E01, level 1; c, preform from N13-E01, level 1; d, broken burned base of Nolan point from N08-E01, level 5.

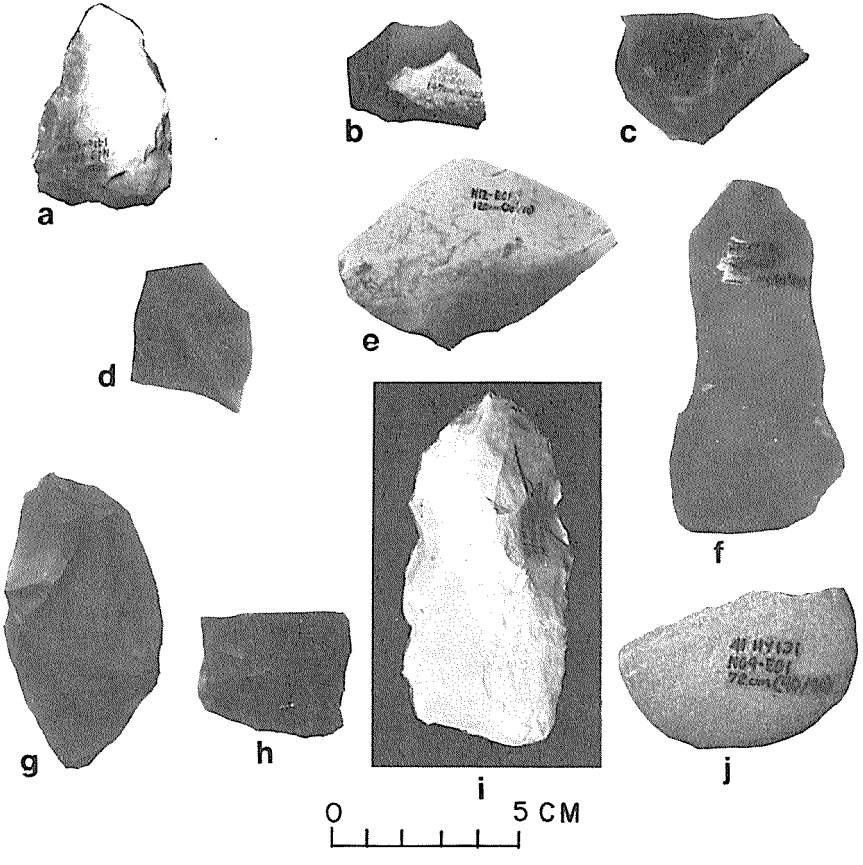

Figure 17. Utilized blades and other tools from the Gregg Ranch site, Area A: a-g, utilized flakes from various levels; h, probable bit end of a Guadalupe Gouge from San Geronimo level; i, preform from N08-E01, level 4; j, broken hammerstone from N09-E01, level 1.

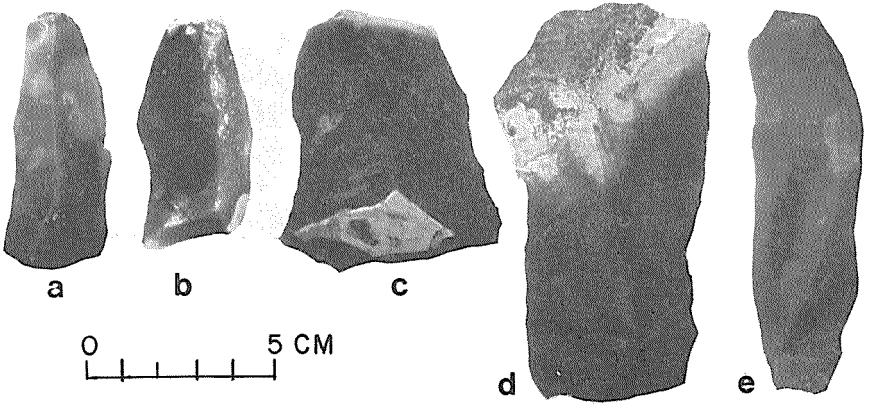

Figure 18. Prismatic blades from probable Paleo-Indian levels.

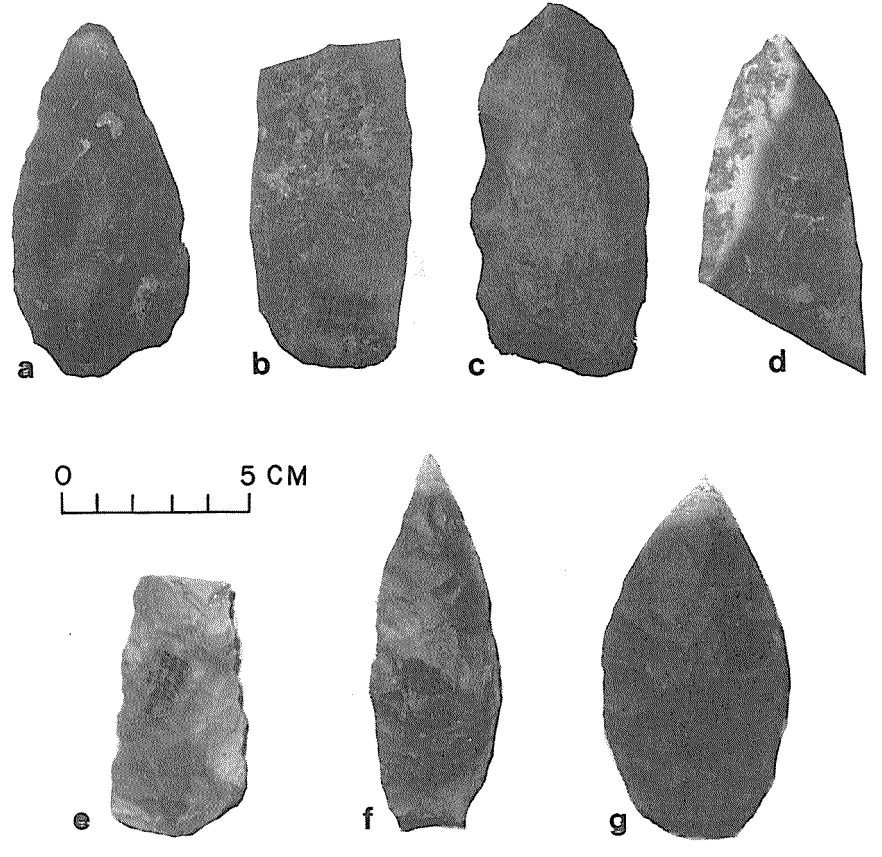

Figure 19. Representative bifaces from the Gregg Ranch site.

parent uniface knives (Figure 20, g-i) came from the San Geronimo level, all with secondary retouch flaking along the cutting edges on one face only and each with a wide safety ridge along the top side. All three have apparent use-wear. Four choppers or cores (Figure 21) were recovered, one (21, a) from well below the Barber point, which was just above the Paleo-Indian level (N11-E01, level 8).

AREA B

Description

Area B (Figures 5, 22) was excavated by Paul Duke, of Austin, at the same time that Area A was being excavated. Metric measurements originated from the site datum (N01-E01). Area B excavations commenced 17 meters east of the site datum and were within a 12-square-meter grid. Squares were excavated individually by 10 cm levels and screened through half-inch hardware cloth.

Surface

On the surface of Area B were two hearths (Figure 23).

Occupation zones began on the surface and continued to a depth of 130 cm. A possible shelter feature, a classic Plainview point, and an Early Triangular point—all in close proximity—and a possible Hell Gap point and a Clear Fork gouge were recovered. Except for these, the artifacts, soil color, bone, shell, and burned rock midden features in Area B were typical of those found in most burned rock middens of Central Texas and are not discussed here.

Excavation

While excavating squares N01-E19, N02-E19, N03-E19, N02-E20, and N03-E20 Duke encountered seven large fragmented limestone rocks arranged in a circle 2 meters in diameter (Figure 22). These rocks lay on soil that was relatively free of other rock and sloped slightly to the south toward the flood plain. Due south of and near this feature were the remains of a stone-lined hearth. The arrangement of the large rocks in the 2-meter circle suggests that they were the remains of a simple windbreak or shelter. A similar feature was noted in the lower levels of locality 1 at the Hell Gap site in Wyoming (Irwin-Williams et al. 1973:45). However, significant artifacts are two projectile points that may have been directly associated with the rock feature. A classic Plainview point (Figure 24, a) was found next to one of the large rocks in Square N03-E20 and an Early Triangular point (Figure 24, h) was found on the opposite side of the same rock (Figure 22, a). All three items appeared to be at the same level and in good context. The Plainview point, of excellent workmanship, is made from a light tan Central Texas chert. It has an indented base, basal thinning, and has been ground on the base and lower edges. The distal end has been damaged. The Early Triangular point is similar to other triangular points found at comparable levels in Area B. Hester considers the Early Triangular point to be pre-Early Archaic in age at the La Jita site (Hester 1971:119). Evidence from Gregg Ranch may push

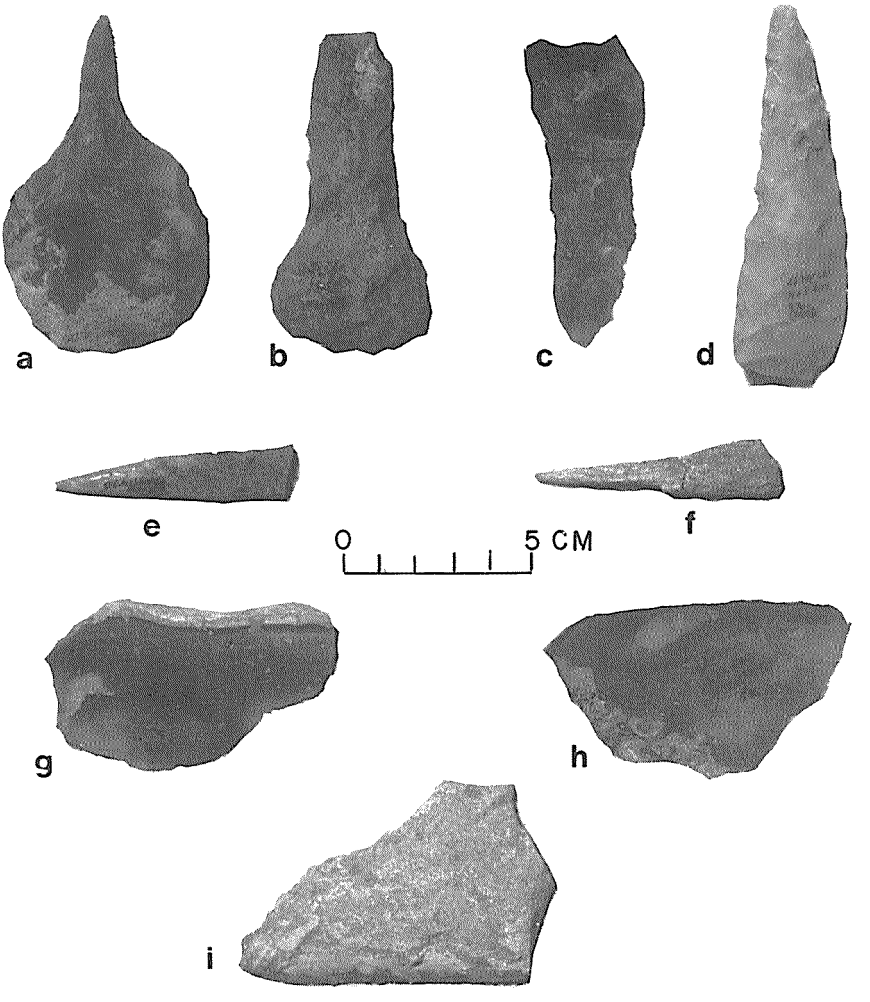

Figure 20. Middle and Early Archaic artifacts from the Gregg Ranch site: b, d, San Geronimo level; e, bone awl from Clear Fork phase of Central Texas Archaic; f, probable bone awl from the Paleo-Indian level; g-i, uniface knives from the San Geronimo level.

the chronological position of the Early Triangular point further back in time, possibly to 10,000 years BP. The point (Figure 24, h) is made from a local blue gray chert, of excellent workmanship, with basal thinning and some grinding along the base, but not on the edges.

Among the other artifacts found in Area B is a possible resharpened Hell Gap point (Figure 24, e). It is similar to points found at several Hell Gap sites in Wyoming (Frison 1974:71–90, 1978:168–177) and was made from a light tan Central Texas chert. It has moderate grinding along the base and lower lateral

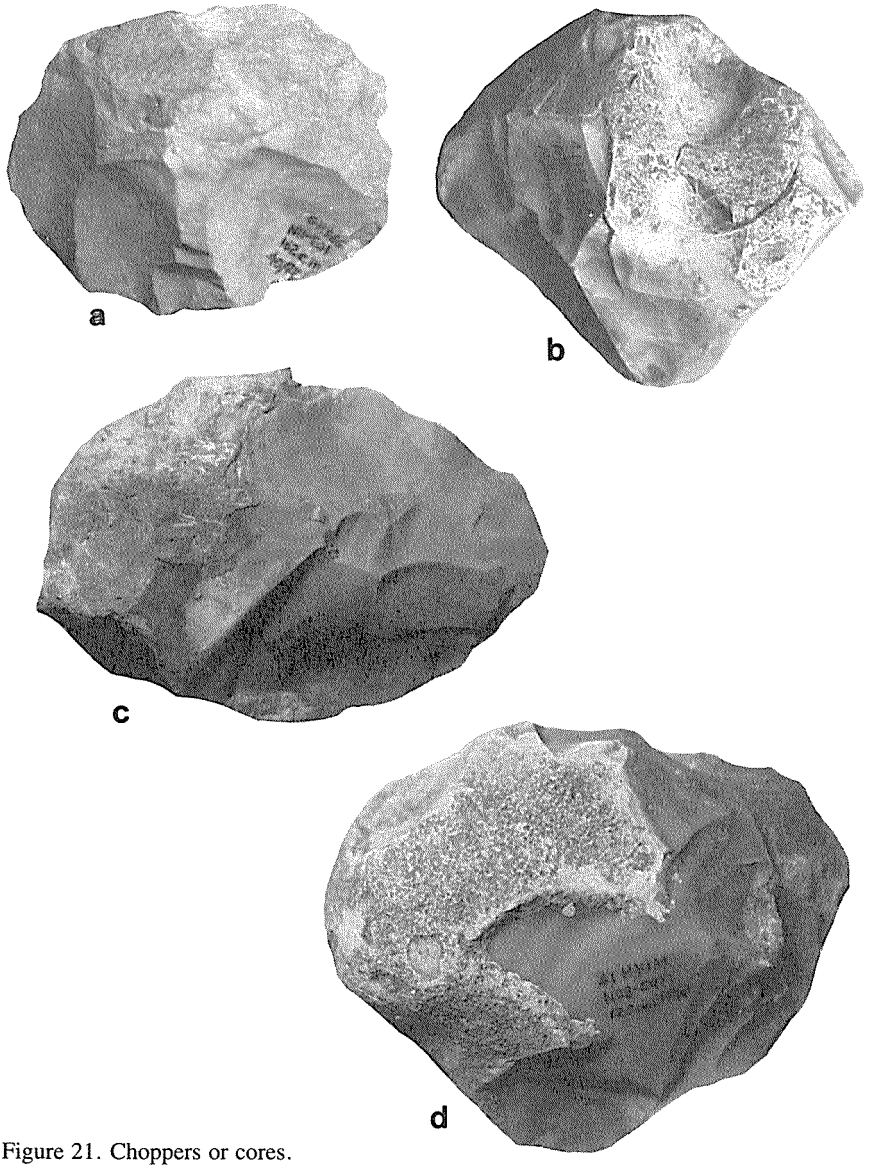

Figure 21. Choppers or cores.

edges. This point was found in the lower levels of Area B. Several Clear Fork gouges (not illustrated) were also found in the lower levels of Area B, but although they are believed to be as old as Plainview, their exact age has not been determined. Several early corner notched points (Figure 24, b, f) of the San Geronimo period were also recovered together with a Travis (Figure 24, d) and a possible Meserve point (Figure 24, c).

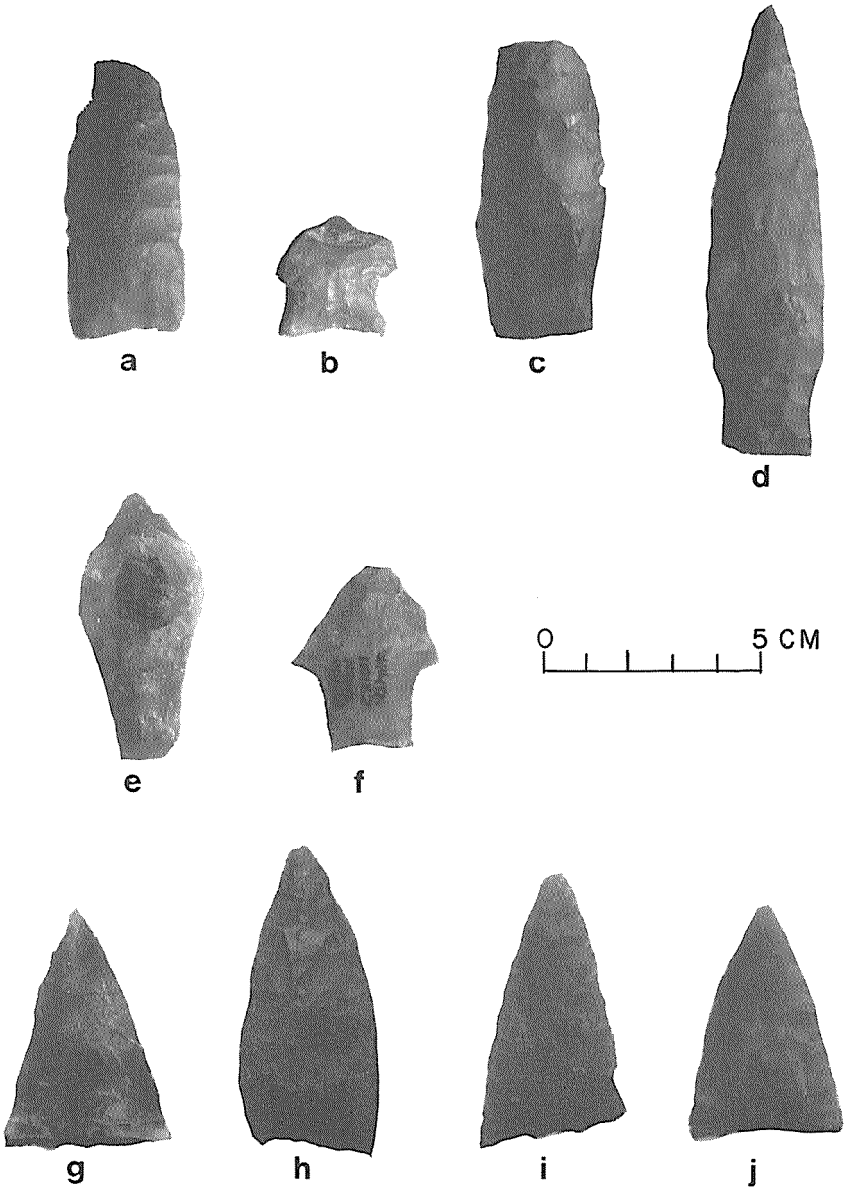

Figure 24. Artifacts from Area B: a, classic Plainview point from N03-E20; b, early corner-notched point; c, possible Meserve point; d, Travis point; e, possible Hell Gap point, resharpened; f, early corner-notched point; g-j, Early Triangular points; h is from N03-E20, made of local blue gray chert.

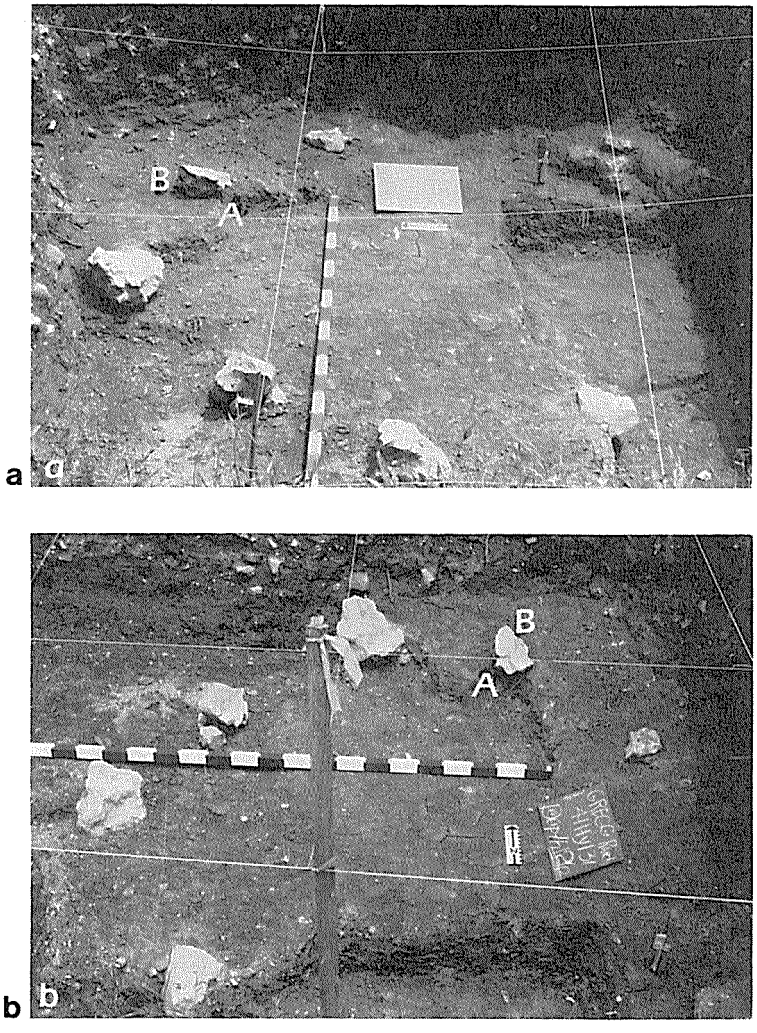

Figure 22. Photographs of Area B: a, east view of possible Paleo-Indian shelter showing location of Plainview point (A) and Early Triangular point (B); b, north view of shelter.

CONCLUSIONS

The prevalence of hunting and hide-working tools (dart points, knives, scrapers, and awls) over grinding tools suggests that hunting was the primary means of subsistence, with a secondary reliance on gathering. Lithic artifacts and debitage are the most abundant materials found at the Gregg Ranch site; they are the basic sources available for the analysis of stone-working techniques.

Figure 23. Photograph showing typical hearth in Area B.

The close association of a Plainview point with an Early Triangular point and a primitive-style, stone-lined, windbreak type of shelter suggests an overlap in time of two different cultures: the highly mobile Great Plains big-game hunting tradition of the Paleo-Indians and the riverine hunter-gatherer tradition of the Archaic. These early peoples most likely exploited the environment using all manner of hunting and gathering techniques, available resources, and ideas gained from contact with other groups—groups both nomadic and fairly stable in their settlement patterns. At the Gregg Ranch site the variety of game and lithic resources, varied topography, good weather, good water, and easy access must have come together as it does today to make an ideal place for man to live.

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Analysis of Ceramic Function: a Late Caddoan Example

Anna J. Taylor

ABSTRACT

Using as a model Shafer's ceramic-distribution study of the Late Caddoan Attaway site in Henderson County, Texas, it is shown that ceramic use-wear studies can be used effectively to provide data about site activities and functions. Ceramic use-wear studies should be planned before collecting ceramics in the field to avoid destroying evidence of use-wear during recovery and processing. (A revision of a paper presented at the 1982 Caddo Conference in Fayetteville, Arkansas)

INTRODUCTION

Recent archeological and ethnographic studies of the uses and disposal of ceramics have indicated that there is a strong potential in ceramic studies for yielding information about the activities and organization of past cultures. Ceramic function analysis includes all stages of a vessel's existence, from its manufacture through its use and eventual disposal, and deals with interrelations between vessel form and design, with utilitarian uses such as storage, cooking, or serving; and ceremonial activities.

Several aspects of ceramic function analysis will be explored, using information from Shafer's (1981) analysis of the Late Caddoan Attaway site. These are the potential of ceramic function analysis for detecting patterned human behavior by focusing upon vessel forms found in different discard contexts, the techniques that can be used for ceramic function analysis, problems connected with recovery of data, and problems connected with preservation of data in the field and laboratory.

THE ATTAWAY SITE (41HE114)

The Attaway site was a badly disturbed Late Caddoan (Frankston focus) settlement that was eroding into Lake Palestine in Henderson County, Texas. The site was investigated in 1975 by anthropology students from Texas A&M University (Shafer 1981), who found that two distinct contemporaneous activity areas—a midden and a cemetery—had been exposed by wave action. Test excavations in the cemetery area revealed about seven burial pits. No undisturbed

midden deposits were found, but ceramics from the eroded midden area were collected and used in the analysis (Shafer 1981:147–152; 157, 158; 166, 167).

Ceramic analysis of the Attaway site was directed toward determining if functionally separate areas such as the midden and the cemetery could be distinguished solely by their associated ceramics. It was hypothesized that ceramics from the midden area would come from vessels used and discarded during domestic activities, and ceramics from the cemetery area—mortuary ceramics—would come from vessels used and discarded during ceremonial activities. The midden ceramics, most of which were small, eroded sherds, were sorted into formal types and vessel forms on the basis of rim form and mode of decoration. The mortuary ceramics, most of which were whole or partial vessels, were also sorted into formal types and forms (Shafer 1981:166–168).

From the midden area 2,452 sherds were collected, and after the badly eroded sherds were excluded, 2,215 midden sherds remained in the sample. About 60 percent of the midden sherds were jar sherds, characterized by wet paste decorations. Only about 5 percent of the midden sherds were from bowls or bottles, characterized by engraved designs. Vessel forms of the remaining midden sherds could not be identified with confidence (Shafer 1981:168–170).

The mortuary ceramic sample consisted of sherds representing 21 vessels and one smoking pipe; 71.4 percent (N=15) of the vessels were bowls; 14.3 percent (N=3) were jars; and 14.3 percent (N=3) were bottles (Shafer 1981:170, 173, Table 3).

This analysis indicates that there are qualitative differences between the ceramic assemblages from the midden and the cemetery. Predominant forms in the midden sample were jars; the predominant forms among the mortuary vessels were bowls (Shafer 1981:168–175). But, as Shafer notes, the differences in frequencies of jars, bottles, and bowls in the midden and mortuary samples cannot be interpreted as meaning that the ceramic assemblage in particular households consisted mostly of jars and a few bowls and bottles, or that bowls were made mainly to serve as grave goods. Different frequencies among ceramic forms and decorative techniques in the midden sample can be attributed to the use of particular kinds of vessels for specific domestic purposes and, in the mortuary sample, to the selection of specific mortuary items by the villagers (Shafer 1981:175; cf. Braun 1980, 1982; David 1972; DeBoer 1974; Foster 1960).

The high frequency of jar sherds and the low frequency of bowl and bottle sherds in the midden sample is mainly a result of (1) differing frequencies of different kinds of vessels, i.e., jars, bowls, and bottles, in the original domestic assemblage; (2) differing life spans (or breakage rates) of the vessels, i.e., jars, bowls, and bottles, (3) the different methods of disposal used for different kinds of broken vessels, i.e., some kinds of broken vessels may have been discarded where they broke, other kinds may have been carried to the midden, or perhaps all broken pottery was taken to the midden for disposal (David 1972; Foster 1960). If all broken ceramics were indeed taken to the midden for disposal, the proportion of jars, sherds of bowls, and bottles recovered from the midden at the Attaway site would indicate that jars were broken more frequently than were bowls and bottles. But comparison of frequencies of sherds from different vessel

forms (or from different sized vessels) do not take into account the fact that breakage of large vessels can result in more sherds than breakage of small vessels. More accurate counts of vessels of different forms and sizes can be obtained by recording and comparing the percentages of total vessel orifices represented by individual rim sherds; these data can provide the approximate numbers of vessels of different forms and sizes in a sherd assemblage (Braun 1980: 176–177; Egloff 1973). The mortuary vessel sample from the Attaway site is considered a valid representation of a Late Caddoan mortuary assemblage, since every vessel in the sample was deliberately selected to be placed with a burial.

Ethnographic studies of the manufacture and use of ceramics have demonstrated that certain vessel forms are used consistently for certain tasks; jars are generally used for food storage and cooking, and bowls for food preparation and serving (Braun 1980, 1982; Ericson, Read, and Burke 1971; Fontana et al. 1962; Stanislawski 1978). Ethnographic accounts of the Caddo support these findings. One account reported that "the Indians fashioned large vessels for the storage of water and for cooking and serving" (Griffith 1954: 104; cf. Swanton 1942).

Although ethnographic descriptions of vessel use are helpful to archeologists, there are other ways to determine how vessels were used, for example investigation of sooting, of organic or mineral residue or stains, of pollen from domestic and wild plants on the surfaces of vessels, of abrasions or cuts on surfaces, of differences in the paste, temper, surface treatment, and of other technological features (Braun 1980, 1982; Ericson, Read, and Burke 1971; Griffiths 1978; Lischka 1978; Shafer and Taylor 1980; Smith 1982; Steponaitis 1980; Usrey 1982). Vessel size, as determined from curvatures of rim sherds or by measurement of whole and incomplete vessels, also can be an indicator not only of vessel function, but also of distance of sites from water sources and of size of household groups (Linton 1944; Nelson 1980, 1981; Turner and Lofgren 1966).

Preservation of organic materials in the moist environment of East Texas is generally poor, but the extent to which organic residues are preserved on ceramic surfaces has yet to be investigated. Sooty deposits on the exteriors of cooking vessels that were used extensively for liquids are preserved in most regions, but often are scrubbed off in the laboratory and usually are not considered in archeological analyses. These layers of soot are indicators of vessel function. At least one vessel, a mortuary jar recovered from the Attaway site, has some sooty residue (Shafer 1981: 163, Figure 9, D) that may indicate either that the vessel, selected from the household vessels, had already been used for cooking, or that food was ceremonially cooked in it before it was placed in the grave. Detailed study of sooty mortuary vessels might yield more information about their functions and about the ceremonial activities of the Late Caddo.

RECOVERY OF CERAMIC FUNCTION DATA

It is important that field recovery methods and laboratory processing be planned so as to preserve information needed for ceramic function analysis. Although ceramic types, ceramic technology, and vessel form can be determined

from scrubbed and acid-treated ceramics, data that could provide information about vessel function—impossible to recognize during excavation—can be literally washed away during processing in the laboratory (Charnela 1969). Excavators should avoid scraping or scratching soft surfaces of vessels during excavation, and they should preserve residues, use-marks, and signs of wear on vessels and sherds. Tools of bamboo, plastic, or wood are recommended; metal excavating tools should not be used. Ceramics to be examined for staining, sooting, abrasion, and other signs of wear should undergo minimal handling in the field and should be bagged separately from other ceramics specimens.

Traces of slip and paint, abrasions, and other use-marks, residues, and pollen can be easily lost during laboratory processing. Caddo ceramics, for example, are often quite fragile due to low-temperature firing and subsequent inundation by ground water, which causes deterioration of bone and shell temper. It is especially difficult to process such pottery without destroying data that pertain to vessel function. In such situations, washing and permanent labeling of the pottery to be examined for function data should be postponed until analysis is completed.

In the field care should be taken to record the contexts of whole vessels, partial vessels, and sherds. Pottery from different contexts can be compared only if contexts are carefully and consistently recorded (Lischka 1978).

SUMMARY

Ceramic-function analysis has great promise for yielding information about cultural activities in which ceramics have been used, and factors such as context, differential breakage, and conditions of deposition are important in such analysis. Other evidences of vessel function such as residue and wear are easily lost during recovery and processing, so field and laboratory methods should be designed to prevent accidental destruction of these kinds of perishable evidence.

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BIOGRAPHICAL SKETCH

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Pictographs of the Red Monochrome Style in the Lower Pecos River Region, Texas

Solveig A. Turpin

ABSTRACT

The Red Monochrome pictographs are the latest of three prehistoric rock-art styles defined in the Lower Pecos River region of Southwest Texas. Twenty-three possible examples of this style are described and compared with pictographs at similar sites in the Big Bend region to the west. Long acknowledged as intrusive into the region after A.D. 600, this pictograph style is only one trait in a complex that defines the Late Prehistoric period in the Lower Pecos region. The adoption of the bow and arrow and the appearance of feature types such as crescent-shaped burned rock middens, cairns, and circular stone structure outlines suggest the infusion of a fully formed culture system. Parallels with both the material culture of the Southern Plains and the pictographs of the Big Bend point to an origin with nomadic hunters and gatherers analogous to the documented movements of the inhabitants of the Southern Plains during protohistoric and historic times.

INTRODUCTION

The Red Monochrome pictogaphs are the latest of three major prehistoric rock-art styles defined in the Lower Pecos region of Southwest Texas (Figure 1). This area, which encompasses the lower reaches of both the Pecos and Devils rivers and their confluences with the Rio Grande, holds one of the largest and most diverse bodies of Native American rock art. The dominant regional form is the Archaic-age polychrome Pecos River style wall art (Kirkland 1937, 1938, 1939; Jackson 1938; Graham and Davis 1958; Gebhard 1960, 1965; Grieder 1965, 1966a, b; Kirkland and Newcomb 1967; Turpin 1982). Although often overshadowed by the more elaborate polychrome Pecos River style panels, pictographs of the Red Monochrome style, when placed in their cultural context, are one of a complex of traits that defines the Late Prehistoric period in the Lower Pecos region. The Red Linear style is the third of the regions's prehistoric rock-art styles (Kirkland and Newcomb 1967; Gebhard 1960, 1965; Parsons n.d.; Grieder 1966a; Turpin 1984).

The Red Monochrome panels are composed of frontally posed, crude, but realistic life-sized human figures, arranged in horizontal bands, armed with bows and arrows, and accompanied by naturalistic animals of many species (Figure 2).

