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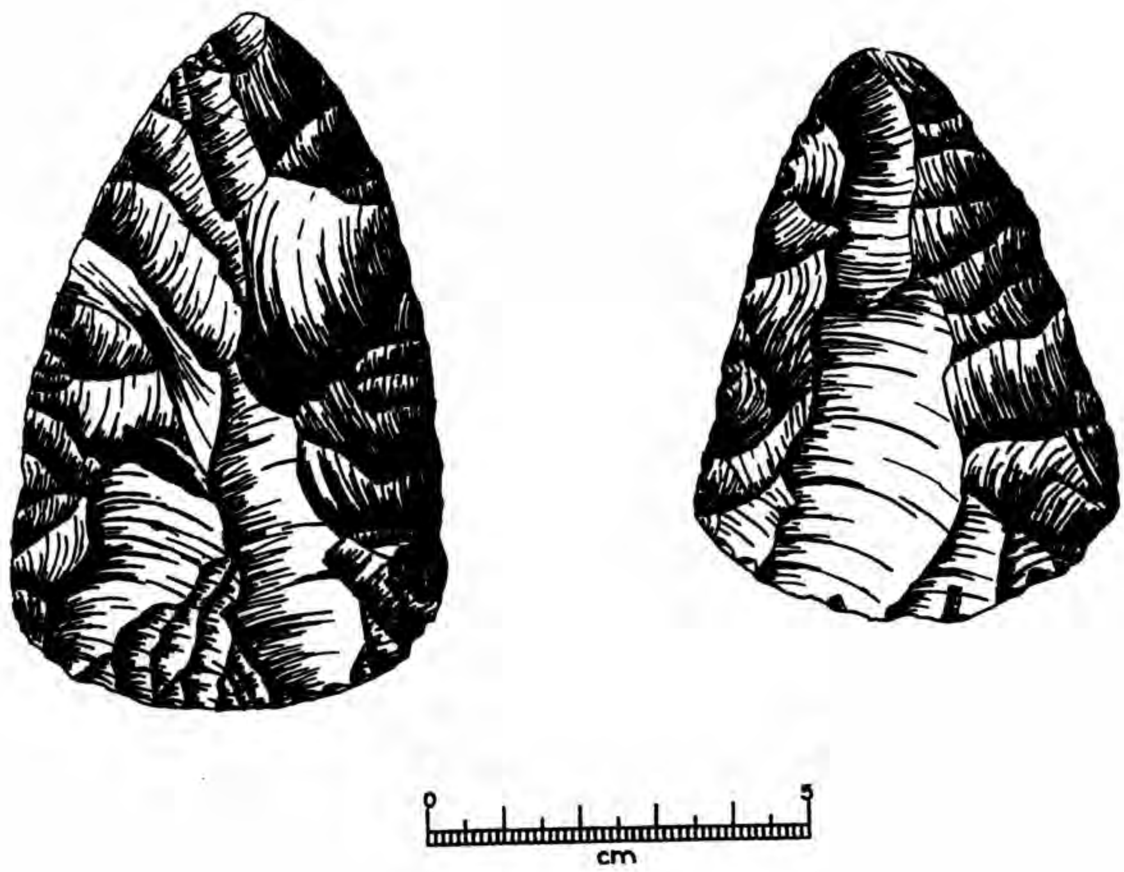

Volume 30
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Journal of the Southern
Texas Archaeological
Association

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The Southern Texas Archaeological Association

The Southern Texas Archaeological Association brings together persons interested in the prehistory of south-central and southern Texas. The organization has several major objectives: To further communication among avocational and professional archaeologists working in the region; To develop a coordinated program of site survey and site documentation; To preserve the archaeological record of the region through a concerted effort to reach all persons interested in the prehistory of the region; To initiate problem-oriented research activities which will help us to better understand the prehistoric inhabitants of this area; To conduct emergency surveys or salvage archaeology where it is necessary because of imminent site destruction; To publish a journal (*La Tierra*), newsletters, and special publications to meet the needs of the membership; and to assist those desiring to learn proper archaeological field and laboratory techniques for southern Texas.

Information For Contributors

Manuscripts for Vol. 31 should be sent to the Editor, Dr. Tim Perttula, 10101 Woodhaven, Austin, TX 78753-4346. Email him at *tkp4747@aol.com*. Dr. Perttula should also be contacted for production matters. New authors are encouraged to contact the Editor for assistance in developing and submitting their papers. We greatly welcome papers on the archeology of South Texas and surrounding areas, as well as from other parts of Texas.

Membership and Publication Information

Request information on joining the STAA and send membership applications to Roy Banning, Memberships and Mailing Chair, 11807 Broadwood, San Antonio, TX, 78249, 210-561-0244. Email: *royb@swlegal.com*. Also see STAA internet address below. Back issues of *La Tierra* and Special Publications should also be ordered online or through Mr. Banning.

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About the cover: Ovate bifaces from the Rudy Haiduk site, Karnes County, Texas.
Drawings by Richard McReynolds.

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Notes on South Texas Archaeology 2003: 3 & 4, The Southern Texas Archaeological Association After 30 Years*

Thomas R. Hester

INTRODUCTION

This year, we celebrate the 30th anniversary of the Southern Texas Archaeological Association (STAA). Actually, we are recognizing the accomplishments of an organization that was not even supposed to exist! Three decades ago, there was very little interest in the archaeology of southern Texas, and even less known about it. In the late 1960s, the Texas Archeological Society (TAS) elected T. C. Hill, Jr., as the regional director for South Texas. In the enthusiasm that has always characterized each of T. C.'s many endeavors, he tried to generate interest and attract new TAS members. One avenue was to publish a newsletter, *South Texas Notes,* which he distributed to the few TAS members in the South Texas region, as well as to a number in other areas. As I recall, some TAS members were not very happy with T. C.'s efforts, since his newsletters bore an unmistakable style which did not follow the norms of standard and typically dull archaeological discourse.

About the same time, Jimmy Mitchell was posted by the United States Air Force to San Antonio, and with his background as an avocational archaeologist in Ohio, he began to record sites, interact with professionals and with collectors, and to document some South Texas collections.

Both T. C. and Jimmy wanted to expand the level of activity in South Texas. I was fortunate to know both of them, and we wrote letters back and forth between Texas and Berkeley, where I was in the doctoral program at the time. After I learned that I had been hired at the newly opened (though temporary) campus of The University of Texas at San Antonio (UTSA) for June 1973, the three of us began discussing convening those scattered souls who had research interests in South Texas, and to form some sort of informal group to exchange information. As one might say in any "origin myth," it came to pass that about 40 known South Texas *aficionados* were invited to attend a meeting on December 2, 1973, at Lackland Air Force Base Officers Club in San Antonio. It was hosted by Jimmy Mitchell, a person whose loss is magnified today by the fact that he was *the* STAA "organizer," putting together meetings, banquets, seminars, and other functions throughout his 27 years with STAA. And, we probably would not have been able to draw 40 people, except for some salvage work that had gone on by local avocationals—such as the Van der Veers and Harvey Kohnitz—at the Granberg II site earlier in 1973. We were also fortunate to draw folks like C. K. Chandler, who then lived in Houston, along with his brother in law, Dave Espy from Corpus Christi; the great duo of the central coast, Smitty Schmiedlin and Bill Birmingham; a Witte Museum curator in San Antonio named Anne Fox; and some UTSA students who attended what was then a 500-student campus in rented office buildings on Loop 410 and who worked on excavations at the Alamo in 1973 (Hester 1993): Col. Ned Harris,

*Revised version of a paper given at the 30th anniversary meeting of the STAA at Kerrville, Texas, October 4, 2003. This paper is dedicated to C. K. Chandler.

Harvey Smith, Jr., Margarita Vasquez Dusek, Col. Feris Bass, and a number of others.

We first operated with a few officers and a coordinating committee, until the bylaws were drawn up. Then, formal officers, quarterly meetings, field projects like the St. Mary's Hall (41BX229, Figure 1) salvage effort, and *La Tierra* all followed. The STAA has also been the host society for three Texas Archeological Society field schools, including the Utopia field school in 1990 which had over 500 participants (Figure 2) Many of these basic facts have all been chronicled in histories of the STAA in published articles about the Association's 10th (Hester 1983) and 15th (Mitchell 1989) anniversaries.

Figure 1. David Espy and Tom Hester at St. Mary's Hall (41BX229), 1975.

OUR ACCOMPLISHMENTS

What has been accomplished, now that the STAA has reached 30 years of age? Our membership has been sustained at a healthy level, likely the second largest organization in the state behind the Texas Archeological Society. Our present membership stands at 384: 121 from the general San Antonio area; 233 from elsewhere in Texas; and 30 from out of state. As our hardworking Membership and Mailing chair, Roy Banning, has told me, we have members from Boston to Hawaii, and Maine to Mexico, and in 14 different states.

We can also point with great pride to 30 years of quarterly meetings (Figures 3-5), held mostly in San Antonio, but with others held in Kerrville, Uvalde,

Figure 2. STAA Stalwarts Supervising the 1990 TAS Field School at Utopia. Left to right: Ray Smith, Paul Ward, Jimmy L. Mitchell, Ray Blackburn.

Fredericksburg, and Victoria. Some of our speakers in the 1970s and 1980s were graduate students at UTSA who are now prominent members of the Texas archaeological community, including Dr. Grant Hall, Dr. Steve Black, Dan Potter of the Texas Historical Commission, and Al McGraw of the Texas Department of Transportation.. The meetings have also been marked by the presentation of awards recognizing a variety of contributions to archaeology.

Figure 3. STAA Members at a Quarterly Meeting. Left to right, Tom Miller, Liz Newcombe, C. K. Chandler.

There have also been 30 years of *La Tierra*, a journal that has grown from a mimeographed publication with stapled covers to a professionally-produced outlet that is a major reference in Texas archaeology. A host of editors have contributed to its rise, from T. C. Hill, Jr. and Anne Fox, in its early years, Jimmy Mitchell for much of the 1980s, Evelyn

Figure 4. At the First Quarterly Meeting of 1975. T. C. Hill, Jr.

STAA has also mounted many salvage archaeology efforts and surveys over the years. In addition to St. Mary's Hall, noted earlier, the Timmeron Rockshelter salvage project (Figure 6) in 1975 was one of the early STAA projects (Harris 1985). For a number of years, in the 1980s, extensive fieldwork was also done at the Dan Baker site in Comal County (41CM104, Figure 7). The STAA also initiated a series of field schools. Like the field schools offered by other archaeological organizations, there was fun to be had during the digging but very little effort put into a prompt, formal publication. For example, the STAA's excavations at the Burris site (41VT66) have been languishing. But, recent action by the Board has caused the artifacts and faunal remains to be moved back to San Antonio, where Dr. Harry Shafer and others will oversee STAA volunteers, helping them to write up specific sections of a final report.

Figure 5. At the First Quarterly Meeting of 1975. Shirley Van der Veer.

Figure 6. STAA Excavations in Progress at Timmeron Rockshelter 1975.

Lewis, and of course, Shirley Van der Veer, with more than a little help from her husband, Van. The journal was a quarterly publication for 29 years. This year, it has switched to a bi-annual publication. The first issue of 2003, edited by Dr. Tim Perttula, was about the size of this year's *Bulletin of the Texas Archeological Society!* And the second issue is a special 30th anniversary issue with a variety of invited papers submitted by both avocational and professional members of the STAA. With the new publication format and schedule, we can look forward to an enhanced status for our journal.

Figure 7. STAA Excavations in the Deep Deposits at 41CM104, the Dan Baker site, 1984.

OUR SHORTCOMINGS AND OUR FUTURE

We have done a lot to be proud of during 30 years of the STAA, and we continue to be an important organization. But, we ought to briefly look at where are we coming up short! For example, our quarterly meetings are often not well enough attended, and while we are always glad to see our long-time members, where are some new members? Do we want to continue to have quarterly meetings, or perhaps two meetings a year? We have recruited well known speakers, and sometimes that helps with attendance and at other times, it does not. We have a new web page that carries STAA news and other informative materials, including the highly valuable index to *La Tierra*, but the web masters are frustrated by the lack of input from our members—including me! It certainly does not appear to me that the STAA is recording sites and documenting collections in the manner that characterized past years.

The editors have a hard time getting manuscripts for *La Tierra* from STAA members. Folks are not writing; I had one member tell me that no one had "taught them to write." No one ever taught me to write (and that probably is reflected in many of my publications), though Harry Shafer tried in the late 1960s! The editors of *La Tierra* have always been there to help new authors. You put something on some paper (or in a disk or attachment) and you send it to the editor. The editor will work with you and if you make the effort, you, too, will learn to write. We have a brand new member in the Corpus Christi area who found a sandstone tubular pipe. He had Dr. Robert Ricklis identify it, and he was encouraged to write it up for *La Tierra*. He had no experience in either archaeology or writing But, within a couple of weeks, here came a manuscript. It needed work, polish, and some citations. But the basics were there, and that is all it takes! If a member of STAA for two months can do this, why are so many long-time members holding back? Finally, we are not getting new or not-so-new members coming forward to help *serve* the Association. If you are going to benefit from it, you have to be willing to contribute your time, whatever that may be. We need to make STAA an organization that you *need* to belong to! For example, the Center for Archaeological Research at UTSA and STAA had a thriving symbiotic relationship in the 1970s-1980s. That relationship needs somehow to be rekindled. STAA was vital to UTSA archaeology students for more than 20 years. Why has that changed? In short, we have to decide whether STAA is going to be an active regional society, or an aggregation of members who pay their dues to support *La Tierra*. I hope it can do both. Clearly, the STAA's accomplishments, its longevity, its influence in Texas archaeology, its new web page, and its journal outweigh any short-term problems that we—or any organization—will have. We have to remember that in the last few years, we lost many of our strongest and most active long-term members—and we need new people to step in and fill their shoes.

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A Look Back at the Contributions of C. K. Chandler to the Study of South Texas Archaeology

Thomas R. Hester and Richard L. McReynolds

ABSTRACT

The late C. K. Chandler published many studies involving the archaeological materials of southern Texas. This article touches upon some of his favorite topics, illustrated by the drawings of Richard L. McReynolds.

INTRODUCTION

This article is an illustrated overview of several South Texas research topics that were published by the late C. K. Chandler, a founding member of the Southern Texas Archaeological Association (STAA). C. K. was an indefatigable recorder of archaeological sites and the material culture that came from them. He documented hundreds of sites during his long career in avocational archaeology. C. K. had a special dedication to the preservation of archaeological data that came from collections scattered across southern Texas. He worked closely with professionals, avocational archaeologists, and collectors, quickly earning their trust and respect. Thus, it was easy for anyone who dealt with him to give him access to information and artifacts, and to loan the latter to him for careful documentation.

The publications that resulted from the work of C. K. Chandler are numerous, and most are found in the pages of *La Tierra* over a period of more than 25 years. His papers were sometimes co-authored with colleagues, especially Don Kumpe. The artifacts that C. K. studied were always drawn by Richard McReynolds, whose technically-correct illustrations enhanced C. K.'s papers.

Thus, we have selected a series of McReynolds' drawings that were used by C. K. in his publications. The drawings are accompanied by brief annotations, to provide a perspective on the topics that he pursued in studying southern Texas archaeology. Our article is intended to demonstrate what one individual, working with an occasional collaborator and an illustrator of great skill, can accomplish. Further, although we have focused on South Texas for this paper, C. K. also authored numerous studies on the archaeology of the Lower Pecos and south central and Central Texas. His publications in *La Tierra* are listed in the *La Tierra* index at www.staa.org.

PALEOINDIAN ARTIFACTS FROM THE OLMOS BASIN

The headwaters of the San Antonio River lie in the southern Olmos Basin of San Antonio. Major springs, like the Blue Hole, surely attracted hunters and gatherers from Paleoindian times on through Historic times. An overview of Olmos Basin archaeology has been published by Stothert (1989). Paleoindian artifacts were first found in the Basin by C. D. Orchard in 1921 (Stothert 1989:Figure 6). Chandler (1994) recorded the collections of Frank Kennedy and Arthur S. Collier, found around the Blue Spring in the 1950s and 1960s and on the surface of the Brackenridge Golf Course (Kit Corbin collection). They range in time from Clovis (two specimens; Figure 1) and Folsom (one specimen) to Late Paleoindian. Of particular note is the St. Mary's Hall point (see Figure 1), originally identified as Plainview by Chandler (1994:17). However, studies at the Wilson-Leonard site near Austin have produced stratigraphic data that these points are later than Plainview. A new type was defined and labeled as "St. Mary's Hall," after the site on Salado Creek (41BX229) first excavated by the STAA in 1974, and later the locus of a field school from The University of Texas at San Antonio.

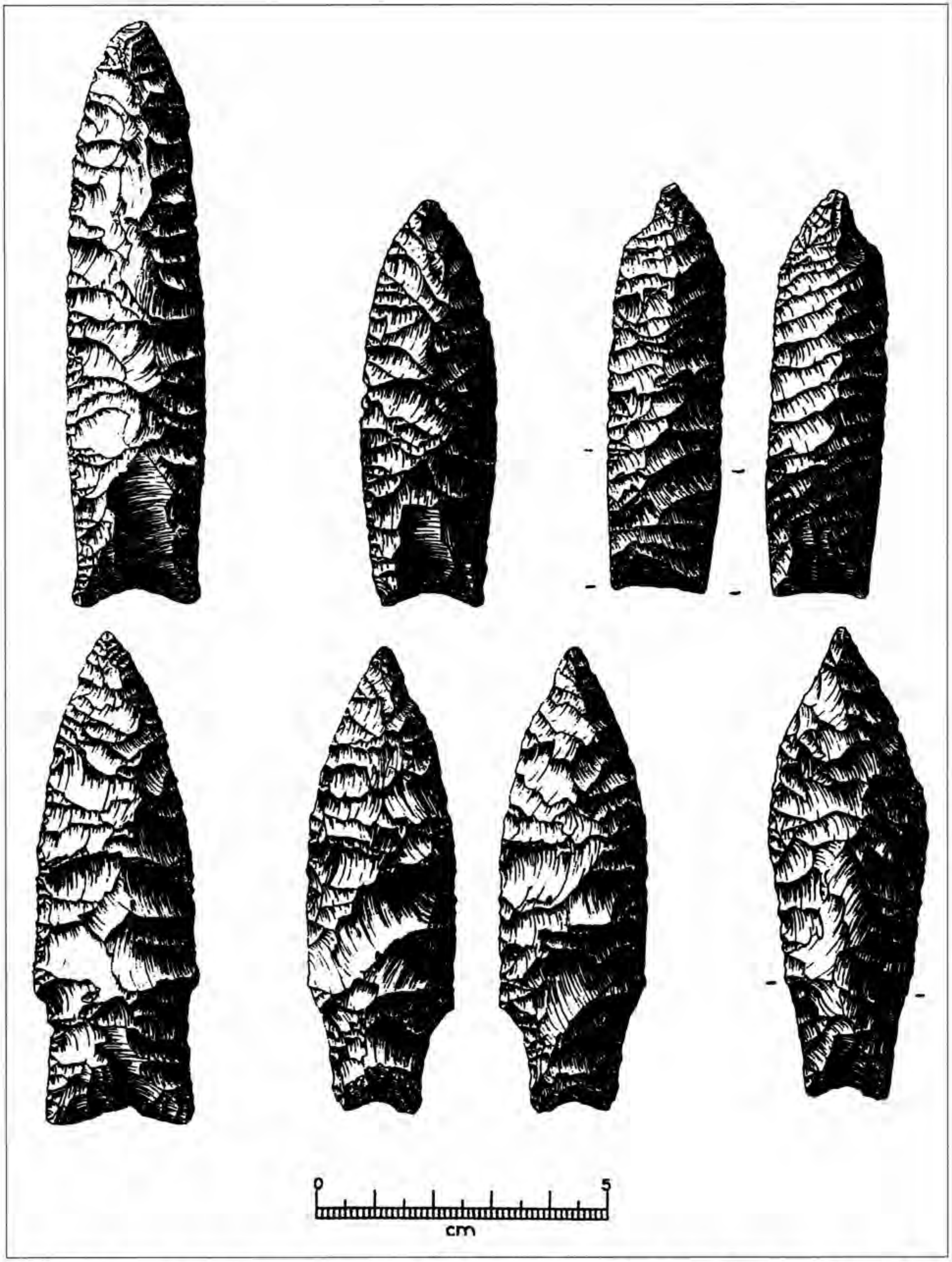

Figure 1. Paleoindian projectile points from the Olmos Basin. (left to right): Top row, Clovis, Clovis, and both sides of a St. Mary's Hall point; Bottom row, Scottsbluff; both sides of Early Stemmed Lanceolate ("Victoria"); Early Stemmed Lanceolate (one side).

Two points from the Olmos Basin (see Figure 1) were described as "Victoria" points by Chandler. This type has been informally discussed and would encompass the slightly shouldered "Early Stemmed Lanceolate" (Turner and Hester 1993) style found mostly on the coastal plain. More research remains to be done on this point style. It may be Late Paleoindian in age, or perhaps Early Archaic, based on a cache found at Loma Sandia (Taylor and Highley 1995).

CALF CREEK SERIES PROJECTILE POINTS

Projectile points of the Calf Creek series, variously called Andice and Bell, date to the Early Archaic as it is defined in southern Texas, around 4000 B.C. They are distinguished by deep basal notches and massive barbs. These points extend from Oklahoma, across a wide area in Texas, and deep into South Texas. In South Texas, where triangular points dominate the Archaic material culture, the Calf Creek points stand out not only because of their form, but also the precise technology used in their manufacture. C. K.'s first paper dealing with these points (Chandler 1983) was based on collections from the Chiltipin Creek sites in San Patricio County on the central coast (Figure 2). At the time of its publication, this paper helped extend the known range of Bell points in Texas. Later, he and Don Kumpe (Chandler and Kumpe 1993) recorded many Andice and Bell points from the lower Rio Grande, in collections from Starr and Zapata counties (see Figure 2).

Typical of the emphasis of point-resharpening on the coast (due to a lack of locally available cherts), the Bell points from San Patricio County are smaller than their counterparts from the Rio Grande, although McReynold's drawings also illustrate the effect of resharpening on specimens from that area.

THE RUDY HAIDUK BURIAL

Rudy Haiduk, a Karnes County rancher, found an isolated burial eroding from the upper terrace of the San Antonio River. Working with a friend, Erwin Kramer, Mr. Haiduk salvaged the exposed burial, finding more than 50 associated artifacts, including corner tang bifaces (Figure 3), Marcos points (Figure 4), ovate bifaces (Figure 4), as well as drills, a ground stone gorget, a lump of asphaltum (from the Gulf coast), deer antler tines, and a number of abrading stones. These and other artifacts are illustrated in detail in the paper on the Haiduk site (Mitchell, Chandler, and Kelly 1984).

The Haiduk site dates to the Late Archaic and for some years, it stood out as an anomaly in the San Antonio River drainage. However, Lovata (1997) has since studied the Silo site, also on that drainage in Karnes County. It is Transitional Archaic in age, with Ensor points rather than Marcos points, but two of the burials also contained corner tang knives (albeit much larger and unused, in contrast to the Haiduk site specimens), ovate bifaces, and deer antler tine artifacts (probably used for indirect percussion flaking). Although the Silo site is a cemetery, with multiple burials, and the Haiduk site is a single individual (as far as we know), the grave goods indicate a continuity in the latter part of the Archaic in terms of grave goods, especially corner tang bifaces, large "cache" bifaces, and antler tine artifacts.

ARTIFACTS OF SHELL

Perhaps because of his experience in working with shell artifacts in San Patricio County, as well as on the upper Texas coast, C. K.'s publications reflect a special interest in the study of shell specimens of various sorts. One of his most illuminating studies in this regard was the documentation of the use—as hammers, choppers and anvils—of large, thick Quahog shells (Figure 5) found in the Rio Grande delta area (Chandler and Kumpe 1998). Most of these specimens came from the A. E. Anderson Collection curated at the Texas Archeological Research Laboratory, The University of Texas at Austin. These specimens are found on both sides of the river, in Texas and Tamaulipas. They are often placed in the Brownsville Complex, which emphasized the use of shell for material culture. However, their actual antiquity remains unknown.

