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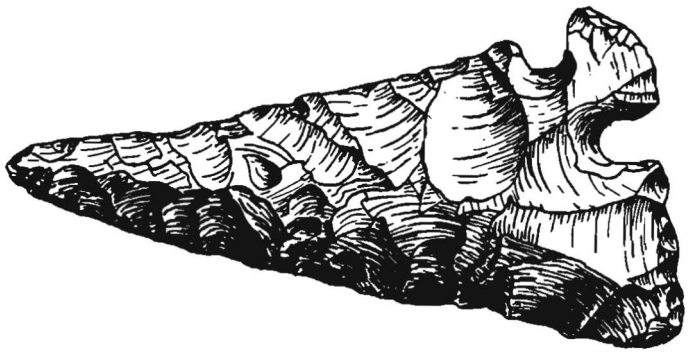

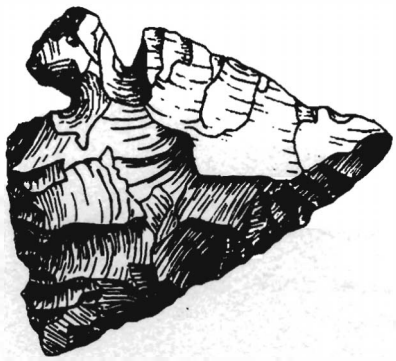

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Jimmy L. Mitchell
Editor

Cover Illustration: Corner Tang Artifacts. See articles this issue.
Drawings by Richard L. McReynolds

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EDITORIAL

CORNER TANG ARTIFACTS

In this issue, we depart from the usual variety of articles to focus on just one type of prehistoric artifact, the corner tang. Such artifacts are widely recognized, particularly in Texas, but not a great deal has been written about the type since the mid-1930s, when J. T. Patterson published a typological and distributional study (which remains the reference on corner tangs). Grant Hall has recently displayed the 1936 data in his *Allens Creek* report as evidence of a widespread trade network in the Late Archaic, but little has been done in terms of studying wear patterns or more closely defining the cultural associations of these artifacts.

Several recent events provided us the opportunity to put together some fairly up-to-date information on this type of artifact. Thus, this issue has as its theme the documentation and analysis of this unusual artifact type. This effort greatly expands our current state of knowledge of corner tang artifacts and should be a worthwhile contribution to the literature.

There is, perhaps, a bit too much emphasis in the issue on [redacted] of corner tang artifacts, with repeated references back to Patterson's 1936 study. This is not meant to institutionalize his typology but rather as a way to bridge the decades and show the relevance of his seminal work to present archaeological problems. In your reading of this issue, it would probably be better to think of these "types" as varieties of corner tangs, rather than having too strict a definitional construct.

The Editor

THREE CORNER TANG ARTIFACTS FROM THE OLMOS DAM AREA, BEXAR COUNTY, TEXAS

J. L. Mitchell and C. D. Orchard

ABSTRACT

Three corner tang artifacts from the Olmos Dam area of northern Bexar County are documented from the Orchard Collection. The specimens represent three different varieties of corner tangs and their limited presence in this substantial collection demonstrates the relative rarity of the artifact type.

INTRODUCTION

The Olmos Creek area of what is now northern Bexar County (see Figure 1) has been a favored camping spot for literally centuries, presumably because of the perennial springs (Fox 1975:1). Aboriginal use of the area dates back to at least the Paleo-Indian period (Orchard and Campbell 1954) and as recent as 1926 (Orchard 1966). Contact with other cultural areas has been demonstrated by the recovery of southwestern pottery in the basin (Orchard and Campbell 1960) and by direct ethnographic observation (Orchard 1983).

The area is an important archaeological zone. In the past decade, the Olmos Basin area has begun to be systematically studied through surveys (Fox 1975) and controlled excavations (cf. Assad 1978); reports of more recent work in the area are still in preparation. Many of the prehistoric sites have been destroyed in this century with the construction of the dam and the development of Incarnate Word College (see Fox 1975). Yet even with the recent archaeological activity in the Olmos Dam area, much remains to be done. One important aspect to be accomplished is the documentation of collections from the area, as has been recommended by Anne Fox (Ibid.:14).

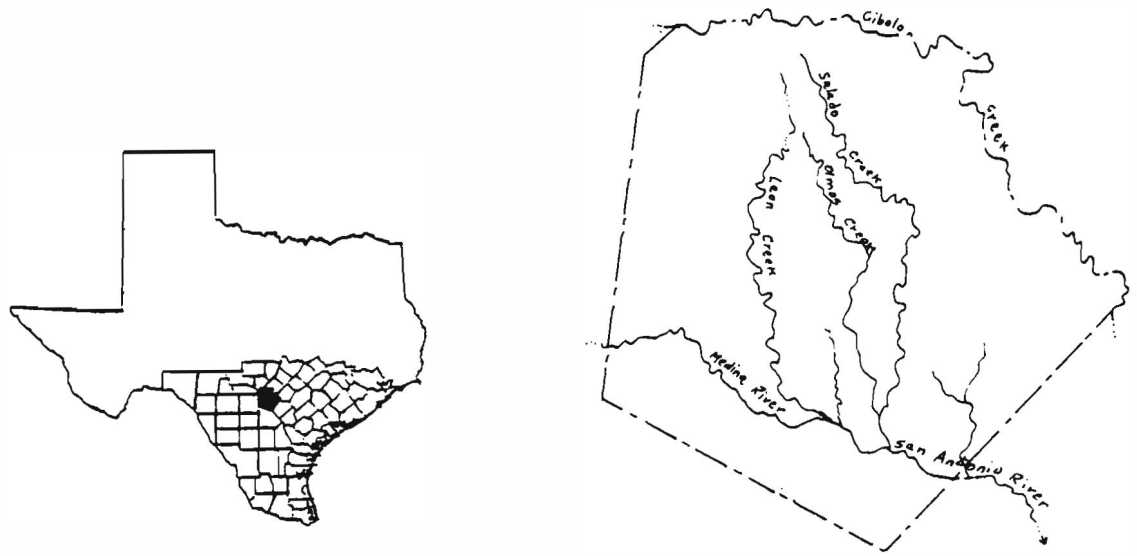

Figure 1. Bexar County, Southern Texas, showing relationships of major rivers and creeks. The Olmos Creek area contains an extensive complex of prehistoric sites. (Map adapted from one drawn by Malcom L. Johnson, Fredericksburg, Texas.)