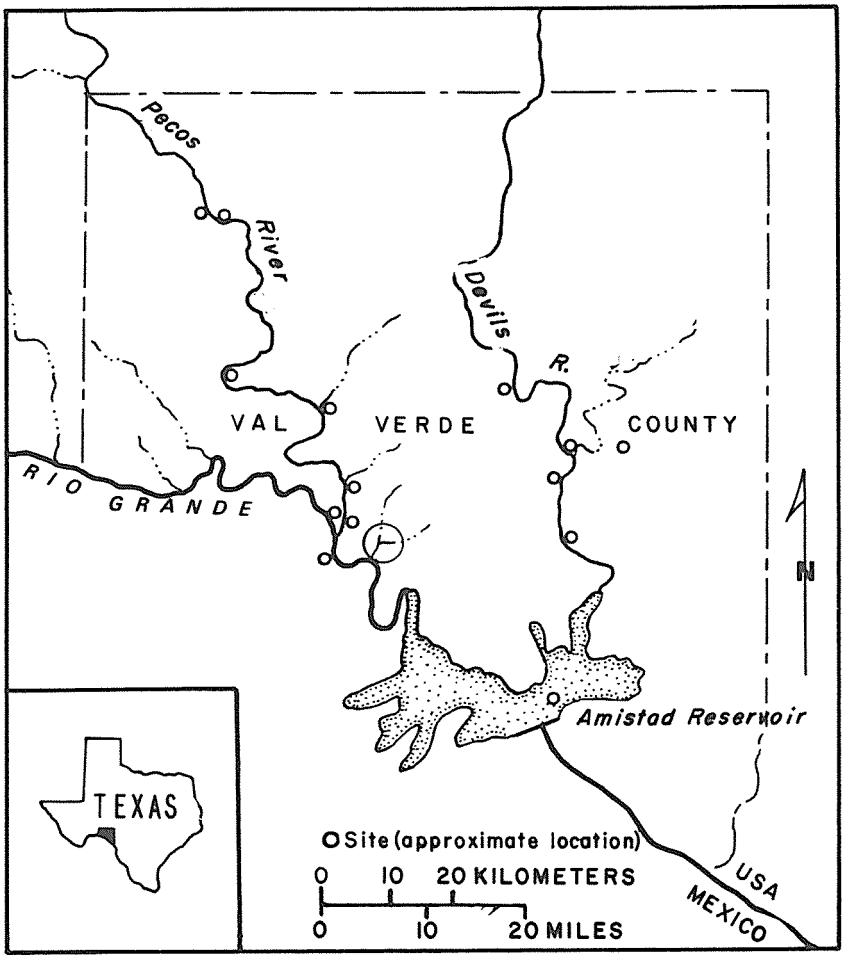

Figure 1. Map showing distribution of Red Monochrome sites in the Lower Pecos region, Val Verde County, Texas. Small circles show approximate locations of sites; large circle encloses three sites.

The humans stand with legs spread, arms raised, and fingers clearly detailed, like victims of a modern-day holdup (Kirkland and Newcomb 1967:81). Occasionally, the fingers and toes are so exaggerated and the bodies so flexed that the images are lizardlike in appearance (Gebhard 1965:36) (Figure 3). Handprints, both negative and positive, are a frequently occurring motif. Large, enigmatic, geometric forms often are found in panels otherwise composed of humans and beasts. Terrestrial animals and birds are shown in profile; aquatic animals such as catfish and turtles are in plan view as they are normally seen in nature. The presence of the bow and arrow (Figure 2, b) dates this style to the Late Prehistoric period, after A.D. 600.

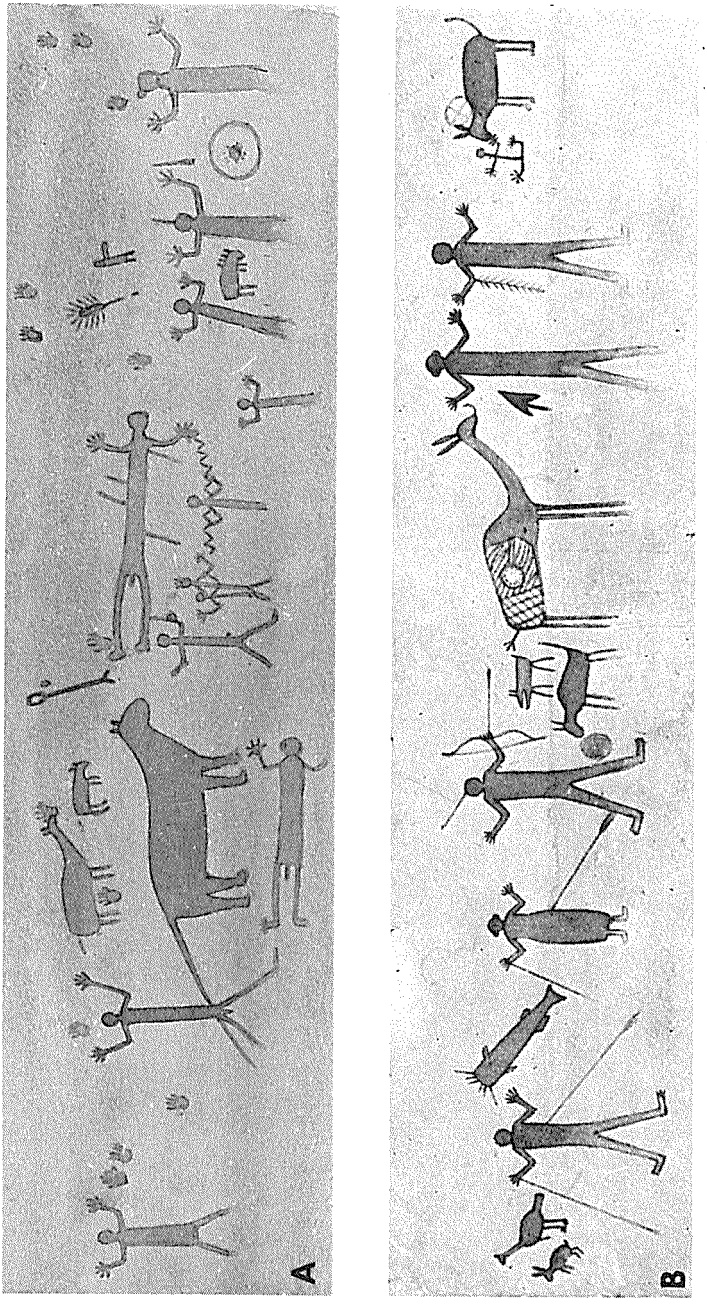

Figure 2. Photographs of Kirkland's panels at 41VV72(a); and 41VV78(b) (Kirkland and Newcomb 1967). Reproduced courtesy of the Texas Memorial Museum.

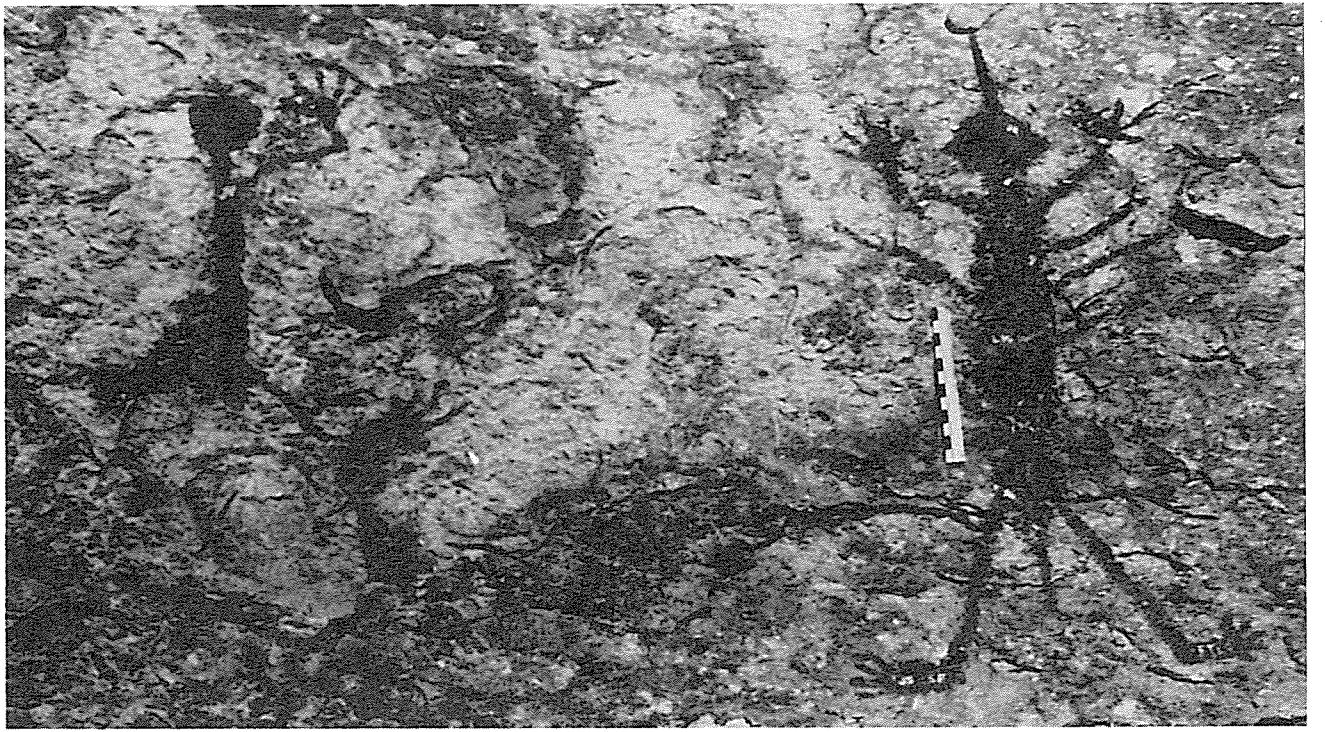

Figure 3. Photograph of site 41VV239. Comparison with Kirkland and Newcomb 1967, Plate 34, No. 3 shows that Kirkland's version has omissions, a result of this copying this site from across the canyon with the help of binoculars.

Although monochrome human figures abound in the aboriginal rock art of North America, a few traits distinguish the Red Monochrome style from the many miscellaneous pictographs. A single line perpendicular to the crown of the head is presumed to be a feather ornament (Figure 3), although to modern viewers it more closely resembles a lightning rod (Kirkland and Newcomb 1967:81). Rounded protruberances on the sides of the heads have been variously called ears (Kirkland and Newcomb 1967:81), caps or curled hair (Lowrance 1982a:65), and buns. Since the heads are usually solid circles of color with no other features delineated, these distinctive protrusions must mirror real characteristics. Male nudity is apparent in the display of male genitals, but no female genitalia are detectable. Clothed figures appear to be wearing long skirts or tunics. An apparent preoccupation with hands and feet results in disproportionately large fingers and toes, with each digit clearly drawn. Handprints are common signatures of preliterate art, but the emphasis on prints in the Red Monochrome style is carried to the extreme in one case (site 41VV327) where turkey tracks are shown following behind the bird.

THE SITES

Twenty-three sites with possible Red Monochrome affiliation are known; 21 of these have been formally recorded. Many of these sites consist primarily of panels in other art styles with only minor Red Monochrome components. Omitted from this count are sites with figures that may belong in the Late Prehistoric period but are either too badly deteriorated or too aberrant to be classifed as Red Monochrome. For example, one site described by House and Hester (1971) has elements of both Red Monochrome and Pecos River styles, but the figures conform to neither of these styles.

Of seven sites located by Graham and Davis (1958) during their survey that preceded the construction of the Amistad Dam, six had been copied or photographed by Kirkland or Jackson in the 1930s. Parsons's (n.d.) rock-art survey for the Texas Memorial Museum and Texas Historical Commission found seven sites with Red Monochrome figures previously documented to some degree by one or the other of these pioneers in Texas rock-art studies (Table 1). Four new sites on the Devils River were recorded during Parsons's and later surveys (Parsons n.d.; Dibble and Prewitt 1967). Three sites were added to the sample in 1984 and 1985 during an intensive survey by the University of Texas under a grant from the Kelberg Foundation. One of these sites, 41VV699, the Turkey Bluff site, was mentioned but not visited by Jackson (1938:Site 94). Another site on the Devils River, reported to Jackson (1938:Site 97) by local informants, has been located but remains unrecorded. It too has as a central figure a turkey, a common motif in Red Monochrome art. One site, INAH 203, is on the Mexican side of the Rio Grande, and only a few photographs are available for study.

Site 41VV52

Site 41VV52, at the upper end of the Devils River arm of Lake Amistad (Figure 1), was recorded by Graham and Davis (n.d.; 1958). These surveyors

Table 1. Correlation of Designations for Red Monochrome Sites, Val Verde County, Texas

TARL[a]	Kirkland[b]	Jackson[c]
41VV52		Site 101 (?)
41VV72	Seminole Canyon Shelter 1 Plates 43–46	Site 85, Plates CLXV-CLXVII
41VV77	Pressa Canyon Plate 64	Site 89, Plates CLXXIII, CLXXIV
41VV78	Painted Rock Shelter Plates 47–49	Site 90, Plates CLXXVI, CLXXVII
41VV89	Pecos River Site 1 Plate 4(1)	Site 70 Plate CXXVI
41VV97	Pecos River Site 8 Plate 31(1)	
41VV201	Pressa Canyon, Site 3 Plate 53	
41VV226	Seminole Canyon Shelter 2 Plate 46	
41VV236	Lewis Canyon Plate 29(4)	Site 81 Plate CLI
41VV238	Pecos River Site 6 Plate 51	Site 67 Plate CXVIII
41VV239	Pecos River Site 11 Plate 34(3)	
41VV241	Pandale Crossing Plate 54	
41VV243	Ingram Ranch Plate 36	Site 65, Plates CXVI, CXVII
41VV699		Site 94
	Tardy Draw Plate 50	

[a]Texas Archeological Research Laboratory.
[b]Kirkland and Newcomb 1967.
[c]Jackson 1938.

suggested that 41VV52 might be Jackson's site 101 (1938:239), a pictograph site plotted on his Map V, but not further documented or described. One human figure with straight arms, bent legs, fingers and toes detailed, a single-feather headdress, and buns around the ears (Figure 4, a) is flanked by two large teardrop-shaped animals, probably bison. Their darker color suggests that they may not be contemporary with the human. Other bison pictographs along this stretch of the Devils River, such as those at 41VV343 and 41VV400, are demonstrably historic (slides on file at the Texas Memorial Museum). Faded red and yellow discs of various sizes and a red conical geometric form appear to be older than the human and animal figures.

Site 41VV72, Seminole Watering Hole

Site 41VV72, Seminole Watering Hole, is above a permanent spring-fed pool just south of US 90, in Seminole Canyon. The location of this site and 41VV78 prompted Kirkland (1938:20) to name the Red Monochrome pictographs the Val Verde Flooded Shelter style. In addition to being damaged by flood-scouring because of its position low in the canyon, the site has been profoundly vandalized due to its proximity to the now-abandoned Southern Pacific Railroad right-of-way. Lichen growing down from the roof of the shelter also has obliterated many of the figures, so Kirkland's copies of this site are virtually all that remain of one of the largest Red Monochrome panels (Figure 2, a). In his water color copies are more than 60 human figures, large and small, that once decorated these walls. Deer, rabbits, dogs, and a panther are discernible among the many animals. The bow and arrow, long garments, male genitals, the single-feather headdress, geometric forms, and innumerable handprints—all traits of the Red Monochrome style—are illustrated. Using Kirkland's reproductions as a guide, one can still detect a very few complete figures, most notably the prone figure riddled with projectiles. Three of the discernible figures have faded to a yellow that Kirkland thought was stain from an oily binder (Kirkland and Newcomb 1967:83).

Site 41VV78

Site 41VV78, the largest and best-preserved Red Monochrome panel, is above a spring-fed pool low in the wall of a tributary of the Rio Grande, a situation similar to that of 41VV72. This site was also copied by Kirkland (Kirkland and Newcomb 1967:Plates 47–49), probably with more accuracy than he was able to attain at 41VV72. A turkey, rabbit, catfish, deer, turtle, and dog are clearly drawn (Figure 2, b). The human figures, in their characteristic frontal posture, are either armed with bows and arrows or riddled with projectiles, implying considerable hostility. Negative handprints, outspread fingers, elbow ornaments, single feathers, and buns on the sides of the heads are easily discerned. One large deer is shown in X-ray style, the only example of this technique as yet found in the Lower Pecos region. (The X-ray style is known at many European Paleolithic rock-art sites.) Newcomb (Kirkland and Newcomb 1967:84) interprets the outstretched tongue as a heart line, a common motif in North American

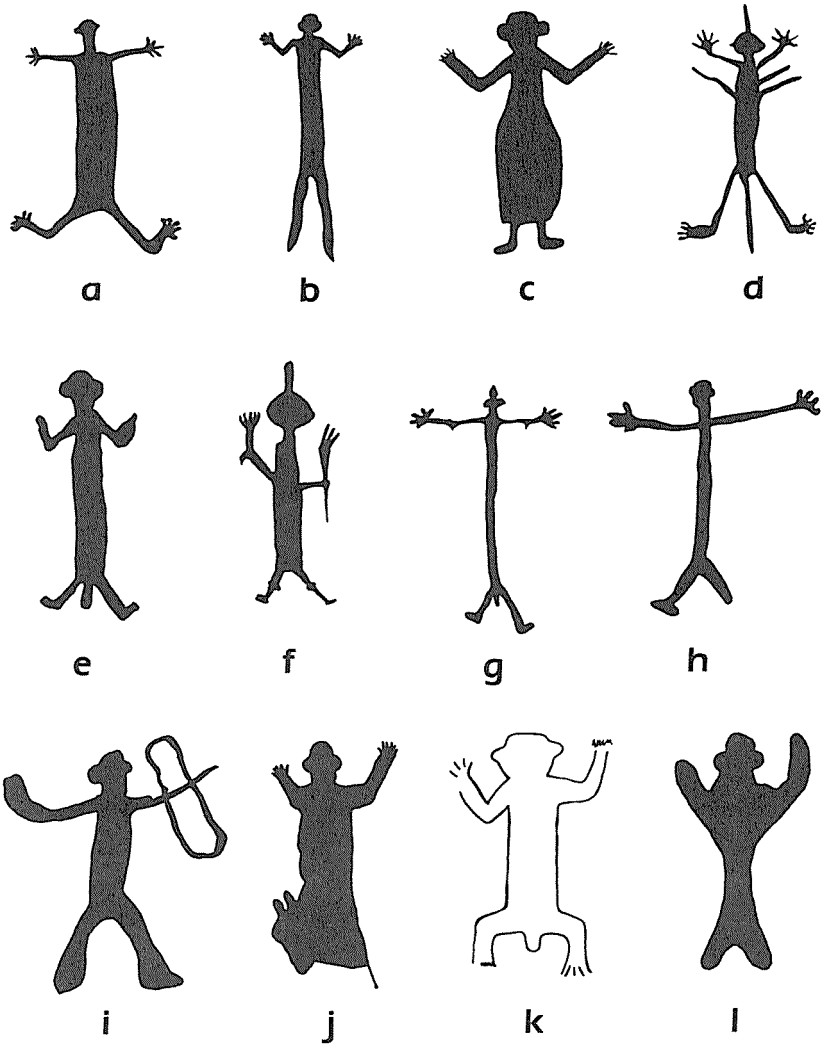

Figure 4. Red Monochrome figures with protruberances around the ears, from: a, 41VV52; b and c, 41VV78; d, 41VV239; e, 41VV243; f, 41VV317; g, h, 41VV327; i, INAH203; j, Agua Fria; k, Bear Creek; l, Payne Canyon. (a, d, g, h from slides at Texas Memorial Museum; b, c, e from Kirkland and Newcomb 1967; e, g, h, j, k, l from Jackson 1938; f from Grieder 1965; i from photograph by David S. Dibble; j, k, l from Lowrance 1982a, 1982b.) These figures differ widely in size, but are reproduced at the same size to facilitate comparison.

art, citing Schaafsma's suggestion that this trait is an Athapaskan import, either developed or adopted from Plains groups. Remnants of Pecos River and Red Linear art are still visible at the upstream end of the shelter, but the superimposed Red Monochrome clearly is later than the Pecos River style.

Site 41VV77, Vaquero Shelter

Site 41VV77, Vaquero shelter, has an outstanding example of historic Native American art: a panel complete with a mission building, horsemen, longhorn cattle, and costumed Spaniard (Kirkland and Newcomb 1967:Plate 64). Shadowy remnants of both Pecos River and Red Monochrome figures are now extremely difficult to decipher (Gebhard 1965:36).

Site 41VV89

Site 41VV89, just above the mouth of the Pecos, was investigated by Jackson (1938:Site 70) and Woolsey (1936), so a photographic record is preserved in the files of the Texas Archeological Research Laboratory. Kirkland's copies (Kirkland and Newcomb 1967:Plate 4–1) are listed as Pecos River site 1. Called Wolf or Coyote Cave for its dominant pictograph—a pair of canines with bristling tails—this site also has minor motifs: a human figure, a round geometric design, and stenciled negative handprints.

Site 41VV97

Site 41VV97 consists primarily of Pecos River style pictographs (Kirkland and Newcomb 1967:Plate 31), but at its base is one possible Red Monochrome human figure. This figure is a standing torso with upraised arms, outspread fingers, and a single-feather headdress.

Site 41VV123

Site 41VV123, above the mouth of the Pecos River, was recorded by Graham and Davis (1958) and was summarily described by them as a few human figures, badly deteriorated and intentionally defaced. Of five Red Monochrome humans there, only three are still clearly discernable. One figure lacks hands and feet but has remnants of the characteristic protrusions about the ears. Another elongated human resembles the pictographs at 41VV327 on the Devils River more than it does its companions at this site. A fourth figure, completely eradicated, has been scratched from the wall.

Site 41VV201, Red Linear Site

Site 41VV201, the Red Linear site, is the type site for the Red Linear style, a miniature monochrome art form tentatively dated to the Late Archaic period (Turpin 1984). The larger, paler figures and a series of tally marks at this site were considered by Gebhard (1965:36) to be superimposed Red Monochromes.

Site 41VV226, Kirkland Camp

Site 41VV226, Kirkland Camp, has a few pale red handprints at the base of a Pecos River style panel. Newcomb included this site in his discussion of the Red Monochrome style (Kirkland and Newcomb 1967:89, Plate 46-2), but only these handprints conform to the characteristics of this later style.

Site 41VV233, Lewis Canyon

Lewis Canyon, is most noted for its intricate petroglyphs. Adjacent pictographs, site 41VV233 include a human male with upstretched arms and bent legs, his body impaled by projectiles. His headdress, as copied by Kirkland (Kirkland and Newcomb 1967:Plate 29-4), is unusual; it has two prongs that are more like horns than feathers.

Site 41VV238

Site 41VV238, adjacent to 41VV89, was copied by Kirkland (Kirkland and Newcomb 1967:Plate 51), described by Jackson (1938:Site 67), and photographed by Woolsey (1936). Eleven prints of right hands and 10 prints of left hands surround a small dog (Figure 5, b). All of the handprints are small, evidently of children (Kirkland and Newcomb 1967:91). Two human figures, another dog, and two geometric designs complete this panel.

Site 41VV239

Site 41VV239, on the lower Pecos River, depicts a phallic, feather-headdressed human pierced by projectiles (Figures 3 and 4, d). The emphasis on fingers and feet characteristic of Red Monochrome art is expressed in both this and the adjacent figure (Figure 3). The larger figure (Figure 4, d) has only four toes on one foot, but whether this was intended to depict a real characteristic is not known. Kirkland copied this panel with the aid of binoculars (Kirkland and Newcomb 1967:Plate 34) from the opposite rim of the canyon, which accounts for inaccuracies in his reproduction (Figures 3 and 4, d).

Site 41VV241, Pandale Crossing

Site 41VV241, Pandale Crossing can be considered Red Monochrome only on the basis of a few red handprints (Kirkland and Newcomb 1967:95). Most of the pictographs are geometric, painted over the older handprints. Of some interest to the discussion that follows on the cultural implications of the Red Monochrome style is a large segment of a ceramic vessel recovered from the midden fill at this site, one of the few instances where pottery has been found in a Lower Pecos rock-shelter (Stewart 1965).

Site 41VV243

Site 41VV243, photographed by Jackson (1938:Site 65) and copied by Kirkland (Kirkland and Newcomb 1967:Plate 36), has Red Monochrome figures superimposed on a larger Pecos River style panel. Among these small human figures is one with a single-feather headdress (Figure 4, f) and another with genitals and the buns or protruberances around the ears (Figure 4, e). A solid handprint completes the traits typical of Red Monochrome art at this site. Jackson (1938:170) likened these Red Monochrome additions to Mescalero or other Apache art.

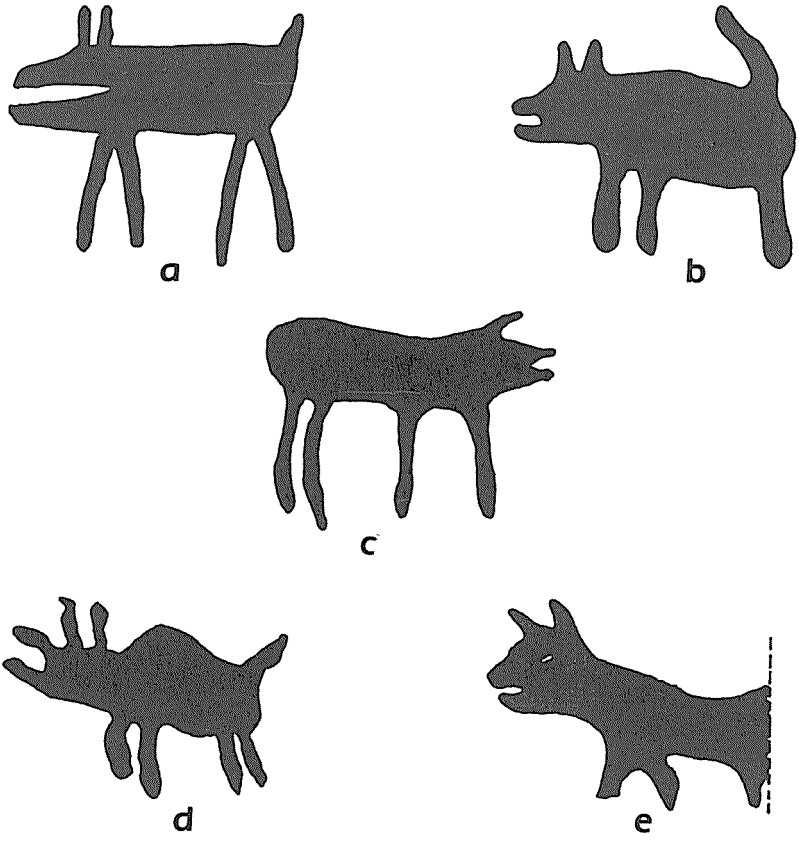

Figure 5. Dogs that are characteristic of Red Monochrome iconography: a, 41VV78; b, 41VV238; c, Agua Fria; d, 41VV317; e, INAH203. These figures differ slightly in size, but are reproduced here at the same size to facilitate comparison. (a, b from Kirkland and Newcomb 1967; c from Jackson 1938; d from Grieder 1965 and photographs at Texas Archeological Research Laboratory; e from photographs by David S. Dibble.)

Site 41VV317

Site 41VV317, on the Devils River, was recorded during a survey of the river prior to impoundment of Amistad Reservoir (Dibble and Prewitt 1967:Figure 9) and was further documented by Grieder (1966a). The site is now inundated and undoubtedly dissolved away. Among the crude anthropomorphic, zoomorphic, and geometric figures was one doglike animal (Figure 5, d) with mouth and ears similar to those of 41VV238. Beneath this red dog was another quadruped, apparently a bear, painted in black. This animal and a turkey, also found at a site on the Devils River, corroborate Graham and Davis's (1958:80) and Gebhard's (1965:48) statements that both black and red figures are found in this

style. Two of the three human figures at this site wore single feathers and had rounded protrusions of the head (Figure 4, f).

Site 41VV320

Site 41VV320, on the Devils River, is included as a Red Monochrome site purely on the basis of about 30 positive right and left handprints impressed on an overhang above a long red streamer. Some of the handprints are child sized.

Site 41VV327

Site 41VV327 is a large Red Monochrome panel overlain by historic pictographs. This site is east of the Devils River and adjacent to other historic rock-art sites. All of the pictographs are red, but the earlier Red Monochromes are paler and have deteriorated more than have the obviously historic figures. The extremely elongated bodies of the older humans are unusual (Figure 6) and are seen in only one other recorded site (41VV123) on the Pecos River. The characteristic method of depicting the human beings with fingers, toes, single-feather headdress, and buns about the ears (figure 4, g, h); a naturalistic turkey complete with three-toed tracks, a dog, turtles, and a geometric star with a blank circle at its center clearly belongs to the Red Monochrome style. The later artists took advantage of the stick-em-up posture of one figure and added a man with rifle leveled at this target (Figure 6). Two other men with firearms take aim at the adjacent Red Monochrome dog.

41VV699, Turkey Bluff Site

Site 41VV699, the Turkey Bluff site, is under a shallow overhang high above the Devils River. A large but typical Red Monochrome dog appears to be chasing a solid black turkey. Both are bullet pocked, obviously targets for riflemen shooting from the river. Jackson (1938:Site 94) had been told that a shelter in this location had pictographs, but the site was not formally recorded until 1985.

41VV700

Site 41VV700 is a complex of five overhangs near 41VV699. All three Lower Pecos prehistoric styles are represented, each in a separate alcove. The Red Monochrome panel consists of 11 yellow right handprints outlining a natural seep fault line near the base of the cliff face. One yellow and two red crosses are at the side of the seep.

41VV701

Site 41VV701, also recorded in 1985, depicts a line of six small red animals. At least five of them are classic Red Monochrome dogs, apparently chasing a deer whose tracks trail behind its rear hooves. One of the three blocky red shapes is the remnant of a Red Monochrome human much like the central charac-

Figure 6. Photograph of Red Monochrome panel with historic additions, site 41VV327. Pictographs have been enhanced for reproduction.

ter at 41VV52 (Figure 4, a). This male figure now lacks a head; the appendages are short and stubby, but the fingers and toes are clearly detailed.

INAH203

Site INAH203, a large panel, lies up a tributary on the Mexican side of the Rio Grande (Dibble n.d.). This site bears the Instituto Nacional de Antropología e Historia (INAH) number 203. The photographs available for study show one human figure armed with a bow and arrow, the arrow pointing at a naturalistic rabbit. The man's posture is more fluid than is normal for Red Monochrome figures, but his characteristic buns about the ears (Figure 4, i) and his companion animals clearly belong to this style. The site is said to include at least four or five such humans in addition to the realistic rabbit, a dog (Figure 5, d), and a turkey.

Tardy Draw

Tardy Draw, an unnumbered site, is stylistically aligned with the Red Monochrome panels at 41VV72 and 41VV78 by Newcomb (Kirkland and Newcomb 1967:89). This site consists largely of geometric engravings and painted handprints. According to Newcomb, the engraved arrowpoint forms—probably Perdiz points of Late Prehistoric age, postdating A.D.900—are related to those seen in Red Monochrome panels. A second petroglyph site with similar geometric designs, Kirkland's Pecos River site 7 (Kirkland and Newcomb 1967:Plate 51-2), is probably site 41VV321, now inundated by Amistad Reservoir.

Unrecorded Site

Jackson (1938:Site 97) mentions a site high on the Devils River that he did not visit, describing the most outstanding pictograph as a turkey, a common animal in Red Monochrome art. This site has been located but has not been recorded.

INTERPRETATION OF THE RED MONOCHROME STYLE

Interpretations of the meaning of Red Monochrome art have been as straightforward as the pictographs themselves. Newcomb (Kirkland and Newcomb 1967:88) considers the style representational—an attempt to portray humans and animals as they were. And, since his premise is apparently justified, the characteristics that distinguish this style from miscellaneous red figures at other sites can be confidently considered to mirror real attributes. The larger Red Monochrome panels seem much like group portraits that show idiosyncratic qualities of the individuals (Figure 2, b).

The animals that can be identified are deer, turkey, turtle, catfish, rabbit, canine, and feline, all known archeologically throughout the Lower Pecos Archaic and seen in the region today. The rarity of vegetation in the panels and the realism with which the menagerie is depicted suggest that a special relationship between man and animal transcended simple dietary needs. Two of the most common central figures are dogs, the earliest domesticated animal, and turkeys,

birds of some ceremonial importance in the prehistoric greater Southwest. This identification between man and beast implies a set of social values, but the specific connotations are not apparent in the pictographs. Never in the available sample is a large or ferocious animal hunted or slain. In the two pictographs where a hunter aims his arrow at an animal, the target is a rabbit, indicating that hunting magic is not an overt function of Red Monochrome art. The notable absence of the economically important horse and bison suggests that neither was of central concern to the artists at the time the panels were painted. This fact, together with the absence of any other European influence and the incorporation of Red Monochrome figures into apparent later historic compositions, clearly indicates a prehistoric age.

Hostility is depicted in several upright and prone human figures that are riddled with projectiles. The penetrating lances are generally longer than the arrows, perhaps an artistic convention to emphasize their power or perhaps an illustration of the type of weapon that preceded the bow. Although this trait could reflect warfare attendant upon the intrusion of foreigners into the region, the injured figures bear many of the characteristics of the group as a whole. One has a single-feather headdress, two have buns about the ears, two have long garments, and two are unadorned. Two wounded figures carry simple bows, but none carry recurved bows. It may be that the Red Monochrome artists were commemorating internal animosities or losses at the hands of their enemies, rather than a successful battle.

CULTURAL IMPLICATIONS OF THE RED MONOCHROME STYLE

Strong parallels among the sites in methods of depicting human figures and animals, together with the many handprints, indicate an internal cohesion interpreted as reflecting a brief time span for the Red Monochrome style (Kirkland and Newcomb 1967:89). Compared to the Pecos River style pictographs, the Red Monochrome figures are rare. However, the far-ranging distribution of the sites (Figure 1) suggests that the groups who painted the Red Monochrome pictographs traversed the entire length and breadth of the region.

The Red Monochrome style has long been considered intrusive into the Lower Pecos region (Kirkland 1937:113). Its divergence from classic Pecos River form and content (Jackson 1938:226) and the lack of an internal evolution of style suggest that it was introduced in fully developed form (Kirkland and Newcomb 1967:89). Gebhard (1965:36) saw a similarity to more western modes of depicting human figures in protohistoric and historic times. Outside of the Lower Pecos region, the Red Monochrome style most closely resembles some monochrome figures in the Big Bend region to the west (Jackson 1938:167; Kirkland and Newcomb 1967:Plate 82; Lowrance 1982a:66, 117). As long ago as 1938, Jackson (1938:170) noted a resemblance between the more recent pictographs at 41VV243 and the picture-writing of Mescalero or other Apache groups.

Lowrance (1982a:66) presents a case for Jumanos as painters of the Big Bend figures. She points out that the hair styles of the Jumanos (Newcomb 1969:237; Hammond and Rey 1966:160, 161), would be shown correctly in two-dimensional representation by the rounded protrusions of the Red Monochrome figures. In addition, she notes that the nude males, feather headdresses, men with hair cut short and curled to resemble caps, and women attired in skirts, bodices, and cloaks described for the Jumano are apparent among the Red Monochrome figures of the Lower Pecos region.

The comparisons drawn by Lowrance (1982b:Plate CCLXXXX) are based on the small sample of Red Monochrome sites described by Jackson (1938) and Kirkland and Newcomb (1967). The less publicized sites documented in the files of the Texas Archeological Research Laboratory of The University of Texas at Austin and the Texas Memorial Museum provide more examples of the shared motifs. The unusual buns, or protruberances, around the ears are found at 41VV52 (Figure 4, a), 41VV78 (Figure 4, b, c), 41VV123, 41VV239 (Figure 4, d), 41VV317 (Figure 4, f), and 41VV327 (Figure 4, g, h) in Val Verde County, INAH203 (Figure 4, i) in Mexico, and Payne Canyon (Figure 4, l), Agua Fria (Figure 4, j), and Bear Creek shelter (Figure 4, k) in Brewster County (Lowrance 1982a:66, 117). A fourth site in Brewster County with black monochrome humans has been reported to the writer by John Green of El Paso. The differences in style found in all attributes except these protrusions reinforces their importance and suggests that the protrusions constitute a defining characteristic of the people. Parallel modes of illustrating the mouth and ears of a small doglike animal are found at 41VV78 (Figure 5, a) near the Rio Grande, 41VV238 (Figure 5, b) on the Pecos River, 41VV317 (Figure 5, d), 41VV699, and 41VV701, high on the Devils River, INAH203 (Figure 5, e) in Mexico, and Agua Fria shelter (Figure 5, c) in Brewster County (Jackson 1938:Figure 112). This commonality in motifs and attributes suggests a sharing of iconographic tradition between the Big Bend and Lower Pecos regions during the Late Prehistoric period. In addition, Kirkland (1937) saw similarities between the Lower Pecos pictographs and the pictographs he copied at Paint Rock in Concho County, Texas, and Meyers Springs in Terrell County, Texas, similarities also evidenced by Jackson's grouping of attributes from these sites (1932:146–157, 269, Plates CCLXIX, CCLXX). Newcomb (Kirkland and Newcomb 1967:122) considered the Indian Water Hole, near Meyers Springs in Terrell County, chronologically equivalent to the Lower Pecos Monochrome style.