Chandler and Kumpe went beyond documentation with the Quahog specimens. They collected modern examples and used them in a variety of experiments documented in their paper. Their evaluation of

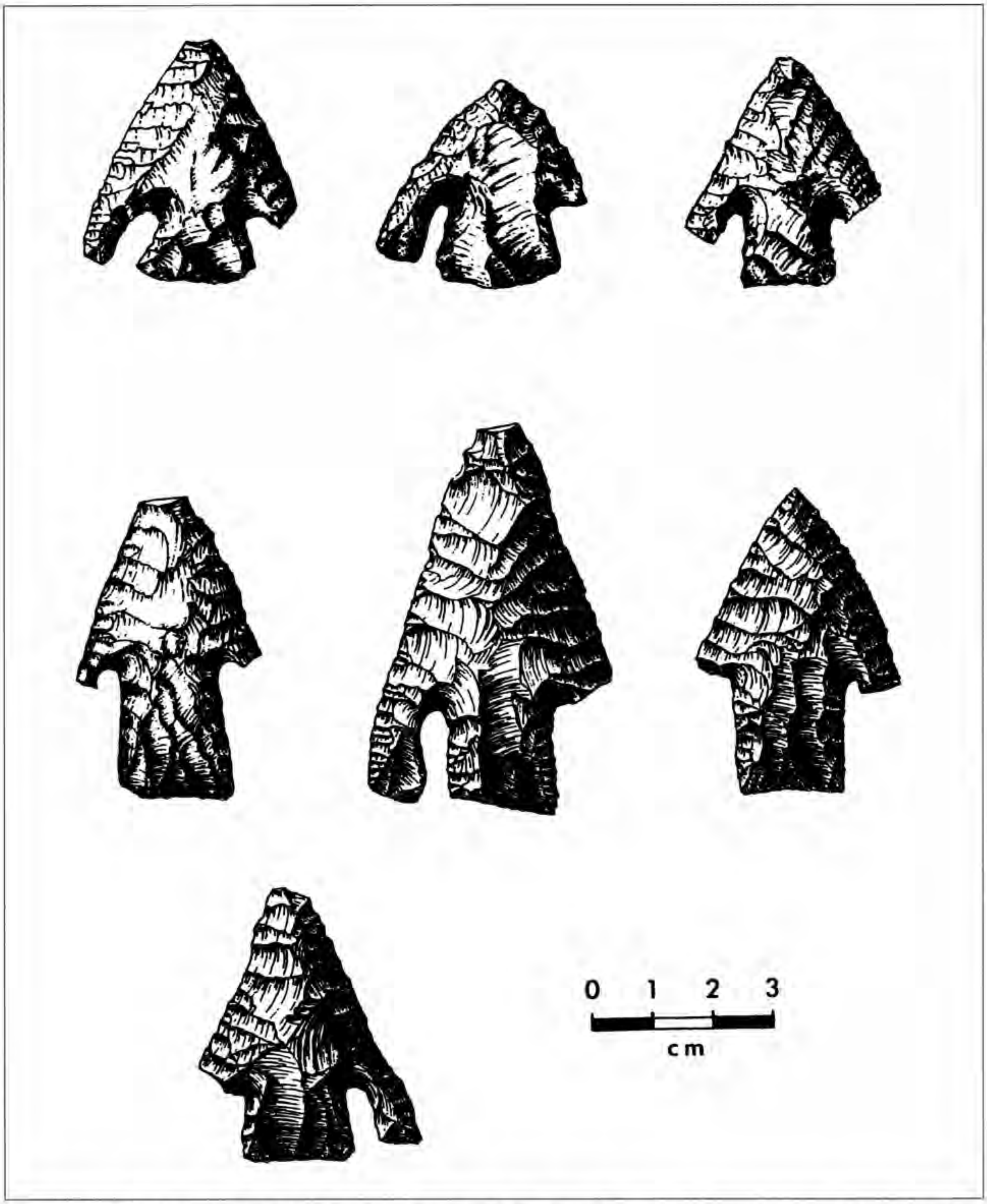

Figure 2. Calf Creek series points from Southern Texas. (left to right): Top row, San Patricio County; Middle row, San Patricio County; two specimens from lower Rio Grande; Bottom row, lower Rio Grande.

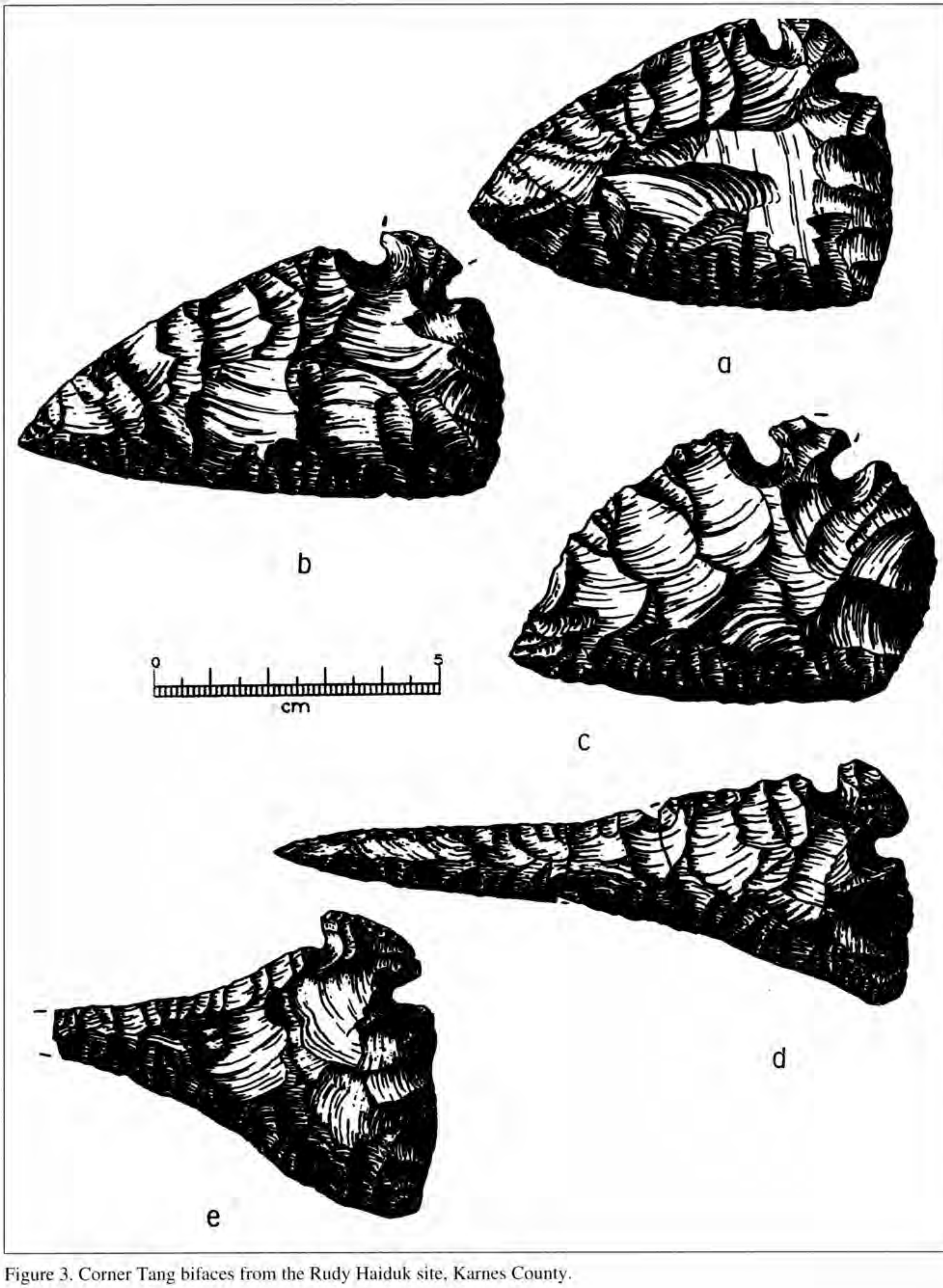

Figure 3. Corner Tang bifaces from the Rudy Haiduk site, Karnes County.

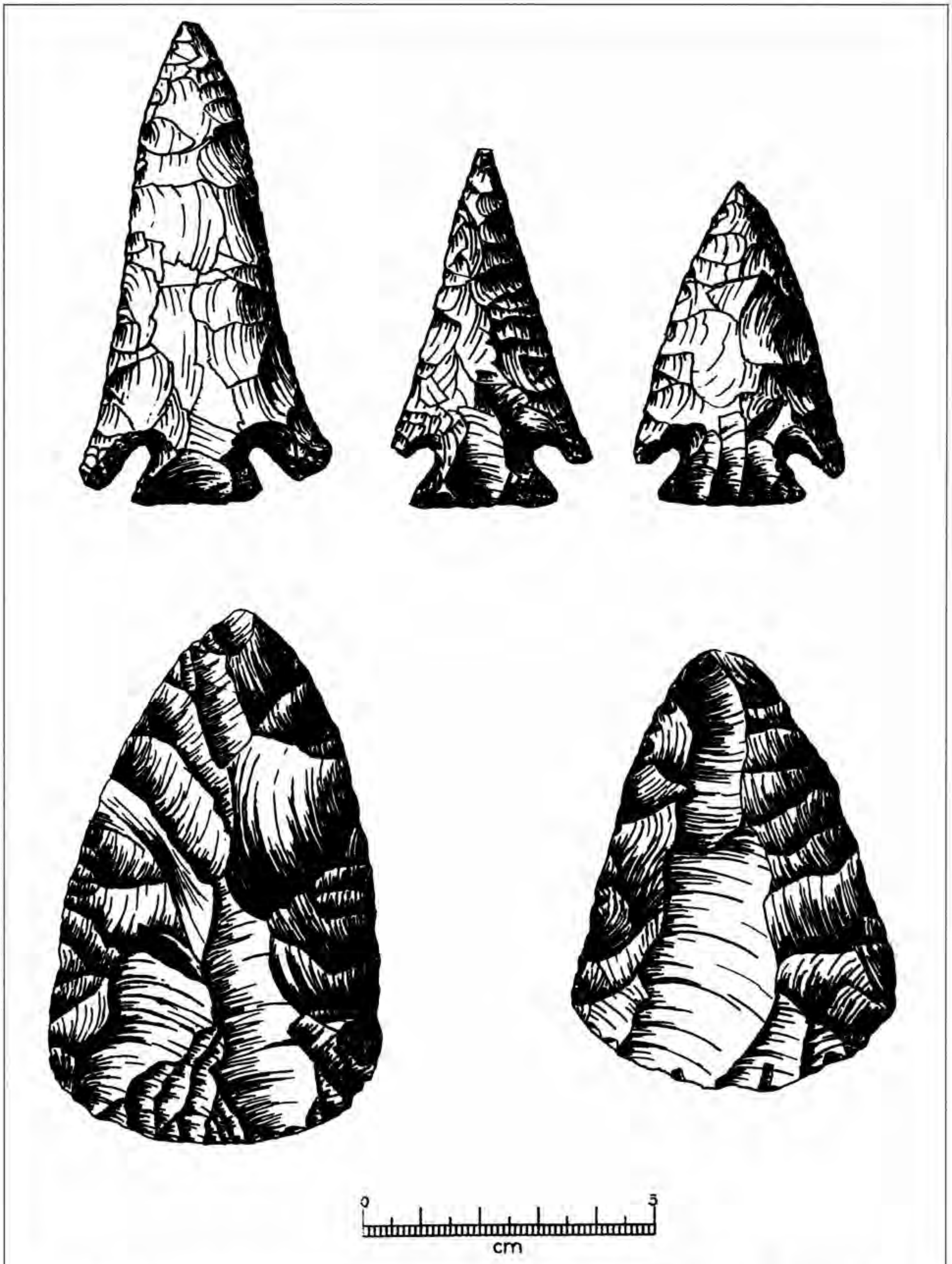

Figure 4. Artifacts from the Rudy Haiduk site, Karnes County. Top row, selected Marcos points; Bottom row, selected ovate bifaces.

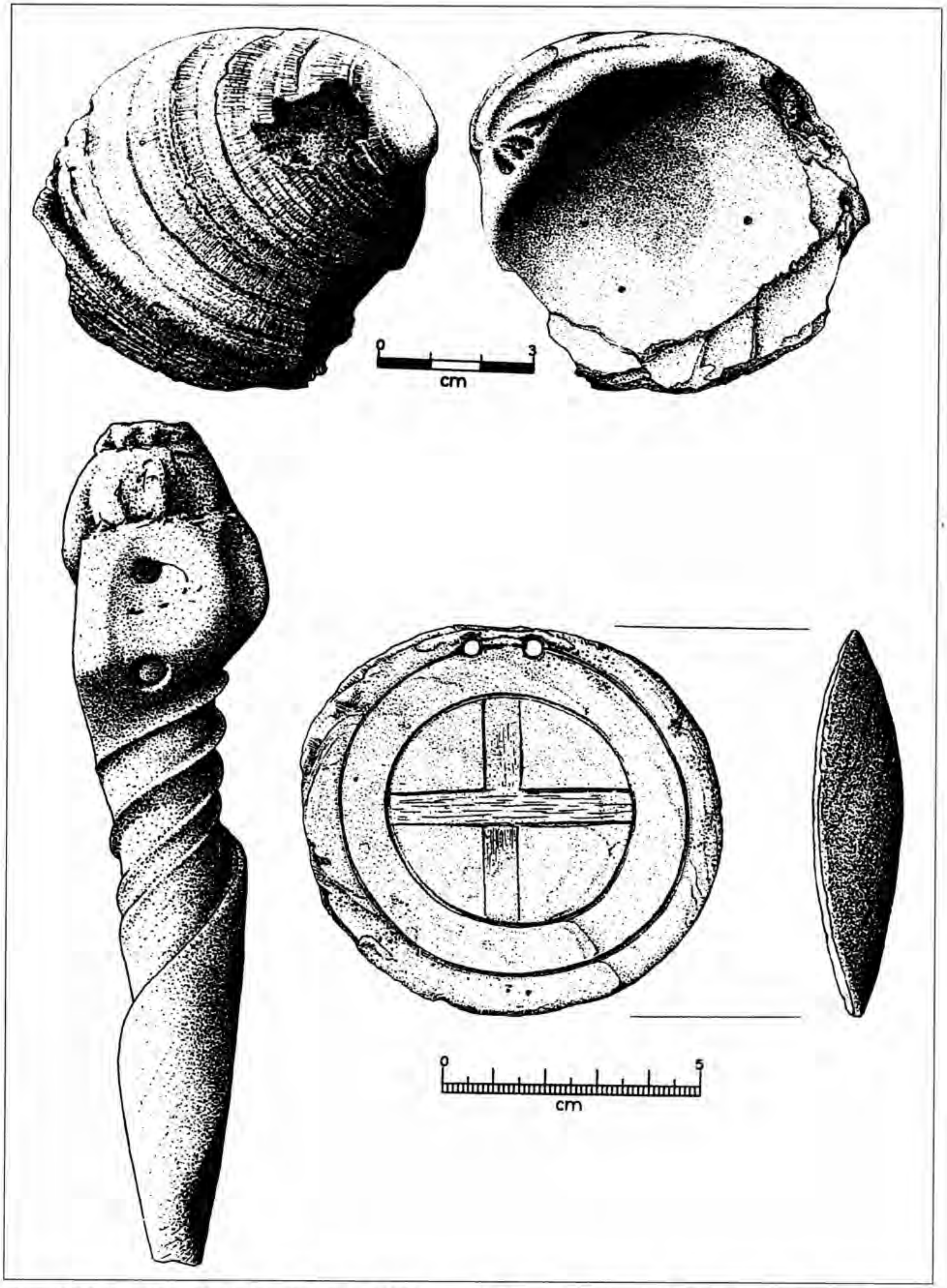

Figure 5. Marine shell artifacts. Top, both sides of Quahog shell; Bottom (left), conch columella pendant (Wilson County); (right) conch shell pendant (Gillespie County).

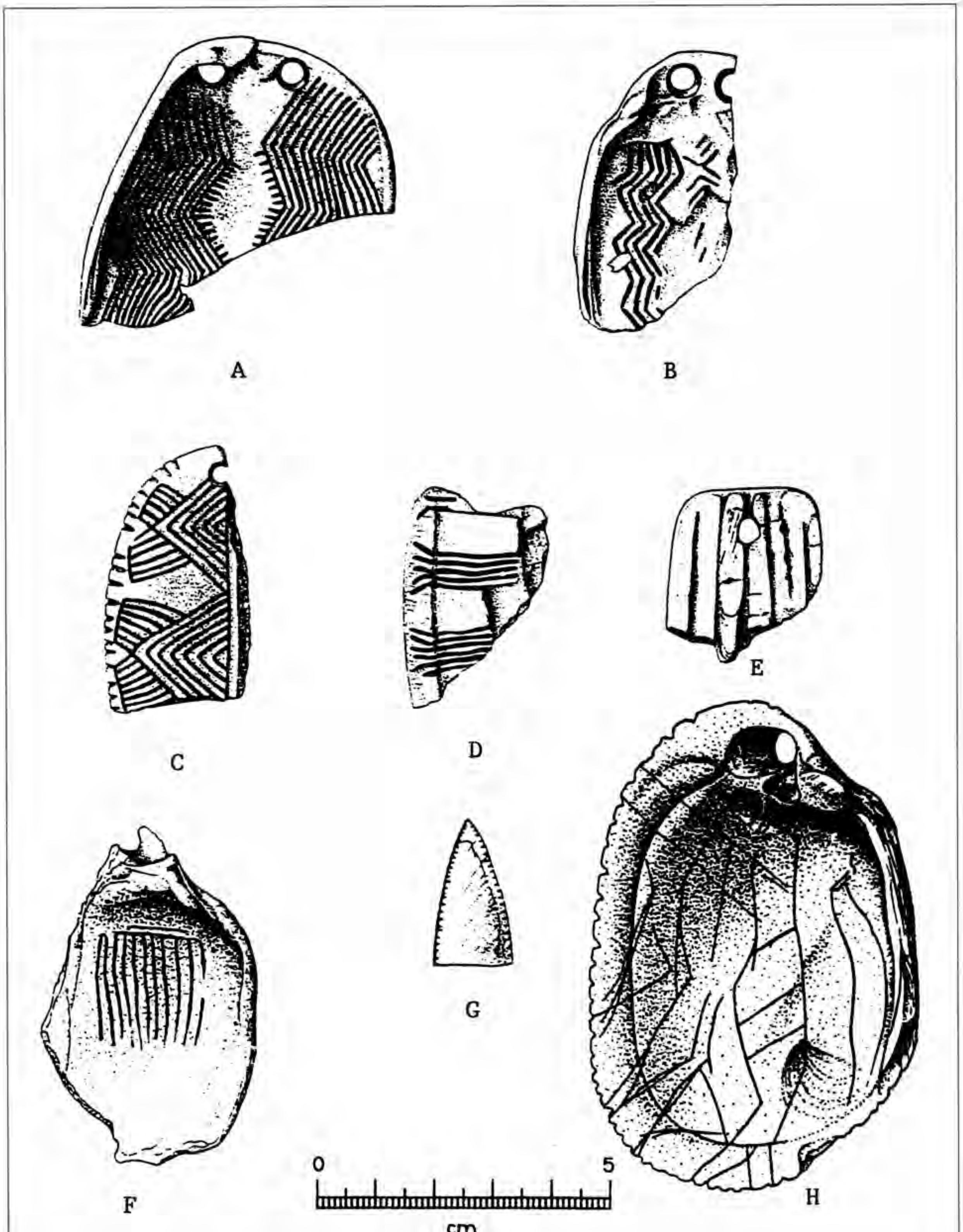

Figure 6. Freshwater mussel shell artifacts. All specimens are from the lower Rio Grande.

the function of the ancient Quahogs were derived from these experiments.

C. K. also saw shell artifacts as indicators of trade. For example, Chandler and Highley (1998) illustrate two distinctive shell ornaments, one from Wilson County and the other from Gillespie County. The large conch columella pendant illustrated in Figure 5 was found in Wilson County, made from the Florida Horse Conch, which occurs along the Texas Gulf coast. In Fig. 5, a pendant made from the whorl of a conch shell is also illustrated. Found along the Pedernales River in Gillespie County, it has a distinctive motif engraved on one side. Although Chandler and Highley (1998:44) did not draw any conclusions about the affiliation of this artifact, the present authors suggest (and the reader should attach no blame to Chandler and Highley) that the specimen is linked with Southern Cult/Southeastern Ceremonial Complex material culture, given the "cross within a circle" motif. The artifacts and iconography associated with the Southern Cult/Southeastern Ceremonial Complex fall within 13th century Mississippian culture of the southeastern United States, which includes parts of eastern Texas and eastern Oklahoma. This is probably a trade item that came from those regions, where Southern Cult/Southeastern Ceremonial Complex materials are known to occur.

A paper by Chandler and Kumpe (1992) reports a number of artifacts made from freshwater mussel shell. These were found at sites in Starr, Zapata, and Cameron counties along the lower Rio Grande, although most were picked up by collectors on the eroded shorelines of Falcon Reservoir.

Freshwater mussel shell fragments are common on many South Texas sites, representing food-collecting debris. However, there is an occasional—very fragile—artifact that demonstrates the use of this raw material for making ornaments. The specimens published by Chandler and Kumpe (1992) are particularly well preserved and some have very intricate designs (Figure 6). Besides expanding our view of the material culture of South Texas hunters and gatherers, we might also consider whether these engraved designs represent "art" (decoration) or whether the lines and combinations of lines have symbolic importance. For example, similar zig-zag lines are found as pictographs at the Old Sullivan Springs overhang along the Rio Grande in Webb County (Hester 1987: Figure 1). These kinds of similarities should be kept in mind for future research.

CLOSING OBSERVATIONS

C. K. Chandler had a tremendous dedication to the careful documentation of South Texas material culture, whether the materials came from known sites (like Haiduk) or from private collections in the region. He felt that, as an archaeologist, there was an obligation to record and publish those distinctive artifacts that added to our understanding of the ancient peoples of South Texas. He wanted to expand our knowledge of typology and chronology and of trade and technology. Not only did these data contribute to the enhancement of our knowledge of South Texas prehistory, but they also "fleshed out" many of the traits of the hunters and gatherers who inhabited the region for more than 11,000 years. With his dedicated work, C. K. Chandler has set a high standard for documentation and rapid publication for both avocational and professional archaeologists.

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New Analytical Approaches to South Texas Cultural Assemblages

J. Michael Quigg

South Texas contains thousands of prehistoric sites scattered across the inland regions. However, relatively few prehistoric inland sites were systematically excavated and reported prior to 1995 (cf. Black 1986; Collins et al. 1969; Hester 1969). The most intensive excavations were conducted at Choke Canyon Reservoir (Brown et al. 1982; Hall et al. 1986; Highley 1986; Scott 1982). Further west, excavations have also been conducted at Chaparrosa Ranch (Hester 1978; Montgomery 1978) and in the Tortugas Creek area (Hester and Hill 1972; Inman et al. 1998). Over the last five years, this situation has been gradually changing thanks in large part to the Texas Department of Transportation (TxDOT), Environmental Affairs Division, Archeological Studies Program's commitment to funding testing and excavation projects at buried sites along planned expansions of South Texas roadways (Mahoney et al. 2002; Quigg et al. 2000, 2002; Taylor and Highley 1995; Vierra 1998) as well as to other private companies initiating development projects and funded cultural resource investigations (Quigg and Cordova 1999, 2000; Miller at al. 2000).

As is the case elsewhere, most South Texas sites contain cultural assemblages dominated by lithic debitage, chipped stone tools, and burned rocks. Major classes of organic material, such as charcoal and bone, are absent or present in only limited numbers, with the notable exception of the Late Prehistoric Hinojosa site (Black 1986) and 41LK201 (Highley 1986). In the absence of direct evidence of subsistence resources, such as bones and burned seeds, other sources of information must be located. To extract more information from sites with restricted cultural assemblages, TRC Mariah Associates Inc. (TRC) has directed some old and some new analytical approaches towards these types of assemblages over the past few years. New analytical approaches have focused on burned rocks scattered across prehistoric occupation areas and from definable features, including examining burned rock size classes, analyzing their chemical composition, and even radiocarbon dating the burned rocks. Although long ignored, burned rocks are a major part of the cultural assemblage on many sites, they may be the most abundant artifact type in the assemblage, and they play a very important role in understanding specific human behavioral patterns as well as provide significant information concerning a variety of important issues.

Why focus on burned rocks? Nearly every archaeological site in South Texas has them, and they are not unique or restricted to any specific time period or culture. Most investigators assume that burned rocks were used primarily for cooking food. Natural rocks were collected and heated in fires, and the stored heat was used to cook food. If this general hypothesis is reasonable, then these rocks probably came into contact with food items and potentially absorbed some food residues while cooking the food (e.g., ovens, stone boiling). This notion—that burned rock matrices may contain residues from the foods they were used to cook—inspired us to focus on burned rocks as a source of information about what foods prehistoric peoples cooked and how they were prepared. It became necessary to locate existing, and to develop new, chemical procedures to extract food residues from the burned rocks and to learn how to interpret the results. When some initial chemical techniques had been identified, researched, and determined to have potential, we began to submit burned rock samples to various specialists to investigate what was in these burned rocks and what that might tell us. Time and space are not sufficient here to provide an in-depth discussion of the details concerning the analytical techniques, sample selection, handling procedures, extraction processes, and the various pitfalls of the techniques, nor to discuss all that has been learned from burned rock analyses; therefore, only selected results will be highlighted here. More detailed information on the techniques, samples, and results can be found in the reports of archaeological investigations upon which the following presentation is based (Quigg 1999; Quigg and Cordova 1999, 2000; Quigg et al. 2000, 2001, 2002).

This article focuses on three analytical techniques that have major implications to understanding the prehistory of South Texas and that are probably applicable to many other regions. The first technique targets visibly undetectable organic residues in the interiors of burned sandstone. Although rocks are thought of as impenetrable materials, minute pores and voids are often present in the rock matrix, specially in rocks like sandstone and limestone. These tiny pores expand when the rock is heated. During the cooking process, these tiny pores can become filled with minute food residues. Thus, the organic residues trapped in the tiny pores of the burned rocks can provide a broad picture of the foods that were cooked. The technique focuses on the fatty acid component of lipid residues, which must first be extracted and then identified. Second, stable carbon and nitrogen isotopes can also be extracted from these residues to aid in the identification of the classes of residues present. Third, we anticipated that the organic residues could be radiocarbon-dated to provide absolute ages for the heating and/or cooking event in which the rocks were used, thus providing a date for associated features, events, components, and other sites that also lack organic preservation.

LIPID RESIDUES

The fatty acid extraction was the easy part, although this is a very sensitive procedure. This analytical technique is quite complex and requires some sophisticated equipment, including a gas chromatograph machine, to obtain raw data about the chemical content of burned rocks that then must be interpreted by a knowledgeable specialist. Fatty acids are insoluble in water and relatively abundant. Unsaturated fatty acids, however, decompose more rapidly than saturated fatty acids; thus, the latter are the primary identifiable component. Interpretations are based on extensive knowledge of food chemistry and backed by experimental data. Understanding the decomposition of certain compounds is extremely important since these compounds will be underrepresented in the analyses of old, decayed residues. This technique was originally designed for extracting residues from pottery sherds (Marchbanks 1989; Malainey 1997). Shifting the focus to burned rocks was troublesome and a learning process. The first attempts that targeted burned rocks were performed on samples from 41ZP176 and published in 1999 (Malainey 1999; Malainey et al. 1999a, b, c). This technique is still in the developmental stages, with new information and a greater understanding of the complexities constantly increasing and upgrading. That means that although we can obtain high-quality raw data during this chemical extraction process, there is a definite need to expand the reference/comparative collection to include South Texas samples, and the interpretation may change over time as the analyst gains more understanding and becomes more sensitive to minor variations in the numbers derived in the process. This is not an exact science and precise identifications to species level are not possible, but broad categories of foods can be recognized (e.g., plants, large herbivore, fish/corn) rather than individual species of plants and animals.