This brief report is a small beginning toward the documentation of the C. D. Orchard Collection of Olmos Basin artifacts, which includes nearly ten thousand archaeological specimens. Just prior to his death in 1983, Mr. Orchard asked for assistance in reporting parts of his very extensive collection. This initial report begins that process with the very unusual corner tang artifacts from Dave's Olmos Dam collection.

THE ARTIFACTS

Corner tang artifacts from the Orchard Collection are shown in Figure 2. These specimens represent good examples of three of the six types of corner tang artifacts, as defined by Patterson (1936):

Diagonal corner tang knife - The specimen shown as Figure 2a is representative of the "classic" form of such artifacts. It has a tang notched into one corner of the blade suggesting that it was hafted for use as a knife. Patterson designated this type of corner tang as Type 2, the diagonal corner tang knife. This specimen measures about 85mm in length and 35mm in maximum width (measured at the edge of the upper notch). Stem length is about 17mm and maximum stem width 16mm. The lower blade edge shows considerable use and has evidence of some resharpening in terms of tiny pressure flaking. The basal edge (to the right in the illustration) also shows some retouching.

Mid-back tang knife - Figure 2b illustrates what Patterson terms a mid-back knife (1936:17). This form (his Type 4; Ibid) permits hafting at a right angle or near right angle to the working edge (or bit). This specimen measures a length of 39mm, measured from the middle of the tang to the bit edge. Its width, measured along the bit is about 53mm. Stem length is about 11mm and maximum stem width is the same. This mid-back tang knife shows considerable use on the bit edge with some resharpening; the lateral edge (to the left in the illustration) also shows evidence of some use and retouching.

Reworked corner tang artifact - The third Orchard Collection corner tang is a broken specimen which shows a great deal of modification. Patterson grouped such artifacts into his Type 6, which he labeled reworked corner tangs (Ibid.). Most collectors would call this form a broken corner tang "drill." The blade width, measured at the break, is about 13mm, which is about the width of most flint "drills," although the hafting angle of this corner tang artifact would make its use as a drill somewhat difficult. Maximum width of the blade (measured from the edge of the upper notch) is 36mm, which is comparable to the width of the specimen shown as Figure 2a. Stem length, measured from the center of the tang, is 12mm, and maximum stem width is about 21mm.

DISCUSSION

The three corner tang artifacts from the Orchard Collection represent an important contribution. Patterson reported only 5 corner tangs from Bexar County (1936:19). None were documented in the Collier Collection of artifacts from the southern Olmos Basin; the most unusual artifact in that collection was a boatstone fragment (Hester 1975). Most of the corner tang artifacts in Texas are found in Central Texas, particularly in the counties along the Balcones Escarpment; this concentration implies they may have been manufactured primarily in that area (Hall 1981:Figure 55). Bexar County and Southcentral Texas in general are well within the "area of maximum availability" for corner tang artifacts (Ibid.).

The relative frequency of the corner tang artifacts in the Orchard Collection may give some indication of the rarity of the artifact type. Only three of about ten thousand specimens in the collection were corner tangs. For Texas as a whole, only 608 corner tangs have previously been documented (Hall 1981).