So little is known of the Jumano (Newcomb 1969:225–245) that attributing the Red Monochrome style to them does little to increase knowledge of the cultural context of the pictographs. We know that some members of the Jumano led a far-ranging Plains existence at the time of contact, traveling between their settlements on the upper Rio Grande and the Caddo region to the east (Newcomb 1969:239, John 1975). The first Spaniards to cross the lower Pecos—Gaspar Castaño de Sosa's expedition from Monclova, Mexico to the Pecos pueblos—encountered a group of bison hunters near present-day Sheffield, on the Pecos River in Crockett County (Schroeder and Matson 1965:51; Hammond and Rey

1966:256); both sets of translators identify these people as Jumanos. The next group encountered by the Spaniards may have been Apaches (Schroeder and Matson 1965:50–56).

Additional evidence for mobility during the protohistoric period is found in historic documentation of travels by allied Indian bands from along the Rio Grande below La Junta, together with groups from northern Mexico, to the mouth of the Pecos River for communal winter bison hunts (Griffen 1969, John 1975). The tribal identity of these people is beyond our grasp today, but from these accounts it is apparent that nomadic hunting groups ranged into the Lower Pecos region in protohistoric times. The lack of knowledge of archeological sites south of the Rio Grande precludes any present attempt to trace the hunters into northern Mexico. It seems unlikely, however, that groups accustomed to winter bison hunts would omit such an important animal from their iconographic repertoire. So the Red Monochrome panels probably were painted before the appearance of bison on the margins of the Southern Plains in protohistoric and historic times (Griffen 1969).

The relative frequency of recorded Red Monochrome sites, which seems to favor a Lower Pecos heartland, is probably a function of past interpretive work. The Amistad Reservoir District has been surveyed for pictographs and studied far more intensely than have any adjacent areas. Virtually nothing is known of the extent of Lower Pecos rock art in the region south of the Rio Grande, and there are fewer surface exposures suitable for painting to the north, east, and west. The long tradition of wall painting in the Lower Pecos region seems to have prompted imitation; every known intrusive group, including the European settlers, has added to the rock art, often in the same locations as their predecessors. For this reason, no continuous or widespread distribution of any of these art styles should be expected. Whether for lack of study or for scarcity of paintable surfaces, the sample from which the regional distribution of pictograph styles has been determined is not sufficiently large to be used for density or frequency projections for Red Monochrome art.

Within the Lower Pecos sample, the choice of locations for Red Monochrome panels clearly favors exposed overhangs rather than the deep, long-inhabited shelters preferred by artists of the Pecos River style. Although Red Monochrome figures are occasionally superimposed on earlier, deteriorated, Pecos River style panels, one has yet to be found in a true sheltered environment. Of the sites for which information is available, only 41VV72, 41VV78, and 41VV320 include concentrated cultural deposits, and in all three cases these are not typical rock-shelter deposits, but are burned-rock and chert accumulations adjacent to permanent water sources. At least 13 of the sites are under shallow overhangs with barren or sloping floors, high on cliff faces overlooking major rivers or tributaries. This notable tendency to select open, barren, rock surfaces may reflect a trend away from sheltered habitation toward open camps. On the other hand, the Red Monochrome panels may have been painted by members of intrusive groups who avoided the confinement of sheltered sites or sites recently or currently occupied by established residents of the region.

Other evidence suggests that the Red Monochrome style was only one of a complex of cultural traits introduced into the Lower Pecos region during the Late Prehistoric period. The traditional time marker of this period, the adoption of the bow and arrow, is signaled by the advent of arrowpoints in shelter deposits dated to A.D. 600 (Dibble 1974). Here they are comingled with dart points characteristic of the later phases of the Late Archaic period. These same dart points are the most common types found in ring- or crescent-shaped burned rock middens, giving rise to the assumption that these features are Late Archaic phenomena. However, radiocarbon dates obtained from charcoal found in these middens are later than A.D. 700 (Luke 1983), and within the Late Prehistoric period as defined here. The morphology of crescent middens is most often explained by comparing them with ethnohistoric descriptions of Apache baking ovens.

Adjacent to some burned rock middens are circles of paired stones thought to be remnants of supports for vegetation- or hide-covered huts. These remnants, the first evidence for this type of open upland camp, may signal a different settlement preference and may account in part for the sparseness of Late Prehistoric cultural deposits in many shelters. A second feature type—piled rocks that probably functioned as burial cairns—has been assigned to the Late Prehistoric period on the basis of only one excavation (Turpin 1982). However, the occurrence of both rings and cairns at several sites suggests a common cultural affiliation.

Finally, a distinctive artifact assemblage that includes small stemmed and triangular arrowpoints, steeply beveled end scrapers, and plain brown ceramics found on the later, larger, stone-circle sites has strong parallels with sites on the margins of the Southern Plains. The pottery has been informally named Abilene Brown (Word n.d.), an indication of its concentration in that area. A few sherds of this same type, found at the Lipan Apache mission of San Lorenzo de la Cruz (Tunnell and Newcomb 1969), are evidence for the late date of this ceramic type.

When the Red Monochrome art is viewed in this framework of late prehistoric culture change, its introduction into the Lower Pecos region by nomads who traveled the margins of the Southern Plains becomes more plausible. The upland types of features—cairns and rings—are more common to the north and west. The late artifact types have broad affinities with the tool kit of the Southern Plains, and the morphology of crescent middens is explained by recorded Apache practices. Although the Red Monochrome style probably predates the historically documented advent of the Apaches in the Lower Pecos region, the archeological remains strongly suggest earlier analogous intrusions, sometime after A.D. 600.

It is difficult to coordinate the dates of emergence of the various cultural traits in the Lower Pecos region. The sites are all surface sites, datable only by their characteristic artifacts. Until the culture history of the Late Prehistoric period is refined, the cultural processes that effected these changes will remain elusive. It may be reasonable to assume that changes such as the adoption of new weaponry (e.g., the bow and arrow) or a variation on an established method of food processing that resulted in the formation of crescent middens took place by

the slow process of diffusion. However, when these traits can be seen in conjunction with changes in mortuary practices, settlement preference, structures, and art styles, it becomes plausible to consider an infusion of a cultural system carried by an intrusive group. Whether those incursions were sporadic or regular, their effect on the resident population, their origins, and precisely when they occurred are research problems for the future.

ACKNOWLEDGEMENTS

This summary of the Red Monochrome style owes its very being to the work of several pioneers in Texas rock-art studies, most notably A. T. Jackson, Forrest Kirkland, W. W. Newcomb, Jr., Terence Grieder, and Miriam A. Lowrance. Mrs. Lowrance's presentation of the evidence for contact between the Lower Pecos and Big Bend regions is the basis for this further corroboration of that possibility. David S. Dibble kindly loaned his photographs of INAH203. Terence Grieder, of the Department of Art, The University of Texas at Austin, provided copies of his original documentation of 41VV317. The Texas Memorial Museum granted permission to examine, copy, and reproduce past documentation of Red Monochrome sites. Herbert H. Eling, Jr., prepared the photographs, and Carol R. Fabac drafted the map. I owe special thanks to David G. Robinson, who produced the line drawings from often obscure past documentation. Draft versions of the manuscript have been revised after many happy hours of debate with David Robinson and Lee Bement, my coworkers in the field. Ronald W. Ralph prompted me to expand the discussion of the distribution of sites in the Lower Pecos region. W. W. Newcomb and Miriam A. Lowrance were kind enough to read an early draft.

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A Petroglyph (41TG54) from Tom Green County West-Central Texas

J. A. Jaquier

ABSTRACT

This paper describes a previously unpublished aboriginal petroglyph found in Tom Green County. The specimen has been excavated and placed on public display in San Angelo, Texas by the U.S. Corps of Engineers. The petroglyph is described, and its composition and probable temporal placement are discussed.

INTRODUCTION

The Concho Valley of west-central Texas has long been noted as the location of Paint Rock (41CC1), the major pictograph site on the Concho River, about 48 km (30 miles) east of San Angelo. The discovery of this isolated petroglyph (41TG54) along the southwestern margin of the O. C. Fisher Reservoir (north of San Angelo in Tom Green County) represents, to the best of the writer's knowledge, the only documented example of rock carving (as opposed to rock painting) along the Concho River.

The petroglyph (Figure 1), herein called the Red Arroyo hunting scene, was discovered in August 1974 on U.S. Corps of Engineers land by two motorcyclists who subsequently reported the find (Thomas 1979). The small sandstone boulder on which the petroglyph is carved was at the side of a draw below a sandstone bluff. The reservoir manager, D. A. Caffey, immediately expressed concern over protection of the petroglyph to the Fort Worth District of the Corps and constructed a small wooden shelter to cover the boulder. By the time the site was recorded by Darrell Creel in December 1975, the shelter had been torn down by vandals, and weathering of the petroglyph was occurring at a rapid rate. In November 1977, under a contract between the Corps of Engineers and the Cultural Resources Institute of Texas Tech University, William J. Mayer-Oakes conducted an archeological survey of the site area. Based on his recommendations (Mayer-Oakes 1977), Corps personnel prepared a statement of work and awarded a contract in May 1979 to Benham-Blair and Affiliates, Inc. of Oklahoma City to excavate and, if possible, remove the sandstone boulder. In June 1979, the work was completed and the Red Arroyo hunting scene petroglyph was placed in a naturalistic setting in a display case in the project office of the O. C. Fisher Reservoir, where it can be viewed today.

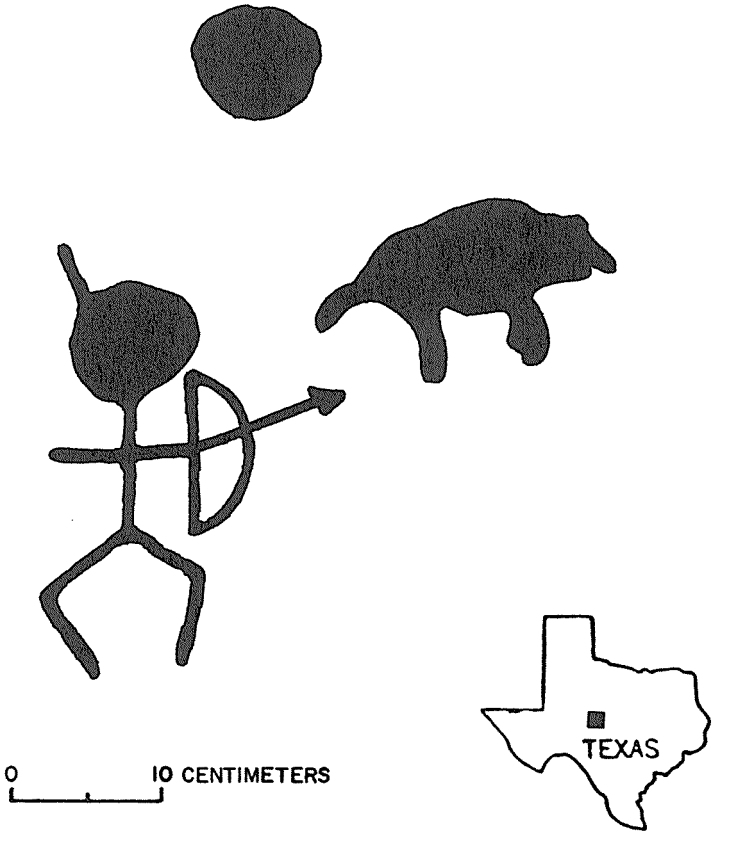

Figure 1. Tracing of the Red Arroyo hunting scene petroglyph, Tom Green County, Texas. From a 1974 U.S. Corps of Engineers photograph.

DESCRIPTION

The Red Arroyo hunting scene is composed of three distinct stylistic representations: a human stick figure equipped with bow and arrow, a discoidal depression probably representing the sun, and a depression in the form of a large quadruped (the target of the hunter). Each of these depictions was carved into the surface of a small (75 by 50 by 40 cm) sandstone boulder that has a gray cortex and tan interior.

The following description of the petroglyph is from direct observation of the rock art, extrapolation of measurements from a 1974 Corps of Engineers color photograph, and discussions with D. A. Caffey, who observed the petroglyph when it was first discovered. Detailed measurements to the nearest millimeter or degree were made of the petroglyph itself with stainless steel calipers and goniometer.

The human stick figure is at the left of the grouping, with the hunter facing and aiming his weapon to the right (as viewed). The hunter has a short protrusion, which probably represents a feather, extending upward at a slight backward angle from the back of his head. The bow, undrawn, is held vertically, and the arrow angles slightly upward at a less-than-optimum shooting angle toward the quadruped. The grooves (lines) of the stick figure are still quite deep (as much as 8 mm) and have near-vertical sides, despite obvious deterioration.

The quadruped, at the right of the grouping and facing to the right away from the hunter, appears to have a tail, a dorsal hump, and horns. Its legs are much thicker than would be expected, even allowing for weathering, and the forelegs thicken considerably toward the hooves.

The circle representing the sun is centered above the two lower figures; the composition of the three elements suggests that the sun was placed in this position intentionally to be the apex of a triangle. The depressions forming both the sun and the quadruped figure are relatively deep, with gradually sloping edges. There are no traces of pigment in or around any of the figures. Gray cortex is visible in the grooves as well as on the lower parts of the rock surface, but on many high spots the cortex has been abraded naturally, so the tan color of the rock's interior shows through. Chips of cortex are still flaking off from the surface of the rock, threatening further damage to the figures. Texture of the rock in and around the grooves is rough and pitted. From the early photographs it was in that condition at the time of discovery.

Basic macromorphological dimensions are:

Human Stick Figure
- Height: 272 mm
- Line width: 6 mm (average)
- Line depth: 8 mm (maximum)

Quadruped
- Height: 105 mm
- Length: 240 mm
- Depth: 20 mm (maximum)

Sun
- Diameter: 65 mm (average)
- Depth: 18 mm (maximum)

DISCUSSION

The two basic methods of creating petroglyphs are grinding and incising. In ground petroglyphs the rock is abraded with another, usually harder, rock. Grinding, whether linear or areal, creates smooth-surfaced depressions with gradually sloping sides and is usually performed on sandstone or other soft stone (unless tools, rather than designs, are the desired end products). Incising, on the other hand, is accomplished by hammering or pecking at the rock on which the design is being carved. Pecking is done either directly (by a hand-held hammerstone

beaten directly against the rock) or indirectly (by a hand-held hammerstone hit against a second stone that does the actual chipping of the rock, similar to the action of a hammer and chisel). Incising virtually dictates a more linear or outline style (Schaafsma 1980:31) with rougher and near-vertical sides of the resulting grooves or depressions, particularly when the indirect technique is used. The Red Arroyo hunting scene's human stick figure has narrow (6 mm), deep (8 mm) grooves with near-vertical sides, so indirect incising is the technique that probably was used by the aboriginal artist. Although the areal depressions forming the sun and quadruped have sloping sides, they are rough surfaced, and the tail, horns, and legs of the animal are more linear than areal, so indirect incising probably was used in the creation of these figures too.

The age of the oldest rock drawing in the Southwest is still undetermined, although Schaafsma (1980:3) states that some are at least 2,000 years old and believes another thousand years should be added for preceramic hunting and gathering cultures. In west-central Texas, the hunting and gathering lifeway persisted much later (Prewitt 1981:84), perhaps as late at A.D. 1750. Schaafsma (1980:3) finds no correlation between the degree of artistic sophistication of groups and their levels of cultural development.

Techniques such as patination, superimposition, and vertical placement cannot be used for dating this petroglyph, but content and comparison are dating techniques that merit discussion. The human stick figure is obviously using a bow and arrow. Hester (1980:86) believes common use of the bow and arrow occurred around A.D. 1000 or shortly after in South Texas, but Prewitt (1981:83) suggests about A.D. 700 as the time when the bow and arrow replaced the atlatl and became prevalent in Central Texas. Although eventually it was replaced by the gun, the bow and arrow continued in use among Indians in the Concho Valley into the late nineteenth century (Clemens 1980:64). Realistically, then, the depiction of the bow and arrow restricts the petroglyph to the period from about A.D. 700 to 1870.

The rock paintings on the bluffs at Paint Rock (41CC1) are believed to be primarily of Lipan Apache origin (Clemens 1980:28, 34), with many scenes obviously depicting historical events. Many of these drawings show wasp-waisted human outline figures—some on horseback—and this style is attributed to historical aborigines (Kirkland and Newcomb 1967). Equestrian Indians, primarily Apaches and Comanches, arrived in the Concho Valley in the seventeenth century (Clemens 1980:28). Since the human stick figure in the Red Arroyo hunting scene is hunting on foot and not on horseback, the date for the petroglyph's creation might be further restricted to the 900-year period between A.D. 700 and 1600.

Considering the depiction of the large quadruped, we must ask what species it was intended to represent. Caffey (n.d.) is convinced that when he first viewed the petroglyph, the animal was clearly a buffalo. Deer, antelope, and bison were present in west-central Texas during historic times and have been documented archeologically as part of the Indian subsistence pattern for thousands of years. The relatively short horns of the animal in this petroglyph appear to be extremely

low on its head; the dorsal hump and massive forequarters argue against deer and antelope and in favor of bison. Too, bison are common themes in at least six petroglyph panels at Paint Rock (41CC1), clearly recognizable from their horns, dorsal humps, and large forequarters (Kirkland and Newcomb 1967). If the quadruped is accepted as a bison (and that certainly appears, also considering faunal evidence from archeological sites, to be the most reasonable conclusion), a brief examination of bison density in the region is warranted.

Dillehay (1974) proposed a period from about A.D. 500 to 1300 when bison were almost absent on the southern plains of New Mexico, Oklahoma and Texas, and in Louisiana. Lynott (1979:98), discussing north-central Texas, postulated a high-density bison population during the period from about A.D. 1200 to 1600, and an even greater density in bison population on the High Plains to the west. Using these two hypotheses as models for the exploitive strategy of the Concho Valley, bison herds were abundant and became a dominant part of the hunting economy in the area during that period. Although it remains to be proven archeologically, should the period from A.D. 1200 to 1600 be found to be a reliable high-density period for bison in the Concho Valley, such a conclusion could further narrow the most likely time span for creation of the Red Arroyo hunting scene to that 400-year period.

Hurt (1977) finds no stylistic parallel between the Red Arroyo petroglyph and the pictographs at the Paint Rock site, but it must be pointed out that the Paint Rock pictographs are an admixture of styles and cultures (Kirkland and Newcomb 1967) covering perhaps 1,000 years (Clemens 1980:34), therefore consideration of the rock art at Paint Rock as a single entity for comparative purposes is invalid. Newcomb (Kirkland and Newcomb 1967:143) sets the Paint Rock pictographs apart as a rock-art form because of their geographic isolation and because the artwork, albeit crude in many respects, does not seem related to that at any other site or to any defined regional style. Human stick figures, as opposed to outline forms, occur clearly at least 16 times in the Paint Rock panels. Kirkland and Newcomb (1967) have illustrated similar human figures equipped with bows and arrows (page 147, plate 98, panel 1), bison (page 147, plate 98, panel 2), and even a human stick figure with feather using a bow and arrow to shoot a bison (page 153, plate 105, panel 5). So, motifs similar to those in the Red Arroyo hunting scene are found at Paint Rock, but at Paint Rock the motifs are in the artwork of a culture earlier than that of the historic equestrian Indians whose work is characterized by wasp-waisted figures, outline forms, and depictions of horses, guns, and Spanish missions.

In sum, the Red Arroyo hunting scene is a valid example of prehistoric Indian rock art. Analysis of the content—particularly the bow and arrow and bison—and a comparison with the mixed artistic styles of the Paint Rock pictographs further confirms the prehistoric nature of this petroglyph. A more finite span of A.D. 1200 to 1600, which fits within Prewitt's (1981:75) Neo-Archaic stage or Hester's (1980:156) Late Prehistoric stage, is tentatively proposed.

Unfortunately, five years of exposure to the elements (from time of recording to removal to the display) after runoff cleaned the surface of the rock of its

protective cover of soil, and were responsible for serious deterioration of the Red Arroyo hunting scene petroglyph. Today, despite being indoors in a display, the petroglyph's human stick figure is barely recognizable, and the animal figure on its right cannot be clearly discerned at all. Flaking and chipping of the sandstone cortex continue. Caffey (n.d.) advises that Thom's (1979:6) recommendation for a protective coating to retard further deterioration has not been followed. A coating of simple polyvinyl acetate or other protectant is urgently needed to preserve what is left of the only known example of prehistoric petroglyph art from Tom Green County.

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BIOGRAPHICAL SKETCH

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Rock Art at Monk's Cave (41RK84) Rusk County, Texas

Henry F. Ball

ABSTRACT

Until Monk's Cave was reported in 1980, there had been only one Texas rock-art site reported east of the Brazos River—that one in Henderson County—and no rock-art sites had been reported in deep East Texas, Louisiana, or Mississippi. A small rock-shelter in Rusk County, Texas, near the Louisiana border, has on one wall incised figures that are of unknown origin and age. They include elements similar to ones found elsewhere in rock art of Indian origin. There is evidence of use of the shelter by Caddos for temporary or permanent habitation, and its orientation suggests that it may have served a ceremonial function as well.

INTRODUCTION

Monk's Cave, or Indian Cave, as the rock-shelter is called by many of the local inhabitants, came to the writer's attention in the spring of 1980, when W. E. Langford, an architect living in Henderson, Texas, described it to him. Langford believed the little cave was of some archeological significance; the only previously reported site in Texas east of the Brazos River is in Henderson County (Jackson 1938:460), and to the writer's knowledge none have been reported in deep East Texas, Louisiana, or Mississippi (Grant 1967:17).

Langford had been shown the shelter first when he was a boy, in about 1935, after a friend had failed to locate a larger cave reported to have two rooms, with lots of Indian artifacts in the back room. Langford was taken to the small cave so he wouldn't be disappointed, and thereafter, he and a friend visited it often when hunting in the area. The shelter is in a rather remote location and remains essentially as it was remembered, by an acquaintance of Langford's, from his youth in the 1890s. A large beech tree on which were carved Civil War period dates grew on top of the shelter, but it is gone.

Upon our arrival at the site, we found that the shelter had been visited shortly before by pothunters. A hole had been dug on the south side of the entry, the incised figures had been traced with aluminum paint (with some embellishment), and efforts had been made, with some success, to pry off sections of the sandstone slab on which the figures were incised (Figure 1). A small pocket-screen and a trenching tool had been left behind.

Figure 1. Photograph of Monk's Cave showing petroglyphs on the north wall.

The site, which is beside an old logging road, was thought to be on the property of the Southern Pine Lumber Co., but was found to be owned by Morgan Strong, of Tyler, Texas. Strong had plans to clear the property for a tree farm, but kindly agreed to permit investigation of the shelter pending that work. He also agreed to preserve the site if it was archeologically important, and we assured him that it was.

INVESTIGATION

Monk's Cave is located southwest of Mount Enterprise, in Rusk County, Texas, on a fast-flowing branch in an area of heavily wooded, rolling terrain with deep, sandy topsoil. Drainage is generally westward to the Angelina River, thence via the Neches River to the Gulf of Mexico. Where it has not been logged or farmed, the land is timbered with pine, beech, water oak, post oak, and sweet gum trees. Chinkapin, hickory, pecan, and black walnut trees can also be found, together with wild plum, muscadine, persimmon, and mayhaw.

The principle determination to be made about the shelter was, of course, the authenticity of the inscriptions. All of the local inhabitants with whom the cave was discussed simply took it for granted that the petroglyphs were of Indian origin. Artifacts were found near the surface at the entrance to the cave, and we were shown a celt and half a celt, apparently of quartzite, and a cast-iron Confederate grave-marker that were found near the site.

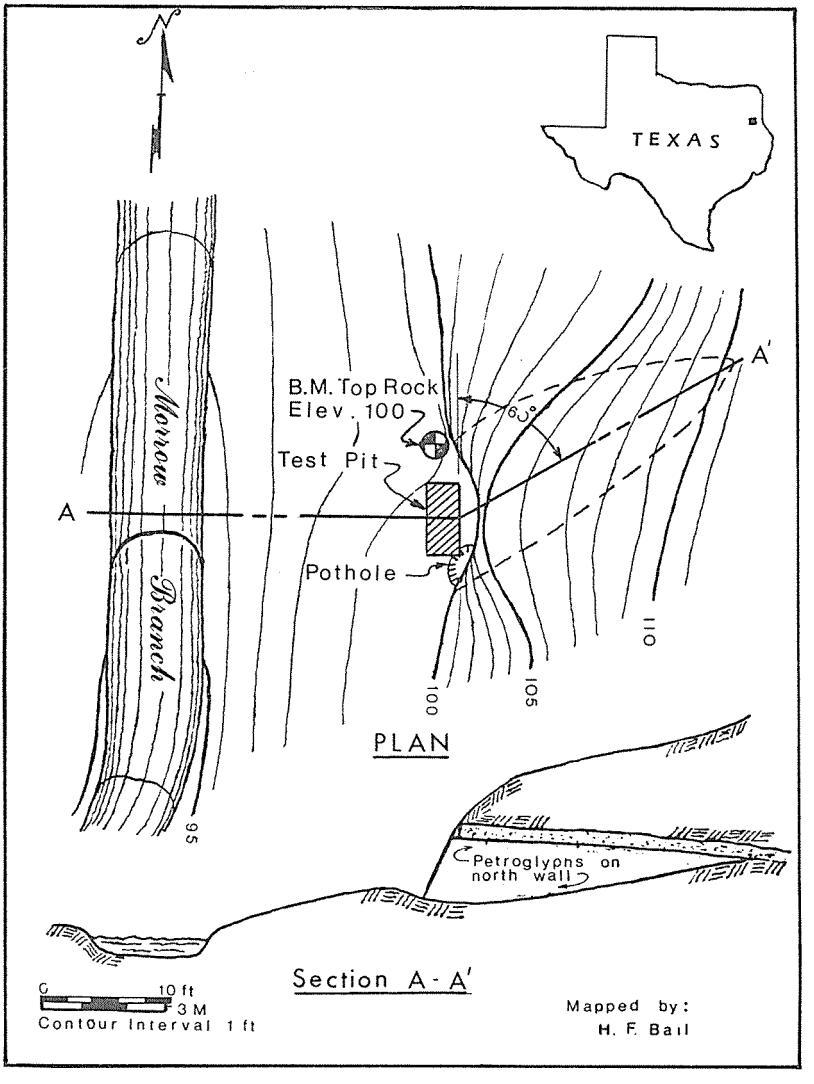

Figure 2. Topographic map and cross section of Monk's Cave.

The site has apparently aggraded over the years; local inhabitants who can remember standing erect in the shelter can no longer do so. Since the water in the branch is gritty, and the shelter is at a point where steep confining creek banks give way to a relatively wide flood plain with a meandering channel, accretion of soil could have occurred at Monk's Cave as the products of cycles of erosion and flooding accumulated.

The site was mapped (Figure 2), and photographs were taken of the petroglyphs, the shelter, and its environs. In the hope of demonstrating that the site

had indeed been used by Indians, a 1 × 2-meter test pit was put down just outside the entrance. This location was chosen on the premise that hearths might be located there, since the shelter is too small to be comfortable with a fire inside.

The premise appeared to be confirmed when artifacts were uncovered at quite shallow depths; one of the first was a Perdiz point. All excavation was by trowel. Time limitations permitted excavation of only two levels of 10 cm each. Primary screening was through quarter-inch hardware cloth, and about six random samples were fine-screened through window screening for trade beads, but none were found.

Historic and prehistoric artifacts were intermingled to a depth of 15 cm, but little was recovered in the last 5 cm. The intermingling and perhaps the shallow depth of artifacts can be explained by the churning that is commonly found in flood plains. (The light soils frequently found in such places become unstable when the stream rises in flood stage, moving and shifting artifacts that are in them.) There was nothing to map in the walls of the test pit except for some charcoal—probably displaced—and little to gain from flotation analysis of the churned matrix.

Excavation records were kept, and progress photographs were taken. These records, together with the artifacts and uncontaminated charcoal samples, were kept for possible future detailed study and analysis that time and resources of this investigation did not permit. Positive association of the occupants of the shelter with the petroglyphs on the wall could not be established. The rock art could be much older than the artifacts, and comprehensive investigation of the site would be justified, since this is apparently a very old occupation site.

The objective of this investigation was attained with the evidence of Indian occupation. The artifacts discovered in the test pit are evidence that the rock art is of Indian origin. A list with brief descriptions of the artifacts documents this claim.

ARTIFACTS

Lithic

Points

A Perdiz point (A.D. 1000–1500), made from petrified wood, was recovered from Level 1, and a Yarbrough point, apparently reworked (500 B.C.–A.D. 1000), made from jasper, was found in Level 2 (Figure 3, C, D) (Bell 1960:78, 98).

Tools

A quartzite knife was recovered from level 1 and a petrified wood scraper from Level 2 (Figure 3, A, B).

Stones

Rather large stones, apparently quartzite, were found in Level 2 at 10 to 15 cm, as much as 10 to 15 cm in major dimension, and associated with some of the larger potsherds. The stones were not fire stained.

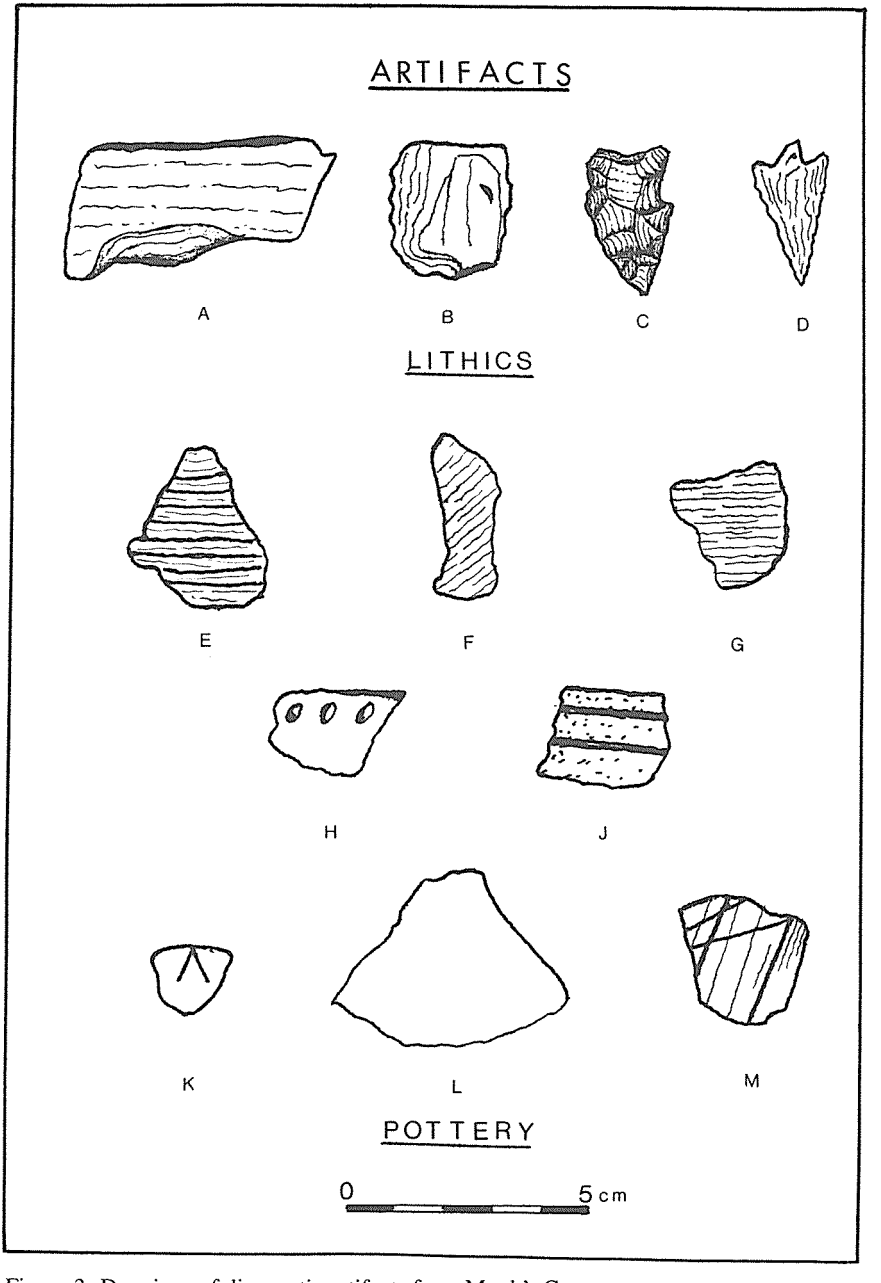

Figure 3. Drawings of diagnostic artifacts from Monk's Cave.

Table 1. Material Recovered from the Test Pit at Monk's Cave

Age	Material	Description	Level 1	Level 2	Remarks
Prehistoric	Lithics	Points	1		Petrified wood Perdiz
				1	Jasper Yarbrough type, reworked
		Tools	1		Quartzite knife
				1	Petrified wood side scraper
		Rocks		12	10–15 cm, ferruginous sandstone, not fire stained
	Pottery	Bullard branch	16	14	Bone, sand temper; utility
		Polished	2	1	Bone, sand temper; eating, storage
	Bone	Deer	14	14	2 vertebrae, 2 joint, leg pieces
		Bird	2		1 wing bone, 1 talon
		Turtle		1	Piece of carapace, 1.5 × 3 cm

Table 1. Material Recovered from the Test Pit at Monk's Cave (continued)

Age	Material	Description	Level 1	Level 2	Remarks
		Unknown	12	11	Fragments < 1 cm
		Milk	2	2	
		Bottle	9	9	3 brown, 1 blue, 2 green
	Glass	Window	7	1	
Historic		Crockery	1	1	
		Ceramics	1		Fragment of ornamental base
		Nails	2		1 6d, 1 12d, rusted, bent
	Other	Ammo case	2	3	.22 cal., U on base
		Projectiles	1	1	.22 cal., lead ball
	Other	Charcoal	x	x	Samples preserved
		Red ocher	10	2	Ocherous sandstone

Debitage

Two interior flint flakes, one gray and one buff, were found in Level 1, and three pieces of petrified wood about 2 × 4 cm. Many small pieces of quartzite, possibly country rock, were found in Level 2.

Pottery

Bullard Brushed (A.D. 1200–1500)

About 15 sherds were found in each level that were diagnostic bone and sand tempered ware typical of Caddo utility ware (Figure 3, E, F, G, H, J) (Suhm, Krieger, and Jelks 1954:252).