Of the 115 burned rock samples submitted for fatty acid analysis from all sites, we have had about an 86% success rate in obtaining interpretable residues. Of the 14% that could not be interpreted, most samples still yielded fatty acids but in such limited quantities as to make interpretation unwise. Burned rocks from four sites along the Rio Grande between Laredo and Falcon Reservoir constitute most of our sample on the recovered fatty acids and the results were summarized according to six broad food categories (Table 1). These broad food categories each include many different individual plants and animals, though these definitions may become more refined over time. Even though we cannot currently identify specific foods or plants, the interpreted results provide an intriguing glimpse into possible prehistoric subsistence patterns at these four sites.

For example, the Lino site (41WB436) reveals a great diversity of potential food-groups compared to the more focused use of fish/corn/mesquite beans at 41ZP176 and 41ZP364 (see Table 1). The variability, or in some cases the lack thereof, within one site and among sites is interesting. The diversity within one site may imply that no single resource supplied all of the prehistoric inhabitants' dietary needs. The burned rocks from the two Falcon Reservoir sites (41ZP176 and 41ZP364) did not yield any large herbivore residues, though the two sites near Laredo did so. This finding might reflect one or more possibilities, including, but not limited to, group preferences, age differences in the sites, or lack of the large herbivore resources (i.e., deer, antelope, or bison) in some regions. All four sites were occupied generally during the Archaic period, which covers a roughly 4000 year time span between about 6000 and 2000 years ago, though some minor use during recent times was also indicated.

The presence of certain fatty acids provide valuable clues as to whether the residue was of plant or animal origin. Confirmation may be possible in the future through the identification of sterols in the residue. Analysis of experimentally decomposed plant and animal cooking residues from the study area should enable the archaeologist to identify the most likely candidates.

STABLE CARBON AND NITROGEN ISOTOPES

In an attempt to help refine the broad fatty acid interpretations, we subjected the same burned rock samples to another chemical technique, stable carbon and nitrogen isotope analyses. The combination of these two chemical techniques targeting residues from inside burned rocks should increase our ability to identify certain food groups that the burned rocks were used to cook. Interpreting stable isotope data is as complex as analyzing fatty acids; however, isotope analyses are already established techniques (used mostly in biological disciplines). Stable carbon isotope signatures reflect how plants photosynthesize sunlight, and are generalized into three broad groups, C_4, C_3, and CAM. The chemical analysis of stable carbon isotopes yields a negative number that reflects one of these three broad plant groups or animals that fed on the various plant groups. The operating assumption is that the stable carbon value obtained would aid in distinguishing what plant groups were represented in the residues. The same is true of the nitrogen isotope value, although less is understood concerning nitrogen isotopes.

Table 1. Summary of lipid residue results on burned rocks from four prehistoric sites in South Texas.

Broad Food Categories	41ZP176 (n = 9)	41ZP364 (n = 10)	41WB437 (n = 43) Lino Site	41WB557 (n = 52) Boiler Site
Similar to Large herbivore			23%	46%
Similar to Large herbivore + plants			5%	20%
Similar to Plants or probable plants	22%	40%	28%	12%
Similar to Fish/corn/mesquite beans	56%	30%	7%	
Similar to beaver/Texas ebony seeds	11%	30%	7%	
Similar to Seeds/nuts/fruits			2%	10%
Not identifiable/insufficient residues	11%		26%	12%

The biological literature provides stable carbon and nitrogen isotope data for most plants, but the published values have been derived from the leaves rather than from the fruit or seeds. Clearly, the fruits and/or seeds, not the leaves, represent the commodity that was potentially consumed by prehistoric hunter-gatherers. Therefore, we began to amass a body of data on the isotopic values of modern seeds, fruits, and other representative food products (e.g., nuts) in the regions of interest. To date, about 100 samples of modern plant and animal remains have been analyzed to establish their stable carbon and nitrogen isotope values. Bones from animals that consumed various plant parts tend to yield isotopic values similar to the plants consumed by the animal. However, chemicals within animals' bodies alter the intake values (through fractionation), which add considerable complexity to the interpretation of results as the consumed plants passed upwards through the food chain. Consequently, this change of value is a complicating factor that must be carefully considered in the results and interpretations.

We completed 137 isotopic analyses on the same burned rocks that were analyzed for their fatty acid content. Although we have results from about 95% of the samples, it is difficult to summarize these data. Many factors influence the isotopic results, one of which is the amount of organic residue that is used in the detection process. In fact, many of the sample results have yielded numeric values that may indicate that the results are not to be trusted because the sample amount measured was to small to have confidence in the obtained value.

Incorporating the results from these two chemical techniques should help to narrow the interpretation of what broad food groups might be represented and/or to eliminate some potential food groups. For example, if the fatty acid interpretation indicates that large herbivore meat was prepared, and the isotopic analysis provides a less negative value (i.e., -13.3‰), the combination of the two results indicates that the large herbivore meat is probably bison. Bison have less negative values because they subsist extensively on C_4 grasses. If the carbon isotope value is more negative (i.e., -22‰), then the large herbivore would likely be a deer or antelope. In an instance where seeds/nuts/fruits is inferred based on the fatty acid results, a very low nitrogen isotope value (i.e., 1‰) may indicate that the fatty acid source was likely derived from a legume such as a mesquite bean. Thus, even though neither of the two chemical analyses provides precise identifications, combining the two techniques allows for more precision in isolating the food groups that were potentially cooked by the burned rocks.

These chemical approaches move toward the identification of the broad food groups that probably constituted the subsistence base at sites that lack direct faunal evidence for identifying subsistence. Even if animal bone and/or mussel shell remains are recovered from archaeological sites, the plant products consumed at these same sites is more often not preserved. One way to detect whether or not plants were part of the subsistence base would be through chemical analyses.

RADIOCARBON DATING

The other technique that was initiated at these four South Texas sites was the radiocarbon dating of the organic resides trapped inside the burned rocks. Specifically, the fatty acid residues discovered in the burned rocks were targeted for radiocarbon dating. Currently, we have not positively identified the dated organic material as fatty acids but, based on the work thus far, fatty acids are the most likely source of the dated organic matter. Once we learned that organic residues were retained inside burned rocks, dating these residues was the next logical step to pursue. Considerable time was spent with the technical experts at the radiocarbon facility, Beta Analytic, Inc., to ensure that we were on the right track with our assumptions. Here again, the dating of burned rocks is a brand new avenue and we are still learning about the pitfalls, although we have many positive results to go along with a few strange or unanticipated ages. We are, however, excited to state that it is a fact that organic residues are present in burned rocks and it is possible to date them through the accelerated mass spectrometry (AMS) radiocarbon process. Even though we receive an absolute age back from the laboratory, we must be very cautious in how we treat that date, since there may be more to what that number represents than first suspected. More controls and experiments are required to help resolve some of the potential problem areas and allow more confidence in using the acquired date as an indication of a targeted cultural event.

In trying to obtain absolute radiocarbon ages on burned rocks, we have achieved a 98% success rate from the 52 samples run through 2002. The standard deviation on the obtained assays ranged from 40 to 60 years, which is similar to that of most charcoal results. This brief article is not going to attempt to discuss each and every sample or discuss all that we have learned over the last six years; however, I would like to provide some examples, including some highlights as well as some "lowlights."

Ten burned rock samples were paired with charcoal samples in direct association with one another in archaeological context to investigate the correlation between the burned rock results and the charcoal radiocarbon results. Running dates on two different types of sample material from the same context allows for a general level of confidence to be established for the burned rock dates. Charcoal is considered the standard and most reliable means of establishing the absolute age of most cultural events. Of the 10 burned rock/charcoal sample pairs dated, five pairs were considered to exhibit good correlations between the two assays and five were considered to have poor correlations. An example of good correlation is from an excellent context in a shallow basin feature (Feature 10) at the Lino site (41WB437) in which one burned rock and one charcoal result yielded two radiocarbon assays that were only 10 radiocarbon years apart (Quigg et al. 2000). An example of a poor correlation is from a slightly scattered burned rock cluster (Feature 9d) at 41ZP364 in which the charcoal date was nearly 900 years older than the date obtained on a burned rock (Quigg and Cordova 2000). At the Boiler site (41WB557), we ran two charcoal samples and two burned rock samples from a single small, shallow basin feature (Feature 21). Three of the four assays clustered within 70 years of each other (between 170 and 240 years B.P.) with one outlier at 540 B.P. (Quigg et al. 2002). Also at the Boiler site, we ran two charcoal samples and three burned rock samples from a single burned rock cluster (Feature 22). Four of the five results were within 20 radiocarbon years of one another with one outlier only 240 years from the clustered dates (Quigg et al. 2002).

The Boiler site yielded very limited charcoal, and the charcoal that was present often was not directly associated with identified features. The exceptions were the two examples discussed above. The lack of charcoal directly associated with the burned rock clusters eliminated the possibility of cross-checking the ages of the burned rocks against charcoal dates. Instead, we dated multiple (two to four rocks) burned rock samples from selected features throughout the profile to determine if burned rocks within the same cluster would yield similar ages. As before, we got mixed results on the clustered samples. In Feature 14, a burned rock cluster that was interpreted as a small, dispersed dump, three separate burned rocks yielded three individual residue dates that were only 30 radiocarbon years apart (860, 880, and 890 B.P.) with standard deviations of less than 50 years (Quigg et al. 2002). In another loose cluster of burned rocks (Feature 23), three burned rock residue dates were only about 250 years apart.

In four instances, we dated two ends of the same burned rock to determine if the assays would be consistent with one another. Again, this approach provided mixed results. The four pairs of dates yielded radiocarbon results that were 80, 100, 390, and 1710 years apart. In general, three of the four pairs yielded what I believe to be acceptable ranges of ages and provided a relatively clear indication of the age of that particular feature.

The 50 radiocarbon dates on residues obtained from the sandstone burned rocks documented a broad range of time. The youngest burned rock assay obtained was 80 years B.P. The oldest date obtained was 7210 B.P. These results are exciting and there is no reason to believe that the oldest cultural events known in North America would be out of the range of this approach. These dates document that organic residues last at least 7000 years even in some environmental conditions such as those found in South Texas. This is especially important, as the older archaeological sites tend to yield less preserved charcoal or other organic materials with which to pursue radiocarbon dating. Thus, the burned rocks appear to be an alternative source for obtaining absolute radiocarbon dates in sites lacking other materials for dating.

OTHER ANALYSES

In an attempt to broaden our knowledge about the organic residues trapped inside burned rocks, we have subjected samples of burned rocks and natural rocks to various other analyses. Petrographic analysis was conducted on two natural sandstone pieces and compared to four pieces of burned sandstone from the Boiler site to investigate whether or not organic residues might be detected under the polarized light of the microscope. The petrographic results revealed nothing out of the ordinary and no materials were suspected to be organic residues (Hill 2002). The effects of firing were observed and differences in porosity and permeability were noted in two different types of sandstone (Hill 2002). It was suspected that the low power used in petrographic microscopes hindered the analyst's ability to detect minute residues.

Ground up burned sandstone and natural sandstone samples were submitted to a soils laboratory for chemical characterization, including such attributes as "percent organic matter," using two different techniques —percent carbonate by two different means—the carbon nitrogen ratios, percent carbon and nitrogen, soluble salts, available phosphate, and total phosphates (Quigg et al. 2002). Comparisons of the burned rock results to the natural rocks from the same context indicated the burned rocks yielded noticeably higher levels of carbonates, calcite, and dolomite, as well as high percentages of carbon. These chemical results were not unexpected and confirmed our earlier assumptions that burned rocks retain organic residues in their interiors.

We have encountered complicating factors that cause some concerns in interpreting the radiocarbon dates of the organic residues. Two pieces of what appeared to be non-burned sandstone from the lower part of the cultural deposits at the Boiler site were also submitted for radiocarbon dating. To my surprise, both apparently natural rocks yielded radiocarbon assays that dated to the Early Holocene (6610 ± 40 and 7220 ± 50 B.P. [Quigg et al. 2002:323]). The fact that these natural rocks yielded absolute radiocarbon ages presents potential problems in the interpretations of the ages obtained from cultural burned rocks. If these were truly natural rocks, then apparently natural soil organic residues may have penetrated the rocks and thus were dated. These natural organic residues might cause some background noise to the culturally derived residues that we are trying to date.

I would like to briefly address this apparent problem. If a natural rock contains natural organic residues prior to being used in a cultural event, it may not matter that much. Let me explain by quickly outlining the rock's potential use cycle to illustrate what I mean. The natural rock is collected (it potentially contains natural residues), then the rock is heated in a fire, presumably an open wood fire that would most likely reach temperatures above 600 degrees Celsius. Then the hot rock was used in one or more ways (boiling, roasting, or an earth oven) to transfer heat from the rock to the foods. When the rock comes into contact with the cultural food residues, it is my contention that the rock would absorb minute food residues into its interior. Once the rock cooled, it was either discarded or recycled in more use episodes, which again would begin with another heating episode. It is my contention that most, if not all, natural organic residues inside the unheated rock would most likely be burned off and destroyed in the initial cultural heating of the rock. Consequently, as the rock cools and absorbs food residues from its cultural use, it would be those cultural residues that filled the tiny pores and would be retained. Therefore, if natural, older organic residues were once present in an unheated rock that was subsequently selected for cultural use, those older residues most likely would be destroyed during the cultural heating event. The organic residues that are extracted, interpreted, and radiocarbon dated would represent cultural use episodes and not natural contaminants. When Dr. Malainey identifies soil lipids in the extraction process, which are fundamentally different in composition from food lipids and do not interfere with the identification of archaeological cooking residues (Malainey 1997), the soil lipids are cleared and ignored prior to interpreting the results.

In another attempt to learn more about the heating process—specifically the potential number of heating events and the temperatures to which rocks were heated—we have subjected at least 19 cultural burned rocks to demagnetization studies. Although this approach is still being developed, some differences in the number of heating events have been detected. Potential heating temperatures were identified and provide some understanding of the temperature ranges that the rocks were subjected to. A few burned rocks appear to have been used as boiling stones (Takac 2000).

SUMMARY

In summary, new analytical approaches and techniques directed at an often overlooked but ubiquitous artifact type—burned rocks—hold promise as means to gain greater insight into the subsistence practices of prehistoric hunter-gatherers at archaeological sites that lack direct evidence of such activities (e.g., faunal bones, carbonized plant remains). We have also pursued various analyses of the burned rocks to extract as much information as possible concerning their contents. Although the two chemical approaches applied to the organic residues extracted from inside burned rocks are complicated and can only be performed by specialists, they appear to have merit even though some results are questionable. These techniques have considerable potential to extract data that will contribute significant information to our understanding of the subsistence practices of prehistoric peoples in South Texas. As an outgrowth of learning that organic residues are preserved in burned rocks, it becomes important to investigate if these organic residues can be dated. Currently, there are some unknowns and some potential problem areas yet to be resolved, but it is quite apparent that burned rocks can be dated and, with care, they can be used as a means of establishing the age of cultural events. We believe that these new techniques, applied thoughtfully and carefully, will provide significant advances to our understanding of South Texas prehistory and, presumably, to other regions.

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Variability Among Biface Caches from Southern and South Central Texas

Thomas R. Hester and David L. Calame, Sr.

ABSTRACT

Three biface caches from southern and south central Texas are documented in this article. Two of the caches, from Frio County, are of large, lanceolate bifaces that likely relate to the Angostura lithic style. The third cache, from Kinney County, consists of three massive bifaces whose cultural affiliation is uncertain. However, it may date to early in the regional cultural sequence.

INTRODUCTION

In this paper, we report two caches from Frio County, southern Texas (Figure 1), that we believe date to the Late Paleoindian period and are linked to the Angostura projectile point type. We further report a third cache from Kinney County in south central Texas (see Figure 1), distinguished by different kinds of bifaces of massive size. These have some attributes suggesting that they are "early" in the south central Texas chronological sequence.

Biface caches have been found in many areas of Texas and a number of these were documented in a Master's thesis by Kevin Miller (1993). Most, if not all, of these caches appear to date to the Archaic period. They often consist of dozens of bifaces, roughly triangular in outline, and greatly varying in size. Just a few examples include the Fairview cache (Miller 1993), the Curbo cache (Harry J. Shafer, personal communication), the Riley cache (Miller 1993), and the extensive Medina cache, now being studied by David L. Calame, Sr. An excellent example of the full publication of a biface cache is the study of the Hoerster cache from Mason County (Lintz and Saner 2002), which should also be consulted for a review of theories related to biface-caching behavior.

Of great interest in recent years have been several Clovis-age biface caches reported from the Western United States. Perhaps best known is the East Wenatchee (Richey) cache found in Washington state in the 1980s, and representing massive fluted Clovis bifaces (Gramley 1993). Other caches of this age have also been published, including the the Simons cache in Idaho (Woods and Titmus 1985) and the Fenn cache, possibly from Wyoming (Frison and Bradley 1999) In the latter cache, there was a mixture of large Clovis preforms, some fluted, some not, and earlier stage preforms that one guesses would have eventually been made into Clovis points. These, and other Clovis biface caches, have been surprising to archaeologists because of the size of many of the Clovis fluted preforms in the caches. Some have suggested that they were ritual or ceremonial deposits, perhaps associated with burials, or were simply flintknapper kits, the contents of which represent various stages in reduction for Clovis points. Kornfeld et al. (1990) believe that such caches may have been intentionally-stored resources to be utilized at a later date

THE CACHES

Kothmann Ranch Cache

The Kothmann Ranch cache (Figure 2) comes from the San Miguel Creek drainage in Frio County, Texas. According to the records of the late Dr. Pat Riley, whose family owned the ranch at one time, this cache was found between 1929-1934. Unfortunately, no further details are known; but, Dr. Riley

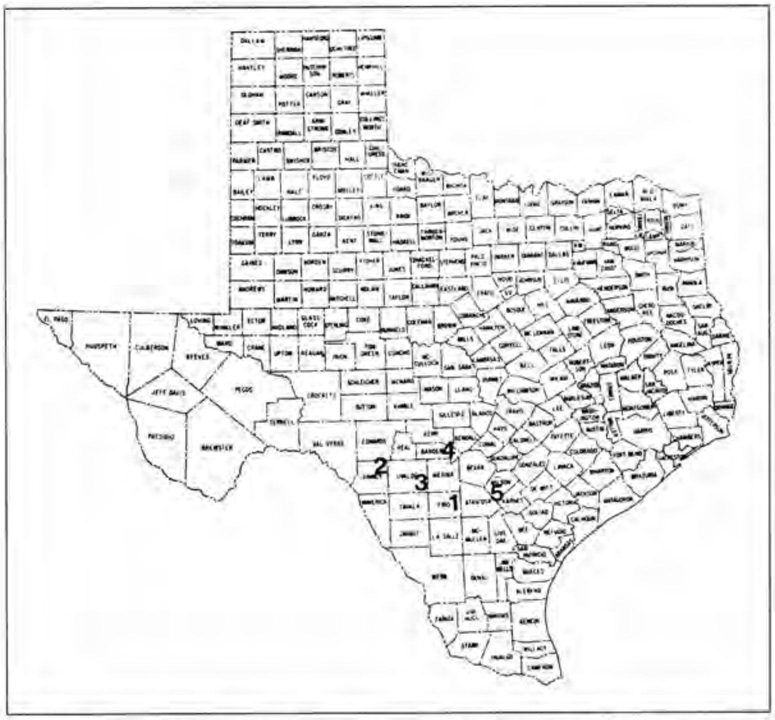

Figure 1. Locations of counties mentioned in the text. 1, Frio County; 2, Kinney County; 3, Uvalde County; 4, Bandera County; 5, Wilson County.

kept the cache together for several decades, and it was ultimately donated to the Texas Archeological Research Laboratory by his family in the 1990s.

Specimen 1 is the largest biface (see Figure 2) and it is broken in three places. It is made of a fine-grained gray chert that is glossy and darker in some areas, perhaps reflecting heat-treating. Though the tip is the darkest (moderate brown), the lower 9.3 cm of the biface seems to have much of the gloss, and in this area, it may well be polish related to hafting. This is reinforced by the presence of dulling along the lower portions of the lateral edges. There is also a slight bevel on the basal edge, as if a platform had been set up for further thinning of the base. Flaking is typified by broad parallel flakes on much of the biface, although the flakes are more narrow near the tip. The specimen is 29.0 cm in length, 4.8 cm at mid-section, and 1.4 cm in width at the base. The maximum thickness is 0.7 cm, though thickness ranges from 0.4-0.6 cm over much of the biface

The second specimen (see Figure 2), of grayish-brown chert, is unbroken. It also appears to be the most finished, with lateral edge smoothing or dulling on the lower 5.5 cm. Like the first specimen, there are slight bevels, or striking platforms, on the basal edge, which is not dulled. The flaking on one face mirrors that of the first specimen, while on the opposite side, the broad flakes near the base are not nearly as carefully removed. However, exceedingly fine parallel flaking is present at the distal end. This artifact is 24.6 cm long, 4.4 cm wide at mid-section, and 2.1 cm in width at the base. Thickness is 0.7 cm at its maximum, though much of the biface is 0.5-0.6 cm thick.

The biface designated as Specimen 3 (see Figure 2), made of light gray, glossy (heat-treated?) chert, is broken is two places, near the mid-section and distally. It also has breaks on the basal end and at the tip, as well as a nick in one edge near the mid-section. A patch of white cortex (2 x 3 cm in size) remains on one face at the base. The overall flaking pattern is very similar to the other two bifaces, with broad parallel flakes on the lower half and narrow parallel, to parallel-oblique, flakes on the distal end. Noting that the tip and the basal edge are broken, the length of the biface is 21.6 cm long. It is 3.8 cm in width near the mid-section and the broken basal edge is 2.5 cm wide. Maximum thickness is 0.7 cm, although much of the biface measures 0.6 cm in thickness. There is no lateral edge dulling on the specimen.

Knothole Cache

In 1998, David Calame was able to obtain information on a cache of two large bifaces from far northern Frio County, and like the Kothmann Cache, along the San Miguel drainage. These specimens, known as the Knothole Cache (41FR33, Figure 3), were found in 1973 by workmen digging a garbage pit; they brought them to the attention of the ranch owner, who did further excavation at the find spot and took color photographs of the manner in which

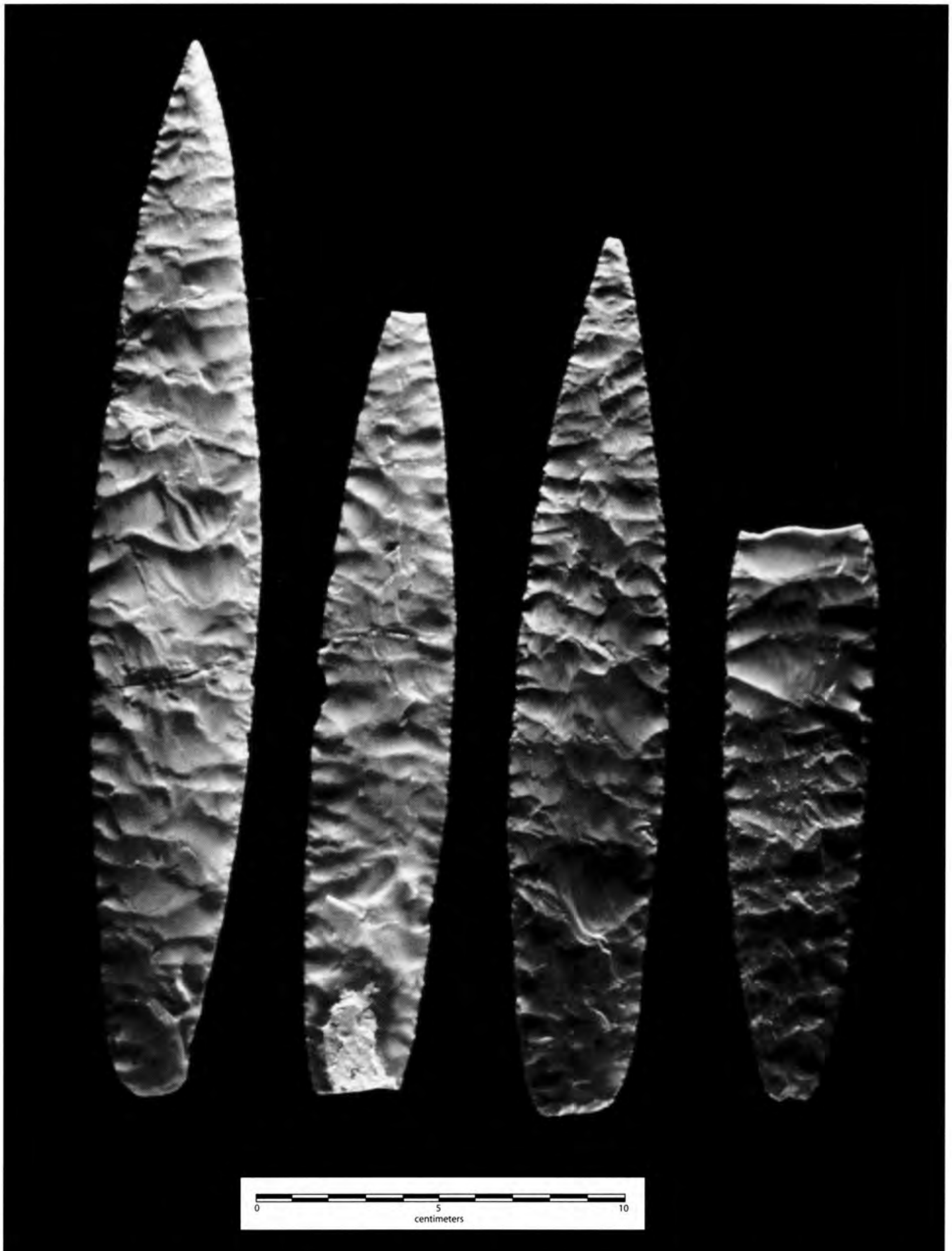

Figure 2. The Kothmann Ranch Cache and specimen from the La Jita site. Left to right, Specimen 1 (Kothmann); Specimen 3 (Kothmann); Specimen 2 (Kothmann), and specimen from La Jita (41UV21).