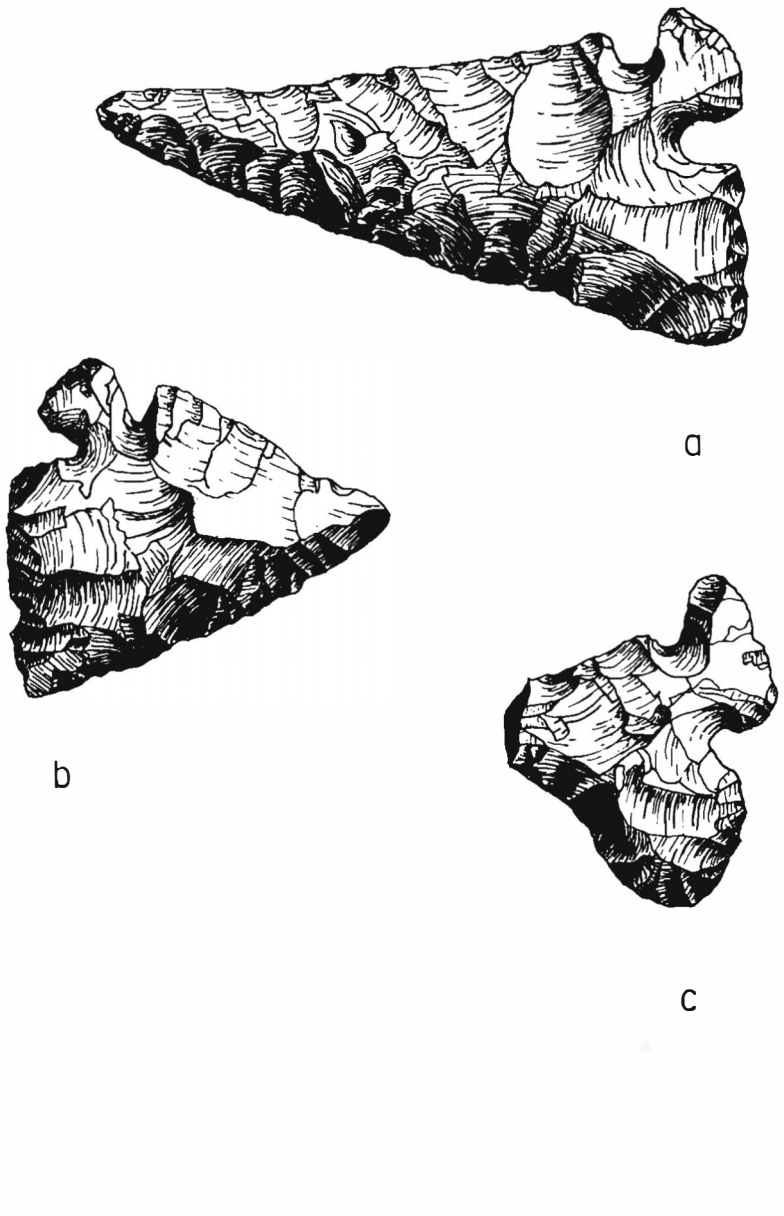

Figure 2. Corner Tang artifacts from the Olmos Basin, Bexar County, Texas. a. Diagonal Corner Tang; b. Mid-base Corner Tang; c. Reworked Corner Tang or "Drill." Actual size. (Drawings by Richard McReynolds.)

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TWO TANGED KNIFE FORMS FROM VAL VERDE COUNTY, TEXAS

Richard L. McReynolds

(with wear pattern analysis by C. K. Chandler)

ABSTRACT

This report documents four fragmentary corner tang knives and three base tang knives recovered from rockshelters on the edges of the Edwards and Stockton Plateaus in Val Verde County, Texas. Analysis of the wear patterns revealed the two types were probably both hafted knives but may have been used to cut different materials.

INTRODUCTION

Seven unusual artifacts were recovered a number of years ago during excavation of several rockshelter midden deposits in the area of the confluence of the Pecos and Rio Grande Rivers (see Figure 1). Four corner tang knives were recovered from the Pecos Canyon. Specific sites included three separate shelters in the eastern or Edwards Plateau side of the canyon; one specimen is from the western, or Stockton Plateau side of the canyon. Three base tang knives were found in two shelters in Seminole Canyon. Regretably, the method of recovery does not lend credibility to any confident statement of association, but the typical depth of recovery would not indicate any great age for either type.

CORNER TANG ARTIFACTS

Four fragmentary specimens of this type are illustrated in Figure 2, a-d. The specimens shown as 2, b and d are from sites on the Edwards Plateau; 2 c is from a site on the Stockton Plateau. The four specimens appear to represent two different varieties of corner tang artifacts, as defined by Patterson (1936):

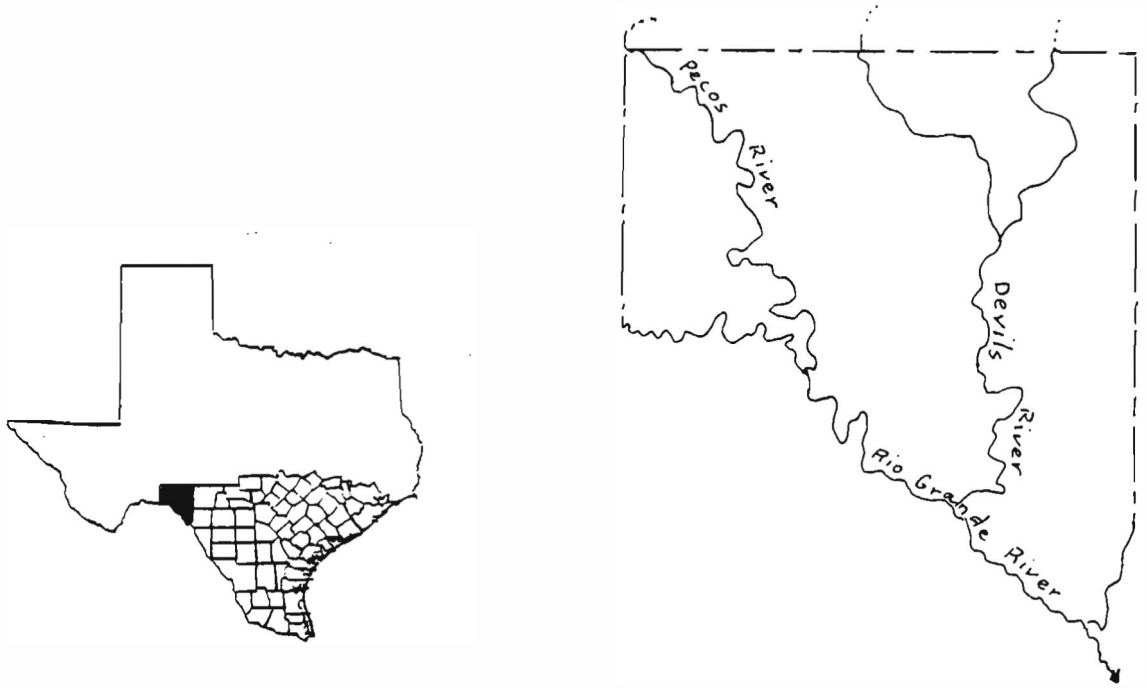

Figure 1. Val Verde County, Texas, showing relationships of major rivers. The Stockton Plateau is west of the Pecos River, with the Edwards Plateau to the east of the Pecos.