Polished Ware

Pieces of finer, polished ware were also found at both levels (Figure 3, L). A rim sherd from Level 1 was engraved with a V pattern (Figure 3, K) and one from Level 2 was incised (and brushed ?) diagonally (Figure 3, M). All appear to be typical of Caddo eating or storage ware (Suhm, Krieger, and Jelks 1954:252).

Bone

Level 1

Deer. One vertebra, two knuckle bones, 11 leg bone fragments.
Bird. One wing bone and one talon.
Unknown. Twelve pieces less than 1 cm long.

Level 2

Deer. One vertebra, 13 pieces leg bone, larger than in Level 1, as long as 4 cm.
Turtle. Carapace 1.5 × 3 cm.
Unknown. Eleven pieces

Historic

Nails

Two rusted, wire nails, one 6d and one 12d, were found in Level 1.

Glass

Level 1. Two pieces of milk glass, nine of bottle glass (one brown), seven of window glass, one of crockery, and a piece of an ornamental ceramic base.
Level 2. Two pieces of milk glass, nine of bottle glass (two brown), one window glass, and one piece of crockery.

Ammunition Cases

Five .22 caliber shell cases marked U on the bases came from both levels.

Projectiles

Two flattened lead balls, apparently .30 caliber ball-and-cap ammunition, were found, one in each level.

Other

Charcoal

Both levels contained several concentrations of charcoal, indicating hearth areas. However, as noted above, cobbles found were not fire stained or associated with the charcoal.

Red Ocher

Several pieces of red ocherous sandstone, soft and readily abraded, were found in both levels.

PETROGLYPH ANALYSIS

The pertroglyphs are on the north wall of the rock-shelter, and there appear to be some 34 figures remaining (Figure 4). A slab of sandstone on which, according to a local resident, was "the best picture of a deer" has been pried off at the upper left corner (facing the wall), and another smaller slab (Figure 5) apparently has sloughed off. The petroglyphs consist of primitive stick figures and other shapes, with little obvious meaning in most cases. A few do appear to be representational.

Indian rock art in the form of petroglyphs and pictographs has been viewed by different observers as having served various purposes for its creators. Some consider it to be a primitive form of writing (Gelb 1963:24). Others consider it to consist of doodles, fetishes, or personal signatures (Colton 1946:1–18). It probably serves all of these purposes and more, considering the diversity and wide distribution of the figures found. There does appear to be general agreement also that although similar figures occur in the thousands of sites in this country and around the world, common meanings cannot be assigned to them. Any universality that exists must be attributed to the limited possibilities available to their creators for figure formation (Renaud 1935:5–8).

This limited commonality of meaning makes classification, identification, and interpretation of rock art difficult. Jackson made a survey of Texas rock art and established two major classifications: (1) realistic figures and (2) conventional figures. The word conventional was used to identify primitive or stylized figures. These major classifications were subdivided into many more categories, grouped under common headings (i.e. weapons, ladders, rakes, Spanish mission and other European influences, animals, and others). Identification of the individual elements was based on resemblance to known objects, geometric shape, and ethnic identification (i.e. tepees, zigzags, headdresses).

Jackson identified two sources of information available to aid in interpreting the elements: (1) ethinic sources and (2) the accumulated knowledge of primitive psychology and the early ways of man in general (Jackson 1938:357). However, he provides few insights into the meanings of the figures, concentrating instead on their identification and distribution.

Jackson also proposed a broad chronology to be applied to rock art in Texas. It consists of three categories: (1) entirely prehistoric, (2) prehistoric and his-

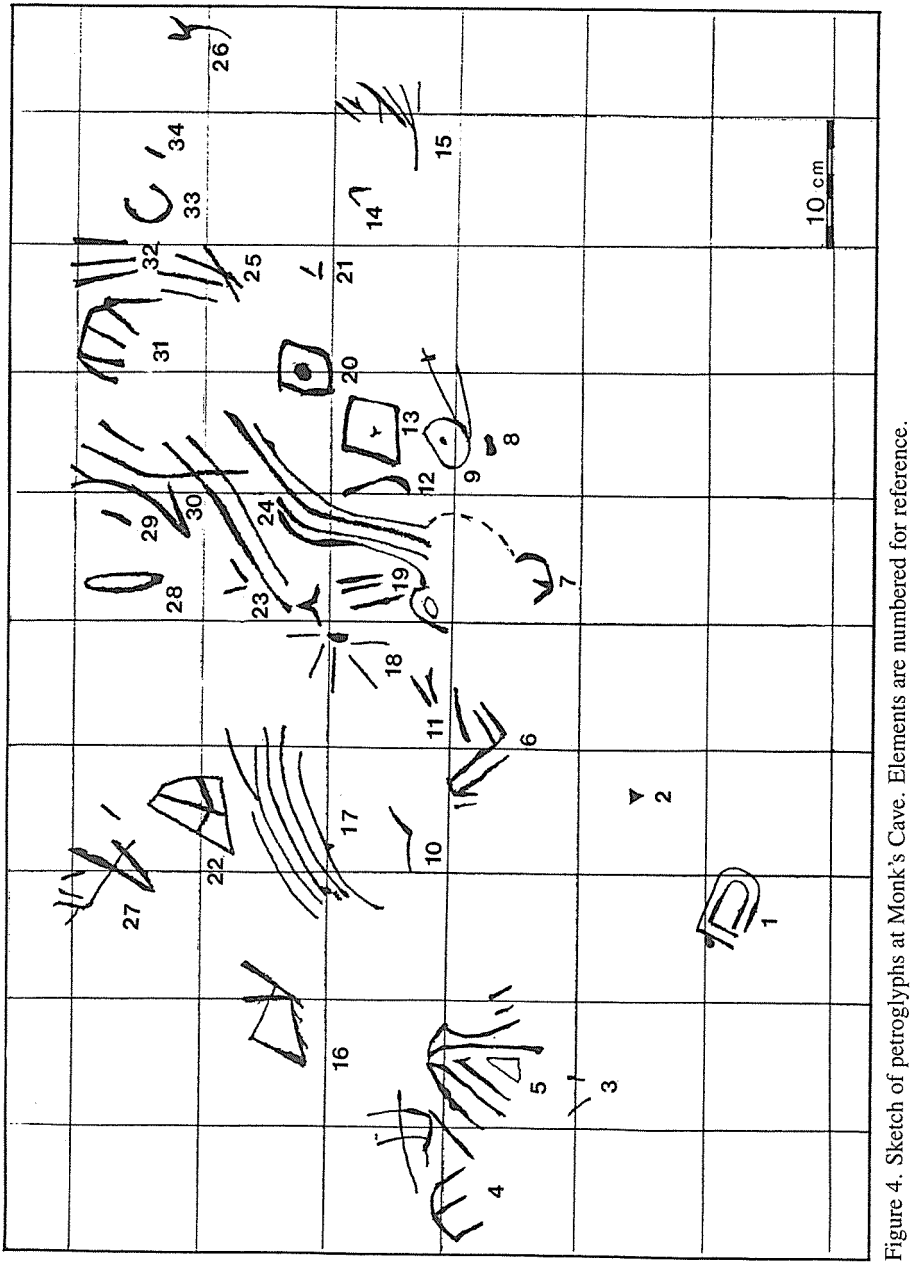

Figure 4. Sketch of petroglyphs at Monk's Cave. Elements are numbered for reference.

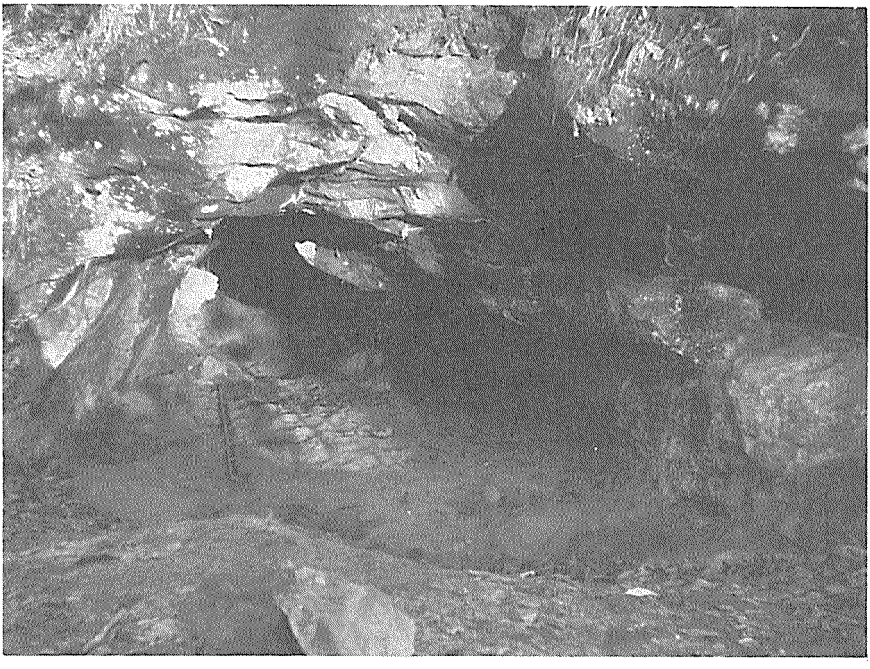

Figure 5. Photograph of Monk's Cave showing illumination by the sun at 5:00 p.m. The apparently scaled-off central part of the back wall can be seen.

toric, and (3) historic (Jackson 1938:5). He found 70 percent of the work to be prehistoric; 20 percent prehistoric and historic; and 10 percent entirely historic. His chronology is based on the presence or absence of historic elements (i.e. men on horseback and depictions of mission buildings) among the figures. This procedure has obvious limitations: it does not account for subsequent additions to earlier figures or the creation of purely magic or hunting fetishes in historic time.

Examination of the elements in Monk's Cave in accordance with Jackson's findings yields the following information:

1. The elements are conventional, identified as
   a. Deer (Figure 6, nos. 4, 16, 27, 31 32)
   b. Wind (Figure 6, no. 17)
   c. Bird (Figure 6, no. 7), possibly realistic
   d. Rain (Figure 6, no. 19)
   e. Y-shape (Figure 6, no. 26)
2. The elements are entirely prehistoric.

More success has been achieved by others in establishing a rational classification system derived from analysis of Great Basin style petroglyphs. They have been divided into four categories: 1) naturalistic, 2) stylized, 3) abstract curvilinear, and 4) abstract rectilinear (Grant 1967:25–27). In California the elements

have been further separated into five styles, according to location: 1) human, 2) animal, 3) circle and dot, 4) angular, 5) curvilinear (Clewlow 1978:619). These rationalizations are the result of the study of thousands of elements that apparently were formed primarily by pecking (Great Basin style). The further stylistic subdivisions appear to be valid only for the sites from which they were derived in California.

A chronology has also been devised for the California pecked figures, spanning the period between 1000 B.C. and A.D. 1500, with some subdivisions for the various styles (Heizer and Baumhoff 1962:226–233). The elements analyzed to establish the time frame were: 1) lichen growth, 2) associated cultural phenomena such as the change from the atlatl to the bow and arrow, 3) patination, 4) erosion, 5) stylistic and technological analysis, 6) superposition, 7) archeological correlation, and 8) ethnographic identification (Heizer and Baumhoff 1962:226–233). The pecked elements lend themselves to the use of such techniques more readily than do incised or gouged elements. It is not clear whether chronology developed from the analysis of pecked petroglyphs can be applied to gouged or incised petroglyphs without substantiating evidence.

Many sites have various combinations of the elements of classification, and this is the basis on which the California sites are futher subdivided (Clewlow 1978:619). Others include all of the elements; Monk's Cave appears to fall into this category.

Heizer and Clewlow (1973) identify five sources of information for use in identification and interpretation of rock art. They are

1. Statistical analysis (Von Werlhof)
2. Ecological analysis (Heizer and Baumhoff)
3. Ethnological analysis
4. Direct observation
5. Eclectic analysis (all or part of above)

All of the various methods have been used at different times and places with varying degrees of success. Interpretations have been established for the following commonly used symbols:

1. Clan symbols, marking boundaries (Grant 1967:28ff.)
2. Ceremonial symbols: weather modification, fertility, puberty (Clewlow 1978; Sutherland 1976:97 ff.; Williamson 1984:77 ff.)
3. Mnemomic memory aids (Grant 1967:28 ff.)
4. Records of important events (Miller 1955:6 ff.)
5. Doodling, copying ancient designs (Grant 1967:28 ff.)
6. Hunting magic (Clewlow 1978:621)

The symbols for weather modification and prayers for assistance in hunting are especially widespread (Clewlow 1978). In California the Great Basin style petroglyphs are almost always associated with game trails, winter grazing areas,

and favored hunting and ambush areas; they are clearly linked with hunting and hunting magic (Clewlow 1978:621). Ceremonial symbols have been identified in Texas (Kirkland and Newcomb 1967:218; Grieder 1982:22 ff.), as have records of important events (Kirkland and Newcomb 1967:328; Jackson 1938:349).

The petroglyphs in Monk's Cave can be examined against this background. A classification system that groups the petroglyphs into five categories will be used in an attempt to be more definitive.

The elements in Monk's Cave (Figure 6) are classified and interpreted as follows. Numbers refer to those in the sketch of the petroglyphs (Figure 6):

A. Naturalistic
   1. Bird (priesthood symbol): 7
   2. Setting sun (religious fetish): 18
   3. Star (religious fetish): 19
   4. Female genitalia (fertility symbol): 28
B. Stylized
   1. Deer (hunting fetish): 4, 16
   2. Unfinished deer (hunting fetish): 27, 31, 32
C. Symbolic
   1. Clan, boundary markers: 1, 22
   2. Wind, rain (weather fetish): 17, 19, 24
   3. Fertility symbols: 5, 9, 13, 20, 28
D. Abstract
   1. Curvilinear: 12, 15, 26, 30, 33
   2. Rectilinear: 6, 25, 27
E. Tool sharpening and unknown: 2, 3, 8, 10, 11, 14 21, 23, 29, 33, 34

These classifications and interpretations are necessarily largely subjective, but the interpretations are believed to be consistent with those made by other investigators cited herein. Perhaps the ultimate test of an interpretation is whether it makes sense, provides information, or tells a story. Applying this test to the petroglyphs at hand, we find that the elements, as classified and interpreted, do appear to make sense and tell stories. We find that the figures to which meaning has been ascribed can be grouped as follows. Numbers refer to those in the sketch of the petroglyphs (Figure 6).

A. Prayers for good hunting: 4, 16, 27, 31–32
B. Prayers for good weather: 17, 19, 24
C. Prayers for fertility, good harvests: 5, 9, 13, 20, 28
D. Religious symbols: 7, 18, 19

These interpretations strongly imply a religious usage for the shelter. Since religion appears to have been a common inspiration for rock art, this is not surprising. For example, rock art is rare in areas of Caddo occupation, so what does exist is likely to have special, possibly religious, significance; and we are told

that the lives of the Caddo were ruled by their priests (DuPratz 1758). We find too that the father (sun) and the child (evening star) are strong religious symbols of the western Indians (Williamson 1984), who appear to have based their calendar on the sun. Their priests established sun-watching stations marked with rock art (Williamson 1984) which permitted them to identify the solstices, the equinoxes, and other important celestial occurrences.

There is also some basis for establishing a more definite time frame than Jackson's inclusive prehistoric dating. Only one of the elements suggested by Heizer and Baumhoff (1962) as useful for establishing time frames—archeological correlation—is present in Monk's Cave. The test excavation uncovered artifacts identified with the Caddo Indians, most recently probably of the Frankston or Allen focus, who once occupied that area, as well as a possible Archaic dart point. Potsherds from the area have been dated between A.D. 1200 and 1700, dates that correspond well with the time span (A.D. 1000–1500 estimated for the California petroglyphs. This comparison is significant primarily because the elements identified by Heizer and Baumhoff were present in California, permitting a more accurate estimate of time than is commonly possible elsewhere.

Obviously, the link between artifacts and cave art is tenuous at best, and any link between Texas rock art and that of California is even more so. Although rock art was being created as early as 1500 B.C. by the Olmecs in Mexico (Smith 1968:37) and by the Indians in Texas well into historic time (Kirkland and Newcomb 1967:207), it is believed that the correlation between the Texas and California dates lends some credence to the archeological linkage.

One final item of interest was the orientation and configuration of the shelter. The discovery of the sun dagger at Chaco Canyon (Williamson 1984:103) spawned a spate of activity in archeoastronomy. One result is the documentation that attests to the knowledge and use of celestial bodies and their cycles by the Indians. Spiral elements appear to have been widely used as calendrical devices (Williamson 1984:103; Sherrod 1984:119), and although there is no spiral element in Monk's Cave, the major axis of the cave is oriented N60°E, magnetic (Figure 2). The magnetic declination is now 8°E of N, making the true azimuth of the major axis of the cave 248°. The shelter is at 31°52′N, and the azimuth of the sunset on the horizon at the winter solstice is 242° at this latitude, a difference of 6°. However, the sun's rays do not penetrate the trees across the branch when it is on the horizon; the last uninterrupted rays of the sun come from above the trees at about the same azimuth as that of the major axis of the rock-shelter.

Monk's Cave has a somewhat peculiar configuration (Figure 2), for it comes to a point at the back wall. This means that the only time that that point will be illuminated by sunlight may be at sunset during the winter solstice period. So the configuration of the shelter might have permitted it to serve the same purpose for its users that the spiral elements served for the desert tribes of New Mexico and Arizona and the tribes along the Arkansas River (Sherrod 1984:119).

The agricultural economy of the Caddos required that they have some means of marking seasonal changes so they could know the proper time for planting their crops. Among ancient peoples the world over this time has been marked from the summer and winter solstices, the equinoxes, and the positions of the

planets. From these observations they could measure the passage of time (perhaps in moons—lunar months) required until the best planting time for their crops came around. Further investigation appeared to be called for in order to see if Monk's Cave could have been used in such observations.

On January 4, 1983 a visit was made to the shelter to see if it was in fact oriented with relation to the solstices. At the previous visit the shelter had not been visible from the approach route because of its orientation and the dense vegetation in the creek bottom, but now winter had stripped the leaves, and from across the creek the first view of the shelter was startling: a bright shaft of sunlight illuminated the petroglyphs on the north wall, while the south wall and rear of the shelter were in shadow. As the sun continued to sink in the west, the illumination crept to the back of the shelter, and, as the sun disappeared at 5:30 p.m., the south wall remained in shadow while the north wall and the narrow back of the shelter were fully illuminated (Figure 5).

The shelter was inspected closely for evidence that it might have been made by man, but although the texture, grain, and composition of the rock and bedding of the rock differ from one part of the shelter to the other, no evidence was found to indicate that Monk's Cave was not a natural shelter.

But it is possible that man may have improved on a natural rock formation. The roof has horizontal fissures that provide purchase for prying loose slabs of rock. Vertical fissures made it possible for vandals to pry off a section of the petroglyphs and for other larger spalls to fall or be pried off the north wall, and a flat shelf had been formed on the south wall by removing some of the overlying rock. Finally, the rock that forms the shelter is unique in its composition and fractured state. The other rock in the area is a uniform, very dense, ferruginous sandstone approaching quartzite in hardness.

CONCLUSIONS

Monk's Cave could have been used to determine the occurrence of the winter solstice. It would have required only a mark on the back wall to indicate the northernmost point reached by the shadow. Whether it was so used is, of course, a matter of conjecture, for no signs of such markings have been found.

A survey of mound-builder sites (Rolingson and Sherrod 1984) it has been found that such orientations existed at most of the sites. Notable exceptions are the George C. Davis site (Caddo Mounds State Historic Site) near Alto, Texas, and apparently the Washington Square prehistoric site in Nacogdoches. It may be significant that Monk's Cave, which does have celestial orientation, is only about 32 km (20 miles) from either of these two sites.

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BIOGRAPHICAL SKETCH

Henry F. Ball was born in Yoakum, Texas, and grew up in Victoria. In World War II he saw active duty in the Army Field Artillery, with combat in the Pacific Theater and occupation duty in Japan.

Upon his return from service, he took his degree in Civil Engineering at Texas A&M University. A registered civil engineer, his professional life has encompassed most phases of the profession in local, state, and federal governments, and he has authored several technical articles. Since he retired from the federal service in 1979 he has operated a consulting business in Euless, Texas.

Ball's active participation in archeology began with his retirement. He is a member of the Texas Archeological Society and has attended several field schools. He is also a member, and has served twice as president, of the Tarrant County Archeological Society.

Big Rock: a Woodland and Caddoan Rock-Shelter in East Texas

Thomas H. Guderjan

ABSTRACT

Big Rock is one of only a few rock-shelters known in East Texas. Test excavations at the site in 1980 indicated the existence of distinct Woodland and Caddoan components, each with a high degree of preservation of biological materials. During excavation, fragments of geometric and abstract pictographs were found between the two components, indicating that at least some of them date from the Woodland period.

INTRODUCTION

This article is a revision, with new material, of "Big Rock Shelter," chapter 11 in *Archaeological Investigations in the Forest Grove/Big Rock Areas, North-Central Texas* (Guderjan et al. 1981).

Big Rock Shelter (41HE1) is a stratified Woodland and Caddoan site located on the western periphery of the Caddo area in northern Henderson County. The importance of the site lies in two unique aspects: its high degree of preservation and its petroglyphs, which derive at least in part from the Woodland occupation.

Surprisingly, Big Rock Shelter has been known since at least 1926. J. J. Faulk, in his history of Henderson County, mentioned the "ancient and peculiar heiroglyphics and etching on the rock" (1926:33). Somewhat later, A. T. Jackson reported the site in *Picture-Writing of Texas Indians* (1938). Nevertheless, until the shelter was rediscovered in 1980, its location had been lost (Carolyn Spock n.d.), and whether the descriptions of Faulk and Jackson were of the same site was not even certain (Bagot and Skinner 1974).

Setting

Big Rock Shelter is near the divide of the Trinity, upper Sabine, and Neches River basins, a ridge of ferruginous sandstone of the Carrizo Formation (Claiborne Group, Eocene), with a north-south trend through Henderson and Van Zandt counties. The ridge is capped with deep deposits of Pickton sands (Hatherly and Mays 1979) that are exposed only intermittently. The Pickton is exposed for 2 km in the area of the rock-shelter and has several outliers, most of which are about 10 meters square, but some of which are much larger. Big Rock Shelter was formed in one of these outliers at a disconformity in the sandstone in a time

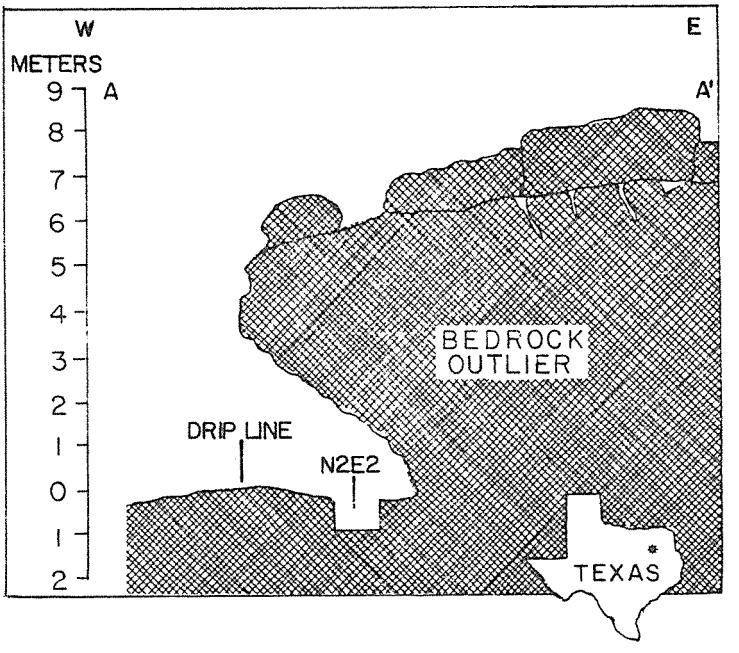

Figure 1. West-east cross section A-A′ through Big Rock Shelter, Henderson County, Texas. See Figure 2 for location of cross section.

when the water table was much higher. The rock-shelter, which faces north and west, is on the northwest slope of a sand hill about 100 meters from the ridge exposure.

The deep sands of the upland ridge and associated hills probably have supported an oak-hickory-pine forest since Pleistocene time. These upland sand hills make the western limit of the present pine forest; the deep sand no doubt allowed the pines to persist. The topography and soils also contribute to the presence of many permanent springs around the ridge. As the topography slopes off to the Trinity River to the west, the more common savannah soils and environments dominate. The far western Pickton sands probably supported some isolated pine stands of a few square kilometers, but mixed hardwoods dominated the Eastern Cross Timbers of Texas.

The sandstone outlier in which Big Rock Shelter has been formed is about 10 meters square and 7 meters high. The rock-shelter itself is 2.5 meters high, 5 meters deep, and 8 meters long (Figure 1); the overhang is literally covered with petroglyphs. In the shelter the ground surface is depressed about 50 cm, but is raised at the drip line due to rock fall; from there it slopes downward to the north. The fill is composed of sands that have washed in from the sides, small boulders that have oxidized and degraded, and, on and near the drip line, large rocks that have fallen from the top of the outcrop. Preservation in the shelter is very good; charcoal, faunal, and macrobotanical remains were recovered in excellent condition.

Prehistory

An initial inspection in June 1980 indicated that some of the site assemblage was Caddoan; arrowpoint fragments and a single potsherd were recovered from the surface. The site had been disturbed; during the excavations the vertical, but not the horizontal, extent of the disturbance was determined.

Our knowledge of the prehistory of the region begins with the Woodland and Caddoan occupations. The Woodland period (A.D. 400–800) has been only recently identified as an independent entity. Johnson (1962), in his pioneering study of the East Texas Archaic, considered the introduction of plainware ceramics an insignificant addition to an essentially Late Archaic tool repertoire. However, Studies in the upper Sabine River basin, northeast of the site, indicate that during the Woodland period small sites were occupied by sedentary groups who practised horticulture and imported lithic raw materials (Bruseth and Perttula 1981). Findings such as these justify the separation of the Woodland from the Archaic. Just as in the rest of East Texas, little is known of upland Woodland behavior in this area, principally because of poor preservation of artifacts in open and upland sites and modern destruction of the soils.

The Early Caddoan period, represented here by the Sanders focus (A.D. 800–1300), is marked by larger groups and more intensive cultivation of maize (Bruseth and Perttula 1981). Much larger sites, such as the George C. Davis site, came into being and probably were centers of regional control. The Caddo were well adapted to the lowland environments, where they developed a system of intensive agriculture. The Early Caddoan settlement system consisted primarily of dispersed small hamlets such as the Hanna site in Louisiana (Thomas et al. 1980), which were linked to one another politically through larger mound-complex sites (Gregory 1980). In the Neches River valley, east of Big Rock Shelter, many such hamlets have been found (Anderson 1972).

A similar situation, coupled with increasing importance of maize agriculture along the upper Sabine (Bruseth and Perttula 1981), was found in the upper Sabine River drainage northeast of Big Rock Shelter. The few Caddoan settlements that existed to the west in the nearby Trinity River basin appear to be outlying hamlets.

THE EXCAVATIONS

Six 1-meter squares were excavated at the site (Figure 2), three in the shelter, two on the drip line, and one about 10 meters from the front of the shelter. In addition, many shovel test pits, 50 cm square, were dug near the shelter to determine the extent of the deposit.

One unit was excavated outside the shelter in the hope that early materials would be found there. An artifact concentration was found in a matrix of heavily leached sand at a depth of 30 cm, but it could not be linked stratigraphically to the interior of the shelter.

Perishable remains were best preserved in the two units excavated on the drip line. The matrices of the drip-line units consisted of dark gray sand, par-

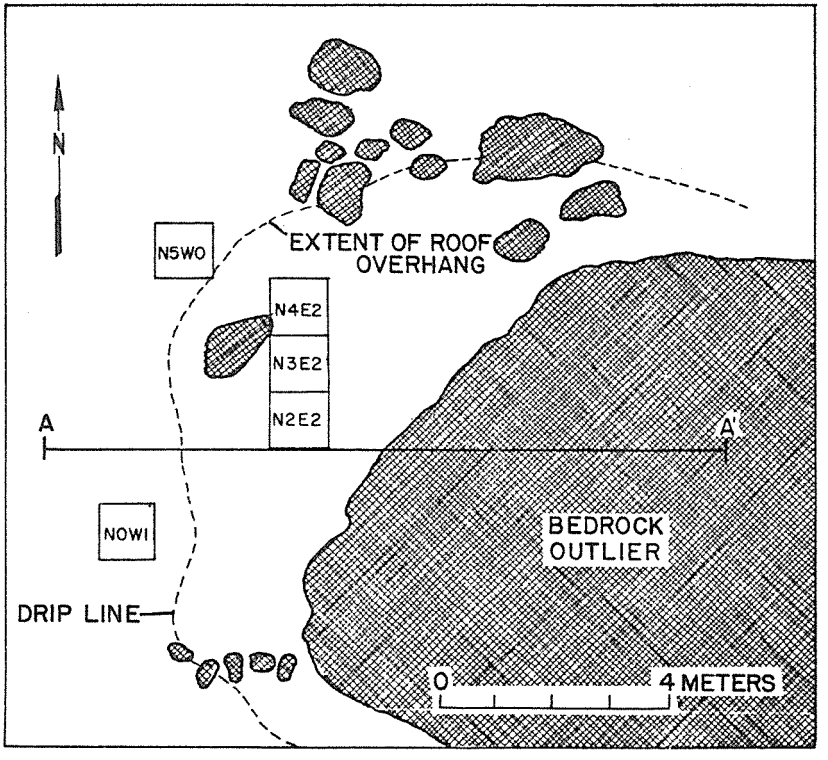

Figure 2. Plan of Big Rock Shelter. Henderson County, Texas.

ticles fallen from the roof and top of the rock, and large flat rocks, which caused the abandonment of both units at a depth of 60 cm.

The three units that yielded the most information formed a trench in the center of the shelter. They were excavated to depths from 1 to 1.5 meters. These units consisted of layers of large oxidized fallen rocks separating strata of particulate fall. One of these, N2E2, consisted almost entirely of oxidized rock and will not be considered further.

The profiles of the west and east sides of the two units of the central trench (Figures 3 and 4) show that the upper parts of the units apparently had been disturbed by looting; the triangular feature in the upper right in the east profile is a remnant of such activity. The looting clearly did not progress below the large boulders and rocks, so the lower two-thirds of the gray-brown sands and all of the orange and white sands and organic deposits are intact.

The disturbed upper part of the gray-brown sands yielded prehistoric Caddoan materials quite like those of the lower part. Although microstratigraphic work may reveal lenses of artifacts in these sandy deposits, the entire upper part of the excavation is probably Caddoan (Sanders focus).

Below this are the orange and white sands, which constitute a single depositional unit. The orange sands are fallen particles that, like the large rocks above

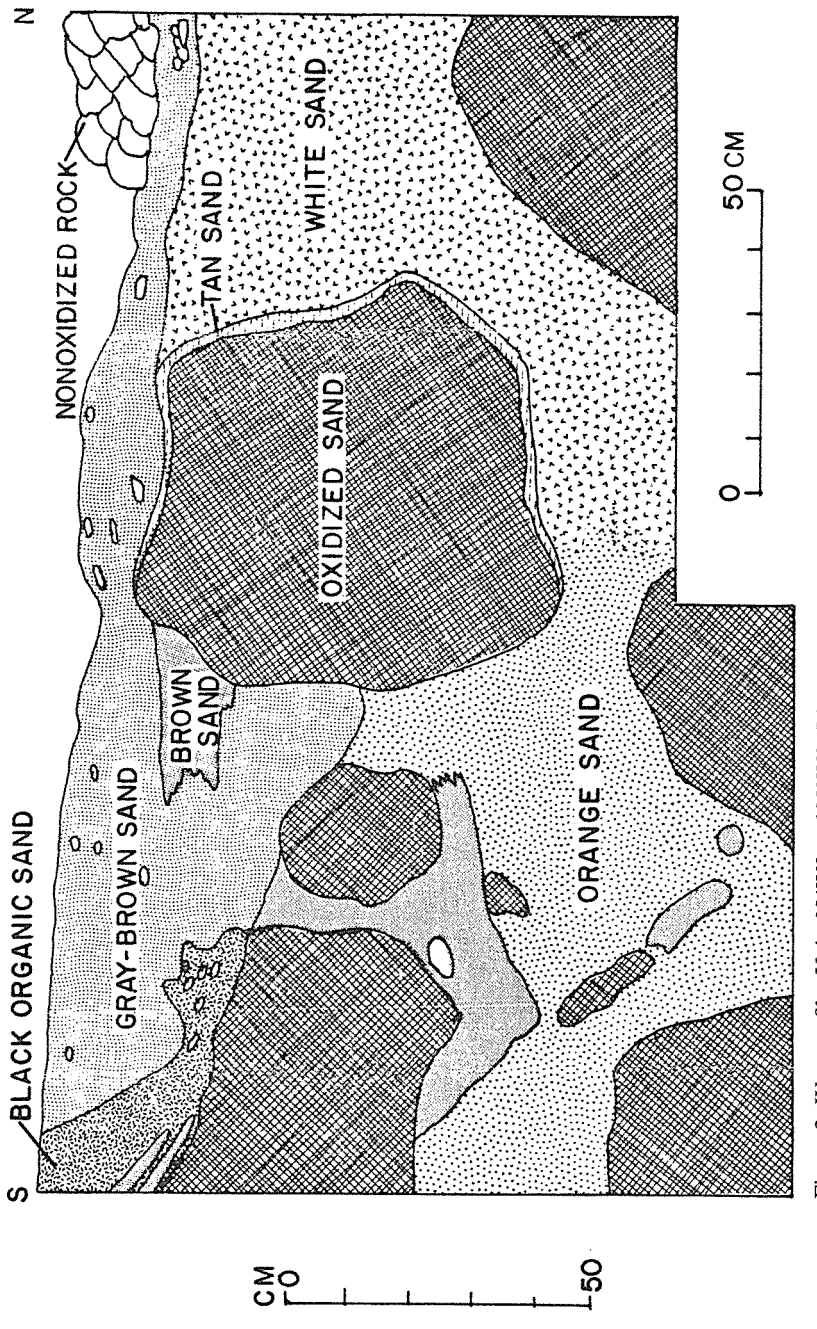

Figure 3. West profile, Units N4W2 and N3W2, Big Rock Shelter, Henderson County, Texas.