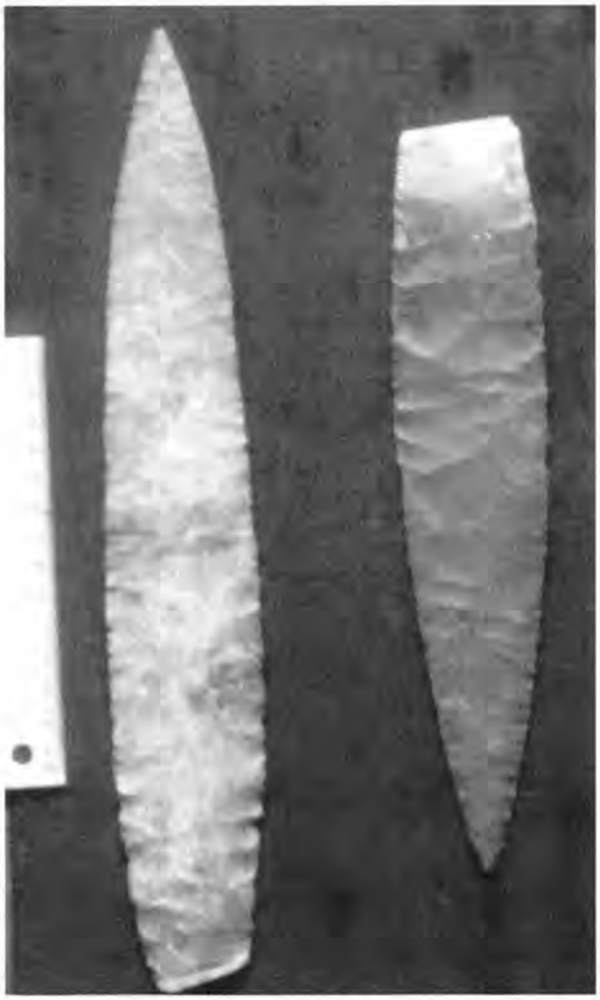

Figure 3. The Knothole Cache. Both specimens from the cache are shown. The owner of the cache had them glued to a display, and thus the different orientations.

Figure 4. View of Knothole Cache discovery pit. Owner has placed the artifacts (1973) in the positions in which they were found. The items around it are rocks, not associated artifacts.

the bifaces were found (Figure 4). The bifaces, although glued down to a display board when we examined them, were photographed and measured and otherwise recorded. The largest specimen (Figure 5, see also Figure 3), of pale brown chert, is very similar in outline to the Kothmann Cache bifaces. It is 33.5 cm long, 5.45 cm wide, and 0. 5-0.7 cm thick; basal width is 3.3 cm. There is cortex at the base (5.5-6 mm thick), as on one specimen in the Kothmann Cache. Prepared platforms can be send along the lateral edges and there is some edge-dulling that appears to be related to the reduction process. The flaking is carefully done, mostly parallel, and with deep parallel flakes near the base.

The second specimen (Figure 6, see also Figure 3), made of gray chert, is 27.5 cm long, 5.3 cm wide, and 0.65-0.7 cm in average thickness. Basal width is

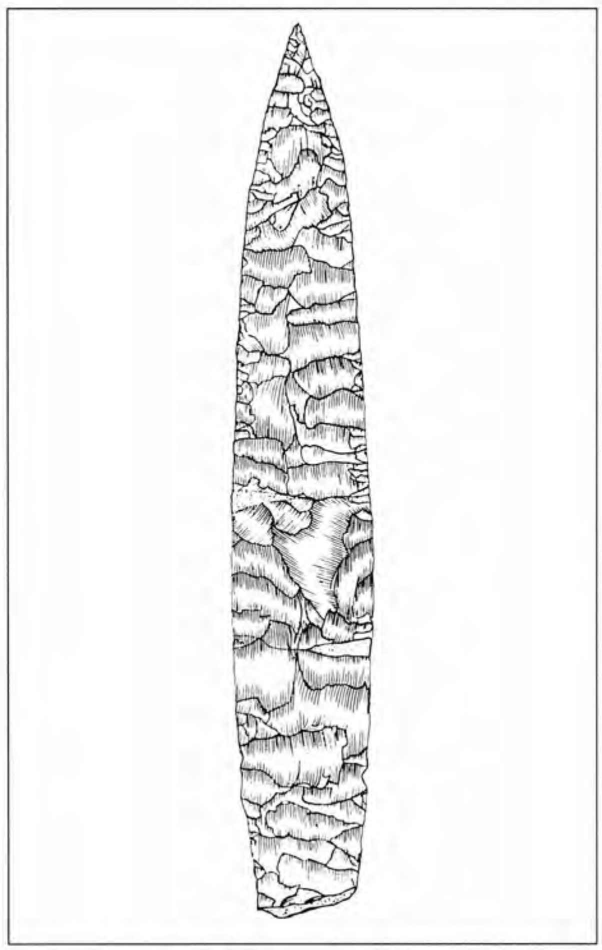

Figure 5. Drawing of Knothole Cache biface. This is the largest of the two specimens, 33.5 cm long. Illustration by David L. (Buddy) Calame, Jr.

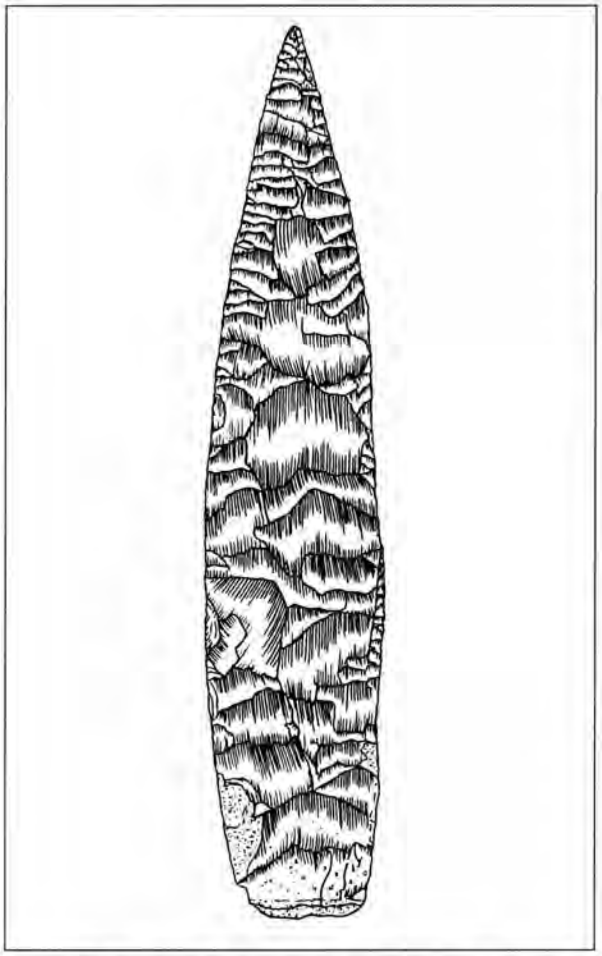

Figure 6. Drawing of Knothole Cache biface. This is the second biface from the cache. It is 27.5 cm long. Illustration by David L. (Buddy) Calame, Jr.

4.0 cm. The biface has cortex at the base, where the edge is straight or flat; this "rind" of cortex is 2 mm thick. The distal portion has short parallel to parallel oblique flakes, and broad percussion flakes on the lower half (see Figures 5-6). There is no dulling of the lateral edges. Interestingly, parts of the edges of both bifaces are lightly serrated.

Also of note is that the Knothole Cache bifaces are not made of heat-treated chert. By contrast, the Kothmann Ranch bifaces are shiny and glossy on the flake surfaces, possibly indicative of heat-treating.

Comparing the Kothmann and Knothole Caches to Other Lanceolate Artifacts

The Kothmann Ranch and Knothole caches are remarkably similar and we offer the hypothesis that these caches represent the Angostura equivalent of the Clovis caches of earlier times. Though some specimens in the caches could have been further reduced and used as spear tips, and two in the Kothmann Ranch cache had dulled proximal edges, our inclination is to view them as special deposits, perhaps ritual in character or perhaps placed with burials, the bones of which have not survived. Three of the five bifaces in the two caches have been broken. Whether this was intentional (i.e., they were "killed") or resulted from the pressure of the earth overlying them is unclear.

Although the Angostura type in Texas is a "catch-all" type for all sorts of lanceolate bifaces of Late Paleoindian times, and though they vary considerably in form and technology, there is clear evidence of presumed Angostura specimens that appear to shed light on the Frio County caches.

The caches are very similar to a broken biface that Hester (1971) excavated at the La Jita site (41UV21) in Uvalde County, in 1967. This light brown biface (see Figure 2) is 16 cm long. It is 4.3 cm wide and 9 mm thick. These measurements are similar to those of the Kothmann Ranch Cache. It also has parallel flaking and is bi-convex in cross section. The lateral edges are not dulled, and it may have been broken during reduction. The artifact came from the base of the deposits, which were dominated by Early Archaic artifacts. However, the deposits at La Jita were quite compressed and with a fair amount of mixing. Hester's field notes indicate that it was quite a surprise to find this large biface at what appeared to be the very bottom of the site. No radiocarbon dates are available.

About 50 miles to the north of Frio County, two relevant specimens are reported from the Medina River drainage of southern Bandera County (Figure 7). These were found in a heavily eroded area, from which dam fill had been removed many years ago. At the request of the landowner, the name of the ranch is not disclosed. Both of the specimens are heavily patinated, and both are broken (the tip of the specimen on the right has since been found, but we have not yet had the opportunity to photograph the "re-united" artifact). The two large bifaces were found on the surface, close together, but obviously exposed at various times. The pieces were even "flipped" by erosional processes resulting in the differential weath-

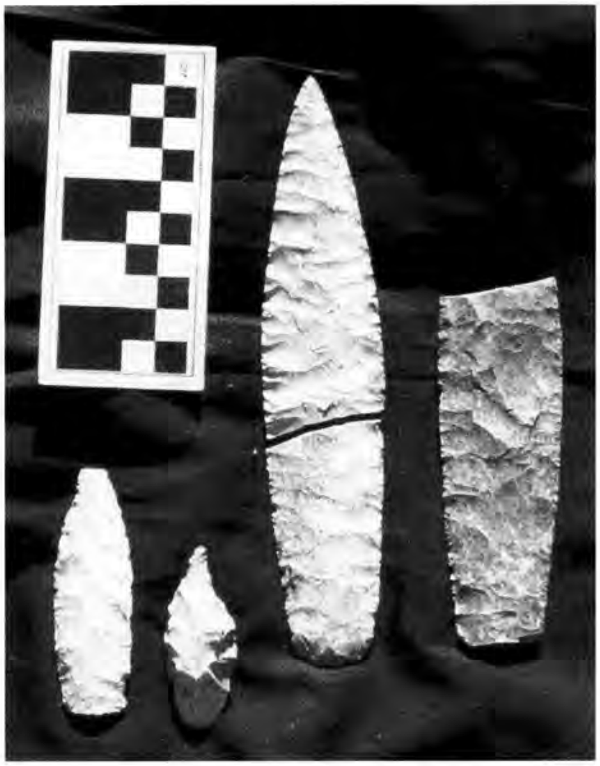

Figure 7. Angostura artifacts from Bandera County. The two specimens on the right are of comparative value for the present study. The two specimens on the left are reworked Angostura points. All were found on a deflated surface in Bandera County.

ering observed on them. The largest specimen (see Figure 7) is almost 19 cm long, about 4 cm wide, and 0.7 cm thick. It has beautiful parallel flaking, but no lateral edge dulling. The other specimen (see Figure 7),which now has its distal half, is essentially the same size, but is not as well made as the other biface. Two other artifacts collected near these bifaces are a heavily patinated Angostura mid-section and a heavily reworked point, also appearing to be Angostura. So, it may well be that these two large bifaces were not part of a cache, but were part of an Angostura component that has been completed deflated.

Other interesting comparative specimens have come from a large locality known as the Cibolo Sand Pit, on Cibolo Creek in Wilson County, around 65 miles northeast of the Frio County caches. Sand mining operations and subsequent sand-processing activities led to the discovery of thousands of artifacts of all time periods, but dominated by hundreds of Paleoindian points. Several of the dozens (hundreds?) of Angostura points from the Sand Pit are specimens that resemble the cache artifacts reported here.

For example, the biface illustrated in Figure 8 (about 24 cm long) is almost identical in form to the Frio County caches, and even has the cortex remnant on the base. Some of the obviously finished Angostura points from the Sand Pit are 17 cm or more in length. These specimens, like the excavated one from La Jita, help to provide a broader context for the Frio County caches.

Figure 8. Large biface from Cibolo Sand Pit, Wilson County. The specimen is similar to the Kothmann and Knothole caches. It is 24 cm long and has cortex at the base. Courtesy Dr. Leslie Pfeiffer.

The Veltmann Cache

Finally, we report an even more controversial cache in terms of its cultural affiliations. It comes from Kinney County in the southwestern Edwards Plateau, in the drainage of the West Fork of the Nueces River (41KY154). These were found by C. C. Veltmann in July 1962, during very heavy rains in the West Fork area. The discovery was made from horseback, while gathering livestock, when Mr. Veltmann spotted a wet and shiny piece of "flint" sticking out of the soil. He dug around this with his fingers, trying to dislodge it. He then dug at it with a stick, eventually pulling it out of the muddy soil. Then, he found that it had been placed vertically, with two bifaces of comparable size placed on either side, face-to-face so to speak, and with their pointed ends place down.

The Veltmann Cache (Figure 9) is characterized by bifaces of massive size. We want to emphasize that we obviously do not relate them in any way to the Frio County caches. All three are extremely large bifaces, but are relatively thin and two have cortex on both faces. This means they were chipped from thin slabs of Edwards chert. Seams that yield this sort of thin, slab chert are known to occur in the drainage of the West Fork of the Nueces River.

The first biface is 33.6 cm long and is triangular to roughly lanceolate in outline (Figure 10). There are some red inclusions in the fine-grained brown chert of which it is made, but also evidence that red ochre or hematite had once been smeared over most of the specimen. There is also scattered dulling along the lateral edges and it is especially notable along the basal edge. Maximum width at the base is 19.9 cm. Remarkably, its maximum thickness is only 2.0 cm and most of it is thinner (1.3-1.9 cm).

The second biface (Figure 11) is a large curved specimen, although most of it is parallel-sided. It is

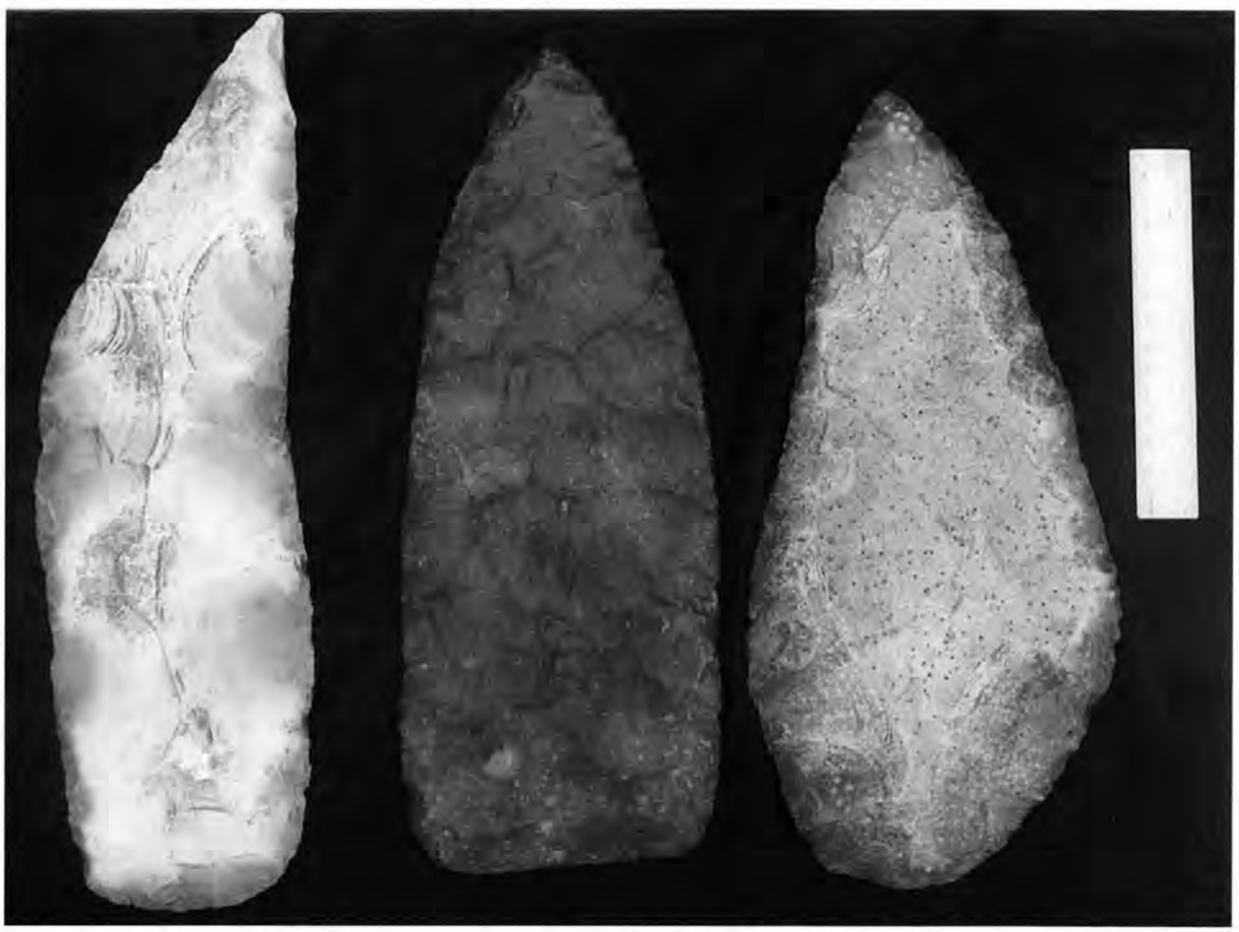

Figure 9. The Veltmann Cache. All three specimens are shown. The scale on the right is 15 cm long.

Figure 10. Specimen 1 from the Veltmann Cache. Scale is 15 cm.

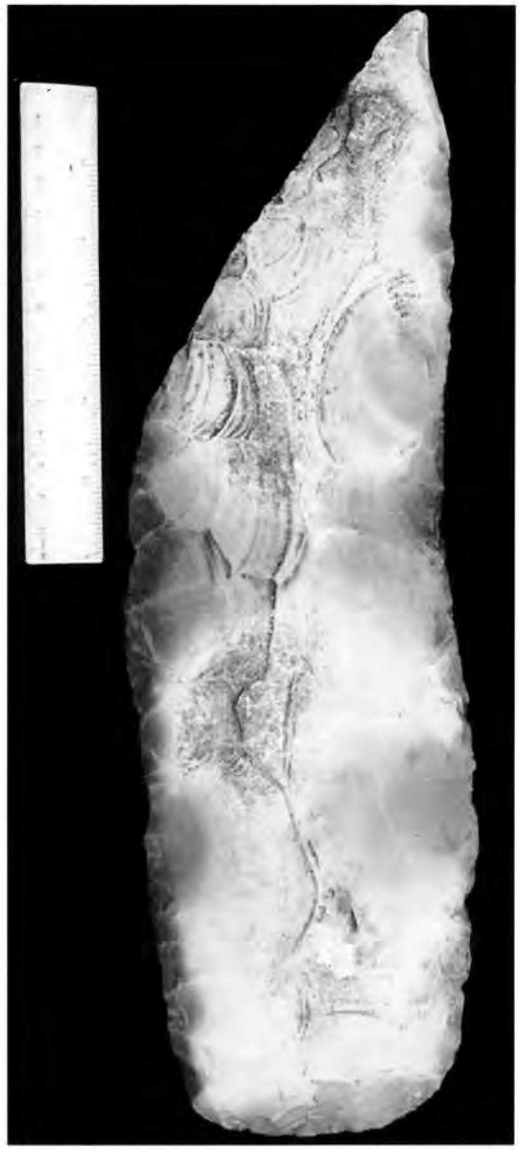

Figure 11. Specimen 2 from the Veltmann Cache. Scale is 15 cm.

made of fine gray chert that is heavily patinated to white in numerous areas. The base is beveled (35 degree angle), probably the result of preparation of platforms for further thinning, and it has two burin facets, struck from the tip. Extensive red ochre residues are found on the cortex on one face. At 36.6 cm, it is a little longer than the first specimen, but is thinner (1.5 cm at the tip; elsewhere, 1.3-1.4 cm). Maximum width is 9.8 cm and the basal width is 9.4 cm. The biface has high glossy polish over all the flake scars.

The third biface (Figure 12) is pointed ovate in form and resembles a typical "quarry blank." It is made of brown opaque chert. Length is 32.1 cm, maximum width is 15.2 cm, and it is 1.9 cm at its thickest point (the rest of the biface ranges between 1.65-1.8 cm in thickness). Like specimen 2, it has areas of heavy polish, along with light, scattered spots of patina.

Both faces have extensive patches of cortex. Of great interest is the area of cortex on one face, near

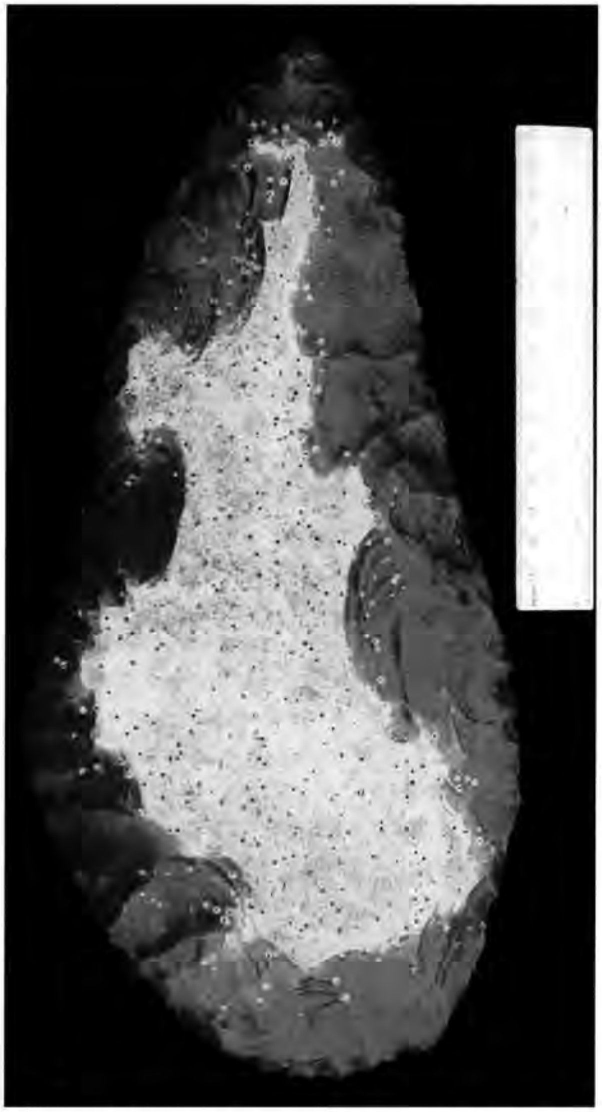

Figure 12. Specimen 3 from the Veltmann Cache. Scale is 15 cm.

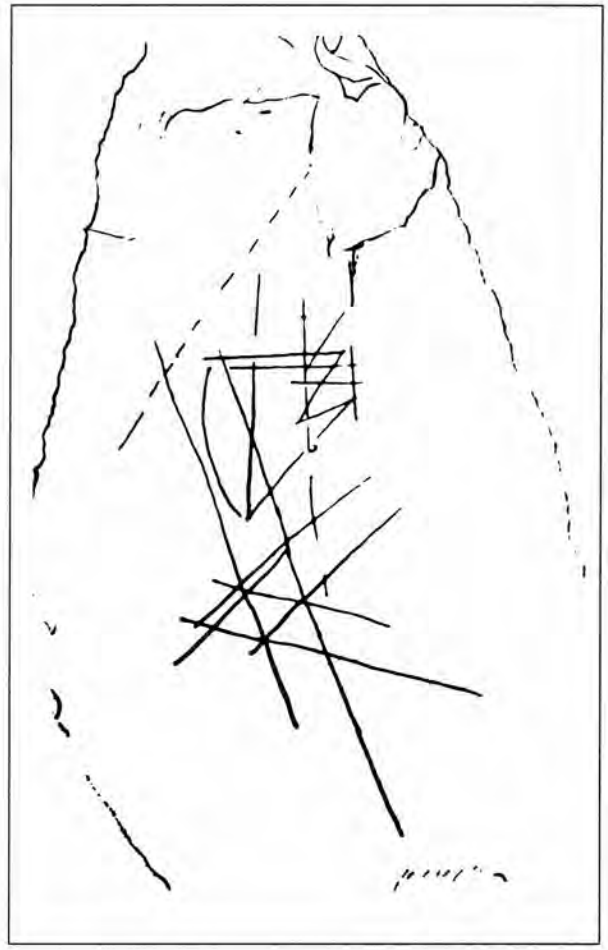

Figure 13. Sketch of engraved lines from Specimen 3 in the Veltmann Cache.The lines are on the distal end of the biface illustrated in Figure 12. Lines are of various length, with the longest about 10 cm.

the distal end, that has numerous faint, but distinct engraved lines (Figure 13). Anyone familiar with the work at the Gault Clovis site in Bell County is aware of the cortex-engraved pebbles of Clovis age found there (e.g., Collins et al. 1992). While this is somewhat similar, Michael B. Collins does not think that the Veltmann Cache bifaces have any distinctive traits of Clovis technology.