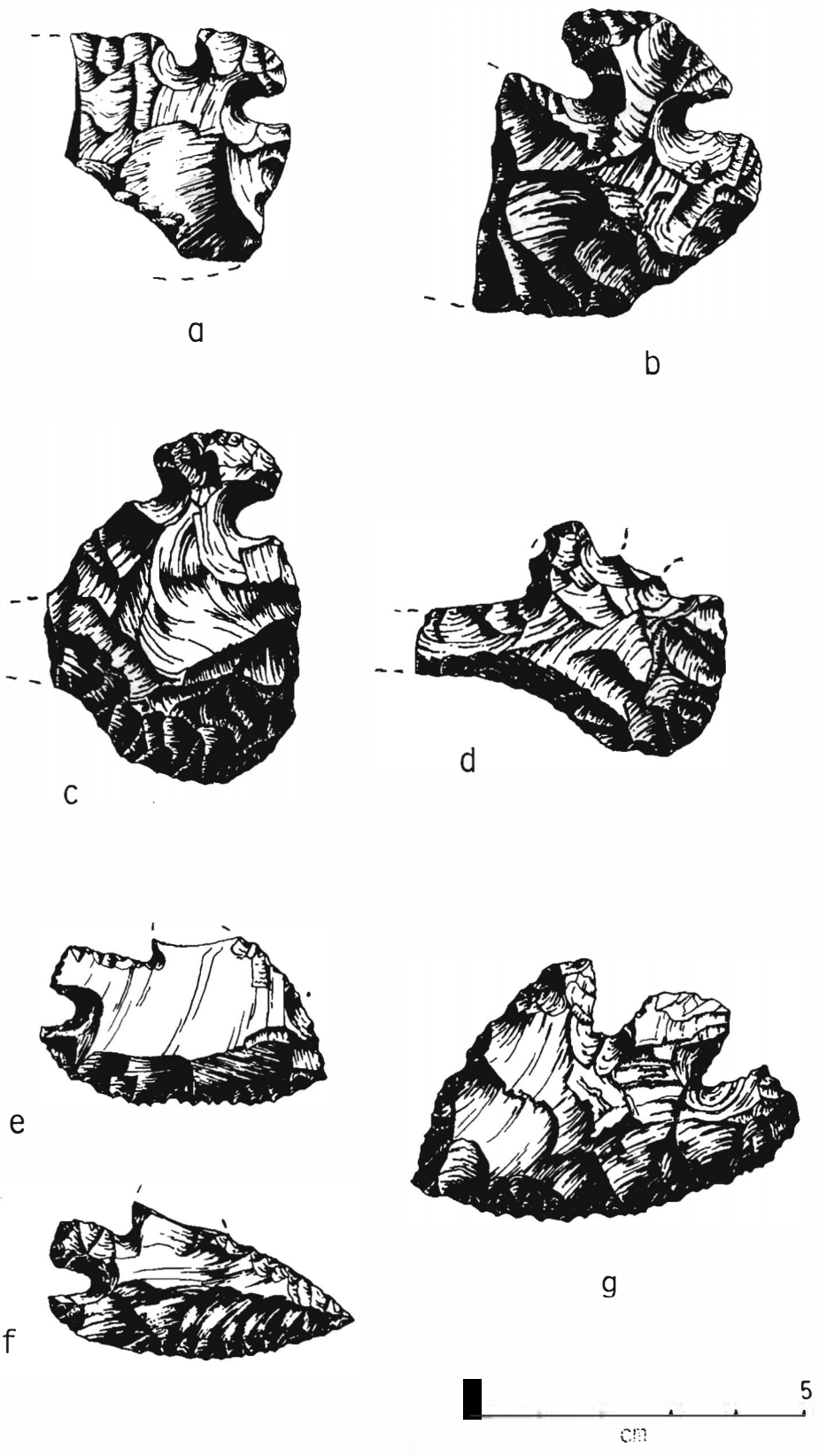

Figure 2. Corner Tang artifacts from Val Verde County. a-d. Corner Tangs; e-g. Base Tang Knives. Actual size. (Drawings by Richard L. McReynolds.)

Figure 2a - This fragment appears to be a diagonal corner tang knife or Patterson's Type 2. The proximal portion of the blade suffered dual fractures. Both the distal end and ventral cutting edge are missing. The artifact has been subjected to extensive heat, possibly after it was completed. The material is a lustrous pink chert of good quality. There is heavy edge wear and polish along the base of the tang and the unbroken edges of the blade. Tang flake ridges and edges are rounded and polished. Blade flake ridges (arrises) and scars are polished but the arrises are not rounded. Length and width measurements are impractical on this type of fragment. Tang length is about 10mm and tang width is 16mm.

Figure 2b - A second fragment appears to also be a diagonal corner tang knife. The distal end is missing. Material is a black chert. No use wear or polish is discernible; this suggests the artifact may have been broken in the process of manufacture. Length - unknown; Width = 31mm (measured at the break); Stem length = 15mm; Maximum stem width = 27mm.

Figure 2c - Proximal portion of a heavily modified corner tang artifact (Patterson's Type 6; Ibid.). The material is a dark grey chert. The blade originally functioned as a knife for an extended period of time and received considerable use. Continued resharpening exhausted the blade to the point where it could not be used as a knife; it was then reworked into an awl-like tool (what some collectors call "drills"). The specimen retains heavy wear polish over all flake arrises with lighter wear polish over all flake scar surfaces. The heaviest wear polish is around the perimeter of the tang and its arrises. Flake arrises are flattened and the edges are rounded. This appears to be due to wear against haft and securements. The blade retains medium wear polish along the edge of the blade heel. Heavy wear polish exists along the expanding base portion of the broken bit, acquired from a clockwise twisting motion. The leading edge is worn, the trailing edge is not. If used as an awl with a twisting back and forth motion, both edges should be worn. The observed wear pattern is more suggestive of a drilling (continued clockwise drilling) motion. Indeed, the angle of the bit snap fracture indicates that pressure was at a right angle to the blade face.