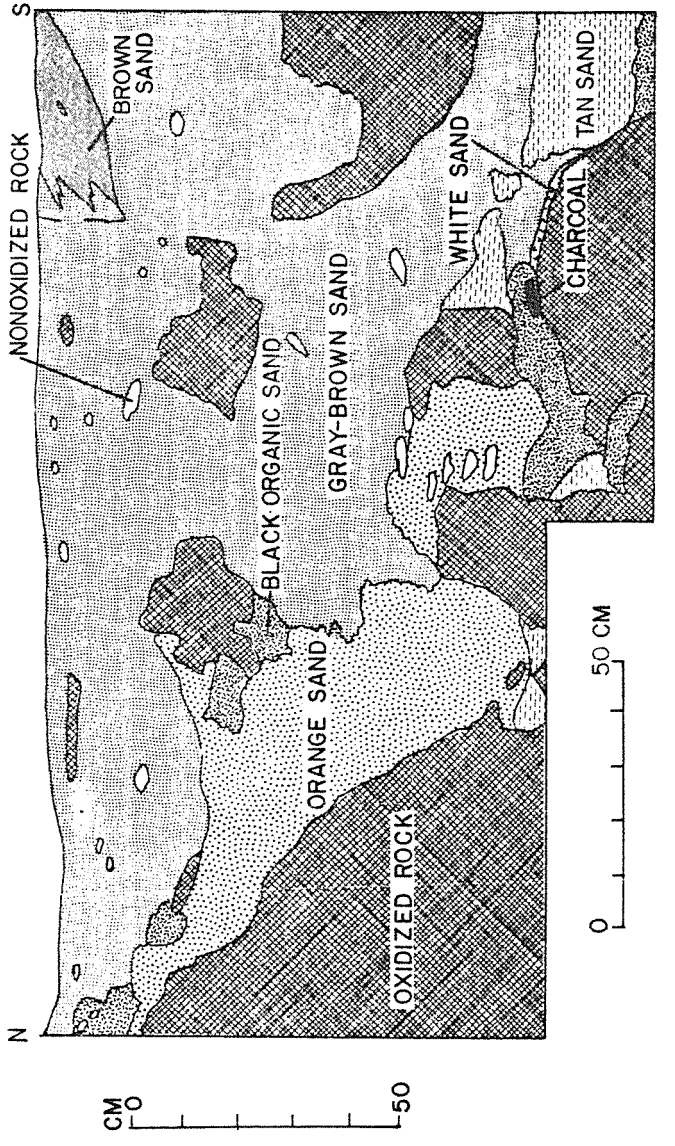

Figure 4. East profile, Units N4W2 and N3W2, Big Rock Shelter, Henderson County, Texas.

and below them, have become oxidized; the white sands are simply leached orange sands. Water running from the drip line between rocks in the west profile has repeatedly saturated the white sands. The edge of the drip line is seen in the upper right corner of the west profile (Figure 4). Except for a few pockets of black organic sand in the east profile (Figure 3), little artifact deposition was found in these sands.

The deposits below about 95 cm are quite different from those above. Below 95 cm the profiles, especially the east profile, become very complex. Shown in the east profile (Figure 4) are discontinuous lenses of black organic sands—the only artifact-bearing strata below 95 cm. Only unit N3E2 was excavated deep enough to encounter the black organic sands. The assemblage includes an undecorated sherd and pre-Caddoan projectile points. A radiocarbon date of 1587 ± 133 years B.P. A.D.:363 (SMU-964) was obtained on charcoal recovered from this level and reveals a lower component that is clearly of Woodland period age.

At least some of the petroglyphs date from the Woodland occupation of Big Rock. A large area of glyphs, once on the central part of the roof of the shelter, had spalled off before Jackson's first visit and our investigation. A glyph fragment was recovered below the Caddoan materials, resting directly on, but not in, the dark organic sands that contain the Woodland materials.

Although the central units were excavated in 25-cm levels, the information presented here is simply separated into Caddoan and Woodland. The homogeneity of the artifacts in the upper levels does not justify further division, and the limited horizontal extent of the excavation precludes examination of intrasite variations.

CERAMICS

In all, 38 sherds were recovered. Nineteen were undecorated, and the decorated sherds were either incised, brushed, or punctate. Due to the small size of the sherds, none of the decorative modes could be identified as representing a specific ceramic type (Irvine 1981).

All of the sherds except for a single plainware sherd were grit-and-grog tempered (Newell and Krieger 1949). The decorative techniques displayed on the pottery also are common to Caddoan ceramic assemblages from northeastern Texas (Brown 1971). A single shell-tempered sherd, which also appears to have Caddoan origins, was recovered from the site. It is likely that the Big Rock Shelter ceramics have affiliations with the Sanders focus, which dates from A.D. 800 to 1200. A single plain sherd, probably of Woodland period affiliation, was recovered from the lowest level excavated at the site.

LITHICS

Lithic artifacts totalling 2,715 were recovered from Big Rock Shelter. The central trench yielded 1,213 specimens, and 1,502 specimens originated mostly in the upper few centimeters of the interior of the shelter, which was removed and

Table 1. Lithic Analysis of Central Trench

A. ARTIFACT FREQUENCIES

Strata	Kind of Artifacts								
	Flakes	Primary Flakes	Core Trimming Elements	Biface Thinning Flakes	Chips	Marginally Retouched Pieces	Unifacial Tools	Bifacial Tools	Projectile Points
Caddoan	160	57	4	3	848	10	6	2	27
Woodland	16	8	0	3	63	0	1	0	3
Totals	176	65	4	6	911	10	7	2	30

B. RELATIVE FREQUENCIES

Strata	Kind of Artifacts								
	Flakes	Primary Flakes	Core Trimming Elements	Biface Thinning Flakes	Chips	Marginally Retouched Pieces	Unifacial Tools	Bifacial Tools	Projectile Points
Caddoan	14.5%	5.1%	.4%	.3%	76.6%	.9%	.5%	.2%	2.4%
Woodland	17.0%	8.5%	0%	3.2%	67.0%	0%	1.1%	0%	3.2%
Totals	14.5%	5.4%	.3%	.5%	75.1%	.8%	.6%	.2%	2.5%

Table 2. Projectile Points

Unprovenienced Points		Caddoan Strata Points		Woodland Strata Points	
Type	No.	Type	No.	Type	No.
Alba	2	Alba	4	Gary	2
Bonham	1	Cuney	1	Untyped dart point	1
Cliffton	4	Perdiz	1	Scallorn	1
Cuney	1	Scallorn	9	Fragments	2
Scallorn	3	Fragments (arrow points)	14		
Wells	1				
Basal fragments (stems)	6	Fragments (dart points)	2		
		Untyped transverse	1		
Basal fragments (nonstems)	1				
		Untyped serrated	1		
Medial fragments	7	Untyped arrow point	1		
Distal fragments	10	Untyped dart point	1		
Total	36	Total	35	Total	6

screened in order to obtain an estimate of the amount of modern disturbance. Also included among the 1,502 artifacts are spot finds from tests outside the shelter where artifact density was quite low. Since controlled excavations were limited to the central trench, the discussion that follows focuses on units N3E2 and N4E2 (Figure 2).

Most (75.1 percent) of the artifacts from the central trench assemblage were chips (pieces of debris less than 15 mm long) of various sorts (Table 1). In this report artifacts are divided into *debitage:* flakes that have potential for further modification into tools, and *debris:* chips that have no potential for modification into tools. The principle distinguishing factor is length. Because the smallest tool found at the shelter was approximately 15 mm long, all specimens less than 15 mm long are considered debris.

Flakes with less than 50 percent cortex comprise 14.5 percent of the assemblage, and primary flakes—with more than 50 percent cortex on the dorsal side—comprise 5.4 percent (Table 1). Projectile points account for 2.5 percent of the assemblage.

The other analytical categories are core-trimming elements, biface-thinning flakes, marginally retouched pieces, unifacial tools, and bifacial tools. Core-trimming elements are flakes resulting from the rejuvenation of platforms on cores. They are characteristic of Caddoan lithic technology, but not of the earlier Archaic technology. Conversely, biface-thinning flakes, although found in later assemblages, are much more common in Archaic assemblages. The technological similarity between Woodland and Archaic assemblages has been noted by Johnson (1962).

Marginally retouched pieces are tools with edge blunting or edge retouch caused either by intentional modification or by use. Unifacial tools are distinct from marginally retouched pieces in that retouch extends along a face of the piece, away from the retouched edge. Bifacial tools require no explanation as a class. It is notable that only one core was recovered from the site.

The Caddoan and Woodland assemblages differed radically (with a chi-square value of 404 and 8 degrees of freedom, $p < .005$). The very high frequency of chips and dearth of cores indicates a scarcity of lithic resources. Apparently the raw material was brought to the shelter in pebble form from gravel beds in both the Sabine and Trinity bottomlands, and the tools were manufactured on the site. The tool assemblage is characterized by small projectile points, unifacial pieces, and marginally retouched flakes. The average size of the non-utilized flakes and primary flakes is notably small, indicating a high degree of conservation of lithic resources.

Seventy-seven projectile points were recovered from the shelter, thirty of which were identifiable as to type (Table 2). The most common point types at Big Rock Shelter are Scallorn (12) and Alba (6). Many of the broken points also may be of these types. Other point types recovered include Bonham, Cliffton, Cuney, and Perdiz (Table 2). Most of the points from the uppermost Caddoan deposits are very small (less than 20 mm long). The manufacturing techniques, however, are similar to those of the larger and more common Scallorn and Alba types. One unique projectile point was recovered: a unifacially flaked point made from a

Figure 5. Photograph showing representational petroglyphs (chalked for visibility) of animal footprints at Big Rock Shelter, Henderson County, Texas.

small flake, with a remnant of the bulb of precussion on the lateral edge of the point rather than on the proximal end. This is an example of the occasional modification of techniques of tool production imposed by limitations on quantity and size of raw material. All of these point types were found in the upper strata, and all are consistent with Caddoan occupation.

THE ROCK ART

Both the ceiling and back wall of the rock-shelter, as well as part of the rock face east of the shelter's drip line, had petroglyphs. Jackson (1938) recognized several conventional human and animal figures, but in the summer of 1980 they were not in evidence. These figures could have eroded beyond recognition in the last 42 years, or it is possible that Jackson saw figures where the writer saw only abstract design motifs.

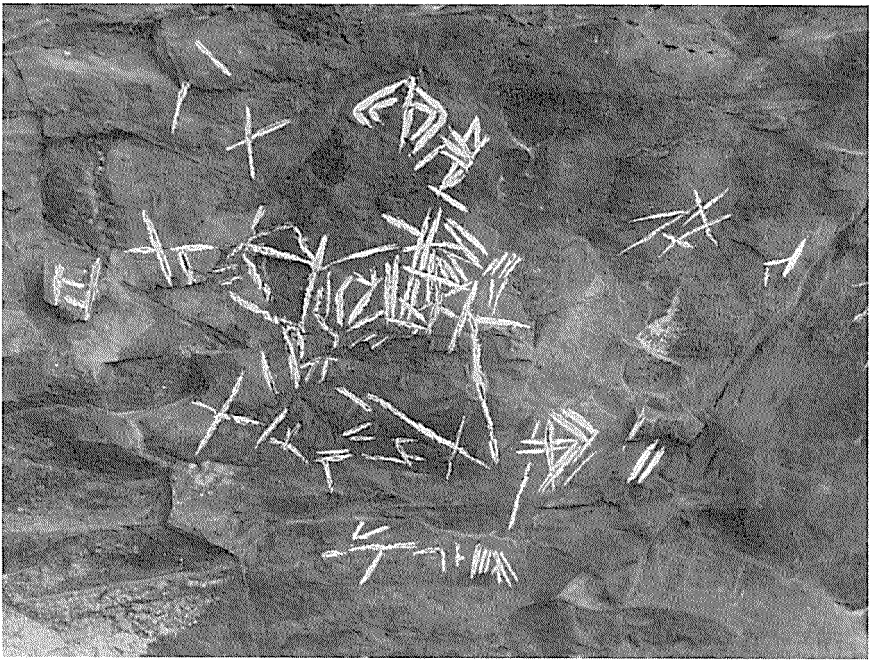

Figure 6. Photograph showing cluster of rectilinear motifs (chalked for visibility) at Big Rock Shelter, Henderson County, Texas. Motifs measure about 1 meter across.

The petroglyphs fall into two general categories: representational carvings of animal footprints (Figure 5) and clusters of abstract geometrical design elements consisting of both rectilinear and curvilinear motifs (Figures 6 and 7). The recognizable animal prints, all outside the entrance to the shelter, are deer, turkey, and raccoon. It is possible that the human hand reported by Jackson (1938) may be the one identified here as a raccoon print. Although it is quite small—about life size for a mature animal—the claws are visible. The abstract designs consist of irregular curvilinear patterns often connected with or superimposed on rectilinear designs made up of crosshatching or lines arranged conically: the "teepees" of Jackson's report.

Most of the grooves were made with a pointed instrument and are V shaped in cross section, but several were carved with round-tipped tools that produced quite deep, U-shaped grooves.

Some of the petroglyphs apparently were produced by the sharpening of bone or wooden tools rather than as artwork (Figures 6 and 7). Other carvings are quite elaborate and no doubt had some meaning—lost to us—for the individuals who put them there (Figure 8). The animal prints may be connected with hunting magic, since bones of both raccoon and deer in the shelter's midden confirm that these animals were targets of the aboriginal hunters. In eastern California and Nevada, Heizer (1962) reports representational rock art where both hunted animals and their footprints were carved by Archaic hunters at ambush sites.

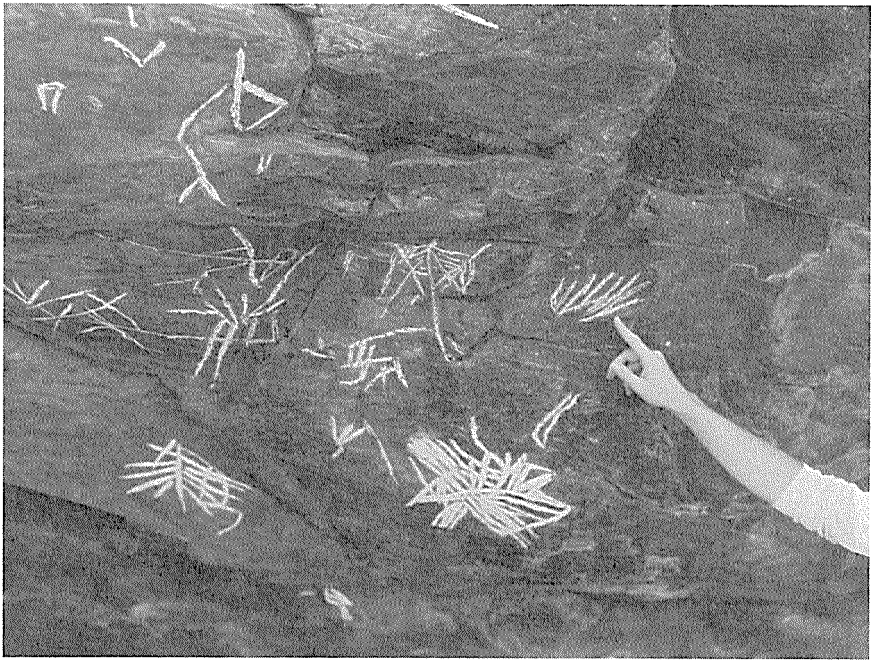

Figure 7. Photograph showing cluster of rectilinear motifs (chalked for visibility) at Big Rock Shelter, Henderson County, Texas. Motifs measure about 1 meter across.

FAUNAL AND FLORAL REMAINS

Large amounts of faunal remains, recovered from all strata, were concentrated principally in the gray-brown and dark organic sands. Due to the small scale of the excavation and the exploratory nature of the research, as well as the fragmentary condition of the material, no attempt was made to count the bones. The following listing of the species recovered focuses principally on materials recovered from the Caddoan deposits.

The dominant component of the faunal remains was deer (*Odocoileus virginianus*) bones, most of which were in fragmentary condition. The largest single bone was a complete mandible recovered from one of the drip-line units. Most of the other materials were burned and broken long bones. Deer are a woodland species, adapted to the hardwood forests because of food resources such as acorns, persimmons, red cedar, and mistletoe (Murray 1981).

An atlas vertebra from a fox squirrel (*Sciurus niger*) was found in Unit N2E2. Fox squirrels prefer open hardwood forests or woodlands and pines (Lowery 1974). Remains of cottontail rabbit (*sylvilagus floridanus*) also were found, but they appear to represent only a single individual. Crushed mollusc shells were found throughout the strata. No identification of species was possible, but the molluscs probably were gathered from nearby stable springs. A few turtle

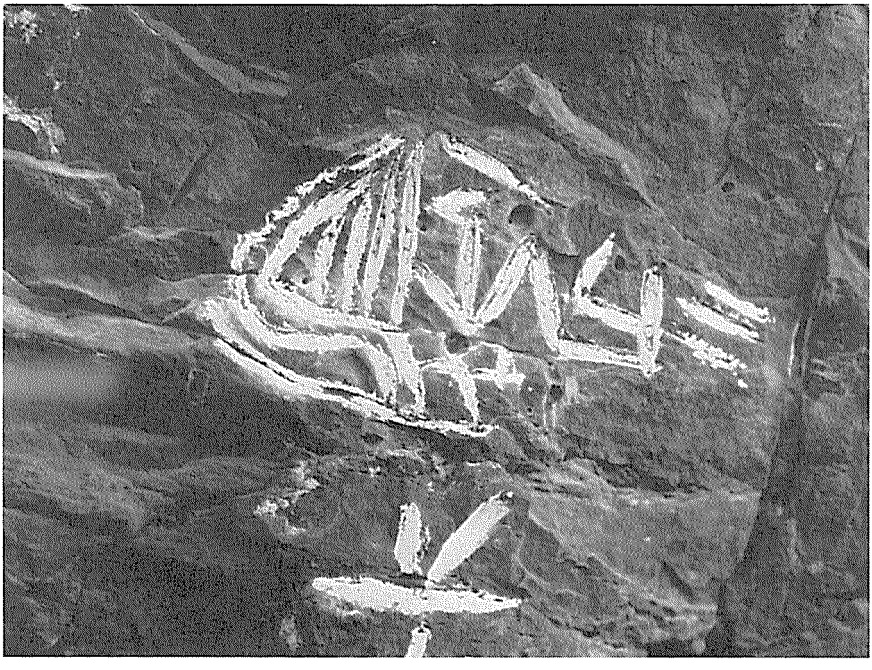

Figure 8. Photograph showing petroglyph measuring about 25 cm across (chalked for visibility) at Big Rock Shelter, Henderson County, Texas.

scutes (*Pseudemys* sp.) were recovered with the Caddo materials. These too may have been caught in nearby springs. Skeletal elements of a gopher snake (*Pituophis melanoleucas*) also were recovered, but may have come into the deposit naturally.

Among the Woodland material were a deer astragalus, part of a deer molar, and a few crushed long bones, probably from deer. Crushed shell was the only other faunal material associated with the Woodland deposit.

No attempt was made to extract pollen from the sands of the shelter, but material from a Caddo period level was recovered by flotation and examined for macrobotanical remains. From a single small sample, 9 g of hickory nutshell and 0.8 g of wood charcoal were recovered (Crane n.d.). Oak and hickory trees now grow next to the shelter and probably did in prehistoric times as well.

SEASONALITY

The location and orientation of the shelter are such that seasonality is easily determined. Since it is open to the north and completely exposed to north winds, the shelter is not an attractive place in winter, but in summer it is the coolest spot for many miles around, and nearby permanent springs are accessible from it. The hickory nutshells in the flotation sample expand the seasonal range to include the fall, but there is no evidence to indicate springtime use of the shelter.

SUMMARY

Big Rock Shelter is a stratified Woodland and Caddoan site. Although the petroglyphs, which date at least in part to the Woodland occupation of the site, include both representational depictions of animals and complex motifs, they are generally uninterpretable.

The site apparently was occupied seasonally, probably for brief periods—certainly in the fall, and probably in the summer too, but never in winter—by sedentary people. In the Caddoan period, these occupants most likely made their homes in the lowlands of the nearby Neches or Sabine rivers.

ACKNOWLEDGEMENTS

Several people assisted with the work at Big Rock Shelter, including Max Baldia, Jim Bruseth, Sue Guderjan, Dan McGregor, Allan McIntyre, Phil Murry, Chris Nunley, Mark Raab, Gary Rutenberg, and Herman Smith. Marilee Irvine and Phil Murry analyzed the ceramics and bone, respectively. Herman Smith's assistance with the rock art also is appreciated. Joel Gunn visited the site and made useful comments. Special thanks are due to W. W. Bradshaw, manager of Big Rock Ranch, for his invaluable assistance. The work at Big Rock Shelter was financed by Texas Utilities Services, Inc.

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BIOGRAPHICAL SKETCH

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An Annotated Index to the First Ten Volumes of the Bulletin of the Central Texas Archeological Society

William E. Moore and Michael R. Bradle

ABSTRACT

The Central Texas Archeological Society was organized in 1934 and is the second oldest archeological society in Texas. The Society has made notable contributions to Texas archeology and has published 10 volumes of *Central Texas Archeologist: Bulletin of the Central Texas Archeological Society.* This index provides researchers with annotations for all entries in the 10 volumes, listed under several headings.

INTRODUCTION

The Central Texas Archeological Society was organized on February 17, 1934 in Waco, Texas, with W. P. Meroney as president. The first *Bulletin,* edited by Frank Watt, was published in January 1935. The Society consisted of avocational archeologists who were determined in their desire to learn about Texas archeology. At that time very little was known about the prehistory of the State. The Texas Archeological and Paleontological Society (later renamed Texas Archeological Society) had been in existence only six years. There were very few professional archeologists in Texas at that time, and most of their work was conducted in the 1930s under auspices of WPA (the work program of the Roosevelt administration) and in the 1940s as part of the River Basin Surveys of the Smithsonian Institution.

Over the years, several members of the Central Texas Archeological Society have achieved recognition in the archeological community. Frank Watt, who served as editor and president during many of his years with the Society, received the George McJunkin Award of Honor from the Instituto Interamericano and was awarded the title Master Archeologist by the Guild of American Prehistorians. Contributors to the Society's journal, the *Bulletin of the Central Texas Archeological Society (BCTAS),* include A. T. Jackson, Forrest Kirkland, J. E. Pearce, Harry J. Shafer, Dee Ann Story, and Frank H. Watt.

The focus of the Society has been primarily on McClennan and surrounding counties, although articles concerning other states and other countries have ap-

peared in the *BCTAS*. Information disseminated through the *BCTAS* has provided important insights into such archeological problems as the distribution and function of Waco Sinkers and the use of rock-shelters as mortuary sites in Central Texas.

The year 1986 marks 50 years since the first *BCTAS* was published by the Central Texas Archeological Society, which is still active and has members throughout Texas. We hope this index will be a useful reference for researchers interested in the archeology of Central Texas and an introduction to the Central Texas Archeological Society. Complete sets of the *BCTAS* are on file in the Archeological Research Laboratory, Texas A&M University and in the private collection of Albert J. Redder, of Waco, Texas.

The main part of the index is the "Authors" section, which is arranged alphabetically and carries the complete citations, followed by the counties, states, and countries the article concerns. Where counties are not mentioned in the text, they are named in cases where they could be ascertained from the locations of sites mentioned or where they were supplied by Albert Redder or others familiar with the area. In order to provide references to as many counties as possible, all counties mentioned in the articles are named.

The articles in the 10 volumes are also listed by areas and by subjects. A key to these listings follows.

Key to the Index

AUTHORS

Aynesworth, K. H.

1936a Biographic studies of twenty-one skulls of Central Texas Indians. 2:30–34 Bell

Results of examination of skulls from Kell Branch Shelter No. 1; first systematic study of a skeletal population in Central Texas; skulls are dolichocephalic; average cephalic index of group is below 75.

Aynesworth, K. H.

1936b Flint arrowhead wounds of bones as shown in skeletons in Central Texas. 2:74–79 Bell, Comanche, McLennon

Discussion of the scarcity of arrow wounds in Central Texas; characteristics of the wounds and examples are discussed, described, and illustrated; one example is buffalo bone with embedded stone point.

1938 Stone artifacts peculiar to the highest Brazos River terrace. 4:98–99

Crude quartzite implements typically found on highest terraces of Brazos River; author says no other types of implements—such as arrowpoints, knives, or scrapers—of this material have been found.

Bryan, Frank

1935 A resumé of the prehistoric human cultural remains so far discovered in Central Texas. 1:5–9 Coryell, Falls, Limestone, McLennan, Williamson

Leadoff article for the first issue of the BCTAS; types of sites in Central Texas, typical artifacts, and presumed dates from prehistoric populations of the area; geological explanations for deeply buried middens.

1936a Geological sketch of Moffat-Whitehall-Pendelton area. 2:28–29 Bell

Moffat-Whitehall-Pendleton area discussed in terms of geology to help explain age of rock-shelter burial on the Leon River in Bell County.

1936b Indian remains of Central Texas buried by earthquakes. 2:55–58 Falls, McLennan, Travis, Williamson

Letter from Frank Bryan to J. K. Mason discussed deeply buried sites similar to those found by Mason (1936a) on Brazos River; Bryan attempts to explain sites by geological phenomena such as earthquakes and shifting faults. Letter is listed in table of contents, but no title is given in the text.

1936c Preliminary report on the archeology of western Limestone County. 2:810–95 Hill, Limestone, McLennan, Navarro

General statements concerning kinds of sites and artifacts in western Limestone County; general locations of such sites shown on maps.

1937 A preliminary report on the archeology of western Navarro County and some camp sites in Hill and McLennan Counties. 3:70–79 Hill, McLennan, Navarro

General statements about kinds of sites and artifacts in these counties; sites mentioned are shown on map.

1953 The Coyote Lake midden. 6:9–26 Bailey

Site on the Llano Estacado in Bailey County, on the ridge of a crater basin; relationship of site to others in vicinity and geology and early history of the area.

1956 Early Texas travelers. 7:57–108 All counties

Probable routes of early explorers who passed through Texas; separate chapters on expeditions of Cabeza de Vaca, Coronado, De Soto, and La Salle.

Conger, Roger H.

1953a Iron trade hatchets in Central Texas. 6:86–87 Stephens

Iron hatchets associated with a rock-shelter burial in Stephens County; other historic finds.

1953b Central Texas Archeological Society, secretary's report. 6:102–104

Society had been inactive for almost 10 years; report lists new officers, past field work, and future goals.

de Graffenreid, Gaines

1937 Notes on some prehistoric ruins in New Mexico. In "Society Notes." 3:85–86 New Mexico

Excavation by de Graffenreids of a ruin on the San Francisco River about 120 km (75 miles) north of Silver City, New Mexico; surface collections from other ruins on both sides of the river.

Dietz, W. H.

1935 Shelter burial on Bluff Creek near Crawford. 1:26 McLennan

Two shelters on McLennan County excavated in 1934 yielded at least five burials, four of adults, one of a child; each burial was under a pyramid of three stones, one of which was usually a metate.

1936 A few Mimbres bowls. 2:61–63 New Mexico

Mimbres pottery and associated artifacts excavated in 1935 by Dietz and his wife; site is about 6.4 km (4 miles) south of Mattocks ruin, north of Silver City, New Mexico.

1938 Notes on some Mimbres excavations. In Society notes. 4:102–103 New Mexico

Ruins excavated in southwestern New Mexico near San Juan; five rooms yielded burials, pottery, shell bracelets, beads, manos, and metates.

Forrester, R. E.
1985 Horn Shelter number 2: the north end. 10:21–35 Bosque
Stratified deposits from this shelter on the Brazos River have yielded artifacts believed to be linked with Toyah and Austin foci of Central Texas aspect, Round Rock focus of Edwards Plateau aspect, and La Harpe aspect of East Texas; Folsom, Scottsbluff, and other Paleo-Indian point forms are reported.

Graffenreid *see de Graffenreid*

Hampton, Howard and Grady Moore
1936 A burial site in northeastern Red River County. 2:65–69 Red River
Excavation revealed nine burials and associated grave goods: bowls, pots, and a frog effigy vessel.

Hawkins, J. E.
1938 Society notes. 4:100–102
Business of the Society, activities of some of its members; speakers and topics presented at the annual meeting.

Horne, Sam
1935 Petroglyphs. 1:30–31 McLennan
Group of petroglyphs on Tonk Creek; referred to as the only petroglyphs known in north-central Texas. (Discussed in more detail by Atlee, 1956.)

1936 A Hamilton County cache. 2:43 Hamilton
Prehistoric cache of 93 stone tools found by E. F. Hill in 1923 on Pecan Creek; most specimens are triangular or oval.

1937 A Mimbres cremation burial and an effigy pot. 3:49–51 New Mexico
Brief discussion of burial from Mimbres River valley, New Mexico; pottery and effigy pot described and illustrated.

1938 Dating Cave Creek Shelter occupancy. 4:96, 97 Coryell
Shelter excavated in 1933 by members of the Society and A. M. Wilson, of The University of Texas; artifacts found are described as flints *similar to those from middle levels of burned rock middens in south-central Texas.*

Jackson, A. T.
1935 Technique of archeological field work. 1:20–23
Basic techniques of excavation, survey, and documentation of archeological sites.

Kirkland, Forest
1937 A comparison of Texas Indian pictographs with Paleolithic paintings in Europe. 3:9–26 Concho, Jeff Davis, Reeves, Terrell, Val Verde; France, Spain.
Rock-art styles and methods for examining sites in Texas and Europe; major examples from various sites illustrated.

1937 Supplementary notes on buried midden on the Brazos. 3:68, 69 McLennan

Additional information from site reported by Mason (1936a) in previous issue of Bulletin; *includes a letter from the Smithsonian Institution identifying shells sent them by Mason.*

Meroney, W. P.

1935 Corner notched tomahawk. 1:30, 31 Colorado

Tomahawk collected in Colorado in 1850 following Indian attack on wagon train, described and illustrated.

1936 A mass burial near Waco. 2:59 McLennan

Discusses 23 skeletons found on Brazos River; associated ear spool—believed to be Caddoan—and three projectile points; one point had penetrated intervertebral cartiledge between ninth and tenth vertebrae.

Moore, H. G.

1935 A sinker factory site. 1:11 McLennan

Discussion of Lattimore Hill on Brazos River, where in 1935 more Waco Sinkers had been found than at any other site in Texas; author proposes that Waco Sinkers were mass produced at this site.

Pearce, J. E.

1936 Destructive activities of unscientific explorers in archeological sites. 2:44–47 Bosque, Coryell, McLennan

Problems of vandalism as they existed in 1936 and some ideas for halting this practice.

Perkins, John L.

1956 Tonk Creek shelter. 7:41–47 McLennan

Shelter on Tonk Creek excavated by Perkins; artifacts (some illustrated) include dart points, arrowpoints, worked bone, and a metate; four burials were uncovered.

Redder, Albert J.

1967 Possum Branch, a forest-buried type midden. 8:21–26 McLennan

Artifacts found during excavation described and illustrated.

1985a Bibliography of Frank H. Watt. 10:12–20

Frank Watt was a prolific writer, often in disciplines other than archeology.

1985b Horn Shelter number 2: the south end. 10:37–65 Bosque

Excavation revealed burials, Paleo-Indian points, bone fishhooks, shell beads, bone tools, and a tooth pendant; Paleo-Indian, Archaic, and Neo-American deposits identified.

Sneed, Gilbert
1956 Ute Fire Dance. 7:30, 31 Utah
Eye-witness account of 1949 Ute Indian fire dance.

Stephenson, Robert L.
1985 Frank H. Watt: a tribute. 10:1–6
More than 30 years of memories of working and corresponding with Frank Watt.

Story, Dee Ann
1985 The Walton site: an historic burial in McLennan County, Texas. 10: 66–96 Hill, Lamar, Limestone, McLennan, Milam, Mitchell, Montague, Palo Pinto, Rains; Kansas, Oklahoma
One of the few historic Indian burials in the Waco area; believed to be Wichita Indian buried between 1760 and 1820; associated artifacts include sword blade, glass beads, ceramic pipe, and metal fragments; includes an overview of historic Indian groups of the area.

Turner, Fred A.
1936 Chronic arthritis in the early American Indian in Central Texas. 2: 35–38 Bell
Examination of skeletal remains from Aycock shelter revealed hypertrophic arthritis as a common malady among the prehistoric populations of Central Texas.

1937 Review of skeletons from a mass burial near Waco. 3:29–33 McLennan
Study of skeletal material from mass burial site revealed 22 individuals in an area 12 by 14 ft. and 48 to 60 in. deep. Each of the 10 skeletons that could be isolated and studied showed some pathology; hypertrophic arthritis was common. Turner's composition of the burial population does not agree with figures of Watt and Meroney (1937b).

Watt, Frank H.
1925 Stone implements of Central Texas area. 1:16–19 Comanche, Coryell, Falls, Limestone, McLennan
Major kinds of stone tools known in Central Texas; certain specimens are illustrated; classification chart of projectile points.

1936 A prehistoric rock-shelter burial in Bell County, Texas. 2:5–27 Bell, Val Verde
Excavations at Kell Branch Shelter No. 1 by Central Texas Archeological Society; 32 burials; one with an arrowpoint embedded in a rib; from the dearth of stone tools and other artifacts it was concluded that primary function of shelter was for burial rather than habitation; letter from Walter J. Williams to Frank Watt identifying species of river mussel from Kell Branch Shelter No. 1.

1937a Central Texas Archeological Society notes. 3:83–87
List of activities of Society members and programs presented at the regular meetings.

1937b Descriptive analysis of glass Indian trade beads found in Central Texas. 3:59–67 Hill
Glass beads from Central Texas; some specimens ordered by color with measurements; no sites mentioned.

1937c A gravel pit burial near Little River. 3:80–82 Bell
Two burials from a site about 275 meters (300 yds.) from a surface site; single associated artifact was flint point directly over arm bones of one burial.

1937d The importance of an archeological survey. In "Editorial Comment." 3:6–8
Necessity for keeping accurate records and following accepted surveying procedures is stressed.

1938a The Waco Sinker. 4:21–70 Falls, Hill, Limestone, McLennan, Milam, Navarro, Williamson
The Waco Sinker, an artifact described as unique to this part of Central Texas, described; emphasis on distribution and description of different forms.

1938b Report on a small rock shelter in Coryell County. In "Society Notes." 4:103–104 Coryell
Small rock-shelter on small spring-fed branch of Leon River was looted by vandals; at least six burials, together with accompanying flint projectile points, were removed.

1944a Abrading implements, cultural indices in the central Brazos Valley area. 5:2–16 McLennan
Article claims that abrading implements occur sufficiently often in archeological sites in Central Texas that they can serve as temporal markers; kinds of abraders found in Central Texas and their primary locations are described.

1944b The Wacoe's teepee pole grove. 5:18, 19 McLennan
Discusses and supports with documentary evidence the location where, in historic times, the Waco Indians collected poles from a grove in what is now Waco.

1953a Ash pit in buried midden on Brazos River. 6:40 McLennan
Buried ash pit near a shallow, rock-lined fire pit; washed away by flood waters shortly after its discovery.

1953b Pottery diffusions of the central Brazos Valley. 6:57–85 Bell, Bosque, Coryell, Falls, Hamilton, Hill, Limestone, McLennan, Milam, Robertson

Detailed study of the several types of pottery found in the central Brazos Valley; emphasis on relations of this region to other pottery regions in Texas; comments on possible trade between regions; discussion of sites that have yielded specific types.

1956a Archeological materials from the Asa Warner sites. 7:7–19 McLennan

Results of extensive excavations at four sites on tributary of Brazos River; burials accompanied by flint tools, shell pendants, a possible deer-antler tool, and pottery.

1956b Two Coryell County burials. In "Society Notes." 7:111 Coryell

Burials in southeastern Coryell County excavated by Harry Shafer and Wilber Carbin; one burial was a child of seven or eight; associated were a gar scale (under right scapula), a hammerstone, and two projectile points.