It is presently impossible to ascertain the age of the Veltmann Cache. We suggest that it is "early," perhaps early in the Archaic—if for no other reason than it is so very different from other Archaic biface caches on the Edwards Plateau. Other caches have some specimens that are similar in size, but not in technological characteristics. The polish on two bifaces may derive from the specimens having been carried in leather bags or wrapped in hide. It is not from wear. The context of the Veltmann Cache indicates that it was a ritual cache, with red ochre, engraved lines, and the distinctive polish. Though we were hoping to carry out test excavations in and around the cache locale, that proved impossible, as the find-spot is now covered by a paved farm-to-market road.

CLOSING COMMENTS

Biface caches remain a mystery, and as documented in the Lintz and Saner (2002) study of the Hoerster cache, there are several potential interpretations for the creation and placement of caches. Fortunately, many caches have been documented in recent years, and if we can get more information on age and context, it is likely that important patterns of "cache behavior" will emerge.

Based on the present data, we suggest that the Kothmann Ranch and Knothole caches are related to Angostura, and would date ca. 6800 B.C. (Turner and Hester 1993). This attribution is supported by large, similarly flaked bifaces of Angostura affiliation which we have documented here. Interestingly, a large cache of lanceolate bifaces has recently been reported from Wisconsin (Carr and Boszhardt 2003). Known as the Kriesel cache, some specimens are reminiscent of the Kothmann Ranch and Knothole caches. However, they are not as well-flaked and the largest specimens are just under 20 cm in length. The investigators of the cache link it to the Agate Basin type of "Late Paleoindian" times.

We can only speculate that the Veltmann Cache is "early" in the cultural sequence of the region. It is distinctive from the numerous Middle and Late Archaic biface caches that have been previously reported (cf. Miller 1993). While they are not Clovis, based on their flaking technology, the presence of the engraved cortex on one of them may be indicative of considerable antiquity. For example, Collins (1998:151) reports a flake from the Early Paleoindian component at Wilson-Leonard with engraved cortex. It is a trait that we have not seen on other biface caches that we have examined. Regardless of its age, the Veltmann cache appears to have been of ritual nature, given the use of red ochre and the close vertical placement of the large bifaces.

ACKNOWLEDGMENTS

We are grateful to the family of the late Dr. Pat Riley of McAllen, Texas, for their generous donation of his collection, which included the cache reported here, to the Texas Archeological Research Laboratory. Mr. Calame wishes to thank the landowner in Frio County who provided access to the Knothole Cache. Both authors express their deepest thanks to C. C. Veltmann and his wife for their hospitality and cordial cooperation in the study of that cache. Cindy Smyers of Midland brought the Veltmann cache to the authors' attention. Dr. Leslie Pfeiffer of San Antonio is thanked for giving permission to reproduce the illustration of the large Angostura specimen from the Wilson County "Sand Pit."

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The Historic Ranchos at Falcon Reservoir on the Rio Grande

Timothy K. Perttula

ABSTRACT

At least 80 historic ranching sites have been recorded to date on U.S. International Boundary and Water Commission lands at Falcon Reservoir in Zapata and Starr counties, Texas. Despite sustained archaeological and architectural research efforts, our understanding of these early Tejano ranching communities and the lives they led can be enhanced by intensive archaeological study of 18th-20th century ranchos along the lower Rio Grande. These sites, many of which are well-preserved even after as much as 40+ years of inundation, contain direct evidence in the archaeological and architectural record of house construction; the spatial layout, use, evolution, and abandonment of ranches and small communities by the ranching patriarch, his extended family and laborers; the furnishings, material culture, and tools of the ranching families, including goods obtained from Mexican and European markets as well as other goods made locally for local consumption; the building and use of outdoor cooking ovens (hornos) and lime kilns, corrals, dipping vats, and other facilities; the raising, consumption, and marketing of cattle, sheep, and goats; and the participation of local ranchers in local and long-distance markets to obtain necessary goods.

INTRODUCTION

Much has been written about the history of the Spanish Colonial, Mexican, and early Texan (post-1836) periods along the Texas-Mexican border, and the lives of the Tejano ranchers that colonized and settled the north bank of the Rio Grande following Jose de Escandon's mid-18th century colonization efforts in the province of Nuevo Santander (George 1975; Graham 1994; Tijerina 1994, 198; Poyo 1996; Thompson 1997; Alonzo 1998). This heritage is deeply rooted in the many ranching communities and ranchos established along the north bank of the Rio Grande after the mid-18th century, and Tijerina (1998:xx) has noted that "the ranching communities along the lower Rio Grande developed a distinctive identity, noticeably different from the people of interior Mexico."

The 1750 ranching community of Nuestra Señora de los Dolores in northern Zapata County (Figure 1) was "the first settlement in Nuevo Santander on the north bank of the Rio Grande in what is now South Texas" (Thompson 1997:27). The Colonial Hispanic cattle ranching and agrarian communities quickly developed along the Rio Grande on large Royal grants or porciones, and they took on great importance as a major ranching area. By 1830, there were 241 Tejano ranches in the lower Rio Grande region, and this had increased to 356 ranches by 1833 (Tijerina 1994:Table 7).

Only recently, however, has the archaeological and architectural character of Spanish Colonial or Tejano ranching settlements and communities along the lower Rio Grande, or in the Falcon Reservoir area (Figure 2), been a serious research concern (see Boyd 1997; Fleming 1998; Fleming and Perttula 1999; Perttula et al. 1999; McCulloch et al. 2003). The archaeological study of the Spanish Colonial and Tejano cultural heritage on the lower Rio Grande has been hampered to date by limited information from rancho excavations such as those reported by Krieger and Hughes (1950) and Hartle and Stephenson (1951) (Figure 3), and the generally sparse data obtained from the historic sites during more recent reconnaissance surveys, such as the work conducted by Perttula et al. (1996, 1998) when there were record-low water levels at Falcon Reservoir (Figure 4a-b), and the investigations reported by McCulloch et al. (2003) and Parsons and Lopez Garcia Group (2002). At least 80 ranching sites have

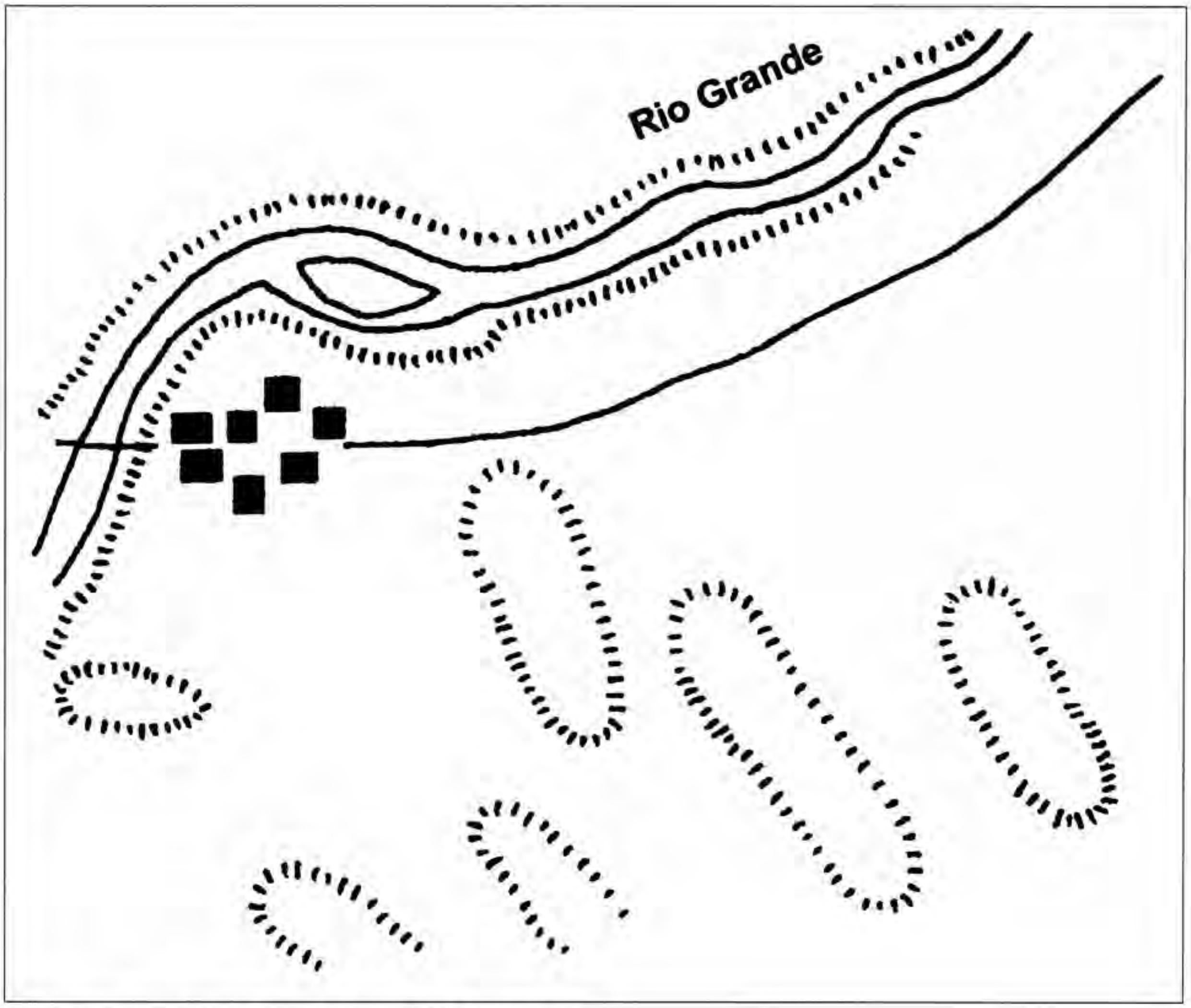


Figure 1. Nuestra Señora de los Dolores, 1757 Cuervo report.

been recorded to date on U.S. International Boundary and Water Commission (IBWC) lands at Falcon Reservoir in Zapata and Starr counties, Texas.

In spite of the lack of sustained archaeological and architectural research efforts, there is no question that our understanding of these early Tejano ranching communities and the lives they led can be enhanced by intensive archaeological study of 18th-20th century ranchos along the lower Rio Grande. These sites, many of which are well-preserved even after as much as 40+ years of inundation, contain direct evidence in the archaeological and architectural record of: (1) house construction, either of stone lajas gathered in an arroyo or along the Rio Grande (Tijerina 1998:23), or of wood, the latter called jacales (see Graham 1997); (2) the spatial layout, use, evolution, and abandonment of ranches and small communities by the ranching patriarch, his extended family and laborers; (3) the furnishings, material culture, and tools of the ranching families, including goods obtained from Mexican and European markets as well as other goods made locally for local consumption; (4) the building and use of outdoor cooking ovens (hornos) and lime kilns, corrals, dipping vats, and other facilities; (5) the raising, consumption, and marketing of cattle, sheep, and goats; and (6) the participation of local ranchers in local and long-distance markets to obtain necessary goods.

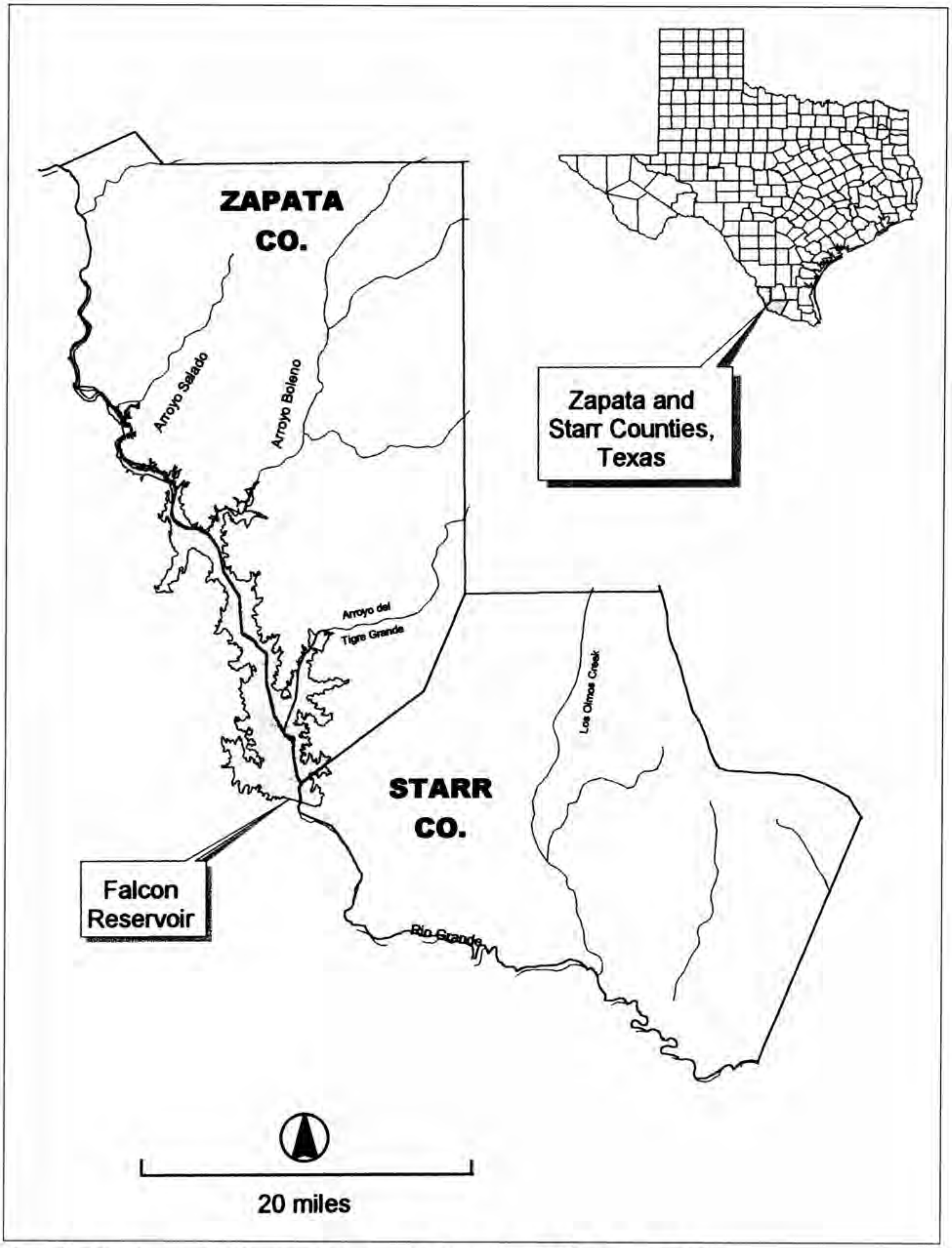


Figure 2. Falcon Reservoir in Zapata and Starr counties, Texas (from McCulloch et al. 2003).

Figure 3. 1950 excavations at a Spanish Colonial rancho (41SR39) in the dam area at Falcon Reservoir.

HISTORIC ARCHAEOLOGICAL AND ARCHITECTURAL SITES AT FALCON RESERVOIR

Some 134 historic archaeological and/or architectural sites, as well as historic era components at extensive prehistoric sites, have been recorded since the early 1950s across the U.S. IBWC lands at Falcon Reservoir in Starr and Zapata counties, Texas. These include small town sites such as Zapata Viejo (41ZP85), Falcon (41ZP92), and Lopeño (41ZP90), ranches or ranchos with stone and wood structural ruins, cemeteries, wells, dipping vats, troughs, quarries, corrals, and engineering structures. These archaeological and/or architectural resources date from as early as the mid-to-late 18th century to as late as 1953, when all ranches and homesteads along this stretch of the lower Rio Grande were abandoned because of the construction of the Falcon Reservoir dam and imminent inundation (McCullough et al. 2003; Parsons and Lopez Garcia Group 2002).

The historic archaeological and architectural ranching sites and communities at Falcon Reservoir "were selected with care, with consideration toward good terrace soil, firewood, shade-trees, and available water" (George 1975:20). The earliest ranches and communities appear to have been situated on alluvial terraces adjacent to low water crossings or fords of the Rio Grande, and on alluvial terraces where a major arroyo enters the Rio Grande valley (Perttula et al. 1999:330). By the mid-19th century, the lower Rio Grande valley in the Falcon Reservoir area had a continuous series of ranch settlements and small communities paralleling, but near the river, laid out on a series of porciones.

The series of maps prepared by the National Park Service in 1996 to accompany the Texas Historical Commission investigations at Falcon Reservoir of historic structures and historic archaeological and/or architectural sites (Perttula et al. 1996) very readily depicts the overall and dense spatial character of the ranching settlements at Falcon Reservoir (McCulloch et al. 2003:Figures 18-29). Most of the named ranches are quite near the 1929 channel of the Rio Grande (in most cases less than 1 km from it), west of the Military Road (old US 83), which the Tejano ranchers obviously drew upon as a

a

b

Figure 4. Exposed stone structures at Falcon Reservoir: a, main stone structure at the Cabaseño Ranch (41ZP79) in June 1996; b, exposure of the La Primavera Ranch (41ZP363), House 2, in June 1996.

source of fresh water. These settlers also had access to rich grassy pasture or vega lands and cultivated plots on the arable soils of the alluvial terraces. It is only in the general area of the town of Falcon (see McCulloch et al. 2003:Figure 28) that named ranches (i.e., Charco Prieto, Jose, and Guerra) had been established that were more than 5 km from the Rio Grande channel; these were also east of the old Military Road. These ranches are likely descendant settlements as the lands were subdivided from the original ranches in those particular porciones.

The earliest ranches contain the sandstone ruins and foundations of ranch structures, hornos or outdoor stone baking ovens, trash pits and bone-filled middens, and extensive trash midden deposits containing Mexican ceramics, locally-made coarse earthenware jars and ollas, and a wide assortment of Mexican and European goods. One such late 18th-early 19th century ranch site was investigated at 41SR43 (Krieger and Hughes 1950). It had four rectangular stone foundation ruins on an alluvial terrace bisected by an arroyo, with an extensive midden deposit along the terrace slopes (Figure 5). Reconstructible coarse earthenware vessels (labeled Mier Plain by Alex Krieger) were found in the midden and structure excavations.

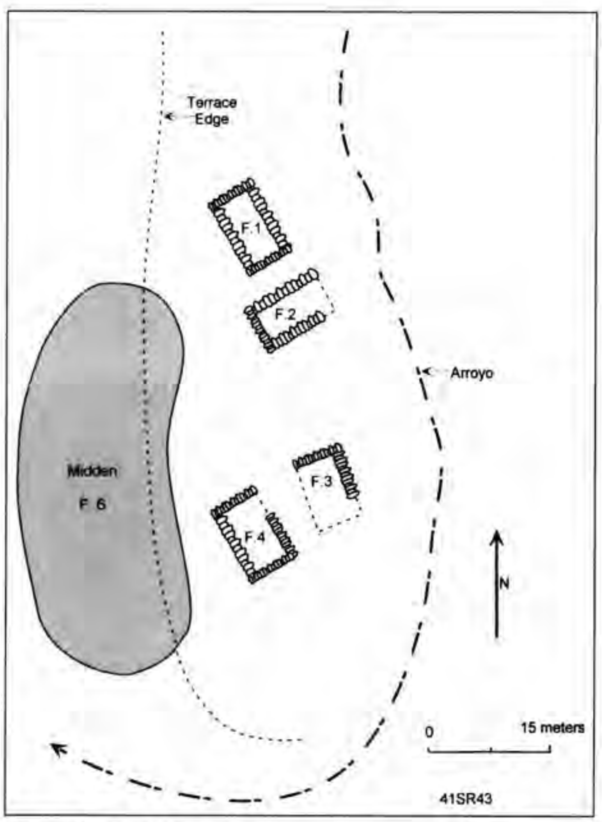
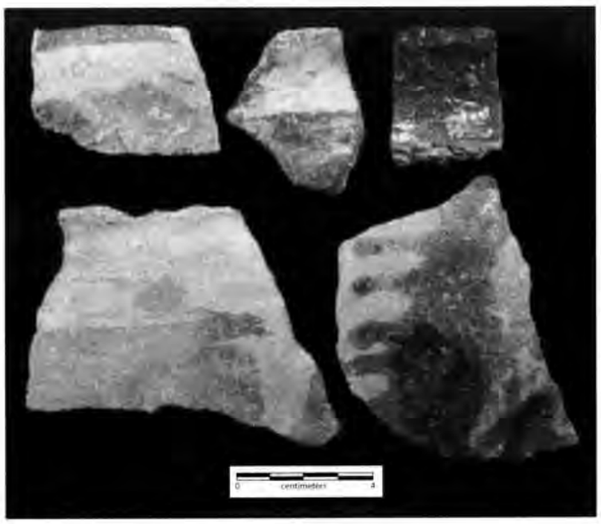


Figure 5. 41SR43 map.

Another early ranch settlement at Falcon Reservoir is Area I at the Cabaseño Ranch site (41ZP79; see Perttula et al. [1999]). This occupation dates from ca. 1775-1800; other areas at the ranch site were apparently occupied from the mid-19th to the early 20th centuries, and they are represented by stone ruins (see Figure 4a), midden deposits, stone rubble piles, a horno and a lime pit, and a wood corral (see Perttula et al. 1998). In Area I, located right along the lowest part of the alluvial terrace and primarily underwater during both 1996 and 1998 investigations, there were the remains of three stone structures and two bone-filled pits. The structures were roughly rectangular, about 6.5 x 4 m in size, and were comprised of uncut sandstone field stones piled in 1-2 courses. They probably represent the foundations to structures that had adobe-covered wood walls and thatched roofs, similar to wood post jacales. The late 18th century artifact assemblage included Mexican majolica from Pueblo, Mexico sources (Figure 6), lead-glazed wares (chocolateras and bean pots), burnished red wares, and abundant coarse earthenwares (Figure 7a-b). The latter were jars, bowls, and ollas, including olive jars, and instrumental neutron activation analysis of several coarse earthenware sherds from the Cabaseño Ranch indicates that most of these vessels were made locally (see Neff and Glascock 2000a,

Figure 6. Late 18th century Majolica sherds from Cabaseño Ranch (41ZP79).

a



b

Figure 7. Coarse earthenwares from Cabaseño Ranch (41ZP79): a, sherds from hand-made vessels; b, lead-glazed earthenwares.

2000b) for local domestic consumption. Perttula et al. (1999:335) note that "the fact that the hand-made earthenwares are so common in a late 18th century context at the Cabaseño site suggests that there was a limited supply of affordable and good quality ceramics. . . available through long-distance traffic with central Mexico, and that the early settlers along the lower Rio Grande needed to also manufacture ceramics for themselves."

Other possibly early ranching sites at Falcon Reservoir, dating to the early-to mid-19th centuries, also have or may have had one to two course-high rectangular stone foundations. At the Santa Rosa Ford site (41ZP302), four such structures were defined (F. 6-

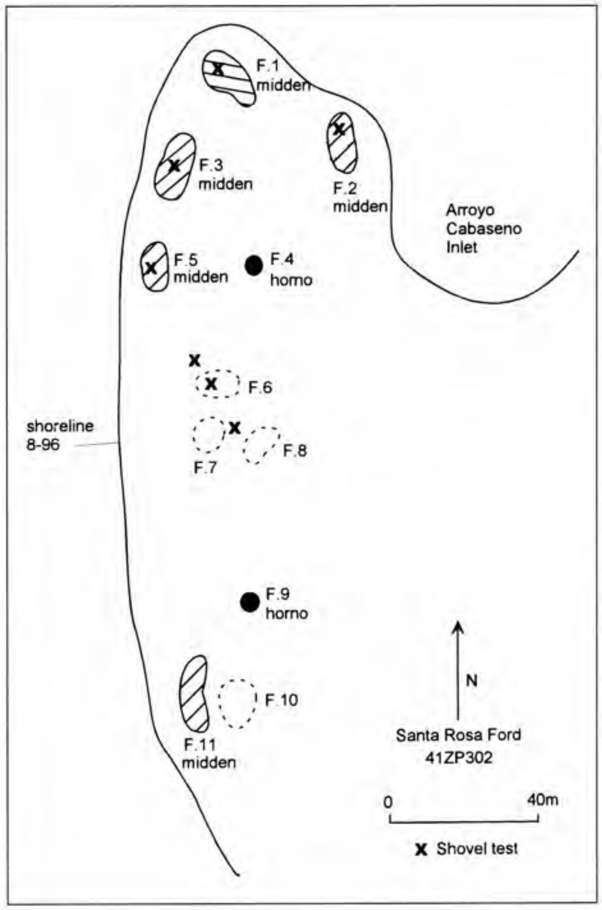


Figure 8. Santa Rosa Ford site (41ZP302).

8, and 10), along with five distinct midden deposits (Figure 8) filled with fragmented animal bones and many ceramic sherds (Figure 9), and two stone hornos. The Santa Rosa Ford site is situated on the northern tip of a Rio Grande alluvial terrace overlooking its confluence with Arroyo Cabaseño. The

Figure 9. Hand-made coarse earthenwares from the Santa Rosa Ford site (41ZP302).

field stone structures are roughly rectangular to square-shaped and perhaps 5 x 5 m in size.