Figure 2d - A fragmentary specimen of a Type 6 corner tang artifact (Ibid.); only the proximal portion remains. The tang and distal point are missing. The blade originally functioned as a knife and was resharpened for another use. The wear polish on all edges and flake arrises is lighter than the previous specimen (Figure 2c). Wear polish is not visible on the flake scar surfaces. The blade retains wear polish on the edge of the heel and along the high points of the flake scars. Flake arrises have light wear polish. Light polish on both bit edges and on the expanded portion of the blade. The blade or bit was fractured from the top, possibly soon after the artifact was reworked. Length, width, and tang measurements are not practical with such a fragment. Width of present blade, measured at the break, is about 10mm.

BASE CORNER TANG KNIVES

Figure 2e - This specimen appears to be a contracting stem base corner tang knife, as defined by Word and Baker (1970:46, Type XIA); this form generally corresponds to Patterson's Type 1 corner tang (Patterson 1936). The specimen was recovered from a rockshelter site in Seminole Canyon. The blade back is convex to straight; the blade heel is rounded. The tang contracts more rapidly on the side toward the cutting edge. Biconvex (thin lens shape) in cross section. The blade has a highly serrated cutting edge; these serrations are still quite sharp and show no evidence of wear. The material is a pink chert. Length = 44mm; width - unknown; tang length approximately 12mm; tang width = 7mm at the end of the tang, 9mm where it joins the blade.

Figure 2f - Straight stem base tang knife. This specimen was also found in a Seminole Canyon rockshelter. The top barb of this knife is missing. The blade edge is lightly serrated; it shows no polish or acquired use wear.

Figure 2g - Complete base corner tang knife; recovered from a shelter in Seminole Canyon. The material is a brown flint. The stem has light wear polish around the edge and flake surface arrises. The heaviest wear polish is on the proximal two thirds of the blade edge, mostly on the higher flake ridges. The proximal one-half of the dorsal edge retains light wear polish. The distal end has been resharpened but also shows light wear polish.

DISCUSSION

There is a very great need for functional analysis of corner tang knives with replicated specimens. The number and fragmentary condition of most existing specimens does not provide enough information to draw definitive conclusions. Some interesting and potentially useful information is obtainable, however, from wear pattern analysis and close examination of specimen attributes.

One question which needs study is how such knives were hafted. Patterson (1936:17) proposed possible hafting styles for his several types (varieties) of corner tangs. Yet the tang on many specimens is relatively small in comparison to blade size and length (see, for example, Hall 1981:Figure 18, 1-2). The tang's offset relation to the blade does not seem to be capable of supporting much pressure application except directly down the handle through the haft.

Many corner tang knives have been resharpened to the point of being functional awls (Figure 2c and d). At this stage, hafting would seem to be of little benefit in awl type activities; perhaps it was of some value if the artifact were used as a racheting tool.

It is possible that the corner tang knives were a hand-held tool; the tang could have been used for attaching a thong to secure the tool to a wrist for handy retrieval (see Figure 3e). From a functional standpoint, there seems to be no advantage in hafting that would not be better served by a blade used by hand or by hafting a base stemmed knife form.

If corner tang knives were straight hafted (see Figure 3a), some tang angles appear inefficient. There are several blade and tang variants. If we assume that the handles were placed squarely on the angle presented by the tang, then the resulting knife use would vary considerably. The haft angle could present either a receding dorsal or a ventral blade edge; this angle relationship would be further complicated with resharpening. A straight haft, at or near 90 degrees to the cutting edge, would not seem to be an efficient angle for this type of tool, if it is used as an ordinary knife. Visibility and dexterity of the blade would be minimal. Blade efficiency might be improved if hafting techniques were varied to suit individual blade-to-tang relationships.

Blades of great length would appear to retain a built-in weakness of tang support, if hafted in any manner. It may be that some of the largest corner tang knives were not meant to be functional but served only a ceremonial purpose (see, for example, those reported from the Ernest Witte Site; Hall 1981).

Conversely, the base tang knives would seem to be very functional as a straight hafted knife form (see Figure 3d). The haft angle is ideal and it would not be useful unhafted, nor would the tang shape and position be favorable for thong attachment. The lower blade edge is convex and the heel extends behind the maximum hafting point. These factors should increase use visibility and lend greater stability to the blade. Base tang knives in this report (Figure 2e-g) could be used quite efficiently in butchering or woodworking activities. The serrations of lower blade edges noted on these specimens give added credibility for their use on fibrous materials and make them ideal candidates as one form of a nocking tool (Kelly 1983:22).

RESULTS OF WEAR ANALYSIS

When wear pattern analysis results were compared with postulated uses, the possible use of corner tang knives unhafted was demonstrated to be unlikely.