1967a A detachable type of atlatl hook. 8:8–17 Bell, Bosque, Brewster, Val Verde; Alabama, Alaska, Georgia, Kentucky, Nevada, Ohio, Oklahoma; Central America, Mexico, Peru

Atlatl hook found by collector in rock-shelter in Lake Whitney Reservoir area described together with specimens from Texas and other states; burial with Perdiz arrowpoint in chest cavity also found at the site.

1967b Lookout Point, Lake Waco. 8:24–39 McLennan

Excavations at site 41ML33 by Frank Watt; artifact illustrations and site-location map.

1967c Society notes. 8:5–7

Officers of the Society named, objectives presented, and programs for the year described.

1969 The Waco Indian village and its peoples. 9:1–244 McLennan

Indians and their village thought to have been located on the Brazos River within the city limits of Waco.

Watt, Frank H. and W. P. Meroney

1937a Glass Indian trade beads in Central Texas. 3:52–58 Falls, Hamilton, Hill, McLennan

The kinds of glass beads found in Central Texas; discussion of specific sites; descriptions (detailed) and illustrations of bead types; virtually all of the 30,000 beads discussed are from Stansbury site now inundated by Lake Whitney.

1937b Supplementary report on mass burial near Waco. 3:27–29 McLennan

Examination of skeletal material from mass burial on Brazos River near Waco (Meroney 1936); 10 of the 12 skeletons studied were adults; 2 were children; ages range from 4 to 65.

White, J. B.

1937 Milam County, the future field for archeologists. 3:41–48 Brazos, Burleson, Falls, Gaines, McLennan, Milam, Robertson, Walker

Discussion of areas and kinds of sites in Milam County and vicinity from which White amassed a large collection of artifacts; other collectors in the area are identified.

Williams, Walter J.

1935 Museum and field sketches: collection of artifacts of the American Indian in the Baylor University Museum. 1:27–36 Bailey, Bosque, Brewster, Burnet, Comanche, Coyrell, El Paso, Falls, Hamilton, Hill, Lampasas, Lee, Limestone, McLennan, Robertson, San Saba, Tom Green; Alaska, Costa Rica; England, Mexico

Brief inventory of Indian artifacts housed in Baylor University Museum; specimens from other parts of the world are included.

Wilson, Loyall

1956 Case report on burials, Warner's no. 2. 7:56 McLennan

Examination of five skeletons and a group of miscellaneous bones from the Asa Warner site shows that most of the skeletons were of young adult males.

AREAS

Counties

Other States

Alabama
Watt 1967a
Alaska
Watt 1967a
Williams 1935
California
Lux 1935
Colorado
Agogino 1985
Meroney 1935
Florida
Story 1985
Georgia
Watt 1967a
Iowa
Agogino 1985
Kansas
Story 1985
Kentucky
Watt 1967a
Nevada
Watt 1967a
New Mexico
de Graffenreid 1937
Dietz 1936, 1938
Horne 1937
Marrs 1953
Reed 1938a
North Dakota
Smith 1953
Ohio
Agogino 1985
Watt 1967a
Oklahoma
Story 1985
Watt 1967a
Utah
Sneed 1956
Wyoming
Agogino 1985

Other Countries

Central America
Watt 1967a
Costa Rica
Williams 1935
England
Williams 1935
France
Kirkland 1937
Mexico
Watt 1967a
Williams 1935
Peru
Watt 1967a
Spain
Kirkland 1937

Drainages

Aquilla Creek
Bryan 1935b, 1937, 1938a
Moore 1935
Story 1985
Watt 1935, 1938a, 1944a, 1953b
Barron Branch
Story 1985
Watt 1969
Battle Creek
Bryan 1937
Beehouse Creek
Watt 1935
Big Creek
Bryan 1935b
Blackwater Draw
Bryan 1953
Bluff Creek
Dietz 1935
Watt 1944a
Bosque River
Bryan 1935b
Watt 1953b, 1967b
Brazos River
Agogino 1985

SUBJECTS

Artifacts

Site Types

Site Names

Early Explorers

ACKNOWLEDGMENTS

We express our appreciation to those who helped make this project possible. Albert J. Redder and D. Gentry Steele read the manuscript and made corrections. David Carlson reviewed the manuscript and allowed us to use his word processor to type it. We also acknowledge the members of the Central Texas Archeological Society who have contributed not only to the articles included in this index but also to the knowledge of Central Texas archeology.

BIOGRAPHICAL NOTE

William E. Moore received his M.A. in anthropology from Texas A&M University in 1980. Since that time he has worked for Heartfield, Price, and Greene, Inc., in Monroe Louisiana; Intermountain Research in Silver City, Nevada; and the Nevada State Museum in Carson City, Nevada. Moore is now employed with the Archeological Research Laboratory, Texas A&M University. His major interests are archival research, editing, and report preparation and his areas of specialization are Southeast Texas and Central Texas. Recent publications include a report of the 1976 Texas Archeological Society Field School (*Bulletin of the Texas Archeological Society,* Volume 53) and a bibliography of historical archeology in Texas (with Roger Moore) to be published by the Center for Archaeological Research, The University of Texas at San Antonio.

Michael R. Bradle is an undergraduate student in anthropology at Texas A&M University. He recently participated in a survey of Fort Hood, Texas conducted by the Archeological Research Laboratory, Texas A&M University and has worked with Frederick Briuer and George Thomas, Fort Hood archeologists, in a monitoring project for Fort Hood sites. His major areas of interest are documentation of vandalism of archeological sites and relations between the archeological community and the public. Bradle is president of the Pecan Valley Archaeological Society in Lampasas, Texas.

Analysis of Human Skeletal Remains from the Palm Harbor site (41AS80), a Mortuary Site on the Central Gulf Coast of Texas

A. G. Comuzzie, Marianne Marek, and D. Gentry Steele

ABSTRACT

In October 1980, during a construction project, human remains were recovered near Rockport, Texas, from what has been determined to be a prehistoric mortuary site. Because the remains were comingled during the uncontrolled removal, they were treated like ossuary samples. There were at least seven individuals (four males, two females, and a single juvenile of indeterminate sex), ranging in age from about five to over 40. The pathologies in the sample are few and are mainly associated with age-related degenerative conditions. The three cases of traumatic injury show evidence of antemortem recovery. These individuals came from a relatively tall, markedly robust population that had a large degree of sexual dimorphism.

INTRODUCTION

In October 1980 the remains of 12 humans were recovered from a site in the central part of the Gulf Coast of Texas, at N27°58′25″, W97°05′45″, just south of Rockport. The site, now known as the Palm Harbor site (41AS80), had been inadvertently exposed during construction of a building on private property.

When the human skeletal material was exposed, the construction crew notified the Aransas County sheriff's office. Believing the remains might be those of recently deceased individuals, the sheriff's staff undertook noncontrolled excavations in an effort to determine their origin and extent. After concluding that the remains were prehistoric, the State Archeologist's staff asked Ed Mokry, of Corpus Christi, to inspect the site and file a report. Mokry in turn requested that the skeletal remains be analyzed by the writers at the Physical Anthropology Laboratories at Texas A&M University.

As a result of the uncontrolled excavation of the site, much of the site was disturbed, and much of the skeletal material recovered had been scattered and severely damaged. To complicate the matter, the remains that were removed for analysis were inadvertently mixed at the site (E. Mokry, n.d.). Because of the

extremely fragmented and comingled condition of the material, it was impossible to reconstruct any of the skeletons. Therefore, the bones were analyzed by skeletal elements. This paper reports on the anatomy of the skeletal material, the pathologies suffered by the individuals, and attempts to reconstruct the basic demographic features of the sample.

ANATOMICAL DESCRIPTIONS

Because the remains were comingled, they were separated into skeletal elements and analyzed as if they were an ossuary sample: they were separated into skeletal elements and analyzed as subsamples. The demographic and pathological data for each subsample are presented separately.

Crania

At least seven individuals are represented by crania: three males (one partial cranium may represent a fourth male), two females, and one juvenile of undetermined sex. The ages, based on eruption of teeth, extent of dental attrition, and the state of suture fusion, range from about five to over forty years. The only evidences of pathology in the cranial remains point to periosteal infections of possibly treponemal origin in two individuals; there is no evidence of traumatic injury.

During the analysis of these cranial remains, basic measurements were recorded (Table 1). These measurements give good indications of both the overall robusticity and the extent of sexual dimorphism of the sample. Comparison of crania B and G provides the strongest indication of the sexual dimorphism in the population, since they appear to be of the same age. This robusticity and sexual dimorphism is most readily apparent in the measurements of the palate and mandible. The mandibles of the males B and E have significantly larger bigonial and bicondylar widths, together with longer ascending ramus heights than do the females C and G. Finally, the males A and B have significantly greater cranial circumference than does the female G.

Although individual C was designated a female on the basis of visual analysis, in some cases its measurements overlap those of the males. This may indicate either that the individual was a male or that the individual was simply a larger than average female. Although the measurements of C are large, the writers believe that C is most likely a female, since there is an apparent absence of well-defined sites of muscle attachment.

Cranium A

The first individual examined is represented by a nearly complete and articulated braincase, missing only the squamous part of the left temporal. Except for the nasals, the face is completely missing. Since the breaks in the bone appear to be fresh, both the loss of the squamous and a fracture of the right parietal are believed to have occurred during removal.

Table 1. Cranial Measurements (mm)

	Specimen						
	A	B	C	D	E	G	Adult Mean
Sex	M	M	F	M	M	F	
Glabello-occipital length	194	185	191	—	—	178	187
Maximum breadth	136	131	141	—	—	141	137
Cranial index	70	71	74	—	—	79	73
Basion-bregma height	137	—	—	—	—	—	—
Minimum frontal breadth	102	100	—	—	—	84	95
Bizygomatic breadth	142	—	—	—	—	—	—
Nasion-prosthion	—	—	—	—	—	57	—
Nasal height	—	—	—	—	—	—	—
Nasal breadth	—	24	—	24	—	25	24
Interorbital breadth	28	33	—	—	—	25	27
Basion-prosthion	—	—	—	—	—	—	—
Basion-subnasal	—	—	—	—	—	—	—
Basion-nasion	110	—	—	—	—	—	—
Orbital height: Left	—	—	—	—	—	34	—
Right	—	34	38	—	—	—	36
Orbital breadth: Left	—	—	—	—	—	—	—
Right	—	41	—	—	—	—	—
Palate breadth	—	65	—	63	—	36	55
Palate length	—	50	—	—	—	—	—
Symphysis height	—	32	36	—	—	35	34
Bigonial width	—	99	—	—	121	89	103
Bicondylar width	—	135	—	—	—	118	127
Gonial angle	—	104°	130°	—	105°	109°	112°
Ascending ramus height	—	73	57	—	72	66	67
Minimum breadth ascending ramus	—	42	—	—	38	31	37
Mandible length	—	91	103	—	82	82	90
Skull circumference	520	512	—	—	—	495	509
Mastoid length	33	30	—	—	—	28	30

This specimen has been identified as male because of the noticeably heavy browridges and a well-developed occipital protuberance accompanied by a well-defined crest running perpendicular to the nuchal lines of the occipital. In addition, the bone is relatively thick.

Since there are no teeth associated with this cranium, dental attrition cannot be used as an indicator of age, but the specimen does have areas of suture fusion and obliteration along the coronal and sagittal sutures, tentatively identifying the individual as an older adult (Bass 1971).

Cranium B

This specimen consists of three-fourths of a reconstructed braincase (Figures 19, 21), together with face (Figure 1) and mandible (Figure 23); the basal part of the braincase is totally absent. These remains are extremely fragmentary, and the freshness of the breaks indicates that they were broken during excavation. The facial remains consist of both maxillae, the right malar, and the right lacrimal (Figure 1). The maxillary dentition is complete except for the first and second right molars. The mandible is complete except for the medial part of both right and left condyles and the left lateral incisor and canine.

These are apparently the remains of an extremely large, robust male. In addition to a well-defined browridge and what is best described as an occipital protuberance, there is a well-developed crest that runs transverse to the nuchal lines of the occipital, indicating an area of large muscle attachment. The mastoid processes are large, a trait generally found in males, and the mental spine of the mandible also has indications of a strong muscle attachment. The mental eminence of the mandible is extremely square and the teeth are relatively large.

The third molars are erupted and show signs of light wear, basically a polishing of the occlusal surfaces. There is no apparent fusion of the cranial sutures. In combination, these characteristics point to a young adult, possibly in the late teens or early twenties.

The cranium shows no signs of pathology or trauma, but it does have an extremely large Inca bone in the lambdoidal suture. This supernumerary bone is bounded by the temporal mastoids, the lambdoidal suture, and a supernumerary suture bisecting the squamous part of the occipital. It has a maximum height of 53 mm and a maximum breadth of 93 mm. It is interesting to note that in a much earlier study, Woodbury and Woodbury (1935) reported that this condition was totally absent in all of the coastal Indian samples they observed.

The dentition of Cranium B shows no evidence of caries or other dental pathology. All of the missing teeth—the right mandibular lateral incisor and canine and the left maxillary first and second molars—appear to be postmortem losses. The maxillary left lateral incisor is morphologically atypical with respect to the other upper incisors. The other incisors have the shovel shape characteristic of Amerindian populations, but this one has a rounded form that is intermediate between the shovel shape and the atypical peg shape commonly seen in most supernumerary incisors. The upper central incisors evidence what Dahlberg (1963) described as lateral winging (Figure 2).

The wear patterns on these teeth can be characterized as light on the second and third molars and heavy on the incisors (Figure 2), a pattern that has been reported for Texas coastal Indian populations (Maples 1962). This individual has a very marked edge-to-edge bite (Figure 1).

Cranium C

This specimen consists of a nearly complete braincase, a left malar, the petrosal and mastoid processes of the left temporal, and a partial mandible (Figure 3), including a right ascending ramus.

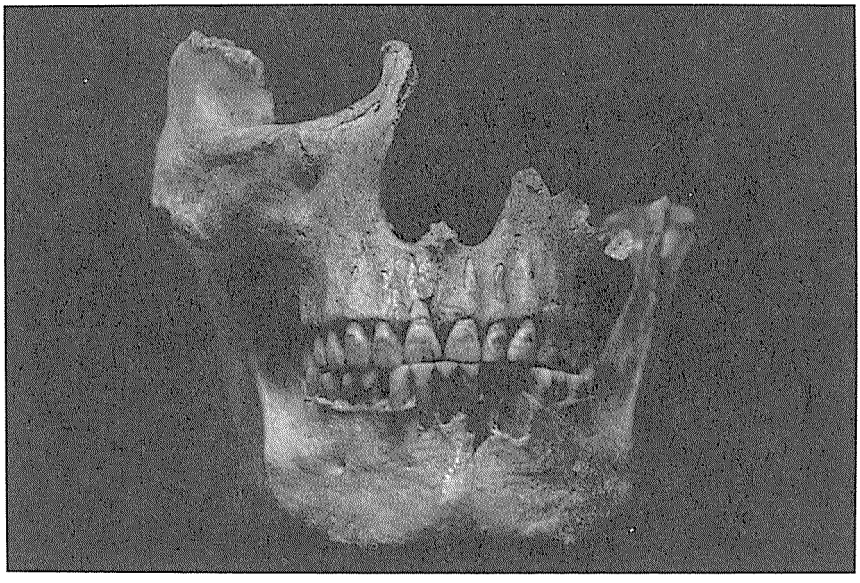


Figure 1. Attrition of maxillary and mandibular dentition of cranium B resulting in an edge to edge bite.

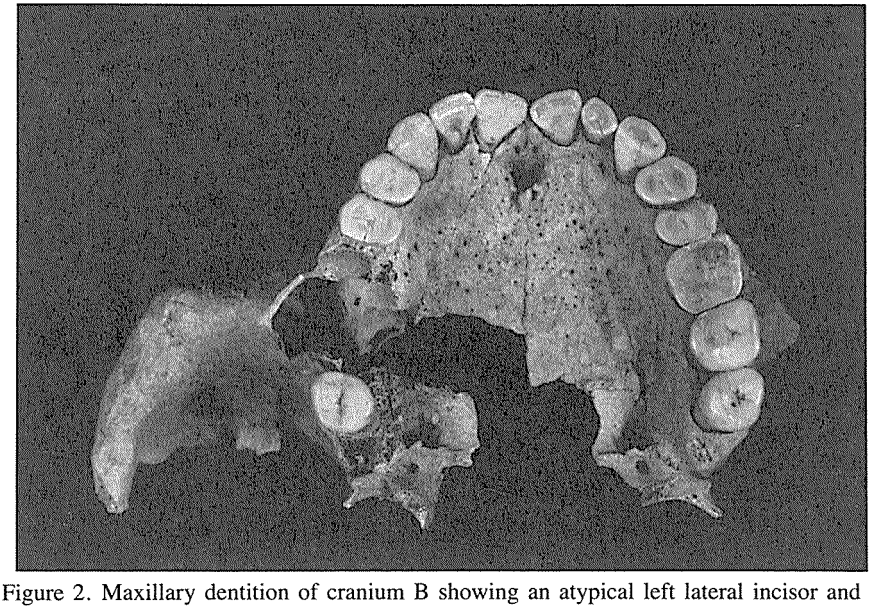


Figure 2. Maxillary dentition of cranium B showing an atypical left lateral incisor and lateral winging of the central incisors.

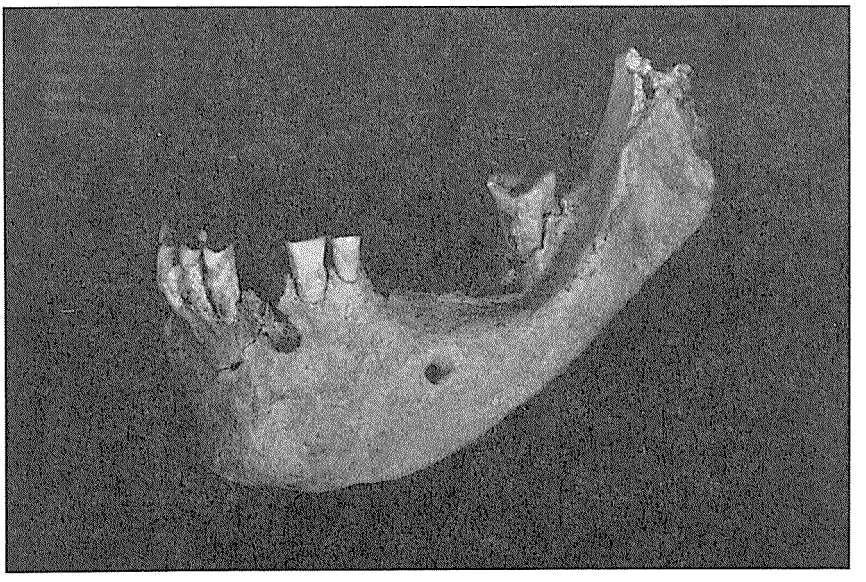
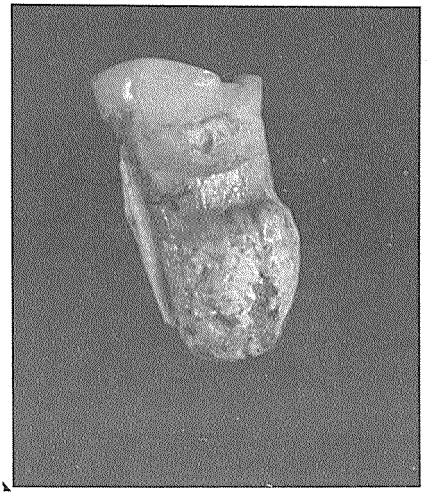


Figure 3. Mandible of cranium C showing severe evidence of periodontal infection together with antemortem loss of teeth accompanied by resorption of the bone.

These remains are much more gracile than those of the males A and B, and are therefore considered female. The browridges are not as well developed, and the occipital region shows no sign of enlargement or marked muscle attachment. The mandible is more rounded, and the teeth that are present are generally smaller than those of the males.

The lower left third molar is present and shows signs of extreme wear, as do most of the other teeth, but the cranial sutures show no signs of fusion or obliteration. Based on these findings, in the context of this population, cranium C is considered an adult of middle to old age.

The braincase and facial bones show no evidence of pathology or trauma, but both the mandible and dentition show signs of a rather severe periodontal infection (Ortner and Putschar 1981) (Figure 3). The body of the mandible shows evidence of an alveolar infection with subsequent loss of the teeth and resorption of the sockets. This individual appears to have lost the right mandibular second premolar, the right first and second molar, the left first and second molar, and possibly the left third molar (the loss of the left third molar cannot be positively documented due to the absence of this part of the mandible). The part of the mandible where these teeth were lost shows evidence of both alveolar resorption and remodeling. This degree of tooth loss and mandibular resorption has been reported in great numbers of individuals from Texas Indian populations (Maples 1962). In addition to the teeth already noted, both of the left mandibular incisors are missing, probably a postmortem loss. The remaining teeth in this specimen have the same marked wear pattern as has been noted in other coastal aboriginal



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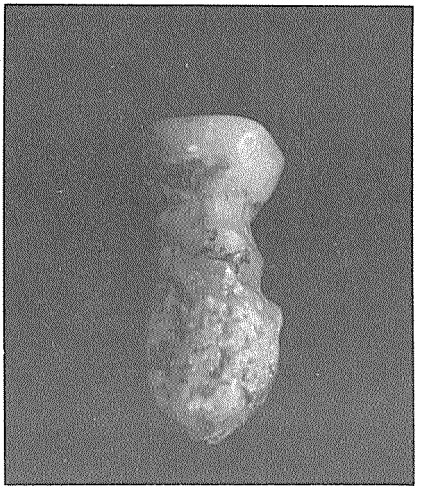

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Figure 4. Distal view of the right mandibular second premolar of cranium C showing evidence of culturally induced interproximal grooving.

Figure 5. Labial view of the right mandibular second premolar of cranium C showing evidence of culturally induced interproximal grooving.

populations: a complete loss of enamel on the occlusal surface, exposing the dentine. Wear has completely removed the enamel from the left mandibular third molar, producing extreme saddling of the occlusal surface. This could be the result of a malocclusion caused by the remodeling of the mandible. It should be noted, however, that even with the evidence of the severe abscessing of the mandible, which either contributed to or resulted from the loss of the teeth, the remaining teeth show no evidence of dental caries.

The dentition of cranium C is also marked by culturally induced dental mutilation. The type seen here is known as interproximal grooving and is found on the mesial face of the right mandibular second premolar (Figure 4, 5). This was accomplished by rubbing a small stick in the interstitial gap between the teeth and has been seen most commonly between the second premolar and first molar, the first and second molars, and second and third molars (Ubelaker et al. 1969). The practice may have occurred in order to counteract dental discomfort by producing a counter pain, thereby inadvertently producing the dental mutilation.

Cranium D

The fourth cranium is represented by a face alone and consists of both right and left maxillae and malars. Except for the right posterior part of the hard palate, the bones are relatively complete, but the specimen has suffered postmortem loss of all the maxillary incisors and the right and left maxillary second and third molars.

Considering the size of the teeth and the width of the face, these remains are probably those of a male. The severe dental attrition indicates that, relative to the rest of the sample, the individual was in late middle or old age.

This specimen shows signs of what could be treponemal scarring, manifested by subperiosteal bone deposition surrounding the anterior nasal spine (Figure 6), an area commonly affected by treponemal infections (Steinbock 1976).

The dentition also has some interesting wear patterns and indications of disease. The anterior alveolar margin above the left and right first premolars shows signs of what appears to be deposition of new bone of a type indicative of periodontal infections (Ortner and Putschar 1981). The wear on these teeth can be best described as extreme (Figure 7). The enamel has been totally removed from all of the teeth; not only from the occlusal surfaces, but down to the cervical margins as well.

The left maxillary first molar has an unusual morphological structure in which the buccal roots extend out beyond the alveolar border, and the occlusal surface is horseshoe shaped (Figure 7). This same form has been noted in molars of several specimens from the Callo del Oso site, which is geographically and perhaps temporally close to the Palm Harbor site.

Cranium E

The fifth cranium is represented by only a few calvarial fragments and a mandible, all of which are considered to be from the same individual, since they share the same extent of discoloration and do not articulate with any of the others. The calvarial fragments consist of a medial part of the frontal, a major part of the squamous of the left temporal, fragments of the left parietal, two fragments of the right parietal, and one fragment that may be from either the frontal or a parietal. Missing from the mandible are the right ascending ramus, all of the incisors, the two canines, and the first right premolar, all of which appear to be postmortem losses.

Cranium E is considered that of a male on the basis of the robusticity of the cranial fragments and mandible and the particularly marked male features, including the heavy browridges on the frontal fragment and the square mandible with its large, well-defined mental eminence.

The high level of wear on the dentition of these remains indicates that in relation to the remainder of this population, the individual is an old adult.

The cranial fragments show no evidence of pathology or trauma; all of the breakage is believed to have occurred during recovery.

Cranium F

The sixth cranium is believed to represent the youngest individual in the sample; it also has the fewest remains. Only four extremely thin fragments of the parietal were recovered. The thinness of this tabular bone suggests that these remains are of a juvenile, but because the remains are so few, no assumptions concerning sex, pathologies, or traumas can be made.

Figure 6. Frontal view of maxilla of cranium D, showing periosteal infection around the anterior inferior margin of the nasal spine.

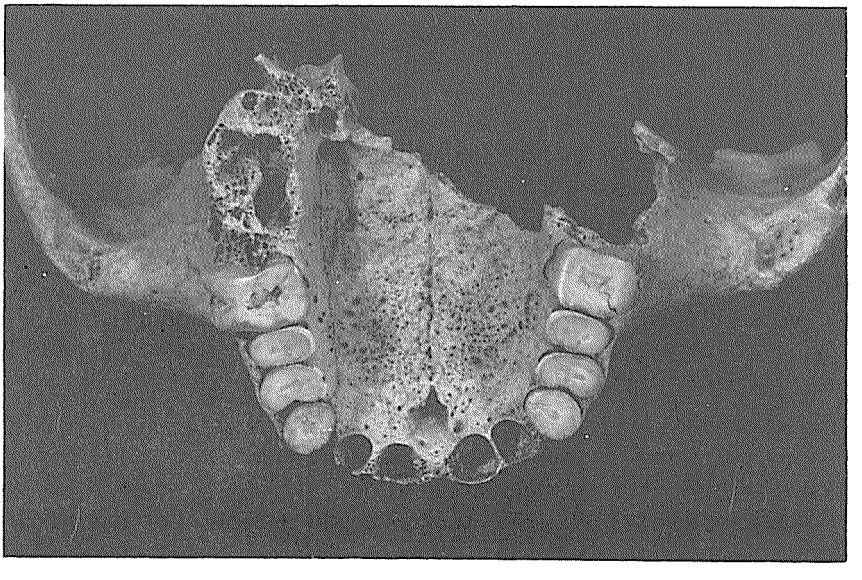


Figure 7. Maxillary dentition of cranium D showing extreme dental attrition and an unusual wear pattern on the left maxillary first molar.

Cranium G

This cranium is in relatively complete condition. The bones of the braincase are virtually intact (Figures 20, 22), with only the left temporal and the basal part of the skull missing. The face consists of both maxillae, the left lacrimal, and the right malar. The maxillary dentition is complete except for the postmortem loss of both medial incisors. The mandible is nearly complete, missing only the right coronoid process.

These remains are much more gracile than those of the males so far described, so cranium G is believed to represent a female. It has neither a prominent browridge nor extreme development of the occipital protuberance and nuchal crest. The teeth are generally smaller than those of the males, and the mandible is markedly rounded; the mandibles of what are considered males in the sample are more square.

The third molars show only light wear, suggesting that in this population this individual was a young adult.

Although there is no evidence of traumatic injury or infectious disease, this individual does have some interesting dental anomalies and pathologies. The most unusual feature is a fossa associated with each of the right and left first upper premolars on the buccal surface of the maxilla. These fossae, in which the roots of both upper first premolars are exposed, appear to be the result of incomplete formation of the bone during development and not the result of traumatic or pathological activity. The best evidence to support this argument is the symmetrical nature of the fossae and the fact that the bone inside of them does not differ from the rest of the cortical bone. However, there is evidence of a carious lesion with associated abscessing of the upper left canine. This cavity on the occlusal surface of the tooth apparently penetrated the pulp cavity and continued into the root, producing an apical abscess. This could have led to the accumulation of pus in the gingival sulcus, which would have sought the path of least resistance for drainage (Gorlin and Goldman 1970). There is an opening, with some associated bone destruction (Figure 8), from the sulcus of the canine into the fossa of the first upper premolar. This suggests that the infection had utilized the fossa as part of its passageway for drainage. The specimen also displays asymmetrical wear of the occlusal surface of the teeth; the left half of the dentition is much more worn than the right (Figure 9).

Vertebral Column

The vertebral sample from the Palm Harbor site is fragmentary and poorly preserved. No juvenile vertebrae were recovered; most elements could be classified only as cervical, thoracic, or lumbar.

Virtually every vertebra in the sample shows some type of pathology, with arthritic lipping and fusion of elements the most common. Only those with the most severe pathological conditions are discussed here.

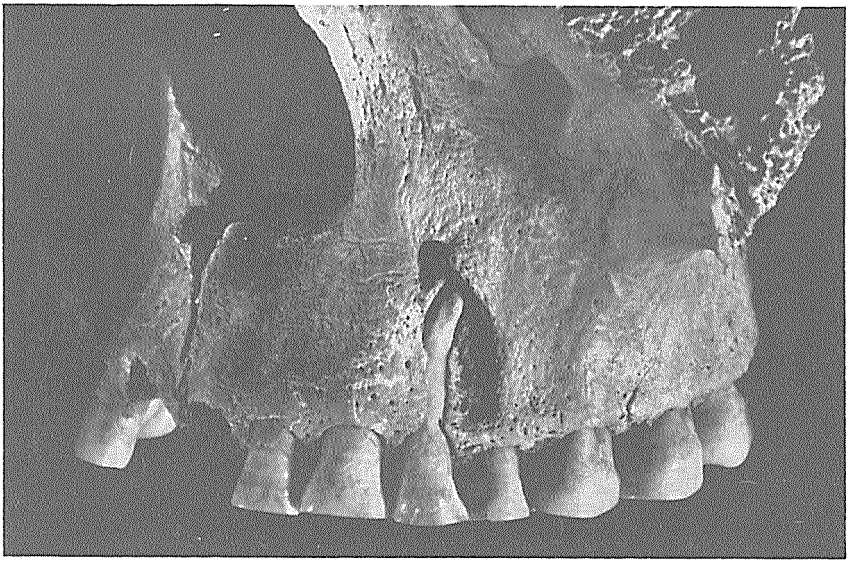


Figure 8. Left maxilla of cranium G showing abscessing and drainage of the anterior premolar alveolus.

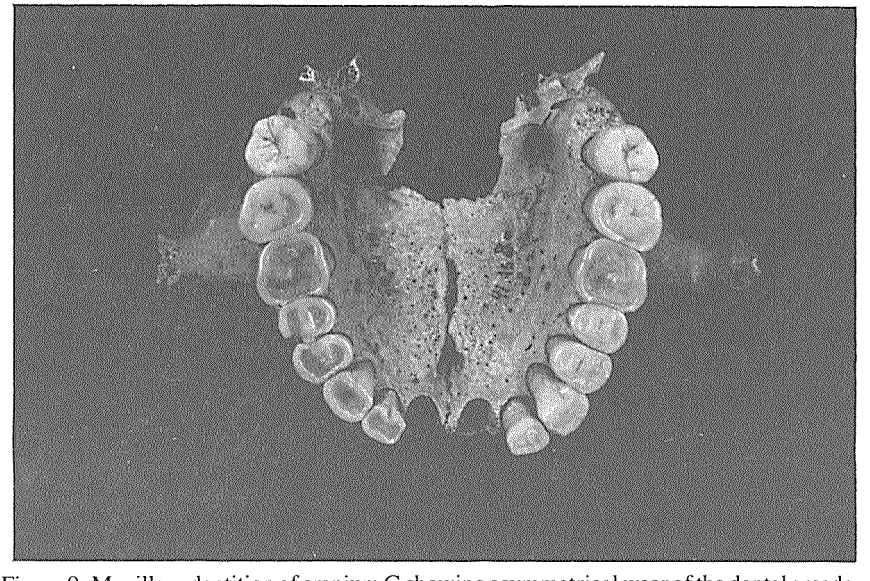


Figure 9. Maxillary dentition of cranium G showing asymmetrical wear of the dental arcade.

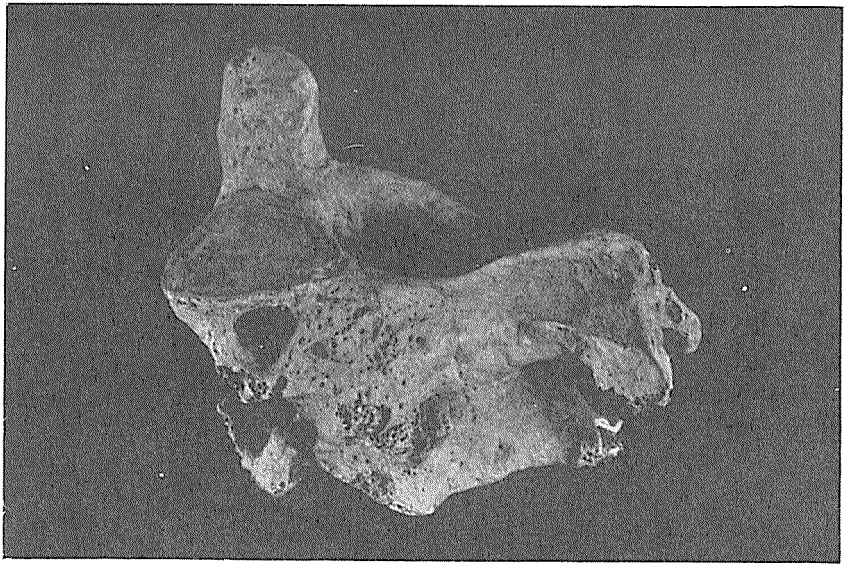


Figure 10. Second and third cervical vertebrae showing evidence of arthritic fusion.

Cervical Vertebrae

The sample of cervical vertebrae, all classified as adult, is relatively well preserved and consists of four atlas, three axis, one third cervical, eight cervicals numbers 3–6, and one seventh cervical vertebra.

The most severe pathology of the cervical vertebrae is fusion of an axis to a third cervical (Figure 10). The fusion occurs predominantly in the region of the neural arches. The articular processes are completely fused, and the beginnings of fusion are apparent in the posterior region of the centrum. The inferior aspect of the anterior part of the centrum of the third cervical also shows some evidence of fusion to a fourth cervical, but this fourth cervical was not recovered.

All of the remaining nine cervicals show some degree of arthritic lipping, characterized by the buildup of bone on the inferior and superior margins of the centrum (Steinbock 1976). Of these nine elements, two have flaring of the anterior inferior edge of the centrum; two other specimens exhibit evidence of fusion to their articulating partners, and two have deposition of numerous bony spicules on the central surface of the centrum.