At 41ZP324, north of the Santa Cruz Ranch (41ZP314), only scattered but unmodified sandstone slabs over a 10 x 20 m area hint at the presence of other simple mid-19th century stone and wood structures. To either side of the structure area were two trash middens, along with a blacksmith work area.

Tijerina (1998:23) notes that Tejano ranches in South Texas had different sorts of features and buildings that "were constructed as time and resources allowed." They included the main house made of stone or sillar, often with a patio covered with an arbor-like roof, jacales surrounding the main houses, a stone cooking chimney or fireplace, an outdoor horno, wood corrals, wells, shade-trees, gardens, and flowering vines and shrubs. The main stone house was where the eldest owner or patriarch lived.

Wood enclosures or fences were often built around the ranch yard, and outside the enclosure would be found larger stock wells and corrals, other buildings (such as a store), and family cemeteries. These burial plots were usually no more than "a stone's throw behind the ranch house" (Tijerina 1998:22). Lastly, and downwind from the other ranch buildings, was the matanza or slaughterhouse, usually a table and posts where animals were butchered, and their remains discarded.

As the individual ranches developed and prospered through time, "all of these features could be present, while on a new ranch, the young settlers might live in a one-room jacal, planning to build their casa de sillar in the years to follow" (Tijerina 1998:23). All these features, in various combinations and ages, are present in the historic 19th and 20th century archaeological and architectural sites at Falcon Reservoir. Some of the larger ranches grew into small towns or communities or ranchers, like Falcon (41ZP92), as is discussed below, but they were comprised of the same set of buildings, outbuildings, and ancillary ranch features. The archaeological and architectural remains of ranching sites at Falcon Reservoir generally had between 1-12 structures, either stone and/or wood buildings. Although probably affected by preservation and surface visibility conditions, as well as deterioration over +100 years in the case of many of the sites, most of the recorded Falcon Reservoir sites do not have jacales.

The smaller ranches, with fewer than four single-room structures, also have hornos and/or nearby rock piles, probably the remains of outdoor kitchens. The stone structures were built with both modified and unmodified sandstone rocks or lajas, with the latter apparently most prevalent. At 41ZP301, one of the two stone structures was built of a single course of sandstone with interspersed mesquite wood piers (Figure 10). The kitchens "consisted of nothing more than a fire-place or a stone chimney with a mantle or a shelf for cooking utensils" (Tijerina 1998:39). Trash midden deposits were usually also present downslope from the buildings.

At the Nueva Ranch site (41ZP181), the one stone structure ruin was built of unmodified sandstone lajas. There were also two rock piles, one less than 10 m from the main house, and the other on the opposite side of a wood pen or corral. These are probably the remains of outdoor cooking features.

In several cases at the smaller ranches, at least one of the ranch structures had multiple rooms, as at

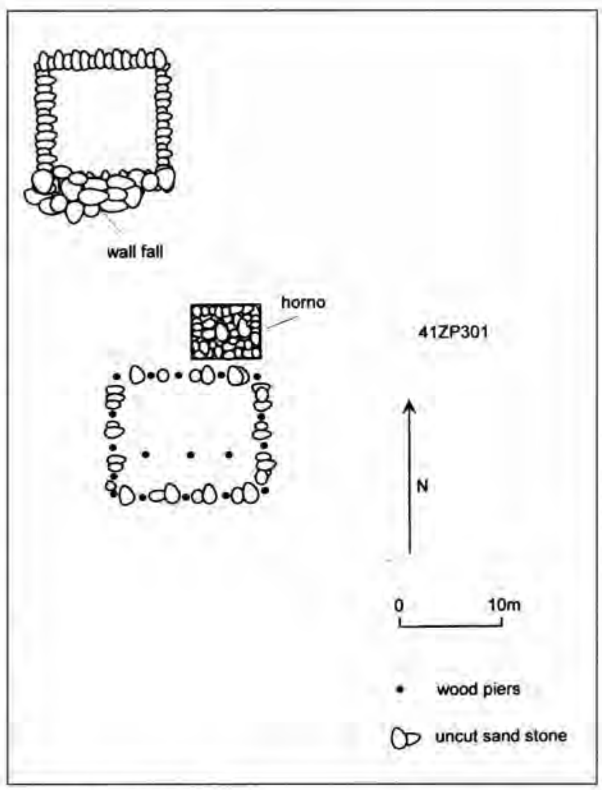


Figure 10. 41ZP301 map.

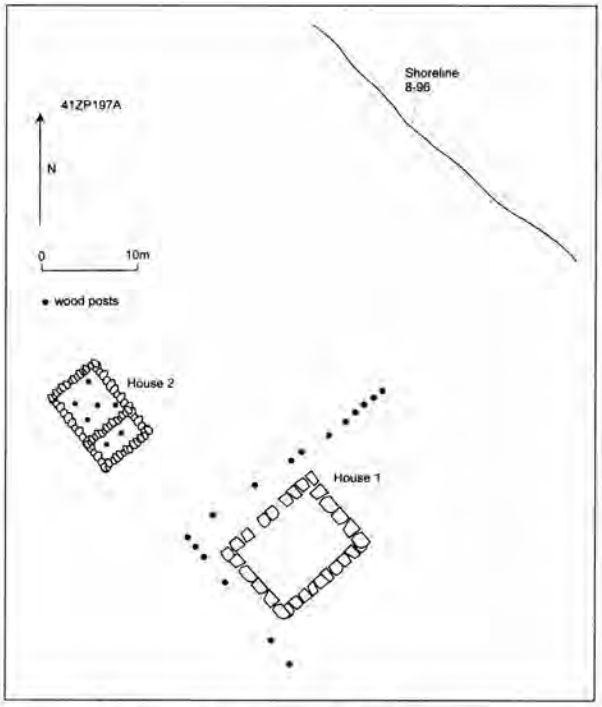


Figure 11. Pete Vela Ranch (41ZP197A).

the late 19th century-early 20th century Pete Vela Ranch (41ZP197A) (Figure 11) and the mid-19th century site 41ZP326 (Figure 12). The earlier ranch had two main and larger houses built of shaped sandstone slabs (F. 1 and 2), and F. 1 had three rooms. There were also two smaller stone foundations built with lajas, as well as a horno, a probable lime kiln or pit (F. 4), and a small circular stone feature (F. 7) that may be an outdoor kitchen or chimney (see Figure 12). At the Pete Vela Ranch (see Figure 11), the main and larger house (House 1) was also built of shaped sandstone slabs, and wood posts on two sides may mark a patio with an arbor-covered roof. The second structure (House 2) had two rooms, with wood posts in both rooms that probably held up a gabled and thatched roof.

The 20th century version of the small rancho at Falcon Reservoir is marked by ancillary facilities such as cattle pens, troughs, and dipping vats, as well as concrete well houses/cisterns; the latter may be 30-50+ m from any of the ranch houses. The basic layout of the ranch features remained the site, with 1-3 stone structures, downwind middens and trash deposits, rock piles, and hornos. The main houses were again built with shaped sandstone slabs, and had one or two rooms.

At the Santa Rosa Ranch (41ZP299), the main house also had concrete steps, and there were two smaller buildings of stone lajas to the immediate west and northwest. A series of wood posts supported the roof of the main house at the Santa Cruz Ranch (41ZP314), and there was a rock pile feature about 15 m northwest of the building; in between the two was a small trash midden deposit (Figure 13). There was also a cattle pen and concrete pad to the north some distance, and a concrete well house to the south of the ranch. The Tepezan Ranch had three stone structures, with a two-room main house built with modified sandstone slabs; it also had wood posts along three sides that probably marked a patio with an arbor-like roof (Figure 14). A smaller stone structure (F. 2) had a chipicil-covered patio. There were extensive midden and trash deposits here, including a bone-filled pit in F. 7, downwind from F. 1, as well as an horno (F. 3), and a third structure, probably an outdoor kitchen, built with unmodified field stones (F. 6). The dipping vat (F. 5) may or may not be related to the rest of the ranch complex, since these

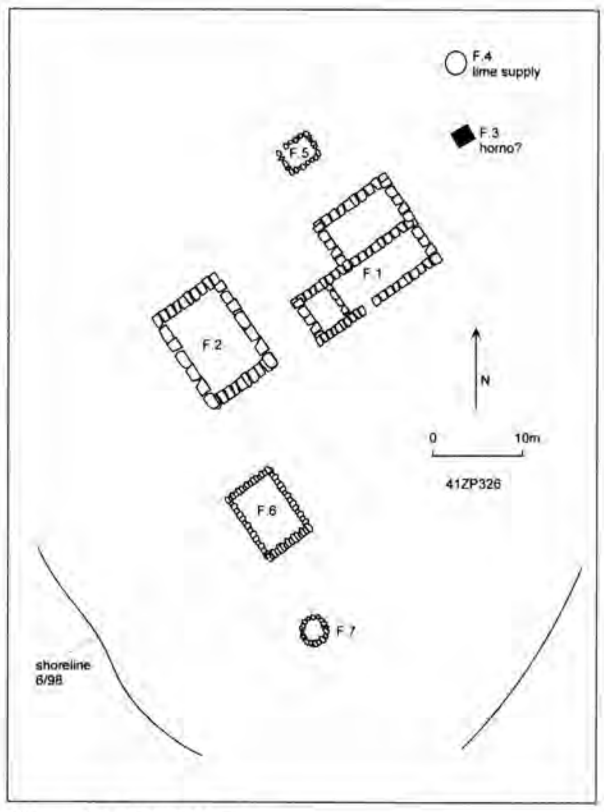


Figure 12. 41ZP326 map.

features were not built and used until the early 20th century, and the majority of artifacts seen at the Tepezan Ranch site appear to date to the mid-to-late 19th century.

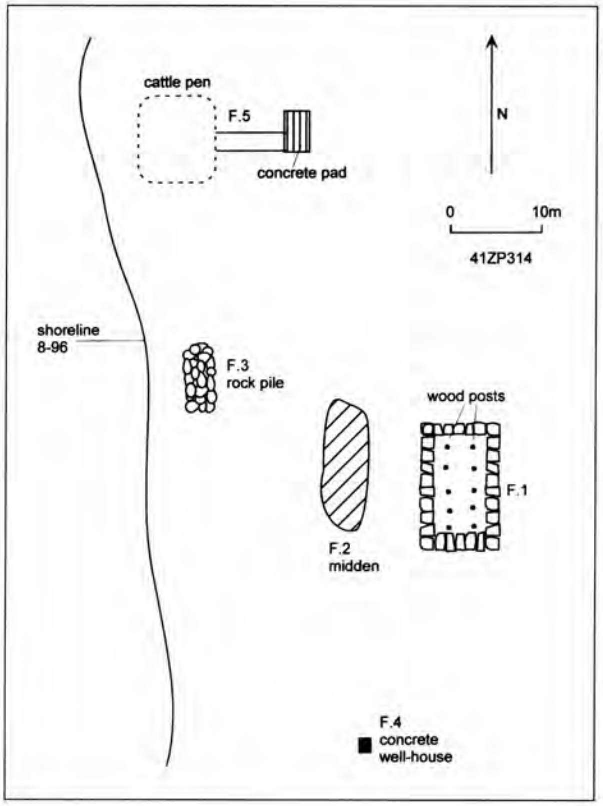


Figure 13. Santa Cruz Ranch (41ZP314).

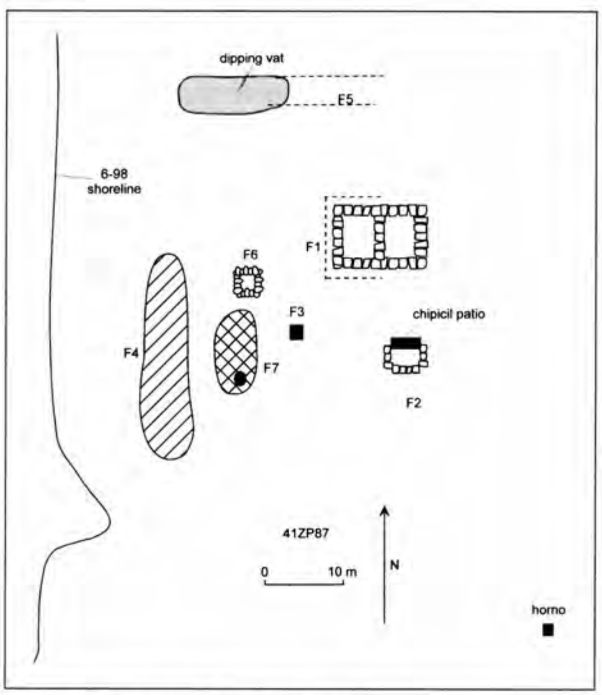


Figure 14. Tepezan Ranch (41ZP87).

Probably two of the more discrete and better-preserved smaller ranch sites at Falcon Reservoir are the eastern component at the Arroyo Loma Blanca site (41ZP316) and 41ZP317. The latter ranch site is immediately north across an inlet from the Arroyo Loma Blanca site.

The Historic European and Mexican ceramics found at the two sites, as well as others at Falcon Reservoir (Figure 15a-b), suggest they date to the mid-19th century (Perttula et al. 1998). In addition to four stone structures built with lajas at the Arroyo Loma Blanca site, one of which may have had two rooms (F. 3), the ranch had a single horno, two rock

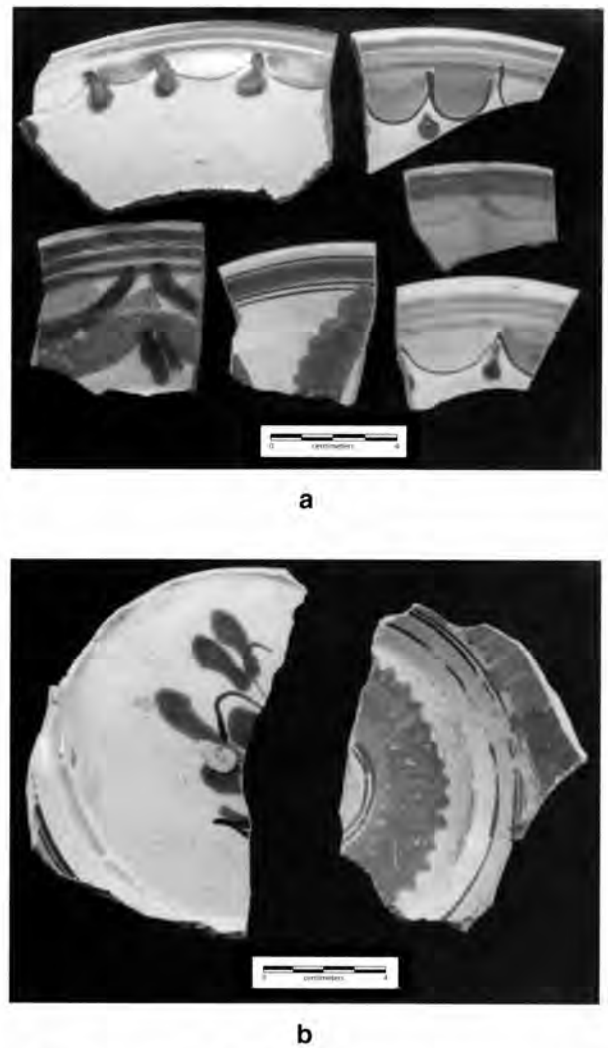


Figure 15. Mid-to late 19th century Guanajuato majolica sherds from 41ZP180: a, rim sherds; b, base sherd decorations.

piles (probable outdoor kitchens), and a large lime kiln (F. 1) (Figures 16 and 17). The stone structures themselves are oriented in the same direction (northwest-southeast) and are roughly equally-spaced, suggesting they were planned and built at the same time, and they may have been occupied by several related families. The largest house (F. 3) may have been the main house at the Arroyo Loma Blanca site. At 41ZP317, all four structures were also built with lajas, and two of them have two rooms. Rubble piles to the east of F. 1 and south of F. 2 may be the remnants of outdoor kitchens or chimneys, and there is a centrally-placed horno between the two multi-room stone structures. The ranch also has a midden deposit along the terrace edge (F. 7), and farther east along the arroyo is a large bone-filled pit (F. 6).

The larger ranch sites (with five or more structures) at Falcon Reservoir, such as Veleño (41ZP41), Uribeno (41ZP83), San Bartolo (41ZP93), and 41ZP422, fall

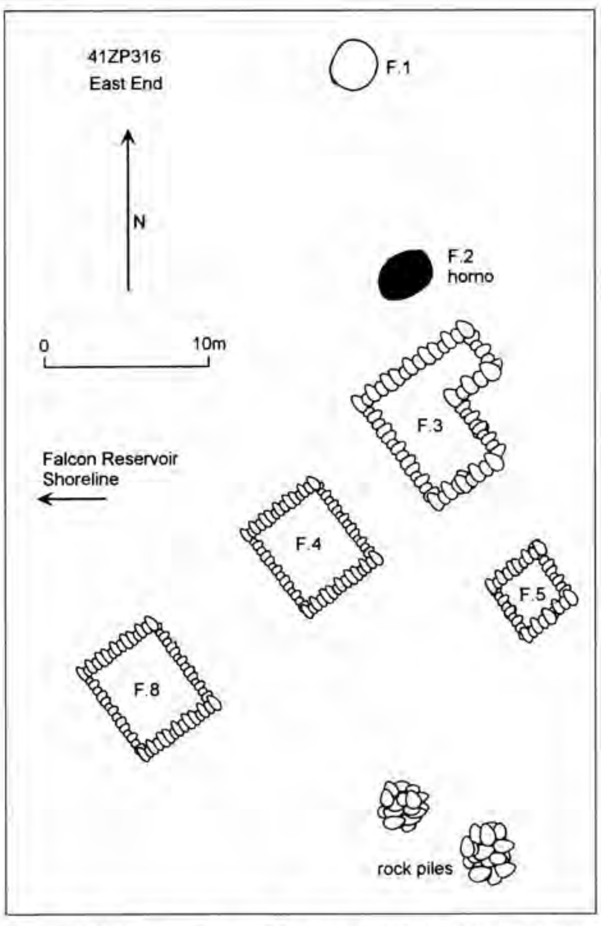


Figure 16. Arroyo Loma Blanca site (41ZP316), east end.

Figure 17. Lime kiln (F. 1) at the Arroyo Loma Blanca site (41ZP316).

into two groups: those ranchos dominated by stone structural ruins, and those with stone structural ruins, jacales, concrete pads, as well as pier and beam structures. Ancillary ranch facilities are also common in this latter group of historic archaeological sites. The temporal evidence suggests that the latter group of sites may represent the most recently occupied Falcon Reservoir ranches; that is, these ranch sites may have been occupied as late as the early 1950s.

San Bartolo Ranch (41ZP93) is one of the larger historic archaeological and architectural sites known at Falcon Reservoir. There are nine structural ruins composed of unmodified sandstone lajas, and two of them have multiple rooms (Figure 18). Structure 1 has five rooms, and is by far the single largest documented stone structure in the project area. There are several hornos in the southeastern and eastern part of the site, and it is interesting that they occur outside of an apparent enclosed or plaza area between Structures 1-5. The existence of this enclosure or plaza, as well as the similar orientation and spacing of the structures, suggests that the San Bartolo Ranch was built following a specific plan for the layout of buildings and work areas. Extensive trash deposits are present along the downwind and terrace edge in Areas A and B (see Figure 18).

Larger ranches at San Rafael Ranch (41ZP86) and Pineño Ranch (41ZP294) each have five single-room stone structural ruins/foundations, and they are dominated by a large main house built with modified sandstone slabs (Figure 19). The other four structures at San Rafael are constructed of lajas, and one has a chipicil-covered floor (F. 3). A rock pile between the

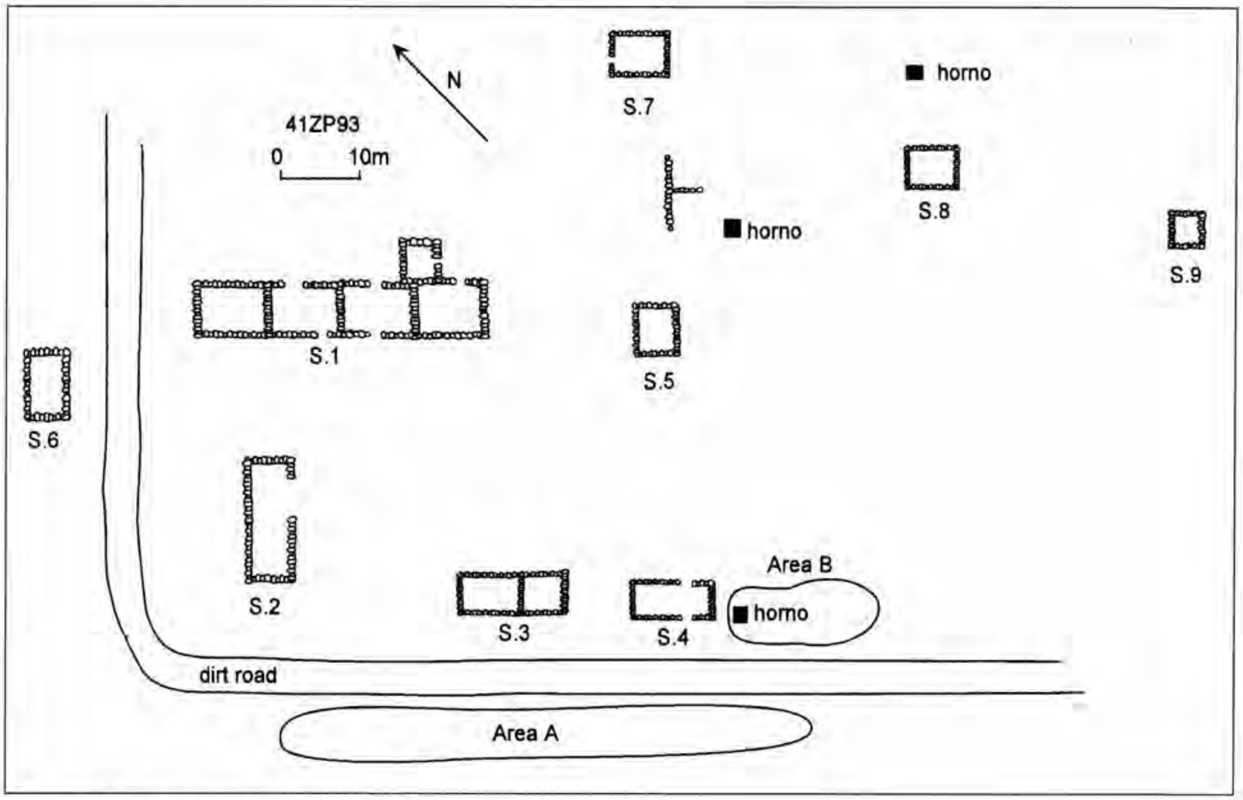


Figure 18. San Bartolo Ranch (41ZP93).

main house and F. 3 may be the remains of an outdoor kitchen. The artifact concentration/trash scatter is downwind, along the terrace slope. All the structures at Pineño Ranch were partially submerged when they were documented in August 1996 (Perttula et al. 1996:39), and little information is available on the structures themselves or any associated archaeological deposits. Four of the five structures were built using modified or shaped sandstone slabs, and there was a stone horno near F. 5. Feature 1 was a 25 x 40 m structure, with a chipicil-covered floor in one corner.

The Clareño Ranch (41ZP89) also had five single room stone structures, each constructed with shaped or modified sandstone slabs (Figure 20). The structures are aligned from north to south along the crest of a Rio Grande alluvial terrace, and the principal structure (House 4) has stone bollasters at the northeast and northwest corners (Figure 21). One of the structures had preserved cypress beams from the roof superstructure; other historic structures at Falcon Reservoir are known with preserved cypress beams (James Boyd, 1996 personal communication). The bald cypress is a long-lived tree that is ideally suited

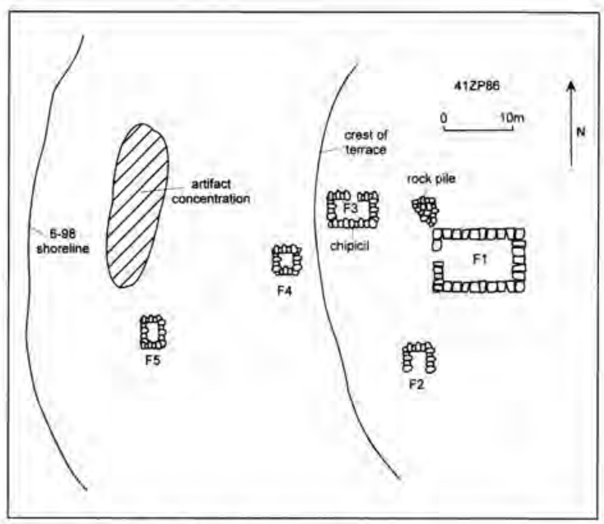


Figure 19. San Rafael Ranch (41ZP86).

for dendrochronological or tree-ring studies extending back several hundred years (see Stahle et al. 2000), and bald cypress trees have been recently examined for paleoenvironmental reconstructions in Tamaulipas and other parts of Mexico (Stahle 1998; Stahle and Cleaveland 1993). Should well-preserved tree rings

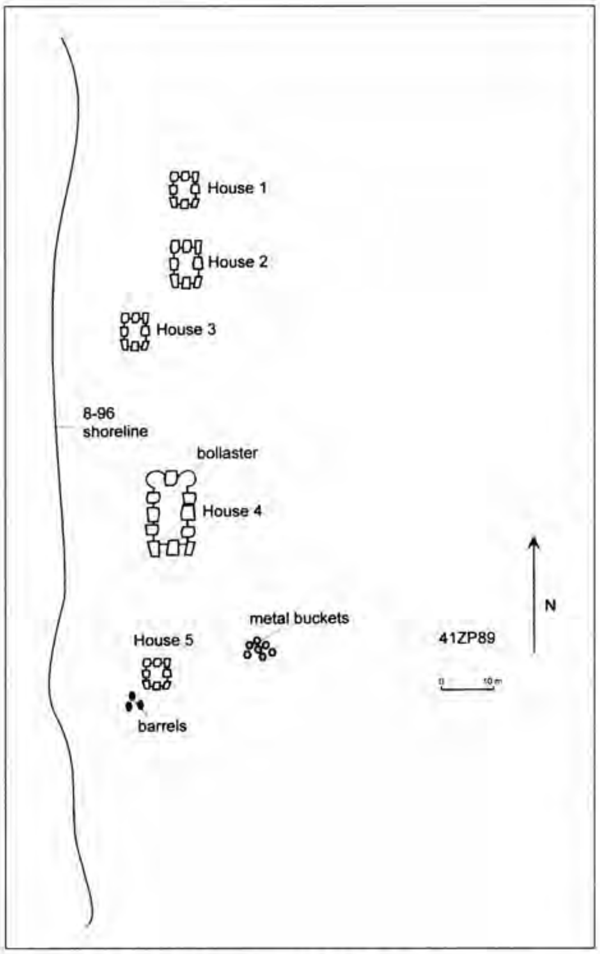


Figure 20. Clareño Ranch (41ZP89).