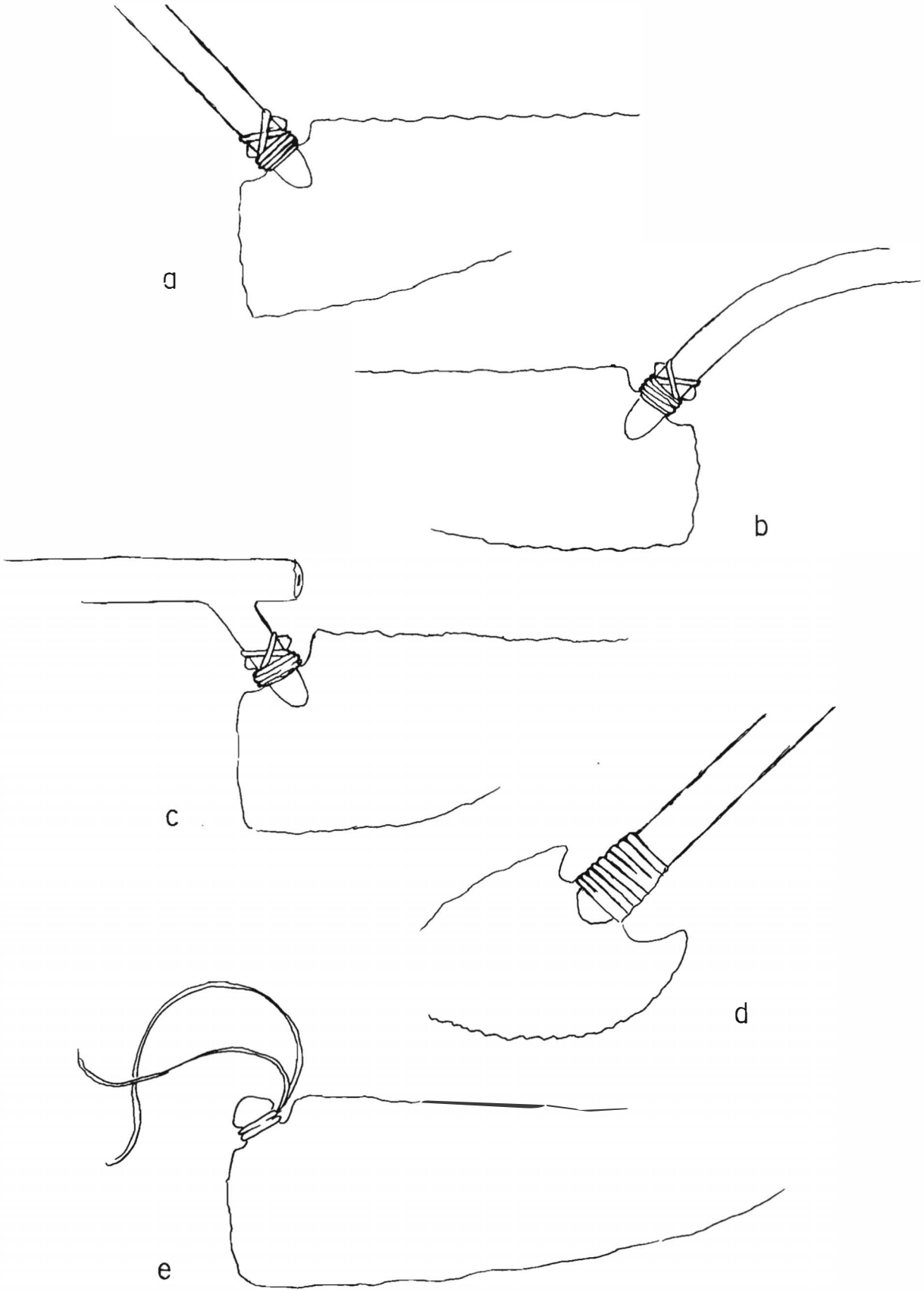

Figure 3. Some possible methods of hafting the Corner Tang artifact. a,d. Straight hafting; b. Curved hafting; c. Off-set hafting; e. Thong attached to tang.

At least two specimens (Figure 2a and c) were used extensively as a hafted tool. The heavily worn tang edges in conjunction with the flattened and rounded flake arrises of the tang faces definitely indicate hafted use. Although the tang is missing on Figure 2d, it would not be unreasonable to assume it was also hafted because of the broken tang. While hafting is indicated on three out of the four corner tang specimens reported here, it may not be a valid assumption for all corner tang knives, especially those of great blade length.

Wear analysis revealed that all blade edges (dorsal, ventral, and heel) were evidently utilized. This would seem to indicate that they were used in a pulling motion (hook knife) as well as a pushing motion (cutting knife). Possibly they were used with curved or offset handles; some possible alternate hafting forms are shown in Figure 3b-c. The wear analysis also somewhat validates the resharpening process, which would eventually result in such an unwieldy blade edge that the knife was converted to another type of tool.

The reworked specimens (Figure 2c-d) were used as an awl or drill, as evidenced by the wear on the bit, as well as on the leading and trailing edges. How they were hafted at this stage of their use is not known; possibly they were used unhafted during this portion of their lifespan. Unfortunately, wear analysis does not help to resolve this issue. Experiments with replicated corner tang "drills" are needed to determine if they could be used hafted and still develop this type of wear.

The base corner tang knives were utilized as expected. Although specimens shown as Figure 2e and f show no use wear, this may have been the result of very limited opportunity. Missing dorsal barbs on both of these specimens may or may not be significant in terms of how they were hafted and used (in terms of applied pressure). The very heavy wear on the blade arrises of the remaining specimen (Figure 2g) provides evidence that this knife form was used on a hard, fibrous substance, such as wood.

Corner tang specimens which show extended use provide evidence that they were cutting a firm but yielding substance; most likely this was animal or plant tissue (less dense or hard than most woods). The polish on flake scar surfaces infers extended use for meat butchering or skinning animals. Similar wear patterns were in evidence on a corner tang specimen recovered in Jim Wells County, near the Texas coast (Chandler, Knolle and Knolle 1983).

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THE RUDY HAIDUK SITE (41 KA 23): A LATE ARCHAIC BURIAL IN KARNES COUNTY, TEXAS

J. L. Mitchell, C. K. Chandler,
and T. C. Kelly

ABSTRACT

Over 50 artifacts were recovered in association with an isolated terrace burial near Falls City in Karnes County, Texas. Artifacts included *Marcos* projectile points, corner tang knives, drills, biface fragments, preforms, a limestone gorget, pieces of ironstone, deer antler tines, a quartz crystal, a lump of asphaltum, and other materials. The burial is unusual in terms of the quantity of grave goods and important in terms of documenting the archaeology of Karnes County. The lithic materials also demonstrate the manufacturing and use sequence of corner tang knives. Wear pattern analysis indicates most of the lithic artifacts had multiple uses.