Thoracic Vertebrae

The 29 thoracic vertebrae were separated into upper, middle, and lower thoracics, based on the relative size of the centrum in combination with the angle of the spinous process. The five uppermost thoracics had the smallest centra and more horizontally extended spinous processes; the six lowest thoracics generally had larger centra and horizontally extending, slightly squarish spinous processes

(Steele and Bramblett n.d.). The middle thoracics have medium-sized centra in combination with sharper, more downward angles of the spinous processes (Steele and Bramblett n.d.).

All of the thoracic vertebrae in the sample have some degree of osteoarthritic lipping similar to that found in the cervicals and characterized by recognizable rings of bone deposition along the superior and inferior edges of the centra. Bony spicules similar to those described on the cervicals occur on only one of the thoracic vertebrae.

Lumbar Vertebrae

The fragmentary condition of the lumbar vertebrae has allowed the identification of only five isolated elements. All are classified as adult and show some degree of arthritic lipping.

The most severe case of vertebral osteoarthritis is displayed on a fifth lumbar; the lipping is most visible on the anterior inferior border of the centrum (Figure 11). The other lumbar vertebrae also display some degree of lipping on the superior and inferior margins of the centra, as noted in the other vertebrae in the sample.

Clavicles

The Palm Harbor clavicle sample consists of seven isolated specimens, six of which are classified as adult and one as juvenile (Table 2). The age determinations of the adult specimens were based on their relatively large size in combination with their degrees of epiphyseal fusion. The age of the juvenile specimen was determined to be under 18, due to absence of the medial epiphysis (Bass 1971). Its size suggests the individual was between five and 10 years old.

Virtually every clavicle in the sample has some form of pathology and/or anomalous sternal facet. The sternal end of one clavicle (A) is extremely flat and worn, with a pitted surface indicative of osteoarthritis (Steinbock 1976). A second (E) has an abnormally deep, sharply depressed area on the surface of the sternal facet, with visible wear on the margins and possible deformation of the epiphysis. Evidence of periosteal infection is seen on the inferior aspect of the distal end near the conoid tubercle of a third clavicle (B). The sternal facets on three other adult clavicles (B, C, and D) differ markedly in shape, a difference noted by others in this facet of the clavicle (McKern and Stewart 1957) (Figure 12).

Scapulae

The sample of scapulae from Palm Harbor is composed of seven isolated specimens that consist mainly of the heavier bone of the spine, glenoid cavity, axillary border, and the acromion and coracoid processes. The thinner bone of the scapula bodies is consistently absent.

On the basis of size, six of these specimens are classified as adult; four of the six have lipping of the glenoid cavity that is considered common after the age of 30 to 35 (Steele and Bramblett n.d.). The remaining scapula has been classified as juvenile due to the billowing of the epiphyseal surfaces of the coracoid

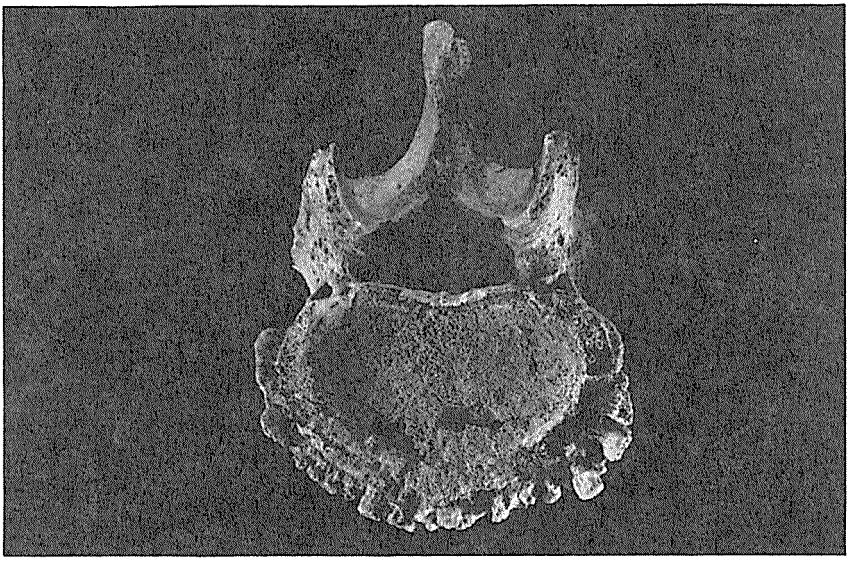


Figure 11. Lumbar vertebra (II) showing evidence of severe arthritic lipping on the anterior inferior margin.

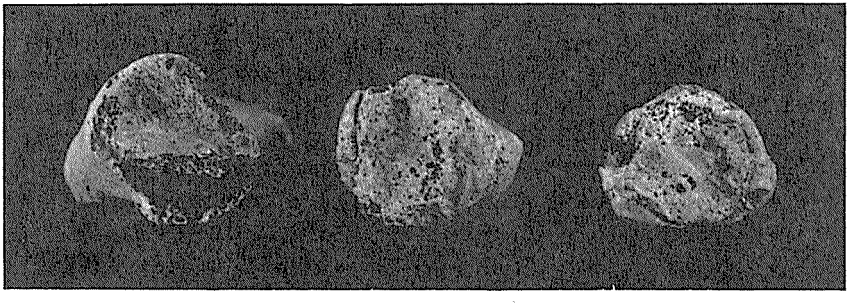


Figure 12. Sternal ends of (left to right) clavicles B, D, and C, showing atypical development.

and glenoid cavity, which indicates that the individual was under 15 (Bass 1971); the size of the bone indicates that the individual was over five.

Only one adult specimen in this sample shows evidence of a pathological condition: a small amount of bone deposition on the surface of the glenoid cavity, which may be the result of the early stages of osteoarthritis.

Sterna

The sternum sample consists of two manubria and one sternal body. Both manubria show evidence of the beginning of fusion, but neither can be articulated with the sternal body. The body consists of three segments, and the inferior surface of the third segment is billowed. All of the sternal remains are classified as adult, and no pathological conditions are evident.

Table 2. Clavical Measurements (mm)

	Specimen							
	A	B	C	D	E	F	G	Adult Mean
Side	Right	Right	Left	Right	Left	Left	Left	
Age	Adult	Adult	Adult	Adult	Adult	Adult	Juvenile	
Maximum length	148	—	—	—	—	—	—	148
Middle circumference	43	42	32	—	36	—	26	38.25

Ribs

The fragmentary condition of the ribs has made it difficult to determine the number in the sample; only two could be reconstructed completely. Two rib fragments appear to be juvenile; the remainder appear to be adult. There is no evidence of pathology on any of the ribs.

Humeri

The Palm Harbor humerus sample (Table 3) consists of nine isolated specimens. On the basis of epiphyseal fusion, seven of these specimens, three right and four left, are classified as adults more than 20 years old (Bass 1971; Steele and Bramblett n.d.). The two remaining humeri belong possibly to one juvenile between five and 12 years old (Table 11).

Abnormal bone development that may be osteoarthritis occurs in four of the adult specimens at the junction between the capitulum and trochlea, and may correspond to a similar bone formation found in the trochlear notches of several specimens of the ulna sample (Figure 13). Further evidence of osteoarthritis is seen in the prominent lipping of the distal edge of the olecranon fossa.

The most severe abnormality of the humeri occurs in an adult specimen where a possible dislocation of the ulna is indicated by a relatively large wear facet on the lateral wall of the olecranon fossa (Figure 14). This fossa is very deep, and there is also a small area of bone formation on the medial wall. No corresponding wear pattern can be found on any of the ulnae in the sample. It should also be noted that this bone has the greatest bicondylar width of the humerus sample (Humerus F, Table 3)(Figure 13).

The only other abnormality of the humerus sample is the extreme gracility of one adult specimen (Humerus C, Table 3). Even without the distal end and olecranon fossa, it is one of the longest bones in the sample and has the largest head of all the humeri. Yet the deltoid tuberosity is almost absent, and the proximal end is unusually smooth, to the extent that the division between the greater tuberosity and the head is barely visible.

Table 3. Humerus Measurements (mm)

	Specimen								
	A	B	C	D	E	F	G	H	Adult Mean
Side	Right	Left	Left	Left	Left	Right	Right	Right	
Age	Adult	Adult	Adult	Adult	Adult	Adult	Adult	Juvenile	
Maximum length	315	306	—	—	—	—	—	—	317.84 ± 11.24
Calculated maximum length[a]	—	—	332.2 ± 2.9	316.7 ± 15.9	308 ± 2.5	330.4 ± 15.9	316.6 ± 19		
Maximum diameter midshaft	24	20	23	24	24	24	22	15	23
Minimum diameter midshaft	19	15	17	21	18	18	17	12	17.86
Maximum diameter of head	45	41	47	—	—	—	40	—	43.25
Least circumference of shaft	65	58	60	64	65	69	60	44	63.00
Bicondylar width[b]	58	58	—	59	56	61	51	—	56.4[c]
Robusticity index	20.63	18.95	—	—	—	—	—	—	19.79

[a] Steele 1970.
[b] Bicondylar width is the maximum width of the distal end from the medial epicondyle to the lateral epicondyle.
[c] Specimen F was excluded due to traumatic injury.

Figure 13. Humerus F, showing the formation of a bony ridge on the ventral surface of the capitulum, with a corresponding development of a bony ridge on the ventral surface of the trochlear notch of ulna C.

Figure 14. Olecranon fossa of humerus F showing a large wear facet on the lateral surface.

Table 4. Radius Measurements (mm)

	Specimen								
	A	B	C	D	E	F	G	H	Adult Mean
Side	Left	Right	Right	Right	Left	Left	Right	Right	
Age	Adult	Adult	Adult	Adult	Adult	Adult	Adult	Juvenile	
Maximum length	235	236	247[a]	263[a]	—	—	—	—	245.25

[a] Approximate length.

Radii

On the basis of the amount of epiphyseal fusion, seven of the eight radii in the Palm Harbor sample (four right and three left) are classified as adults more than 20 years old (Table 4). The remaining radius is classified as a juvenile between five and 18 years old (Bass 1971; Steele and Bramblett n.d.).

Periosteal infection is evident on the distal ends of two of the adult specimens; osteoarthritis is evident on two others. In one, osteoarthritis is manifested by lipping along the edges of the lunate surface, and there is a small area of bone deposition along the anteriomedial aspect of the border between the lunate and scaphoid surfaces. In the other, the medial side of the head has an overhanging lip (Ortner and Putschar 1981).

An important abnormality of the radius sample is seen in four of the adults as a deep depressed area located laterally on the midshaft in the area of insertion of the *Pronator teres* muscle (Gray 1936)(Figure 15).

Ulnae

On the basis of epiphyseal fusion six (three right and three left) of the eight Palm Harbor ulnae are classified as adults more than 20 years old (Bass 1971, Steele and Bramblett n.d.) (Table 5). The two remaining ulnae are from a young adult about 17 to 20 years old (Ulna A) and a juvenile between five and 16 years old (Bass 1971; Steele and Bramblett n.d.).

Robusticity is reflected in four of the adult ulnae by the prominent depression under the coronoid process of the trochlear notch, in the area of insertion for the thick tendon of the *Brachialis anticus* muscle (Gray 1936).

In two adult specimens, a pathological condition is suggested by a sharp, medial-lateral ridge of developed bone on the nonarticular strip of the trochlear notch (Figure 13). As mentioned above, this bony ridge may correspond to a similar development of bone on the distal articular surfaces of several specimens of humeri. Together, these bone formations appear to indicate degenerative arthritis. Another abnormal ulna (Ulna D), which has an unusually straight, smooth shaft, is from an adult.

Table 5. Ulna Measurements (mm)

	Specimen								
	A	B	C	D	E	F	G	H	Adult Mean
Side	Right	Right	Right	Right	Left	Left	Left	Right	
Age	Adult	Adult	Adult	Adult	Adult	Adult	Adult	Juvenile	
Maximum length	266	—	—	—	—	—	—	—	266
Physiological length	224	—	—	—	—	236	—	—	230
Least circumference of shaft	31	36	40	34	37	35	—	—	35.5

Evidence of a traumatic injury, in the form of a midshaft fracture, is shown on one adult specimen, Ulna E (Figure 16). The injury is manifested by a large callus whose surface appears to be composed of relatively smooth laminar bone, indicating complete mending of the break before death (Steinbock 1976).

Pelves

The shattered and warped condition of the pelvic remains permitted only limited reconstruction. Seven ilia fragments (four right and three left) with identifiable sciatic notches were recovered. Determinations of sex were based on the angles of these notches together with the presence or absence of preauricular sulci. Specimens with sciatic notches of less than 50 degrees and lacking preauricular sulci were considered male. Specimens with angles greater than 50 degrees or with preauricular sulci were considered female (Table 6). As with the rest of the skeletal remains, there is marked sexual dimorphism in the pelvic sample. The bones of the males appear to be heavy and generally robust; those of the females are much more gracile and usually thinner.

Six of the seven ilia in this sample are identified as adult. The remaining one, based on the absence of fusion of the ischium with the pubis, is considered a juvenile between five and 12 years old (Bass 1971; Steele and Bramblett n.d.).

No traumatic or pathological evidence is associated with any of the specimens in the pelvic sample.

Femora

Ten adult femora (five right and five left) from this population were recovered from this sample (Table 7).

Periosteal infection is evident in the slight scarring of the anterior part of the lower shaft of only one specimen. Another (Femur G) has extreme anterior-posterior flattening that is often associated with healed fractures, but since the

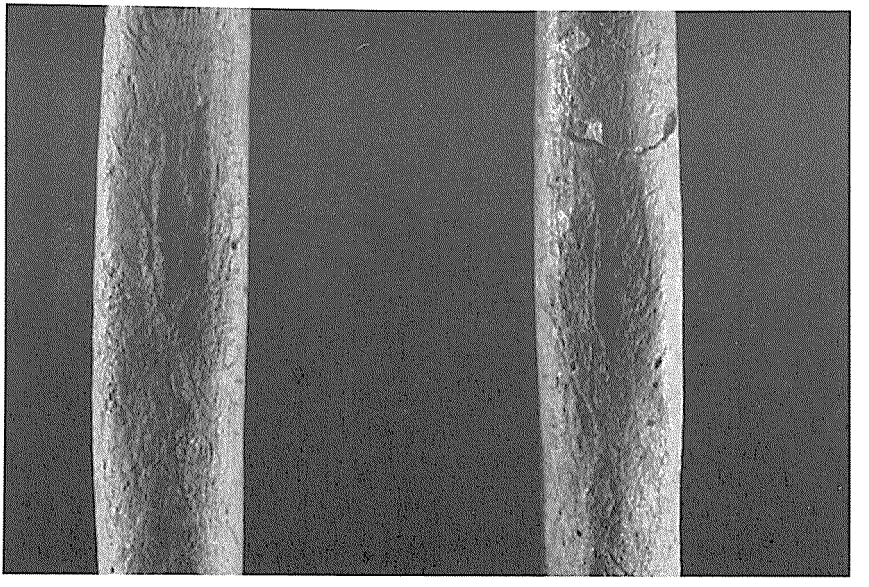


Figure 15. Depressions on the lateral surfaces of radius C (left) and radius F (right) near the site of insertion for the *Pronator teres*.

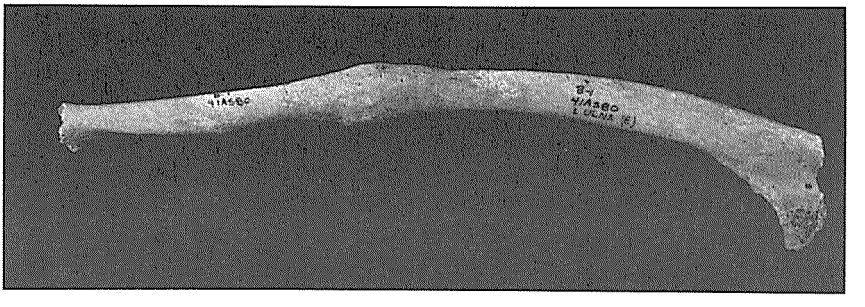


Figure 16. Ulna E, showing a large callus near the midshaft marking the site of a healed fracture.

surface of the bone does not show any evidence of bone deposition that normally would be associated with a healed fracture, this flattening is thought to be not from a traumatic injury, but a structural variation.

Tibiae

All of the nine tibia specimens (five right and four left) represent adult individuals (Table 8).

The only abnormality in the tibia sample occurs in periosteal infections of five specimens. In the two most advanced cases (Tibiae A and B) severe periosteal

Table 6. Innominates

	Specimen					
	A	B	C	D	E	F[a]
Angle of sciatic notch	44	80	97	66	48	62
Pre-auricular sulcus	Absent	Present	Absent	Present	Absent	Absent
Sex[b]	Male	Female	Female	Female	Male	Female
Age[c]	Adult	Adult	Adult	Adult	Adult	Adult

[a]Specimen F is considered a female because of the gracile nature of the sacral-illiac joint.
[b]There is also a marked sexual dimorphism in this sample, the males being more robust than the females.
[c]Age for these specimens is based on the state of fusion of the epiphysis and overall size.

infection and deformation in the form of large areas of rough, subperiosteal bone cover the entire bone surfaces (Steinbock 1976)(Figures 17, 18). Surface pitting and several prominent transverse lines, all probably attributable to the infection, are visible on the shafts. This pathological condition, commonly seen in tibiae, may be associated with treponemal infections (Steinbock 1976; Ortner and Putschar 1981).

Fibulae

The fibula sample consists of only the shafts (two right and three left) of five adult specimens. No measurements were taken.

The entire surface of the shaft of one fibula is covered with a slight periosteal infection. Another has sustained a longitudinal fracture of the distal shaft.

Carpals and Tarsals

In all, 18 carpals and 10 tarsals (Table 11) were recovered from the Palm Harbor site; only two are classified as juvenile. One of the juvenile bones, a right calcaneus (D) with evidence of possible periosteal infection, has been identified as an individual less than 14 years old (Krogman 1962).

It was possible to estimate the sex of the adult tarsals by utilizing the formula developed by Steele (1976). Based on calculations from measurements of the calcanea (Table 9), at least one male and one female are represented in the sample. The one complete talus recovered is apparently from an adult male (Table 10).

Table 7. Femur Measurements (mm)

	Specimen									
	A	B	C	D	E	F	G	H	I	Adult Mean
Side	Left	Left	Left	Left	Left	Right	Right	Right	Right	
Age	Adult	Adult	Adult	Adult	Adult	Adult	Adult	Adult	Adult	
Maximum length	440	—	—	—	—	—	—	—	—	443.36 ± 17.16
Calculated maximum length[a]	—	494 ± 24	—	425 ± 15.7	512 ± 24.2	381 ± 12	458 ± 23.2	369 ± 12	468 ± 9	
Anterior-posterior diameter at the midshaft	31	28	33	31	—	33	22	31	33	30.25
Medio-lateral diameter at the midshaft	28	24	27	28	—	21	27	28	26	26.13

Table 7. Femur Measurements (mm) (continued)

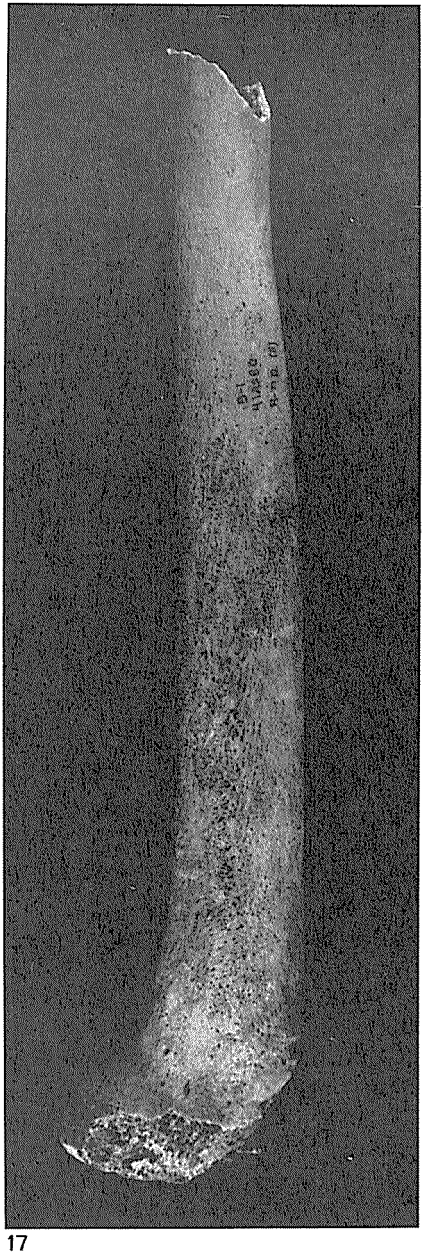
	Specimen									
	A	B	C	D	E	F	G	H	I	Adult Mean
Midshaft circumference	92	81	96	90	—	93	78	91	92	89.13
Maximum diameter of head	44	—	—	—	—	46	43	45	—	44.5
Subtrochanteric anterior-posterior diam.	28	—	26	26	—	27	23	27	23	25.71
Subtrochanteric medio-lateral diameter	35	—	35	34	—	34	35	36	30	34.14
Bi-epicondylar width	—	76	—	—	—	—	—	—	—	76
Bicondylar width	—	74	—	—	—	—	—	—	—	74
Platymeria index[b]	80	—	74.28	76.47	—	79.41	65.71	75	76.66	76.97

[a] Steele 1970.
[b] Brothwell 1981.

Table 8. Tibia Measurements (mm)

	Specimen									
	A	B	C	D	E	F	G	H	I	Adult Mean
Side	Left	Right	Left	Left	Left	Right	Right	Right	Right	
Age	Adult	Adult	Adult	Adult	Adult	Adult	Adult	Adult	Adult	
Maximum length	—	—	—	—	—	—	—	—	—	—
Calculated maximum length[b]	384 ± 5.2	381 ± 12.4	353 ± 2.6	—	407 ± 18.6	375.9 ± 18.2	404.3 ± 18.6	385 ± 18.6	—	384 ± 13.46
Anterior-posterior diameter at the nutrient foreman[a]	—	—	35	—	35	—	36	36	—	35.5
Medio-lateral diameter at the nutrient foreman[a]	—	—	24	—	25	—	25	25	—	24.8
Platycnemia index[a,c]	—	—	71.43	—	68.57	—	71.43	71.43	—	70.72

[a] Specimens A and B were excluded due to pathological conditions.
[b] Steele 1970.
[c] Brothwell 1981.



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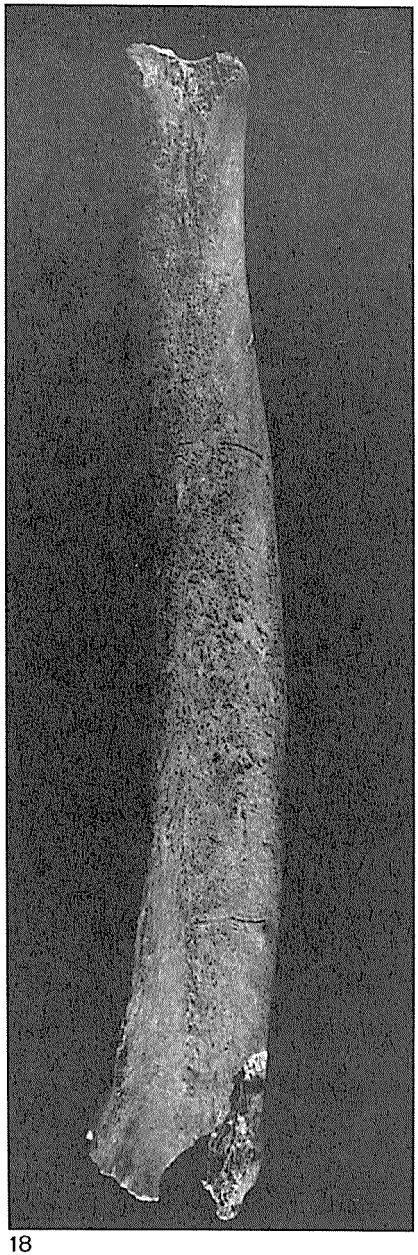

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Figure 17. Tibia B, showing pitting of the shaft resulting from a severe periosteal infection.

Figure 18. Tibia A, showing pitting of the shaft resulting from a severe periosteal infection.

Table 9. Calcaneus Measurements (mm)

	Specimen				
	A	B	C	D	Adult Mean
Side	Right	Left	Left	Left	
Age	Adult	Adult	Adult	Juvenile	
Maximum length	76	73	81	—	76.7
Minimum width	29	28	26	—	27.7
Body height	48	46	44	—	46.0
Load arm length	51	50	49	41	50.0
Load arm width	42	42	38	32	40.7

Table 10. Talus Measurements (mm)

	Specimen A
Side	Right
Age	Adult
Maximum length	56
Maximum width	44
Body height	32
Trochlear length	31
Trochlear width	29

Source: Steele 1976.

DISCUSSION

At least seven individuals are represented in the Palm Harbor sample (Table 11): four probable males, two females, and one juvenile of indeterminable sex. The individuals ranged in age from a juvenile between five and 10 years old to relatively old adults over 40. It is impossible to determine if the sex ratio and age distribution found in this sample are results of its limited size or of population structure or burial practices.

Estimates of stature for the Palm Harbor sample are based on the femora, tibiae, humeri, radii, and ulnae (Table 12). The fragmented condition of the remains made it necessary in most cases to calculate the length of each long bone from its fragments (Steele 1970) and then to estimate stature, following both Trotter and Gleser (1952) and Genoves (1967).

Table 11. Minimum Number of Individuals—Palm Harbor Site (41AS80)

Element	Right		Left	
	Adults	Juvenile	Adults	Juvenile
Cranium[a]	6	1	—	—
Humerus	3	1	4	1
Radius	4	0	4	1
Ulna	3	1	3	0
Femur	5	0	5	0
Tibia	5	0	4	0
Fibula	2	0	3	0
Clavicle	3	0	3	1
Scapula	3	0	4	1
Innominate	4	0	3	1
Carpal				
Pisiform	0	0	1	0
Capitate	0	0	1	0
Lunate	0	0	1	0
Metacarpal				
First	2	0	1	0
Second	1	0	3	0
Third	1	0	1	0
Fourth	1	0	1	0
Fifth	2	0	2	0
Tarsal				
Calcaneus	1	1	2	0
Talus	1	0	0	0
Cuboid	1	0	0	0
Navicular	1	0	0	0
Cuneiform	1	0	0	0
Metatarsal				
Third	1	0	0	0
Fifth	0	1	0	0
Sacrum[a]	1	0	—	—
Manubrium[a]	2	0	—	—
Sternal body[a]	1	0	—	—

NOTE: Due to identification difficulties caused by their fragmentary condition, vertebrae and ribs are not included in this table.

[a]For convenience, cranium, sacrum, manubrium, and sternal body counts are listed under the right column only.

Table 12. Summary of Stature Estimates

Bone	N	Minimum	Maximum	Mean	Formula
Femur	8	149.4 ± 4.5 cm	183.4 ± 5.7 cm	167.0 ± 4.8 cm	Trotter and Gleser
		150.0 ± 4.6 cm	182.2 ± 5.8 cm	166.6 ± 4.9 cm	Genoves
Tibia	7	167.6 ± 3.6 cm	181.4 ± 5.2 cm	175.5 ± 4.7	Trotter and Gleser
		163.0 ± 3.1 cm	173.7 ± 4.7 cm	169.1 ± 4.2 cm	Genoves
Humerus	7	164.7 ± 4.1 cm	172.8 ± 4.3 cm	168.4 ± 4.9 cm	Trotter and Gleser
Ulna	1			172.5 ± 4.3 cm	Trotter and Gleser
Radius	2	167.8 ± 4.3 cm	168.2 ± 4.3 cm	168.0 ± 4.3 cm	Trotter and Gleser

Estimates of stature range between 189.1 cm (6 ft. 2.5 in.) and 144.9 cm (4 ft. 9 in.). The mean for all stature estimates is 168 cm. These estimates compare favorably with those from the Shellpoint sample (Wilkinson 1973), the Oso series (Woodbury and Woodbury 1935), the Doering and Kob sites (Neuman 1952), and the sample from the Harris County Boys School (Wilkinson 1977). The inhabitants of these sites (Wilkinson 1977) and the Palm Harbor site are estimated to have been taller than other Amerindian populations (Wilkinson 1977).

This population is also characterized by its high degree of robusticity, especially noticeable in comparisons with Indians of the Southwest. This robusticity, also noted in other Indian samples from the Gulf Coast of Texas (Wilkinson 1977), is best expressed in the marked development of the sites for muscle attachment, the marked development of nuchal cresting, the well-defined cranial and facial features such as browridges and occipital protuberances (Figures 19, 20), and also in the massiveness of the postcranial remains.

In conjunction with well-defined robusticity, this sample is also characterized by marked sexual dimorphism, most apparent at the sites of muscle attachment and particularly noticeable on the crania. There is also marked dimorphism in the shapes of the male and female crania: those of the males are relatively oblong in superior view, whereas those of the females are much more rounded (Figures 21, 22). Wilkinson (1977) has also pointed out what appears to be dimorphism in the shape of the mandibles in remains from the Shellpoint and other coastal Indian sites in Texas: the male mandibles are markedly square along the mental eminence, and the females are more rounded (Figures, 23, 24).

In the postcranial remains this sexual dimorphism is expressed in both the marked rugosity of the sites of muscle attachment and the diameters of the shafts of the long bones. However, since their condition precluded accurate sexing, a coefficient of sexual dimorphism cannot be calculated for the long bones. The shaft lengths and diameters of the long bones do vary widely, and this variation is thought to be a result of sexual dimorphism. The degree of sexual dimorphism in this sample is generally greater than is found in other coastal Indian populations.

According to Wilkinson (1977), the unusual robusticity and sexual dimorphism among certain prehistoric mortuary samples from the central coast of Texas are indications of a common cultural affinity, and represent populations of precontact or early postcontact Karankawan culture. All of these populations share not only morphological similarities, but also to some extent common mortuary practices (E. Mokry n.d.). It is interesting to note that both the Palm Harbor and Shellpoint samples match the Otamid skull type of Neuman (1952), which is based on remains from the Callo del Oso site (Jackson 1933). This is significant, since the Callo del Oso site has been considered a type locality for Karankawan material culture. But whatever their cultural affinities may be, the Palm Harbor, Shellpoint, and Callo del Oso remains share a common morphology that distinguishes them from other Texas Indian populations.

Important to understanding the environment and life-style of this population are the identification and interpretation of their pathological conditions.

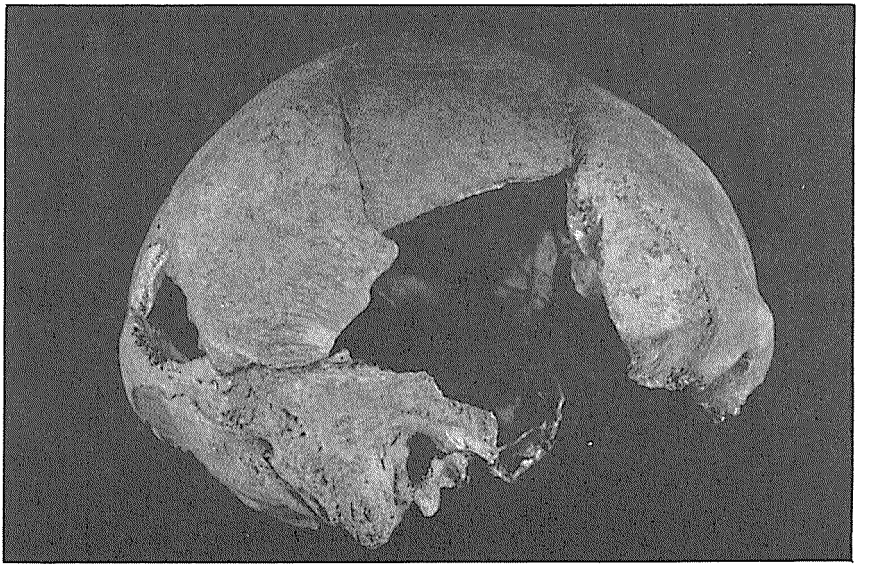

Figure 19. Lateral view of male cranium B showing pronounced browridges, large mastoid process, and prominent site of muscle attachments.

Figure 20. Lateral view of female cranium G showing slightly more gracile browridges, mastoids, and muscle attachments than does cranium B, Figure 19.

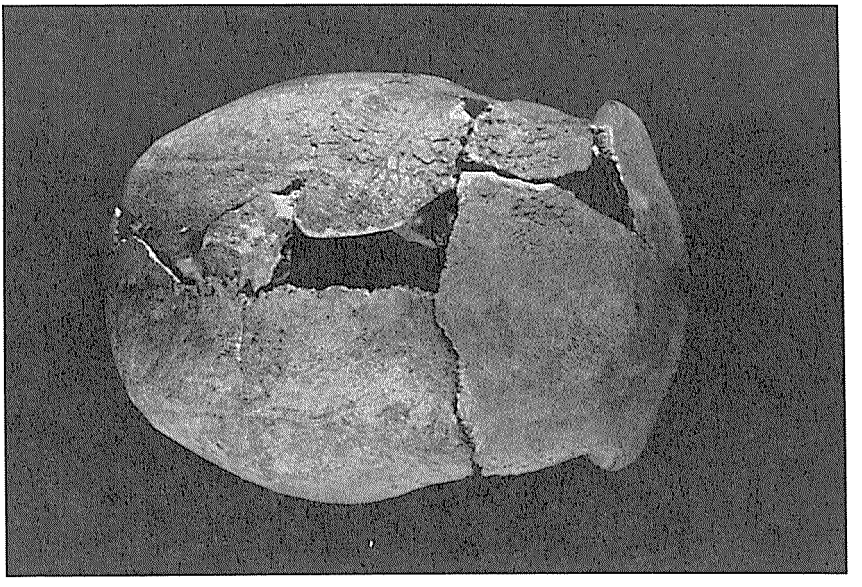

Figure 21. Superior view of cranium B showing the elongated skull characteristic of the males in the sample.

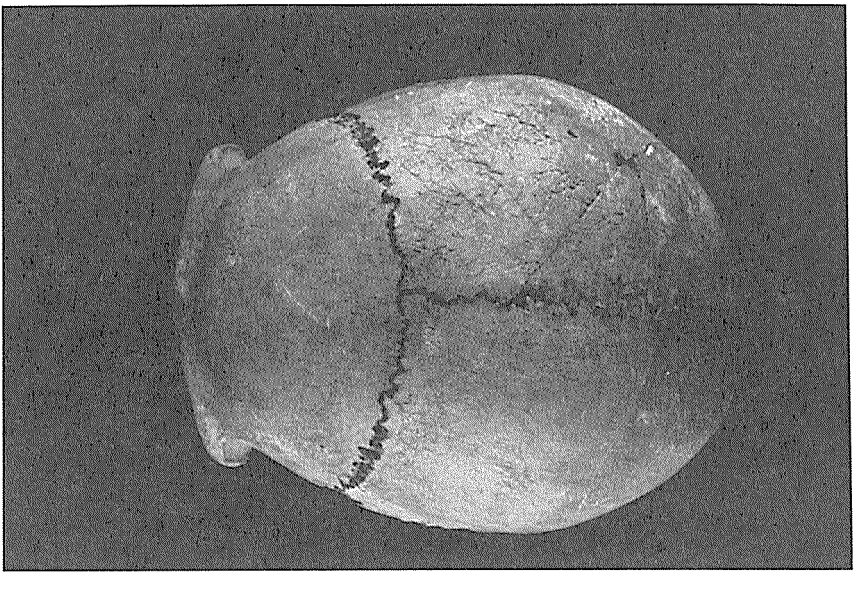

Figure 22. Superior view of cranium G showing the rounded skull characteristic of the females in the sample.