Figure 21. Bollasters on House 4 at the Clareño Ranch, June 1996.

remain in the Clareño Ranch roof beam, and if the tree was cut in the 19th century, then there is considerable potential to establish a tree-ring reconstruction of past climates specific to the Falcon Reservoir area (cf. Boyd and Perttula 2000).

At the Guadalupe Ranch site (41ZP300), there are three different clusters of structural ruins, as well as ancillary ranch facilities (cistern and trough) at the northern end of the site. It is very likely that each cluster of structures may not be related either temporally or spatially, and thus the site overall is a palimpsest of three different ranch occupations (Figure 22). The northern and southern structure clusters have four buildings, constructed with either cut or unmodified sandstone slabs; as with most of the other Falcon Reservoir ranchos, the structures built with cut or modified stones are larger than those built with unmodified stones. The southern structure cluster also has a stone horno (see Figure 22). The middle structure cluster is the most recent, certainly dating to the early part of the 20th century (if not later), based on the one pier and beam structure and a second structure with two concrete pads and a wood post patio (see Figure 22). Between these two is the main house for this cluster, a small stone building with modified sandstone slabs. Just to the north of it is a small midden deposit. The southern and eastern parts of this 20th century ranch component are

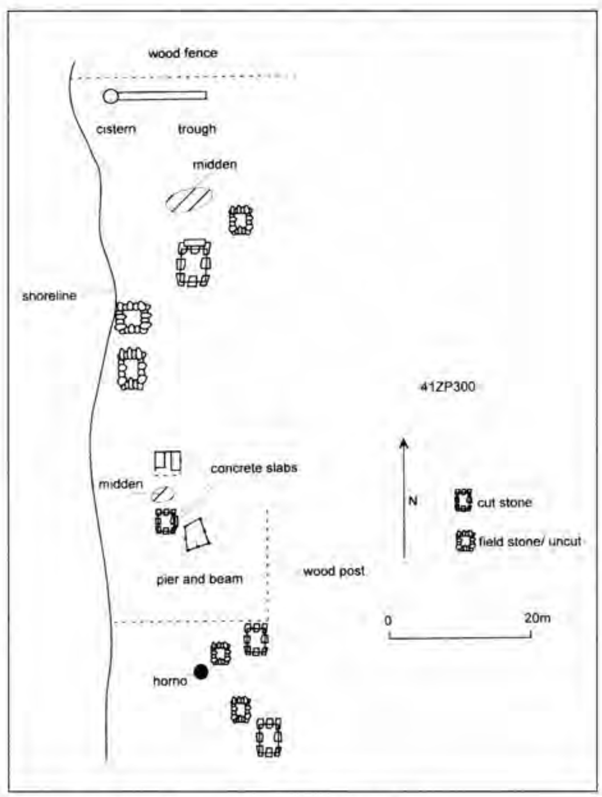


Figure 22. Guadalupe Ranch (41ZP300).

enclosed by a wood post fence. The wood post fence along the north side of the cistern and trough at the northern end of the Guadelupe Ranch may mark a porcion boundary.

Archaeological work reported by Perttula et al. (1996, 1998) noted the distinctive jacal or wood structure at seven Falcon Reservoir sites. During the 1996 investigations reported by Perttula et al. (1996), Eugene George initially noted the remnants of these wood structures by pointing out collapsed rectangular piles of ocotillo wood pieces. Graham (1997:296-297) considers the jacal to be "a rectangular-shaped vernacular dwelling, consisting of four corner posts (horcones) embedded about eighteen inches in the ground at the bottom and forked at the top to hold the roof supports (vigas). Between these upright corner posts were smaller intermediate posts (puntales) also buried a few inches in the ground. Horizontal poles (testeras) were fastened at intervals to the inside and outside of the upright posts, and these horizontal poles formed a framework which held the wall materials in place." Such structures were common at one time in South Texas, and may well have been the first kind of buildings constructed in the lower Rio Grande area when it was initially settled in the mid- and late 18th centuries. They had thatched roofs, dirt floors, and clay or lime-plastered walls (Tijerina 1998:32-33), and generally ranged from 2.5 x 4 m to 3 x 6 m in size, depending upon if they were built as one-room or two-room structures (Figure 23).

Of the seven Falcon Reservoir historic ranch sites with jacales, only one, La Libertad Ranch (41ZP327) did not also have stone structural ruins. The others do, along with ancillary ranching facilities, including animal pens, fencing, well house, cistern, and a corral. As a group, these seven sites probably were occupied from the mid-19th century to the mid-20th century, but the most intensive occupation is thought to have occurred during the early to mid-20th century. La Libertad Ranch has seven jacales, two pier and beam structures, and another structure with a concrete and chipicil pad or foundation (Figure 24). One of the larger jacales has two concrete pads (F. 3). There are no hornos or outdoor kitchen features, suggesting a significant change in the processing and cooking of foods on the ranch compared to other Falcon Reservoir sites; there is no evidence of a

Figure 23. Abandoned jacal at 41SR48, dam area at Falcon Reservoir, 1950 photograph by Jack Hughes.

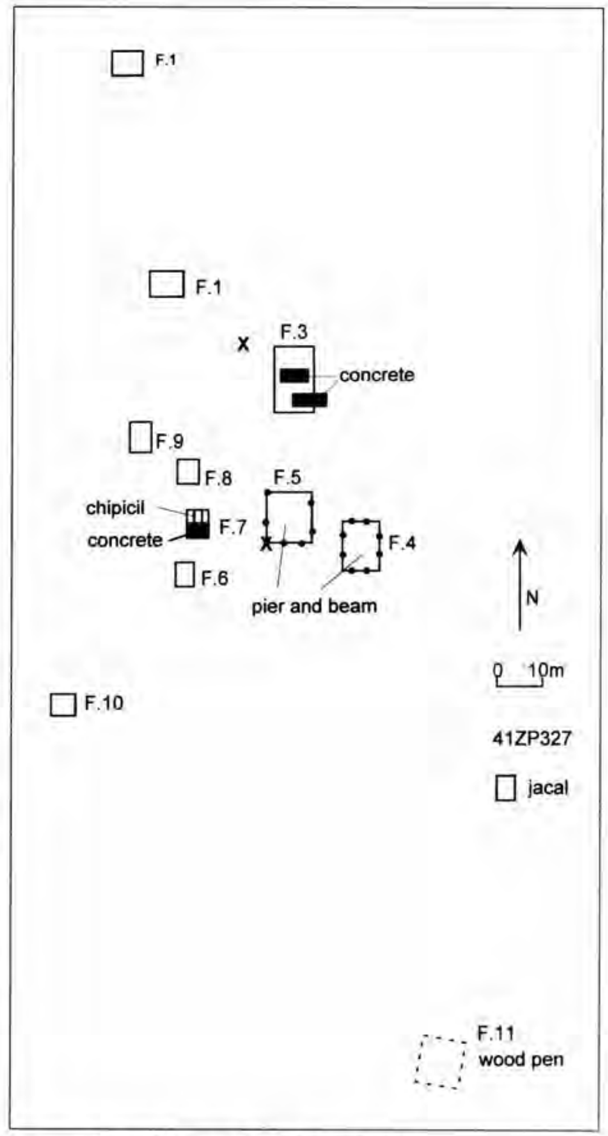


Figure 24. La Libertad Ranch (41ZP327).

stove in any of the buildings (cf. Tijerina 1998:39). The ranch also has a wood pen, but it is well south of any of the ranch buildings.

A small and seemingly self-contained ranch at 41ZP197B, probably related to the Pete Vela Ranch, had one stone structure (F. 1) and a single jacal. The stone structure was constructed of unmodified field stones or lajas. A cistern or well had been constructed to the immediate northeast of the stone ruin, and there was a stone horno about 15 m west of F. 1. The ranch also had a wood corral.

At Soledad Ranch (41ZP80), the complex was dominated by a large stone structure (F. 1) with concrete steps; it had been built using cut or modified sandstone slabs (see McCulloch et al. 2003:Figure 53). To the west and northwest a short distance were two wood (pier and beam) structures with chipicil floors and/or patios (F. 5 and F. 6), and between them was an horno. To one side of the main ranch house was a small jacal (F. 2) and a second horno, both near a wood fence and an animal pen. A stone pile near the northeastern corner of F. 1 may be the remains of an outdoor kitchen or cooking area. About 30 m north of the ranch buildings is a second wood post animal pen (F. 8).

Stone, wood, and concrete structure ruins and foundations are scattered along an alluvial terrace of the Rio Grande at Las Lajitas Ranch (41ZP88). The structures are oriented to parallel the northwestern-southeastern direction of the terrace and the Rio Grande channel (Figure 25). There are six stone structures, two of which (F. 1 and F. 5) had two rooms; the others are single-room buildings. Feature 1 also had wood posts interspersed with the cut stone foundation. In addition to the regularly-spaced stone ranch buildings along the terrace, there are two other more recent buildings with concrete slabs/foundations, and two jacales (F. 2 and F. 3). One jacal is round, and there is an adjoining lime slab. In this same area is one horno, and then immediately downwind is a trash midden deposit (F. 12).

The rancho at 41ZP180 also has a round or circular jacal (F. 12), perhaps some sort of outbuilding rather than an occupied structure, as well as three rectangular jacales; two have ocotillo posts, and one (F. 10) appears to have been divided into two rooms (Figure 26). The jacales are at the northern and eastern

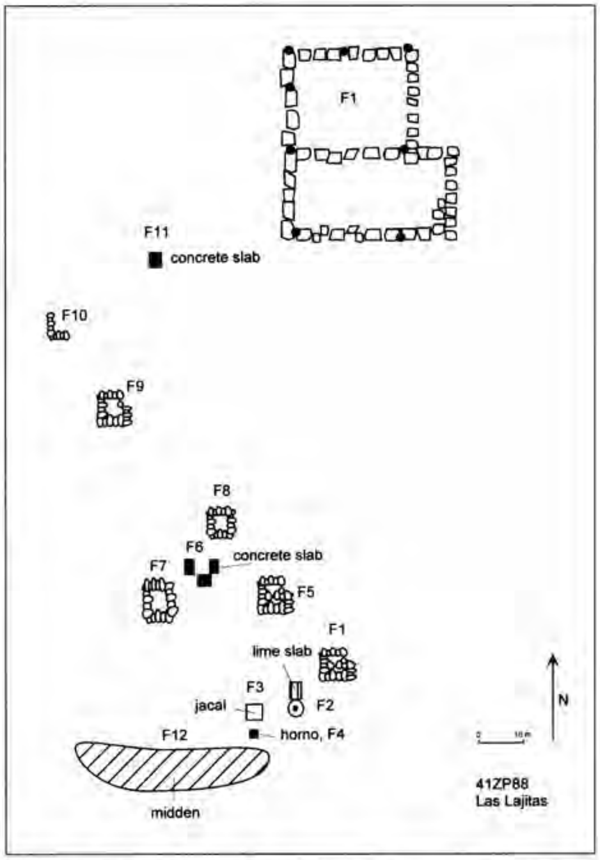


Figure 25. Las Lajitas Ranch (41ZP88); note the blow-up version of Feature 1 (F1) to show interior stone and wood construction details.

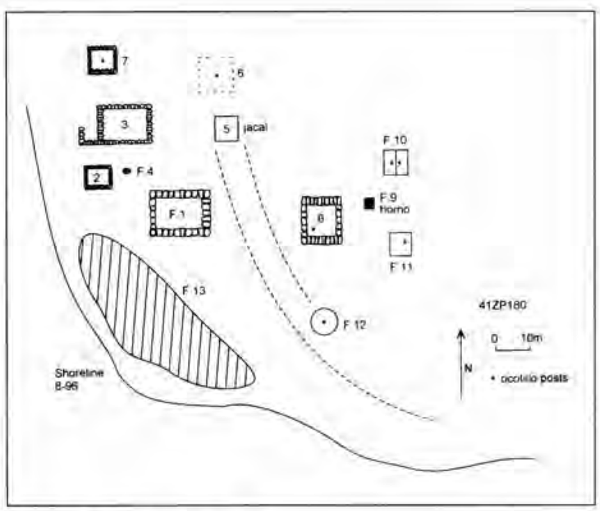


Figure 26. 41ZP180 map.

parts of the ranch, outside two parallel sets of wood post fence. An animal pen is in the same area (F. 6). The inhabitants of the F. 10 and F. 11 jacales may have shared a stone horno. It is interesting that one of the five stone structures (F. 8) at 41ZP180 is east or "outside" of the wood post fencing, and amidst the series of jacales. If it is associated with these wood structures, then it was probably the main house for this part of the ranch complex. It is about 30 m east of a second set of structures (F. 1-3 and F. 7), but all of these are built of stone. F. 1, the largest and constructed with cut or modified sandstone slabs, is the principal house in this part of the ranch, and may have been the main ranch house at 41ZP180. The other three structures were built with unmodified field stones. There is a bone-filled pit near F. 2, and a large midden deposit immediately downslope and downwind from F. 1 that has many majolica sherds made in Guanajuato, Mexico (see Figure 15a-b).

At 41ZP296, the 20th century rancho is dominated by one multi-room stone structure with two rooms (F. 5) and a wood post patio with an arbor-like covering. About 10 m to the northeast of the main rancho structure is a single room jacal (see McCulloch et al. 2003:Figure 56), and on the other side are two trash dumps (F. 4 and F. 7). The most recent structures in the ranch complex are two concrete slab foundations, and nearby is a concrete well house. The Santeneno Ranch (41ZP298) has a diverse range of structures spread out along more than 200 m of a Rio Grande terrace, defined both north and south by westward-draining arroyos. Artifacts noted on the site suggests that the ranch may have been occupied as early as the mid-19th century (see Perttula et al. 1996:Table 7), and it probably was continuously occupied through the early part of the 20th century (i.e., 1929, if not later).

The large rancho has six stone structures, seemingly divided into three clusters with two structures apiece (see McCulloch et al. 2003:Figure 57). Two (in the northern and central structure clusters) were built using cut or modified sandstone slabs, while the others were built with lajas. Each of the clusters has at least one midden deposit, and the northern and southern structure clusters also had hornos and 1-2 jacales. The northern structure cluster also had two trash pits and two other buildings with chipicil slabs; one of these buildings had a vertical slab border, and the other had wood piers. In the southern structure cluster, the main ranch house had a chipicil slab covering half the floor, suggesting it may have been partitioned into two rooms, as well as a wood post patio and arbor-like covering. The patio faced west, towards the Rio Grande. The fairly recent age of the larger stone structure in the central structure cluster is suggested by a cinder block slab along the northern wall of the building.

Lopeño (41ZP90) is considered here to be a small town in the Falcon Reservoir area, primarily because it had a small store or comisaria (F. 1), as well as evidence for several roads along which structures had been built. In actuality the archaeological and architectural remains there can just as readily be seen as part of a very large ranching community that grew up at this crossing of the Rio Grande. The road leading to the crossing appears to have been in the vicinity of F. 5, F. 6, and F. 7, in the northern part of Lopeño.

There are more than 20 structures at Lopeño, and they occur in at least two different clusters along two different alluvial terrace landforms (see McCulloch et al. 2003:Figure 58). In the case of the "Lopeño Island" cluster, a number of structures were partially submerged but still visible in August 1996, but it is possible that there are other smaller structures present on this alluvial terrace.

The northern and east structure cluster stretches for more than 300 m along north-south and east-west roads, with the comisaria at the far northern end of the site. There are four rectangular stone structures, each constructed with lajas, five different concretion pads or foundations, and one structure built with cinder blocks (F. 10). Two of the concrete pads (F. 8) are enclosed by a wood post fence, and they are probably part of a single residential compound. Behind two of the stone ruins (F. 5 and F. 6) is a trash midden deposit (F. 4) and a concrete well (F. 3).

The western structure cluster at Lopeño parallels the 1929 channel of the Rio Grande, and extends more than 450 m from north to south. There are 12 stone structural ruins here, including six large structures that were built with cut or modified sandstone slabs (Figure 27). Two of them (F. 19 and F. 28) appear to have been two-room structures, and may have been main houses in this part of the ranching community. There is a single jacal (F. 21) near F. 19, and the two may be spatially related, and

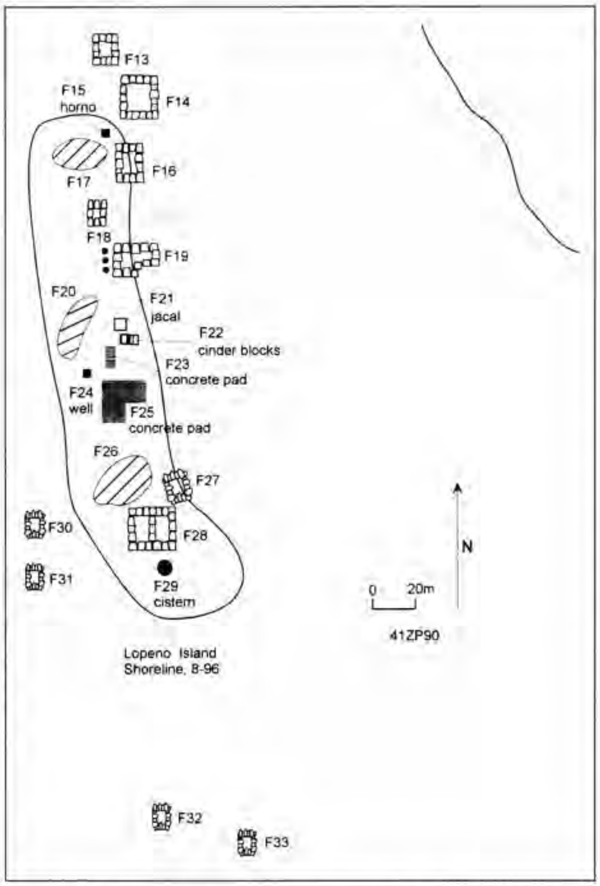


Figure 27. Western cluster of structures at Lopeño (41ZP90).

the two of them also related to several structures 20-40 m to the south. Other structures, of more recent age, are marked by concrete pads (F. 23 and F. 25) or cinder block ruins (F. 22). The concrete pads, cinder block structure, and the one jacal seem to be grouped together in the central part of the "Lopeño Island" structure cluster, along with a trash midden deposit and a concrete well (F. 24). Perhaps these represent one ranching complex, along with the F. 19 main house, within the Lopeño community. Furthermore, smaller structure and feature groups on "Lopeño Island" can be defined in proximity to the other larger cut or modified sandstone ranch ruins. At the southern end of the structure cluster is a grouping of one large stone structure (F. 28), a smaller stone structure built with lajas (F. 27), a midden deposit (F. 26), and a concrete cistern (F. 29) (see Figure 27). Another grouping is at the northern end of the structure cluster, and is comprised of three stone structure ruins (F. 13, F. 14, and F. 16), a midden deposit (F. 17), and a stone horno (F. 15). The partially submerged structures represent other distinct structure and/or feature groups at Lopeño, each probably with their own history of construction, settlement, and abandonment.

The town and ranching community of Falcon (41ZP92) began ca. 1781 on a porcion granted to Jose Eugenio Ramirez. The community was named after his wife's family, a prominent family from the Matamoros area in Tamaulipas, Mexico (Tijerina 1998:5). According to George (1975:53) and Tijerina (1998:38), by 1800, Falcon had more than 100 family members and workers living there, as well as its own chapel, school, and six business establishments. The 1929 USGS topographic quadrangle indicates 29 structures in the community, and the community was occupied until the mid-1950s.

More than 30 stone structural ruins have been recorded at the site of Falcon, including the structures recorded by Perttula et al. (1996) and those recorded at a higher elevation by McCulloch et al. (2003) (Figure 28). The structures are oriented along a series of north-south and east-west roads through the town. Based on a comparison with the 1929 USGS topographic quadrangle, only a por-

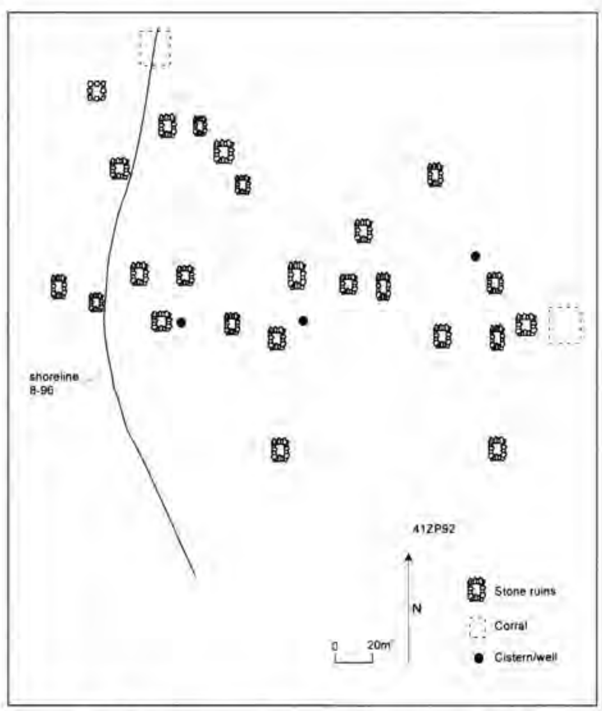


Figure 28. Structures at the town of Falcon (41ZP92).

tion of the town or ranching community has been explored archaeologically, but it also appears to be the case that some of the structural ruins that have been recorded may have already been abandoned by 1929, while others may have been constructed only after that time.

CONCLUDING COMMENTS

I have barely scratched the surface in this narrative of the archaeological and architectural character of 18th-20th century ranchos and settlements on the lower Rio Grande at Falcon Reservoir, but I hope that what has been presented here will be intriguing to those readers interested in the history of the Texas-Mexico border. Much remains to be done to better understand and document the ranching heritage in this part of Texas and northeastern Mexico, including (1) further archival research to identify the locations of land grants, land owners, and probable construction dates for the stone structures found in the reservoir; (2) additional archaeological survey investigations to plot the distribution in space of all ranchos and ranching communities along this part of the Rio Grande; and (3) more detailed archaeological and architectural studies of ranchos of different ages to tell the unique story of the colonization, settlement, and development of Tejano ranching communities along the lower Rio Grande.

ACKNOWLEDGMENTS

I would like to thank Nancy Reese for preparing the various maps of structures and features from the Falcon Reservoir historic archaeological and architectural sites. I also appreciate the assistance rendered by James Boyd, Bo Nelson, and Sergio Iruegas, and others too numerous to mention for the 1996 work, in the investigation and documentation of these Tejano sites in 1996 and 1998. Finally, thanks are extended to Samuel D. McCulloch for permission to include revised sections from a recently published report (McCulloch et al. 2003) on work done by Archaeology Consultants, Inc. at Falcon Reservoir.

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A Clovis Polyhedral Blade Core from Northwest Victoria County, Texas

William W. Birmingham and James E. Bluhm

ABSTRACT

We document a polyhedral blade core from northwest Victoria County, Texas. The core exhibits traits that are typical of Clovis lithic technology and is the first such specimen to be reported from the Texas coastal plain.

INTRODUCTION

A large polyhedral blade core (Figure 1) was found by James DeYoung of Victoria in the Coleto Creek drainage, at the bottom of a dry gully that runs west a mile into the creek. The area gently slopes west toward Coleto Creek, and is intermittently covered with live oak, post oak, anaqua, hackberry, mountain laurel, brazil wood, and persimmon trees, along with brush and grasses.

We obtained permission from the landowners to visit the spot where the core was found, accompanied by Mr. DeYoung. No other artifacts were found and the core appears to be an isolated find. A GPS reading was taken and a site survey form was filed with the Texas Archeological Research Laboratory; the number 41VT140 was assigned to the locale. At a later date, we intend to profile the gully wall and floor in hopes of finding the source of the core.

Numerous sites dot the east bank of Coleto Creek, variously dating from Late Prehistoric, Archaic, and Paleoindian periods. The nearest that Clovis points have been found are at the Johnston-Heller (41VT15; Birmingham and Hester 1976) and Bird Point Hill (41VT34) sites on the Guadalupe River, some 4.25 miles east of where the blade core was recorded.