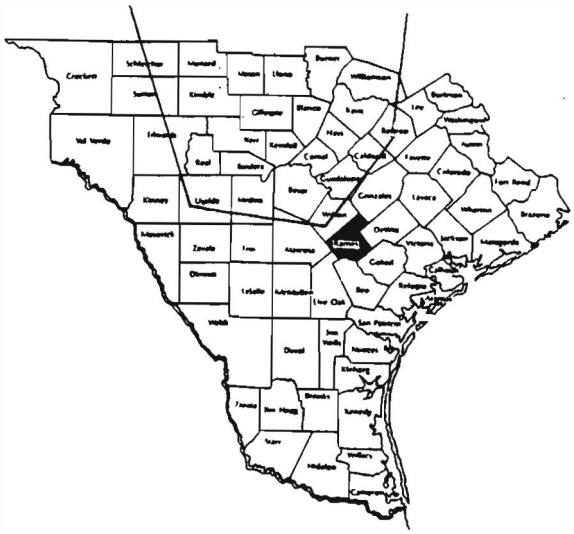
INTRODUCTION

About 30 years ago, a bulldozer was scraping a path down the upper terrace along the San Antonio River near Falls City, Texas, to clear the way for a fenceline. The 'dozer pushed brush and earth off the edge of the terrace and went on to other work. Some 27 or 28 years later, the present landowner, Mr. Rudy Haiduk, was checking the fenceline when he noticed part of a human skull visible in the 'dozer cut near the edge of the terrace. A friend, Erwin Kramer, excavated the burial, and both men found artifacts in the 'dozer load which had been pushed off the edge of the terrace into a thick patch of brush. Recently, Mr. Haiduk notified the Center for Archaeological Research at the University of Texas at San Antonio to report the discovery and both men consented to documentation of their collections from the burial. The site was visited by CAR and STAA workers, was recorded and assigned a site number, and the artifacts were borrowed for analysis. This burial appears to be a very significant find, for a number of reasons, and the site was named the Rudy Haiduk Site to honor Mr. Haiduk for having recognized, salvaged, and reported it.

Previous archaeological work in Karnes County has been rather limited. Kelly (1982:11) has reported *Golondrina* points from sites 41 KA 36 A and B. Kelly and Highley (1979) reported a survey of the county with minimal results; at least 30 percent of the sites identified were classified as limited "lithic scatters." McGraw (1979) in the Conquista Project sampled 540 acres in northeastern Karnes County and identified only four sites which were not recommended for further study. Calhoun (1979) excavated a hearth area at the Scarbrough Site (41 KA 1) and recovered 119 sherds of two *ollas*, similar to Goliad ware produced at Mission Espiritu Santo after 1749. None of these reports suggests any extensive prehistoric occupation in the Karnes County area, and none involved burials. Thus, the Rudy Haiduk Site is an important new find in terms of expanding our knowledge of the archaeology of Karnes County.

THE SITE

The lone burial was located on the upper river terrace along the San Antonio River about 100 meters east of its confluence with Marcelinas Creek. The area is a mile or so southeast of Falls City in Karnes County (see Figure 1). In terms of archaeological regions, this part of the South Texas Coastal Plain is very near the southeastern margin of Central Texas as defined by Prewitt (1981:72).



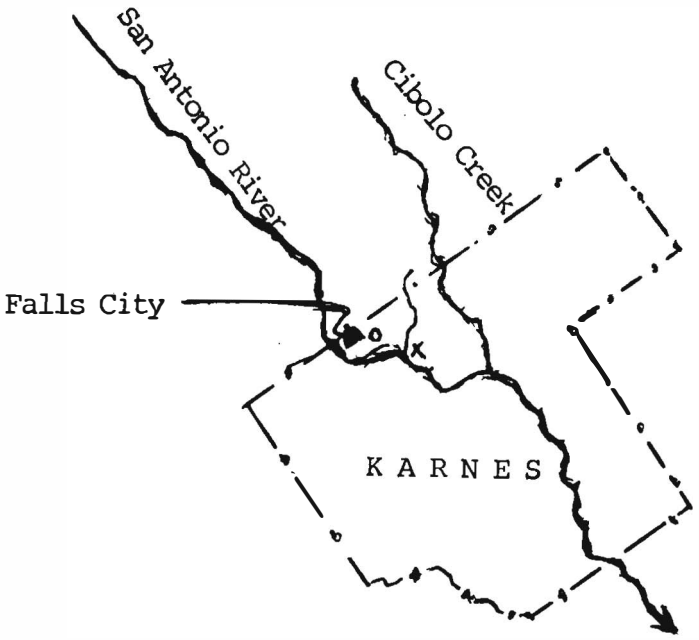


Figure 1. Upper Panel: Location of Karnes County in southern Texas; outlined area is the southern section of Central Texas as defined by Prewitt (1981). Lower Panel: Location of Site 41 KA 23 and Falls City in Karnes County.

The upper terrace area in the vicinity of the site is covered with a thicket of oak, elm, mesquite and pecan trees, with typical weeds and brush except where it has been cleared for the fenceline and ranch roads. The eastern boundary fence is oriented on a heading of 28°; from the edge of the upper terrace at the 300-ft. contour line, the fence drops to the lower terrace and the San Antonio River. The burial is located about four meters west of the fenceline on the edge of the upper terrace, at the base of a small oak tree (see sketch map, Figure 2). The site location coordinates are 3,205,970 mN, 597130 mE, Falls City 7.5 Quadrangle map, and the area has previously been designated as Site 41 KA 23.

THE BURIAL

Only the oval outline of the skull was visible when first discovered. In the subsequent salvage excavation by Mr. Kramer, the skeleton of an adult human, probably a middle-aged male, was uncovered. The skeleton was in a flexed position with head to the southwest, toward the San Antonio River. The skull was facing to the northwest. Fragments of red ochre were encountered just above the chest area but no artifacts were recovered *in situ*. The burial was in a prepared pit since a layer of fine white sand was found below the skeleton; the typical terrace alluvial soil in the area is a yellow sandy clay. Since part of the skull was missing as a result of the bulldozer cut, Mr. Haiduk and Mr. Kramer decided to search the area down the embankment. In the very thick brush halfway down the slope, they located a pile of dirt and debris against a tree, apparently undisturbed over the last twenty-seven or twenty-eight years. From this dirt pile, they recovered a variety of artifacts which included two human teeth and several bone fragments. Thus, the artifacts and other materials recovered from the slope must have been associated with this upper terrace burial.