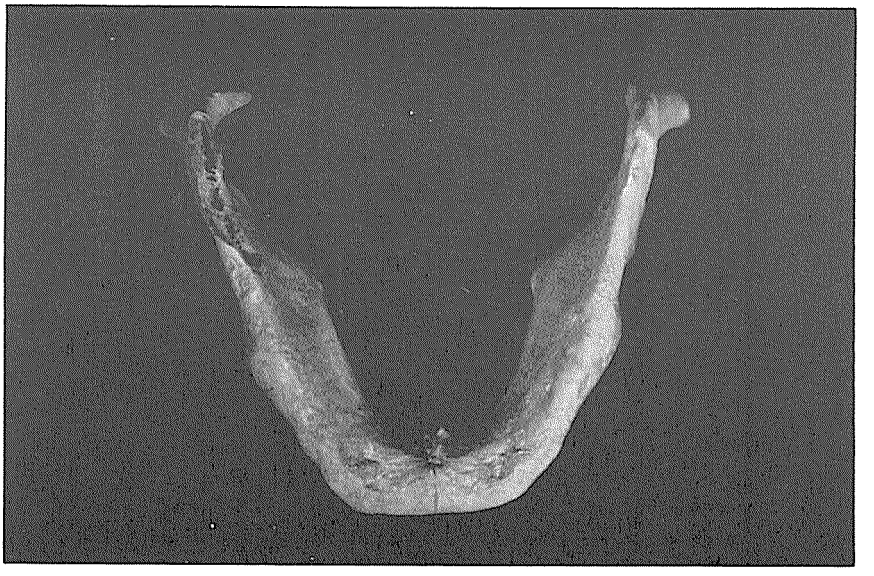

Figure 23. Inferior view of the mandible of cranium B showing the bilobed chin and thick body of the males.

Figure 24. Inferior view of the mandible of cranium G showing the single lobed chin and gracile body of the females.

The most severe pathological condition in the sample is periosteal infection, which is manifested by surface pitting and scarring of the affected cranial and postcranial elements. These conditions are typically associated with treponemal infections and can result from any of three diseases—syphilis, endemic syphilis, and yaws. The cause of this periostitis in prehistoric populations is not well understood (Hackett 1976).

Another frequently encountered pathological condition is arthritic lipping on the vertebrae and the articular surfaces of the arm and leg joints. The vertebrae are the most severely affected; nearly every vertebra in the sample has some degree of arthritic damage. There is also evidence of fusion of several vertebrae, particularly of the atlas-axis complex and other cervical elements. All of the arthritic damage in this sample has been identified as resulting from degenerative arthritis, which is caused by both age and wear on the articular surfaces. This is the most common disease of the bony parts of the joints, and it has been suggested that its effects do not often appear until about the fourth decade of life (Heine 1926). The first evidence of this disorder usually occurs as marginal lipping at the edges of the articular cartilage, apparently caused primarily by stress on the joints over time. Studies have indicated that the rates of degenerative arthritis are highest among populations with vigorous life-styles and that males are more often affected than females (Ortner and Putschar 1981).

Although all the dental material from this sample is characterized by heavy attrition, there is only one case each of dental caries and periodontal disease. Absence of dental caries is to be expected in populations with high grit content in their diets, for grit is a natural cleaning agent, and its attrition obliterates the natural crevices on the teeth where decay usually begins (St. Hoyme and Koritzer 1976).

The only severe case of periodontal infection is in Cranium C (Figure 3). This disease is usually caused by a buildup of plaque and calculus, which produces mechanical irritation of the gums that leads to infection. Although there are several causes for the evulsion of teeth, tooth loss resulting from decay or trauma can be distinguished from loss resulting from periodontal infection. Infection is indicated in this specimen by calculus deposits on many of the remaining teeth, exposed root surfaces, and the presence of reactive alveolar bone.

Only three bones in the Palm Harbor sample show evidence of traumatic injury. These injuries are a longitudinal fracture on the distal part of a fibula, a possible dislocation of the ulna indicated by a large wear facet in the olecranon fossa of a humerus, and a fracture of another ulna indicated by a large, prominent, midshaft callus.

The ability of a coastal environment to provide a healthy and nutritious diet has been questioned. Rathbun, Sexton, and Michie (1980), in a study of a coastal population of South Carolina, found that the people had suffered from sufficient severe seasonal malnutrition and parasitic infections to cause arrest of growth and development. In addition they found high rates of traumatic injury and degenerative bone disease (degenerative arthritis), both of which they believe were

due to the severe demands placed by the environmental surroundings on the lifestyles of the population.

The pathological evidence from the Palm Harbor site, however, contradicts the conclusions of Rathbun, Sexton, and Michie (1980). Considering their stature and robusticity, there is no indication that the Palm Harbor population suffered nutritional deficiencies or related disorders, and the low rate of traumatic injury and cortical thickness of the long bones indicate healthy, strong bones and absence of extreme physical stress. The apparent lack of physical stress also suggests that the degenerative arthritis in some of the joints is predominantly a result of old age. Since degenerative arthritis usually does not appear until the fourth decade of life, the degree of lipping seen in some of the vertebrae indicate that life expectancy in this group was substantial.

It is therefore our belief that the pathological conditions associated with this sample are the result of normal aging and typical of climatic stress, and are not the result of living in an area of marginal nutritional resources.

ACKNOWLEDGEMENTS

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Book Reviews

Indians of the Upper Texas Coast. By Lawrence E. Aten. Academic Press, New York. 1983. 392 pp. $39.50

Most of the research on the Indians of the upper Texas coast has been done in the last twenty years, and a significant amount of literature on this subject is now available (Patterson 1982). Until now, however, no book has been published that was devoted completely to the Indians of this region. A book on this subject has now been published by Lawrence Aten, which concentrates mainly on post-ceramic prehistoric Indians and historic Indians of the upper Texas coastal *margin.* This specific emphasis by Aten constitutes both the strength and weakness of this book. The strength of this book lies in Aten's detailed presentation of the archeology and ethnohistory of the late prehistoric and historic periods of the upper Texas coastal *margin.* Aten has been a major contributor to research in these subject areas, and is well qualified to present syntheses on various topics within these subject areas. Newcomb (1984) noted in a separate review, that in this book Aten developed a surprisingly detailed synthesis from a limited amount of data.

The weakness of this book is centered in the representation made that this is a synthesis of works about the entire upper Texas coastal region. Not all time periods, geographic areas, and various material cultural remains of this overall region are covered in a uniform manner, even for topics where significant published data are now available.

One of the most important subject areas covered by this book is the ethnohistoric period, with five chapters devoted to various details of this subject. Discussion of research objectives and ethnic groups are followed by more detailed discussions of specialized subjects, including population reconstruction, social organization, and ritual and cognition. A detailed bibliography for this time period is included, which was previously available only in Aten's (1979) doctoral dissertation. Although reliable estimates of Indian population have been difficult to make, Aten has attempted estimates of populations of several ethnic groups from approximately AD 1750 to 1900, including considerations of historic population declines. Discussions on social organization include sections on status, level of social integration, and reciprocity and trade. These discussions are fairly well connected to ethnohistoric references.

Aten presents a tabular summary of ethnohistoric references of native ritual and cognition on the upper Texas coast. He also presents a preliminary model of cognitive structures for late Indians of this region. This is a controversial subject because of the level of abstraction required, compared to the available data, but this model still represents a good start on the subject in regard to religious and other ritual activities. Future research will determine how far this model can be tested.

A considerable part of this book is devoted to the late prehistoric situation, mainly of coastal-margin shell middens. There are chapters on site descriptions, ceramic artifacts, nonceramic artifacts, local chronologies, technological history, and archeological evidence for group territories. Aten's considerable body of work on coastal-margin ceramic typologies and chronologies is summarized in this book, including the Galveston Bay area, the Brazos River delta, and the Sabine Lake area. Some attention is also given to the inland Conroe-Livingston area. This is one of the best parts of the book. Aten has developed an especially detailed ceramic chronology for the Galveston Bay area, and notes the variations in ceramic typologies for other local areas. Since many of the reports referenced are now out of print, it would have been desirable for Aten to have included more details on at least some of the major sites discussed.

In some case, Aten has attempted interpretation of available data on rather high levels of abstraction. While he is to be admired for attempting to gain so much from a small data base, testing of some of his models would be very difficult. For example, in Chapter 16, archeological evidence for group territories has been discussed, based on a few technological traits. The concept of relating the geographical distribution of isolated technological traits to the indentities of specific social groups is extremely nebulous. In the case of shell tools, geographic distribution may be simply a matter of raw material availability.

The various models of cultural patterns presented in this book are useful because they are explicit. Whether or not these models are ultimately proven to be correct is probably not the major consideration. The main value of these explicit models is to serve as a definite point of departure for further research and discussion. In this, Aten has been successful.

In the development of chronologies for the upper Texas coastal margin, an appendix has been included that gives details on carbon-14 dating of *Rangia cuneata* shellfish remains. Since many investigators do not regard dating of shellfish remains as a very reliable technique, Aten's discussion provides a rationale for his extensive use of this dating method.

Throughout his book, Aten insists on stating that there have been no sites discovered for the Paleoindian, Early Archaic, and Middle Archaic time periods in this region. This is not correct. A number of sites with components from these time periods have been published. It is true that many of these sites are deflated, but this does not negate their existence. One of the major points established through archeological investigations in the last 10 years is that there are very long occupation sequences on many sites in the inland part of the upper Texas coast, with many of these occupation sequences starting in the Late Paleoindian period. The population dip that Aten postulates for the Altithermal period of roughly 8,000 to 5,000 BC is not well supported in the available archeological record. Butzer (1982:301) and Madsen and O'Connell (1982:3) both warn against the pitfalls of relating generalized climatic data to cultural events.

A chapter of this book is devoted to details of terrace geology of the lower Trinity and Brazos rivers. This information should be useful to future investigators in these geographic areas. It should be noted, however, that most sites

having early preceramic components have been found inland on the banks of smaller streams that have less complicated sequences of alluvial geology than these major rivers.

Aten has chosen not to cover some basic subjects, such as settlement and subsistence patterns, but plans a future volume covering additional subjects. This is an unfortunate circumstance, considering the high cost of this book, as some persons may not wish to purchase a series of volumes on this subject.

In summary, Aten's book is a major contribution to the late prehistory and ethnohistory of the upper Texas coastal *margin,* and it should remain a major reference for some time. A detailed synthesis of the prehistory of the upper Texas coast that gives uniform coverage to all time periods and geographic areas of this region remains to be published.

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Living Archaeology. By Richard A. Gould. Cambridge University Press, Cambridge. 1980. xv + 270 pp.

Ethnoarcheology is more than just another noisesome neologism. This term usefully identifies a fertile discipline that has done much in its one-score years to enliven the study of the past and allow actual behaviors to be reconstructed. The African studies by John Yellen and Henry Harpending (Yellen 1977) are among the very best. And Richard Gould, the writer whose book is being reviewed, should be put at the top of this list of dedicated and specialized ethnographers—yes, the work these people do is truly ethnographic, in spite of ultimate archeological concerns.

Gould's book offers the reader two things: a partly new methodology and terminology for doing "living archeology," and a wealth of interestingly described information from Australia as examples for his ideas. Of course he makes a few mistakes; he sometimes gives new labels to old notions and does things for which he criticizes other archeologists. But these errors and lapses are trivial when compared to the importance of the main argument.

Let me discuss, first, Gould's position in respect to methods and concepts. He cleanly breaks with 1960s archeologists of the avant-garde school who treated their profession as one more science dedicated to establishing lawlike explanations or nomothetic regularities. His disaffection with that school is explained by his belief that lusting after laws leads to the use of uniformitarian ideas. In human studies, uniformitarianism supposes that historic behaviors are also prehistoric behaviors; its use, according to Gould, causes archeologists to sin through explaining archeology by analogy with the behaviors of historic and living peoples. His suggested alternative is to search for anomalies—irregularities or unusual occurrences—in archeological data, especially those that appear poorly adaptive to nature or bespeak behavioral detours from established regularities. General principles or propositions of behavior can be found by studying these anomalies and accounting for them. This idea is so strongly advertized throughout the book that I might suggest a new title, perhaps *Living Anomalies?* At any rate, several principles or trends in behavior are suggested that are most interesting, and no claim is made for their finality.

My discussion above is so abstract and conceptual that we must quickly turn to Gould's human subjects or else lose the tenor of the book. The reader will be comforted to hear that *Living Archaeology* includes wonderful stories about real people and their activities, and is not just another boring treatise on what passes for philosophy in the field of archeology. For one thing, the reader is almost literally taken by the hand and introduced to various members of a group of Western Desert Aborigines and is given episodes of behavior throughout Australia. To whoever anticipates a dry presentation I recommend a quick inspection of the story (p. 245) about the Ngatatjara woman usually given to petting and nuzzling her dogs. After much pestering and thieving by these animals, one day she picked up a metal digging rod, uttered a piercing cry, and began to flail every dog

she could reach, arousing the whole camp with the terrific bedlam of her screams mingled with the howls of dying canines. So much for dry scholasticism.

Gould describes several sets of ethnographic and archeologic data to illustrate his new approach, only one of which will be reviewed here. To conform to the tone of the *Bulletin,* I have chosen an archeological example rather than an ethnographic one—a comparison of human residue (artifacts, bones, and "appliances") from Puntutjarpa Rockshelter, in the Western Australian Desert, with similar residue from a shelter of the Central Desert called James Range East. Puntutjarpa is used as a base for deciding what a typical and uniform sequence of archeological residue is like, though James Range East also has similar items. But the latter site additionally yielded a greater number and range of flaked and seed-grinding stone tools than did the former. Also, more of the stone raw material at James Ridge East was exotic than at Puntutjarpa, and local rock art was more widely distributed near the former site. In addition, the fragments of broken kangaroo bones at James Ridge East were much larger than those found at Puntutjarpa.

Gould sees the "additives" of the Central Desert site as anomalies that are more important than the things that make the two sites similar. This sort of hankering after unusual finds and happenings is the very core of Gould's approach to studying archeological residues and living societies. In the present example he concluded that (my wording):

> 1) A greater variety of finished tools was present in the Central Desert than in the Western because of the availability of water near quarries in the first area (p. 201). The reasoning is that people could stay at Central Desert quarry sites near water long enough to produce many finished tools in a wide variety of forms, and reduce the loads of raw stone that would be transported to the living stations; scarcer water in the west limits the time people can stay at such quarries.
>
> 2) The size of the pieces of butchered bone mirrors differences in the amount of stress caused by dissimilar distributional patterns of available water in the two site areas (p. 194). In the drier west it is more important to secure all available liquids from cooked kangaroos, since water is more precious there; hence bones are broken into tiny pieces for maximum extraction of liquids.
>
> 3) The greater abundance of rock art in the Central Desert may be due to the wider distribution of the water resources there, which allows more artists to work in more places throughout the region, although ideational variables may also come into play (p. 203).

There is no room here to repeat Gould's abundant evidence for the three conclusions I have outlined, and I can only say that some of the proof leaves me doubting. Generally, he maintains that the two studied sites show different adaptations to nature. In the Western Desert, behaviors are seen in the archeological residue that minimize the greater risks to human life there.

Gould's employment of the concept of adaptation is extremely sophisticated—much more astute than others that appear in the literature. Although archeologists have generally fallen into the enticing embrace of adaptationism, Gould has not: ". . . living archaeology needs to examine relationships within the society being studied for possible adaptive and materialist explanations to the utmost on one hand while, on the other hand, accepting the possibility that some kinds of behavior may in fact prove to be maladaptive" [p. 237]. His allowance for the interference of ideas and beliefs in a society's adaptation to the environment, and the recognition that fairly inefficient modes of adaptation can be gotten away with in some surroundings, raise *Living Archaeology* from the mire of adaptationism in which many archeologists seem to have become entrapped.

It is encouraging that biological evolutionists such as Stephen Jay Gould (e.g., 1982) are fighting against adaptationism in evolutionary biology—adaptation being "the idea that organisms respond to changing environments by evolving a form, function, or behavior better suited to these new cricumstances" (Gould 1982:78). It is the word *better* that causes the problems, for it implies that the fit between organism and nature is excellent. Tosh! Both in the case of pandas' thumbs and the economic systems of humans, the adaptation achieved can be awkward and inefficient when compared to other possibilities. Human behavior can be very inflexible, even downright maladaptive.

I hope Texas archeologists will take the lead given by Stephen Gould and that they will even abandon the extension of adaptationism which asserts that changing environments *necessarily* produce very different, efficient adaptations. The view is rampant in archeology that societies adapted, or changed, in knee-jerk ways to altering climates and that the resulting adaptations were something highly efficient and marvelous. It is instructive to recall that human hunting activities at the French site of L'Hortus changed very little during a span of 20,000 years, and that designs of the site's flint Mousterian tools stayed almost unaltered through that long period—this in spite of major changes in climate and life forms (Lumley 1972).

A few deficiencies of *Living Archaeology* need to be aired. It is pleasing that Richard Gould is unhappy with the deductive method and the goal of finding nomothetic regularities, but the major criticism of that school of thought was not addressed. I mean the argument made within the field of philosophy by Michael Scriven (e.g., 1956, 1963) and others, and applied only once to archeology (Johnson 1972), that deductivism is inappropriate in studies of human behavior. I firmly recommend Scriven's writings to the reader, since a definition of good conceptual tools in archeology is of more than passing interest.

Richard Gould avoids the core of the philosophic debate by defining principles or general propositions that can be tested in different areas. He eschews, rightly perhaps, a discussion of the nature of the proof required, but seems to imply that supporting evidence can simply be weighed, and a conclusion reached that at times must be tentative. This is basically the approach labeled *Holmesian Detectivism* recommended long ago (Johnson 1972:386f.). I do not

agree with all the propositions and principles Gould has suggested, but will cite two of the best-documented and most reasonable:

> A "successful" adaptation is one that in the long run correctly assesses key resources as potential limiting factors, that is, in terms of periods of greatest scarcity rather than optimal availability, and responds appropriately [p. 109].

> Behavior that might appear to be maladaptive at one level of interpretation (like the disproportionate expenditure of time in hunting large game by desert Aborigines) may be viewed as adaptive at another level (as, for example when large game serves as a special staple to permit maximal aggregates of population, with consequent establishment of sharing networks) [pp. 109–110].

All these propositions can be studied and tested by archeologists working in Texas and other parts of the south-central United States. In fact, the influence of *Living Archaeology* on the rather stagnant archeological approaches presently used in Texas is potentially enormous. In casting about for a useful work to review for the present volume, I chose Gould's study because it appeared to offer the greatest benefits to the reading audience. But before recommending the book, I need to proceed to its main failure—the unnecessary attack on the use by archeologists of ethnographic analogy, substituting in its stead the study of anomalies.

This part of Richard Gould's argument is not well done, since there is no logical conflict between the use of analogies and anomalies that would make one ever want to choose between the two. In fact, employing analogies is one possible way of explaining anomalies, for the archeologist always makes use of some knowledge about living people to interpret the past. We could not even identify some prehistoric tools were it not for our knowledge about how historic people manufacture and use artifacts. Are we really out in left field when we call a pointed sliver of eyed bone a needle, just because this interpretation is based altogether and utterly on analogies with historic needles and an understanding of their use? The fact is that Gould draws upon analogies throughout his book.

I have specific examples in mind when I say that Gould himself employs analogy in interpreting Australian archeological information. His statement that archeological base camps show the widest observable range of activities, performed by people of both sexes and all ages, draws on observed analogies in residue and connected activities among people such as the Tikatika (pp. 132, 200). Though the analogy is a very general one, it is still an analogy. Also, the recognition of Puntutjarpa Cave as a hunting trap depends on knowledge of hunting drives reported in the historic period (p. 183), and uses another analogy. (Gould's further employment of general analogies may be found on pp. 156, 176, and 169.) What I think Gould wants to say, when he rejects analogies, is that the postulating of propositions—in terms of general trends of behavior having to do with minimizing life's risks—is safer than suggesting by specific analogy the past existence of patrilineages, totem worship, and the like. Any kind of analogy, however, may legitimately be suggested, as long as the evidence is given in detail

and the low probability of some very specific analogies is advertized. Unfortunately, in his methodological exposition Gould threw the baby out with the bath, but then rescued the little fellow for use in his general reconstructions.

In summary, Richard Gould's *Living Archaeology* is a cleverly written and useful little tome which, if studied, will certainly improve the framework of interpretation used by archeologists in the south-central United States. Though many of his ideas, such as the importance of noting unusual changes in data, have been around in other guises for years, his use of *anomaly* as a new label is a heuristic device that adds importance to the study of divergence in archeological residue. His breakaway from the inappropriate search for nomothetic regularities (but for the wrong reason), together with the substitution of general propositions or principles to be generally evaluated in many cases, saves his book from philosophic error. Also, the wealth of ethnographic information Gould summarizes cannot but be useful to archeologists, who benefit from every new account about the beliefs, resources, and environments of living primitives. The plethora of typographic mistakes in a book published by Cambridge University Press is a surprise, but is compensated for by a witty and lucid writing style that quickly leads the reader past spelling boo-boos such as *expecially.*

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BIOGRAPHICAL SKETCH

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Cabeza de Vaca's Adventures in the Unknown Interior of America. Translated by Cyclone Covey. University of New Mexico Press. 1961. 160 pp. $6.95.

The names of the early Spanish explorers—Columbus, Cortez, Pizzaro, DeSoto, Coronado—often seem more mythical than real. Often one is unaware of the extensive infrastructure supporting their explorations and their capacity for making the conquests they undertook. They seem to spring onto the stage of American exploration from virtually nowhere. The reality, however, was somewhat more prosaic. The major explorations were based on earlier reconnaissances and documents such as captains' logs and pilots' notes. By 1527, the time of the Panfilo de Narvaéz expedition to Florida, the coast of the Gulf of Mexico had been mapped, and Spanish settlements existed at Veracruz and Pánuco on the east coast of New Spain (Mexico). Indeed, Narvaéz had participated in early explorations as sponsor, in his capacity as governor of Cuba, and personally, in his expedition in 1520 against Cortez.

Accounts written by first-hand witnesses of the early explorations and later colonists, military personnel, and officials provide an excellent data source on the early Amerind cultures of the southern third of the United States and northern Mexico. A knowledge of the Spanish documentation can provide prehistorical archeologists deep insights into the functioning of the late prehistoric cultures they study. Virtually every recent archeological report on the Caddo area I have read speculates on the Caddo settlement pattern, but nearly always ignores Spanish descriptions of Caddo settlement seen as early as 1542 and mapped in 1691. Likewise, there has been considerable discussion as to whether the Coahuiltecans of South Texas used pottery in the protohistoric period. Cabeza de Vaca referred to the use of ceramics in his *Relación*. Over a period of 120 years the Spanish explored much of what is now Texas and dealt with Indians in virtually all parts, constantly writing reports and descriptions. By far the vast majority of these documents have never been translated, apparently causing insurmountable difficulties for most prehistoric archeologists.

The reissue of Covey's translation makes one of the earliest and most valuable documents on Texas and northern Mexico Indians readily available for the first time in several years. Thus, the University of New Mexico Press is providing

a very valuable service and is to be applauded. One would hope that in the future they will publish more such primary documentation.

Translation of any document from a foreign language is at best a difficult undertaking. One must deal with archaic grammar and spellings and particularly with words that are not often used today or which may have very specific technical meanings. Often the precise meaning of a word is critical to the understanding of a document. I know of one case in which an archeological project was initiated in search of a structure which was in fact not a structure at all but a doorway. The mistranslation in this case was an extremely common one based on the first dictionary definition. Indeed, I do not know of a perfect translation of any early document. Therefore, any reader of Covey's translation or any other should not wholly and unquestioningly accept a translation. In general, one can use Covey's translation as a good general translation with relatively few glaring errors in the interpretation of the meanings of most words.

There are, however, serious drawbacks to the work. They center on two points: proceedural matters and interpretation of the route followed by Cabeza de Vaca after leaving the Florida panhandle. Covey has taken the original order of chapters and transposed several of them and has extracted part of certain chapters and placed them within others. He states in his preface that this was done for clarity and to enhance the logic of the account. Although he notes in the text in brackets that he has done this, the need for this transposing proceedure is questionable. I have read the original Spanish version and find no great difficulty in following the train of the account. Flashbacks are clearly indicated in the original. Covey has, in some cases, also changed chapter titles. There also are some mistranslations of words. For example, the shipwreck survivors landed on an island they named *Malhado,* and Covey translates this as "the Island of Doom," whereas a more accurate translation, especially in the context of the shipwreck, might be "ill found" or "wretched."

The second major problem lies with Covey's interpretation of the route taken by the survivors to arrive at their final destination. Although his interpretations are clearly identified by being inserted in brackets in the text, the reader may find it difficult to make an independent analysis without being influenced by his opinions. Major drawbacks in his interpretation include the juxtaposition of chapters, labored explanations of why specific statements by Cabeza de Vaca could not be true, and mistranslation of key passages. In order to use the observations made by Cabeza de Vaca regarding Indian groups and customs, it seems critical to know where he was while describing the various groups. Unfortunately one still sees the Hallenbeck (1940) route (modified by Covey) cited as the acceptable route of the Narvaéz Expedition. Although Covey states that the route he proposes is based on archeological, geographical, and historical data, it is clear that his proposed route contradicts much of the data available. Archeological and ethnohistorical scholars (Alex D. Krieger and T. N. Campbell) familiar with Texas and Northern Mexico accept a route nearly identical to the one I have herein proposed (Figure 1) as an alternate to the Hallenbeck-Covey proposal. Since the route is critical I will discuss it in some detail. Early in the work

Cabeza de Vaca states that the immediate goal of the survivors of the expedition, even before they departed the coast of Florida, was the site of Pánuco (p. 34). Covey made an error in stating that Pánuco has now been renamed Tampico. The village of Pánuco still exists and Tampico was founded at a later date. Slightly later it was stated that the goal of the survivors' barges was to be the Rio de las Palmas, now known as the Soto La Marina, the site of Pánuco (p. 48), and reiterated again (p. 59) after landing on the island of Malhado. Based in large part on Cabeza de Vaca's description of the island's size, Covey identifies Malhado as Galveston Island. However, this is an extremely poor basis for identification because historical documents indicate that the barrier islands are quite dynamic in nature, constantly changing size and shape. The key to the location of the island is found in the original Spanish version:

> En fin, al cabo lo saqué y le passé el ancon e quatro rios que ay por la costa, porque el no sabía nadar. Y ansi fuymos con algunos indios adelante hasta que llegamos a vn ancon que tiene vna legua de traues y es por todas partes hondo, y por lo que del nos parescio y vimos es el que llaman del spiritu sancto . . . [Núñez Cabeza de Vaca 1906:61].

> Finally, at last I took him out and passed him over the bay and four rivers there are on the coast because he did not know how to swim. Thusly we went ahead with some Indians until we arrived at a bay one league across and deep in all parts. Because of that it seemed and we saw that it is the one called Holy Spirit. [Núñez Cabeza de Vaca 1906:62, 63].

The second bay certainly has to be the present Corpus Christi Bay and the first would then be Matagorda Bay with Matagorda Peninsula (connected to the mainland in the nineteenth century) as Malhado Island (Figure 1). There are several other reasons to suggest such a configuration but there is no need to belabor the subject.

A series of errors appears, such as the statement that the prickly pear matures from east to west rather than from south to north. The description of the monte adjacent to the river of the nuts describes the brush country near the Nueces River rather than the area adjacent to the Colorado River. Covey also consistently misspells the San Saba River ("San Saber," p. 87). The description of the spiny monte (p. 92) is not an appropriate description of the Texas hill country as he contends, but of the south Texas brush country from Laredo south. On the page following the description of the spiny monte is Cabeza de Vaca's description of the preparation of mesquite. There is historical documentation (Inglis 1964) indicating that the mesquite monte was confined to the lower Rio Grande valley and to areas adjacent to south Texas water courses.

The arrival of Cabeza de Vaca at the Great River is another important key locality (p. 101). At the river, Cabeza de Vaca's group received gourd rattles as gifts. Since it is Covey's contention that the survivors were on the Concho River at this point, far off course of the stated goal of Pánuco, he is required to argue, rather unconvincingly, that the gourds had floated down the Rio Grande to be

picked up by traders finally arriving at the Concho River (p. 102). It seems more likely that the survivors were on course toward the south and had encountered the Rio Grande. Shortly after crossing the Great River the group saw mountains some 15 leagues from the coast (p. 103). Again there is a quite unconvincing argument supposing the mountains to be the Davis and Guadalupe Mountains. After arriving at the base of the mountains the Spaniards turned inland (104) and again Covey indicates that the survivors were somewhere in west Texas. Cabeza de Vaca (1906:103–104) says

> . . . y tomamos por lo llano circa de las sierras, las quales creyamos que no estauan lexos de la costa. Toda la gente della es muy mala, y teniamos por mejor de atrauessar la tierra, porque la gente que esta mas metida adentro es mas bien acondicionada y tratauannos mejor, y teniamos por cierto hallariamos la tierra mas poblada y de mejores mantenimientos. Y nosotros caminamos por le rio arriba . . .
>
> . . . and we went via the plain near the mountains which we believed were not far from the coast. All the people there are bad and it would be better for us to cross the mainland because the inland people live under better conditions and treated us better. For certain we had to go to better populated land with better resources. And we went up river . . .

Alonso de León (1980:15) assumes that the survivors passed near Cerralvo, Nuevo Leon. In any event, the area north of Pánuco was the subject of slave raids authorized by Governor Nuño de Guzmán (Chipman 1967:157) at this time and was quite impoverished. Clearly the northern Huaxtecs had no use for more Spaniards. The survivors then proceeded to a point where they found a mountain seven leagues long covered with iron scoria near a beautiful river. It is suggested that this point is the present site of Monclova, Coahuila, which is the major area in northern Mexico for iron mining and smelting. It is situated near the Rio Salado de los Nadadores and at the foot of the Sierra de la Gloria.

In Covey's translation Chapters 44 and 45 are reversed from the original version, apparently in order to justify his projection of the route of the survivors. Chapter 44 describes a rabbit hunt using rabbit sticks and the recrossing of the Great River. This area is most likely the area near and perhaps just west of Amistad Reservoir where rabbit sticks, rabbit-skin robes, and skeletal remains of rabbits have been found in dry archeological deposits.

One certain point on the itinerary of the survivors was their arrival at La Junta de los Rios (Presidio-Ojinaga), the confluence of the Rio Grande and the larger Rio Conchos, at present Ojinaga (Chihuahua)—Presidio (Texas). Covey suggests (p. 114) that this is present El Paso-Juarez and that they went upstream to other pueblos, eventually following the Gila River into Sonora. In 1581 the Rodriguez-Chamuscado expedition arrived at La Junta and the chronicler Gallegos said: "We asked them if any men like us had passed that way, and they replied that long ago four Christians had passed through there. By the description they gave us we saw plainly and clearly that it must have been Alvar Núñez Cabeza de Vaca, because according to his relation [account] he had come by way

of these people" (Castañeda, 1936, Vol. 1:163). Archeological and historical sources indicate that the El Paso area was substantially depopulated and occupied only by scattered bands of hunting and gathering peoples, Mansos and Sumas. Likewise, archeological surveys by the Texas State Department of Highways and Public Transportation (September 1981) and by Charles A. Johnson II (1977) for The University of Texas at El Paso indicate a lack of prehistoric agricultural villages in the area between La Junta and El Paso.

From La Junta, Cabeza de Vaca and his companions traveled to the Rio Sonora or Rio Yaqui and thereafter encountered Spanish slave raiders operating out of Culiacán, recently founded by Núño de Guzmán as a part of his new colony of Nueva Galicia. From there they traveled to Guadalajara, the capital of the new province, thence to México, and embarked for Spain at Veracruz.

In conclusion, the reissue of Covey's translation of Cabeza de Vaca's *Relación de los Naufragios y Comentarios* provides important data for the archeologist, ethnohistorian, and average reader regarding the protohistoric Indians of Texas and Northern Mexico. The translation suffers from several serious flaws, among which are the rearrangement of the sequence of certain chapters, occasional mistranslations, and the advocacy of an obviously erroneous route. Those using this translation should be aware of these problems and should attempt, if at all possible, to check the translation against a reprint of the Spanish original.

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Traces of Texas History; Archeological Evidence of the Past 450 Years. By Daniel E. Fox. Corona Publishing Company, San Antonio. 1983. xx + 416 pp. Paper $12.95.

The book traces archeology at historic sites in Texas from the earliest investigations to the present. It is easily readable, not laced with tedious language or technical jargon, and the author admits having specifically avoided "academic arguments about method and theory." His approach has been to review hundreds of written works pertaining to Texas archeology, concentrating on historic sites. The result is an intermittent history, and it is written as much for the general reader as for archeologists and historians.

Daniel Fox has put much effort into the book. It is largely a collection of annotations of nearly every major report of archeological research at historic sites in Texas, plus references to numerous other works. Researching these technical and often esoteric materials consumed a year of the author's "nights, weekends, and holidays" while he maintained another full-time job. Few people tackle such projects.

In the "Introduction" the author notes, among other things, the role of the Texas Archeological Society in the development of archeology in Texas, from the early limited popularity of archeology among a few enthusiasts to the important avocational and professional occupation it is today.

The book presents discussions of particular sites in a general historical sequence rather than following the chronology of archeological investigations. This layout makes pleasant reading and puts archeological research in a better

popular and historical perspective than is obtained by poring through typical reports. The author has tried not to emphasize a particular region of Texas. A careful reading will make apparent the paucity of archeological research at historic sites in many parts of the state.

From the first European contacts with Amerindians in what is now Texas, Fox works his way to the present, ending the book's main section with a chapter on archeology at historic sites in urban areas of the state. The final chapter is an essay on preservation in light of contemporary cultural resources management. Two appendices follow. The first is "Recommended Readings," a list of general published works pertinent to historic sites' archeology in Texas and the second is "References Cited." An index completes the book.

Despite the nontechnical approach there are many thorough descriptions of architectural details and of artifacts from various sites. These usually are preceded by a synopsis of the site's history and are accompanied by citations to the research from which the information was gleaned. The book also is very well illustrated with properly credited photographs, maps, and drawings from the cited research works. The descriptions and illustrations probably will inspire many readers to seek publications about specific sites.

I make these complaints about the book. One paragraph in the "Introduction" ends with the statement "What may seem like glaring historical omissions simply result from the absence of archeological work in some areas." This disclaimer does not disguise the overemphasis given to data only available at The University of Texas at San Antonio and written by Anne or Daniel Fox. The Fox name would appear no more conspicuously than names of other historic sites researchers were it not for unpublished reports at that facility, manuscripts in preparation, "field notes on file," personal communications, and letters-to. Also, listing references by chapters may make the book more salable as a textbook, but emphasizes works repeatedly cited. For a book whose subject is so broad, the reader can expect an impartial effort to mention, at least bibliographically, the existence of other obscure research results. And the use of in-text citations should connote a sense of objective scholarly intent, an impression not well conveyed in seeing so many citations to the author's own works.

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