ARTIFACT DESCRIPTION

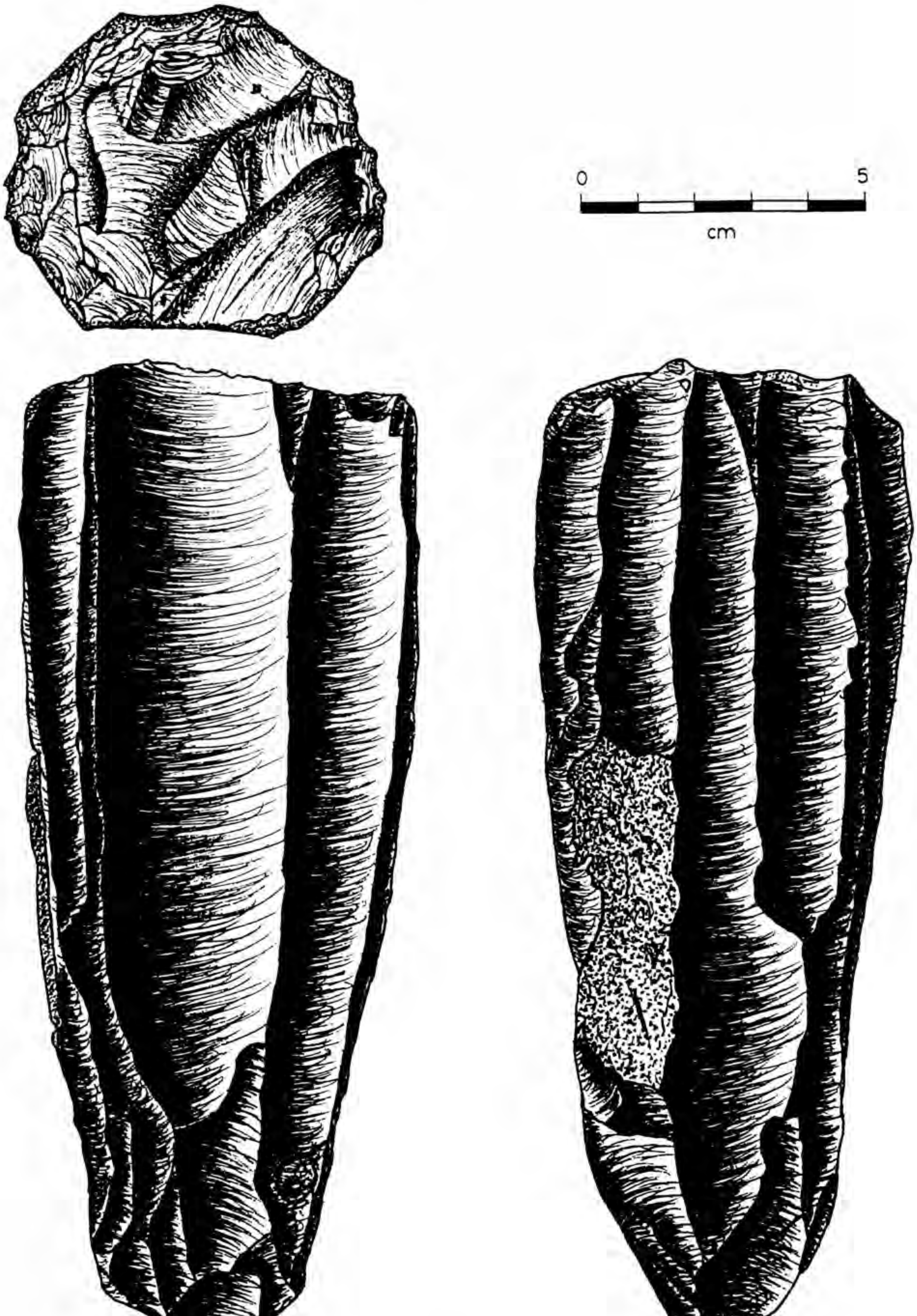
The line drawings of the core show the top view of the platform and four side views in clockwise rotation (Figure 1). The core is made of mottled, medium brown, chert with a small section of white cortex. Ultra-violet (black light) inspection shows the core to be pumpkin orange, indicating an Edwards chert source (Michael B. Collins, personal communication).

The platform maximum width is 70 mm and the minimum width is 63 mm. The platform shows numerous flake removals and edge trimming during its use span. The remnant of what probably is the original platform can be seen in the center of the platform. All percussion negative bulbs, from blade removal, were removed by trimming in preparation for the next blade removal, including the last blade to be detached. The distal end shows removal of flakes in the reverse direction, done in order to straighten the core face, to reduce curvature of the blades being removed, and to remove hinges where the failed blade removals terminated. The length of the core is 182 mm and its weight is 1052.3 grams (2.32 lbs.). It has 11 facets, the longest being 168 mm and the widest being 35 mm.

DISCUSSION

The Victoria County blade core is the first of the typical polyhedral Clovis cores to be found on the coastal plain (see Collins 1999). Furthermore, it appears to be the longest such core that has been recorded in Texas, although it is very similar in size to a core that was recovered from the Gault site (41BL323) in Bell County (Michael B. Collins, personal communication). The Victoria blade core is distinctively similar in shape and technology to many of the Clovis blade cores that have been documented in Central and south central Texas (Collins 1999:53-57).

Although no other Clovis polyhedral cores have yet been found in the Victoria area, there are many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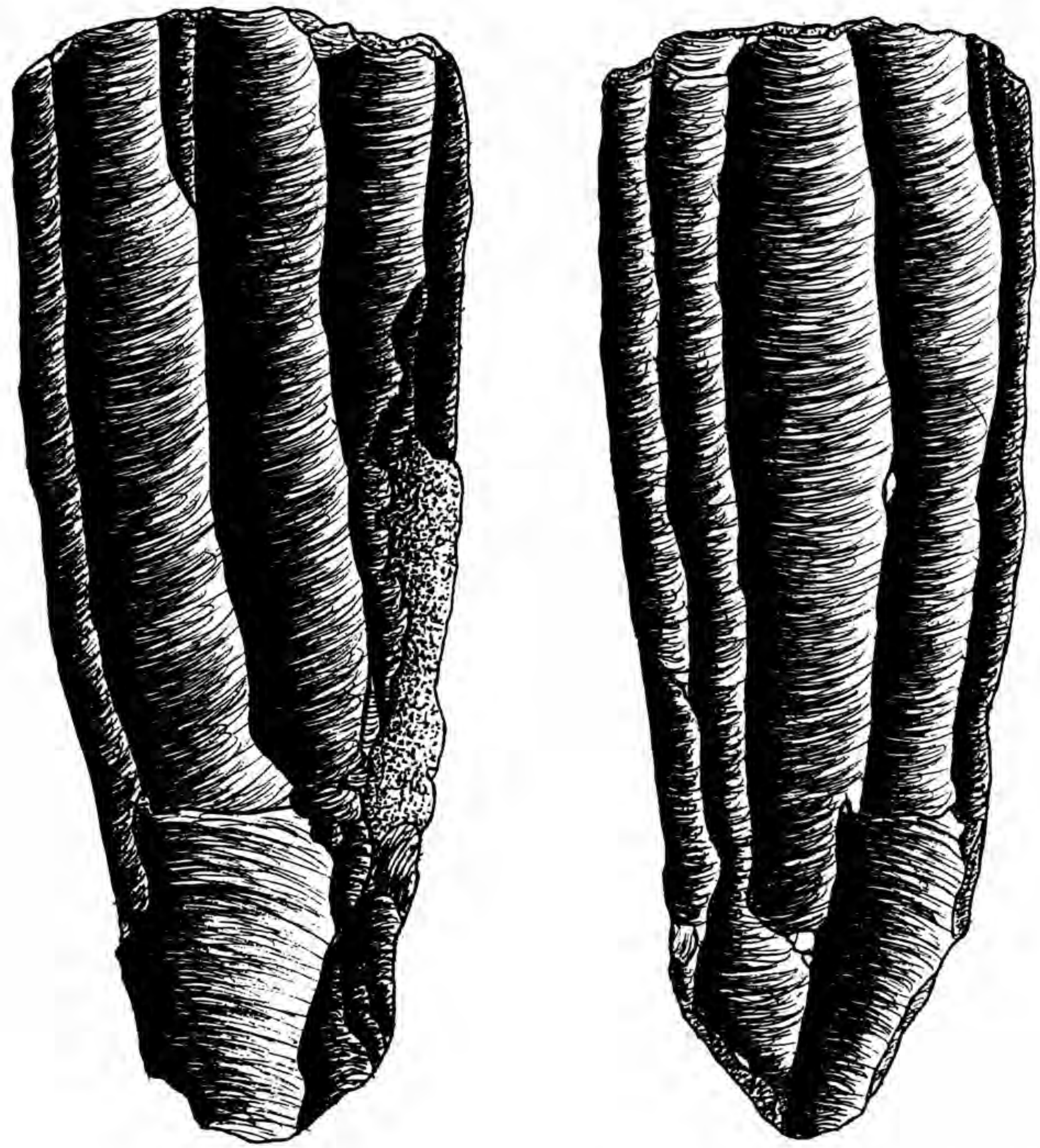

Figure 1. Polyhedral Clovis blade core from 41VT140. Top view of platform; bottom, four views of side, rotating clockwise. Drawing by William W. Birmingham.

small cores, often with blade or blade-like facets, from the Archaic and Late Prehistoric periods. As more private collections are documented and new sites are exposed through construction, cultivation, and natural erosion, it is possible that more Clovis polyhedral cores may be found. Each additional polyhedral blade core that is properly documented can add to the overall knowledge of the extent of Clovis lithic technology.

ACKNOWLEDGMENTS

Sincere thanks are extended to Marcy Worsham, the landowner, for allowing us to document, photograph, and visit the site. Special thanks go to James DeYoung, of Victoria, the discoverer of the core, for bringing it to the authors' attention. We also extend our gratitude to Drs. Thomas R. Hester and Michael B. Collins for their comments and assistance.

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A Tubular Stone Pipe From Nueces Bay, Texas

H. F. Apple

ABSTRACT

A tubular pipe made of sandstone is documented in this article. The artifact was found on a shell midden on the northern edge of Nueces Bay, San Patricio County, Texas.

The artifact documented in this article was found on the surface of a shell midden on the north shore of Nueces Bay in San Patricio County, Texas. The site area encompasses two contiguous shell middens. Interestingly, these features have created distinct "crop marks," in which planted crops maintain a yellow color, rather than green, in the area of the middens. The predominant shell in these middens is oyster, although a few *Rangia* (*R. cuneata*?) and lightening whelk are also present.

The artifact (Figure 1a-b) was on the surface at the edge of the "crop mark" on one of the middens, at the point where the two middens (or debris eroded from them) merge. The site area has been farmed for many years. The field is level and not eroded, and it is likely that the artifacts on the present site surface come from plowing that did not exceed 30 or 40 cm in depth.

This specimen is in two fragments which, when joined together, constitute most of a tubular stone pipe. It is manufactured of a dense, fine-grained sandstone of a brown to reddish-brown material. Both the inner and outer surfaces of the artifact have been extensively smoothed. The wider end of the pipe is the bowl, which has been created by biconical drilling (see Figure 1a), is 41 mm in diameter and 35 mm deep; at the spot where the biconical perforations meet, the diameter is 9 mm. The outside diameter of the small end of the specimen is 34 mm. When the two fragments are joined, the estimated overall length of the pipe is 75 mm and it has an outside diameter of 45 mm.

Average thickness of the edge of the bowl wall is 2 mm. The exterior of the pipe fragments have some evidence of plow damage (see Figure 1b).

Other artifacts found on the surface of the two shell middens include small pottery sherds (Rockport ware, with asphaltum on the interiors), and eight lithic artifacts. Both the Scallorn and Ensor forms are represented, while the other specimens appear to be

a

b

Figure 1. Tubular stone pipe from Nueces Bay: a, the two fragments are oriented to show the interior of the pipe; b, the exterior surfaces of the pipe.

Figure 2. Lithic artifacts from Nueces Bay shell middens. These artifacts were found within a 115 m radius of the tubular stone pipe. Scale on the right is in centimeters.

largely of Late Archaic age (Figure 2). One specimen has been distally reworked, perhaps for use as a drill. All of the materials occurred within a 115 m radius of the tubular stone pipe.

Numerous tubular stone pipes have been reported from the South Texas coastal plain and on the interior Rio Grande plain. Several stone pipes are known from Nueces, Kleberg, Aransas, and other coastal counties (Hester 1969). A summary of those reported along the lower Rio Grande was published by Chandler (1997). Eleven tubular stone pipes from the Loma Sandia site in Live Oak County have been published by Leneave (1995). These date to the late Middle Archaic period and were associated with burials. Leneave noted that the Loma Sandia specimens, and perhaps as much as 77% of the tubular pipes in southern Texas, were manufactured from sandstone. Although tubular stone pipes are often linked to the Middle Archaic (Turner and Hester 1993), many documented specimens are surface finds and cannot be dated. It is likely that such pipes continued to be manufactured into Late Archaic and Late Prehistoric times.

ACKNOWLEDGMENTS

Thanks are extended to Dr. Thomas R. Hester and Dr. Robert Ricklis for assistance in identifying the artifact, and to my daughter Mary Catherine Gardner, and my son Stephen Apple, for finding the pipe.

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John E. "Swoose" Alexander's Parallel Oblique Flaking Technique

David L. Calame, Sr., Cindy K. Smyers, and R. Paul Stein, Jr.

John E. "Swoose" Alexander was born in Brown County, Texas, on September 6, 1919. After more than 70 years of flintknapping, Swoose has become somewhat of a legend across Texas. He began knapping in 1932 after discovering his first artifact while walking along the Pecos River in West Texas. He became interested in replicating the parallel oblique flaking that he had observed on Angostura points. After 18 years of trial and error, he mastered the art of parallel oblique flaking using only the materials that were available in ancient times.

Swoose lives in McCamey, Texas, and is active in the Iraan Archaeological Society. He is also a member of the American Society for Amateur Archaeologists. Swoose visits the local schools and talks to school children about artifacts and archaeology.

In addition to his contributions to archaeology, Swoose is active in track and field events. He holds many records, and has been recognized for excellence in the Senior Track and Field Games. In 2000, he was inducted into the Texas Senior Games Hall of Fame and was recognized for his achievements and presented an award by then Texas Governor George W. Bush. Swoose also developed a jet ski propulsion engine and owns the patents on several inventions.

Swoose Alexander began hunting for arrowheads at an early age. He found his first one when he was 12 years old. Even at that young age, he was not satisfied with just finding them. He wanted to know how they worked and how they were made. He began trying to make arrowheads in his grandfather's barn.

Swoose developed his own methods of parallel flaking completely alone and uninfluenced by outside sources. In his own words: "I spent the biggest part of my time from 1932 to 1950 trying to learn this method of oblique parallel flaking and to find this clue of how the Paleoindians did their flaking. There were no knap-ins in those days. Nobody that I knew of made arrowheads. I did it completely by trial and error, day after day, year after year, in my garage by myself. I guess you could say I was obsessed. Then around 1950, I finally discovered the secret and started making those Paleo points."

There were some gaps in that 20 years for Swoose, such as serving in World War II. One of his hobbies was amateur radio and he used this skill in his war efforts in World War II, but the majority of his spare time was spent trying to learn the art of manufacturing projectile points.

Once he learned the methods, Swoose kept them to himself, thinking that he had good reason for keeping them a secret. By that time he had learned of the commercial market for artifacts. Mr. Alexander feared that someone might learn to make them and sell them as ancient artifacts. So, for years, he kept his secrets to himself and continued to perfect his techniques in the privacy of his small West Texas workshop.

Knowing that there are now so many flintknappers across this country, and not wishing to take his methods to the grave with him, Swoose has changed his mind and decided to share his knowledge and experience with the public. By doing so, Swoose Alexander has generously contributed a vast amount of knowledge to the understanding of oblique parallel flaking techniques. His examples of these Paleoindian projectile points are recognized across this country as some of the best reproductions ever made.

He uses only tools that would have been available to prehistoric people. The knapper's tool kit that was discovered with Oetzi, the "Ice Man" in the

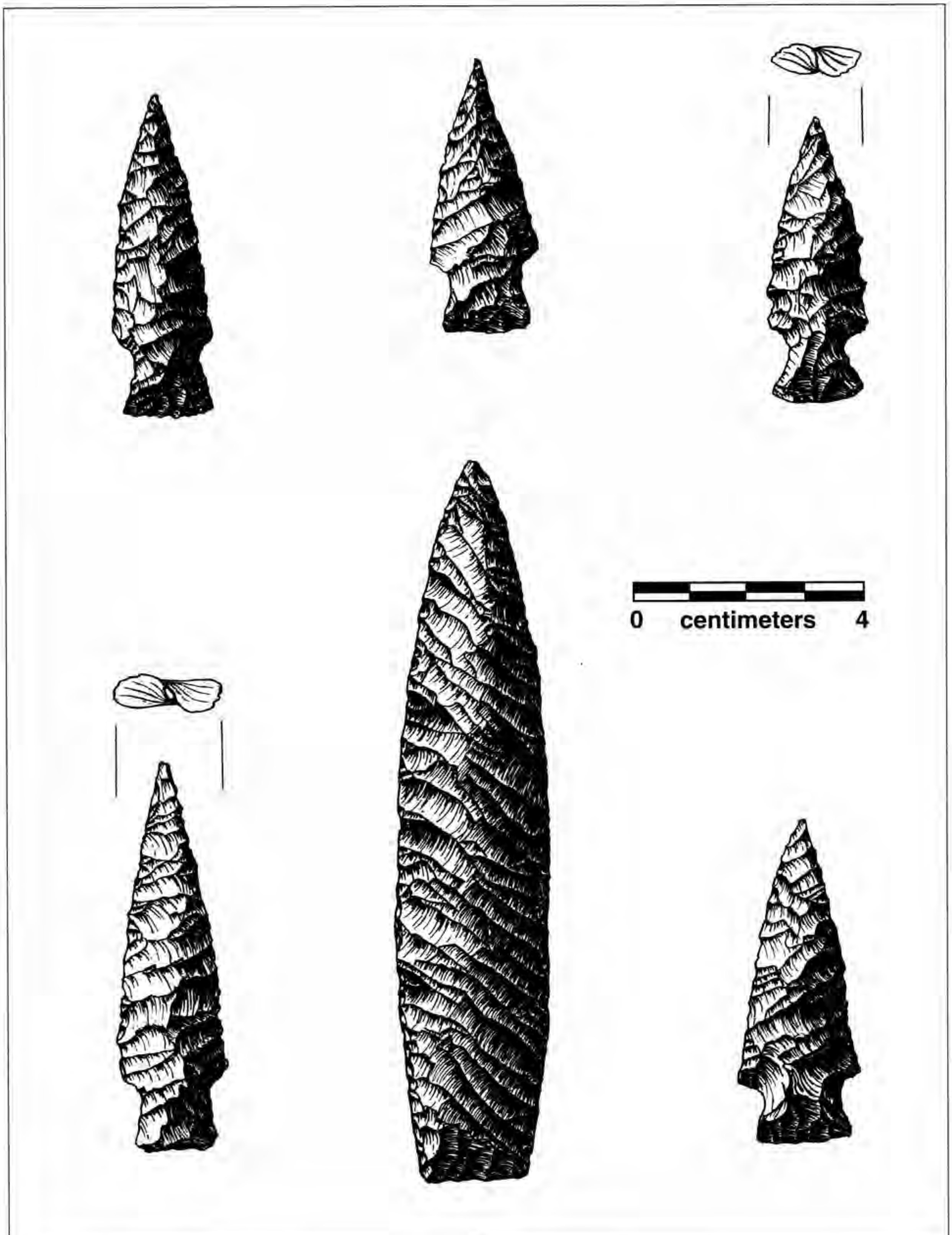

Figure 1. Projectile points knapped by Swoose Alexander.

Dolomite Mountains of Italy, is virtually identical to the tool kit that Swoose has been using since the early 1930s. Not only are the tools that were uncovered with the "Ice Man" similar in size, shape, and material but they show virtually the same scar patterns of use wear.

Mr. Alexander is one of the very few knappers who has been able to accurately replicate the Pandale projectile point. Swoose generously agreed to be interviewed and to demonstrate the techniques he uses in the production of Pandale points. Drawings by Richard McReynolds of points made by Swoose (Figure 1) demonstrate his ability to replicate both Late Paleoindian and Early Archaic parallel oblique flaked artifacts.

SWOOSE'S METHOD OF FLINT KNAPPING

Tool Description

Swoose prefers using a buffalo horn for knapping, but he says that a cow horn also works well. His knapping tool is made from a slice of horn cut in a rectangular block with a ramped, or chisel-shaped end, similar to a thick wood chisel (Figure 2). The end result is a pressure flaking tool with the working edge approximately 24.0 mm wide and 8.0 mm thick. The working edge is the flat and sharpened edge of the tool, as opposed to the sloping sides. The point of contact between the tool and the preform edge is approximately 6.0 mm from the tool's lateral edge.

Tool Wear

With use, the tool wear pattern develops and appears as a notch in the tool's sharp working edge (see Figure 2). Up to a point, functionality increases as the notch deepens. The sharp edge of the flint digs into the horn. The notch keeps the horn from slipping off the sharp preform edge, as pressure is increased.

Flint Knapping Technique

One major difference in Swoose's parallel oblique flaking technique from other knappers is his flake support while applying pressure. Swoose positions his hands between his thighs and applies pressure to the horn tool and preform, directing pressure directly into the lateral edge of the preform by squeezing his thighs together.

No rotation of the horn tool was observed, as is usually the case with knappers attempting to snap off a flake when using other types of hand-held pressure flakers and Ishi sticks. Also required for successful knapping are the convexity of the preform and the natural characteristic of flint to fracture in a curve.

Swoose stresses that each flake sets up the ideal conditions for the removal of the next flake; i.e., an ideal platform and a ridge for the next fracture to follow are left by the flake previously removed. Swoose does some edge crushing, but his technique does not require heavy grinding to provide a strong platform, since he applies pressure directly into the longitudinal axis of the point. Swoose completely supports the flake being removed by pressing the preform firmly against a soft leather pad, which is held in his left palm and the large fleshy pad at the base of his thumb.

As pressure from the tool is increased, support of the area in which the flake will be removed increases. After the flake releases, Swoose quickly resets his tool in line with the ridge produced by the previous flake removed and applies pressure again, keeping the soft leather pad in the same place. Each flake does not release as pressure is applied by hand, but, rather it initiates as Swoose squeezes his thighs together, which he calls his "machine."

ACKNOWLEDGMENTS

The authors wish to thank Richard McReynolds for the Figure 1 and 2 artifact sketches, and J. E. "Swoose" Alexander for allowing us to spend the day interviewing him and observing his knapping skills.

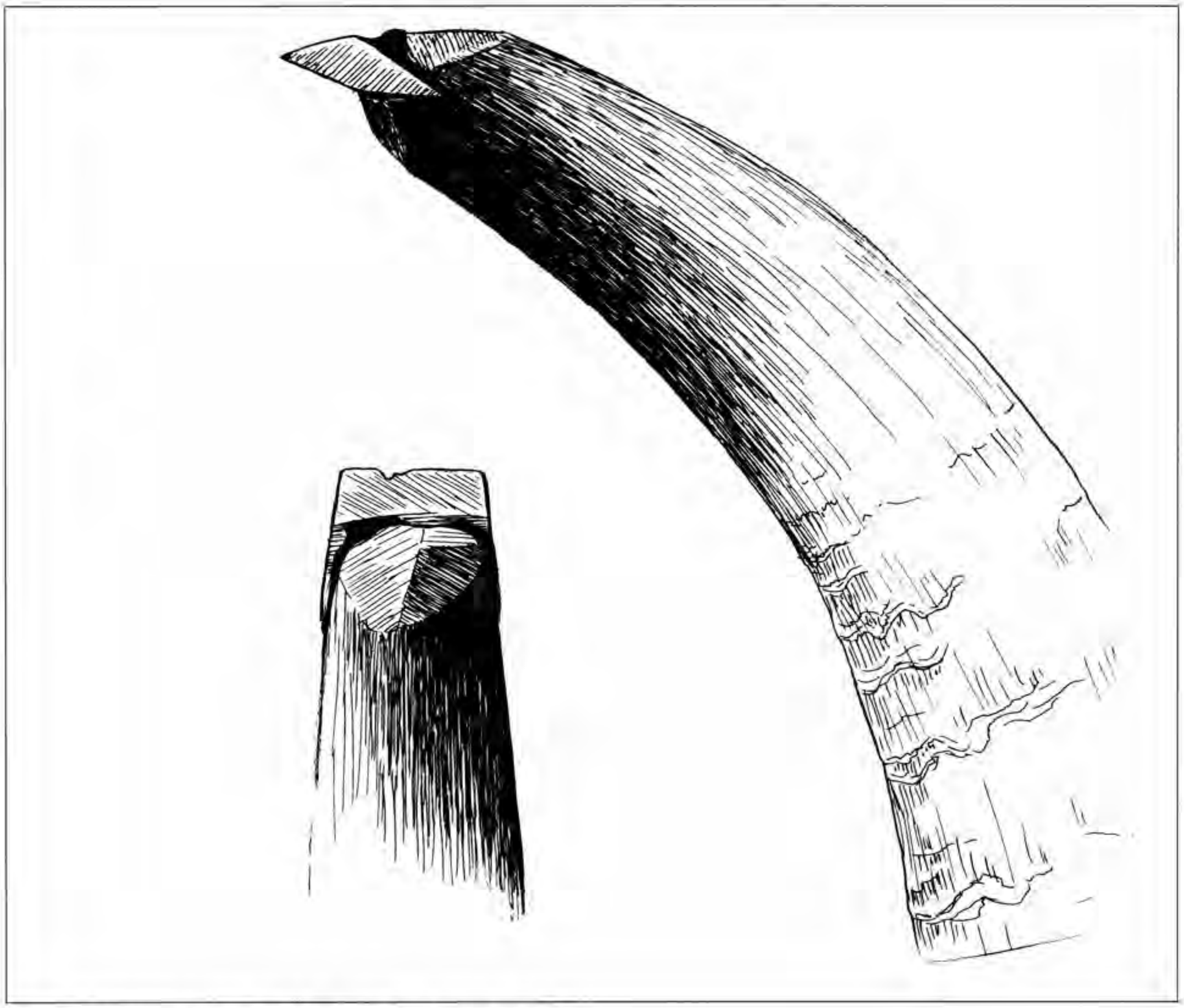

Figure 2. Swoose Alexander's buffalo horn knapping tool.

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