A number of fragments of the skeleton were recovered including part of the skull. The bone was not in good condition, but sufficient material remains for some analysis. The skeletal material, along with some of the sand and fragments of ironstone rocks, are currently stored at the Center for Archaeological Research of the University of Texas at San Antonio awaiting analysis (as funding or a qualified volunteer becomes available).

THE ARTIFACTS

The materials recovered included thirteen projectile points, a variety of preforms and bifaces, five corner tang artifacts, two flint "drills" or awls, part of a concave ground stone gorget, a piece of asphaltum, grooved abrading stones, a number of scratched ironstone pallettes or pebbles, a rock crystal, a possible hammerstone, a deer antler section (possible billet), antler tines, and other miscellaneous objects. This large collection of grave goods is most unusual for this area of Texas, although somewhat similar burial caches have recently been reported from the Ernest Witte Site (41 AU 37) on the Lower Brazos River (Hall 1981), and from the Loma Sandia Site (41 LK 28) near Three Rivers in Live Oak County further south on the Texas Coastal Plain (Hester 1980).

BIFACES

Projectile Points

The thirteen points recovered (see Figures 3 and 4) show considerable variation in size, blade outline, and degree of reworking. All, however, appear to fall within the range of the *Marcos* type (Suhm and Jelks 1962:209-210). Metric data for these specimens are given in Table 1. All are made of a good quality, brown, Central Texas flint, which infers some contact with or travel to the Balcones

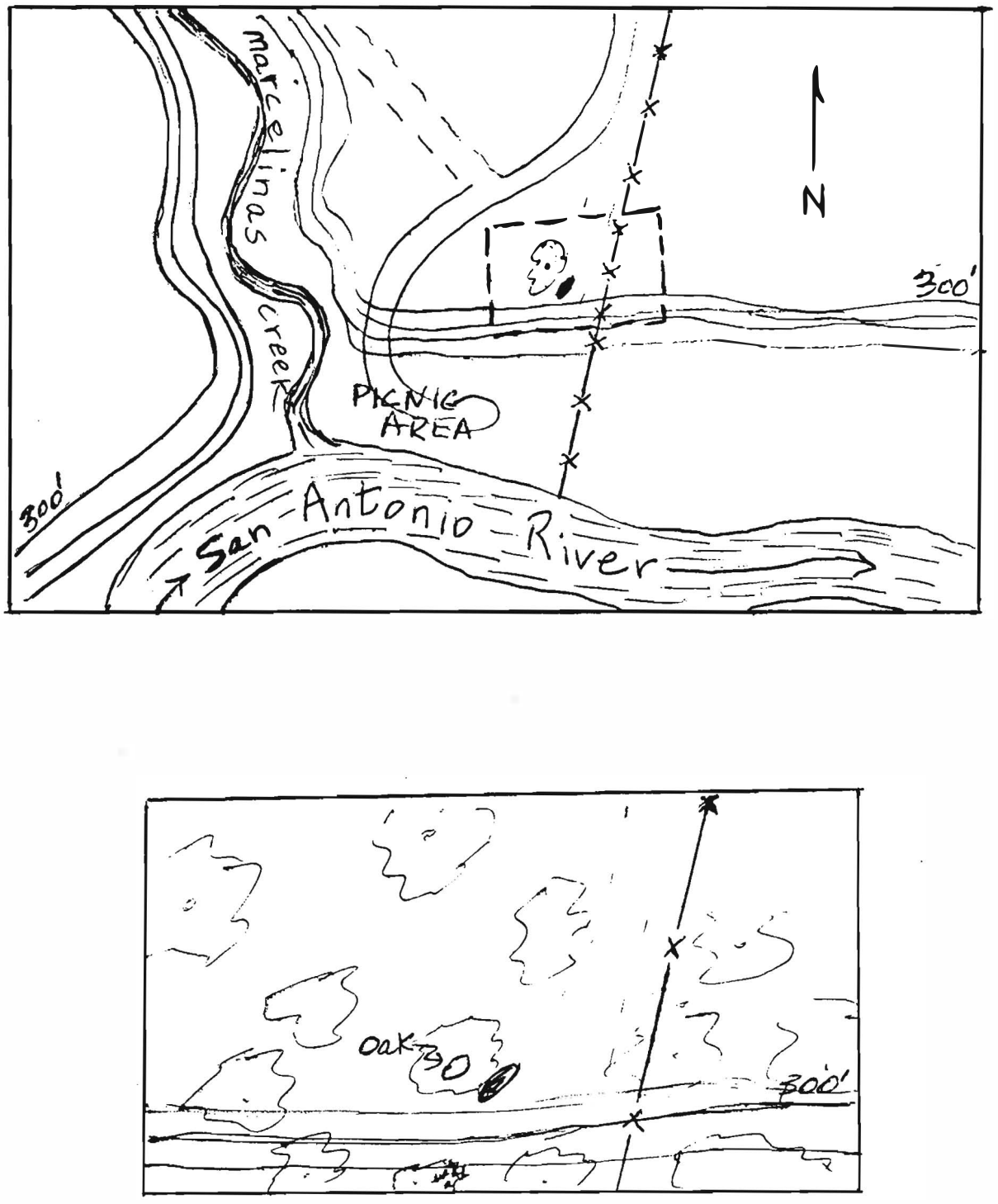


Figure 2. Field sketches of the area of the Rudy Haiduk Site (41 KA 23): Upper panel - General area showing relationships to Marcelinas Creek and the San Antonio River; the site includes the outlined area and portions of the adjacent field. Lower panel - Relationship of the burial to fence-line, tree, and slope. (not to scale).

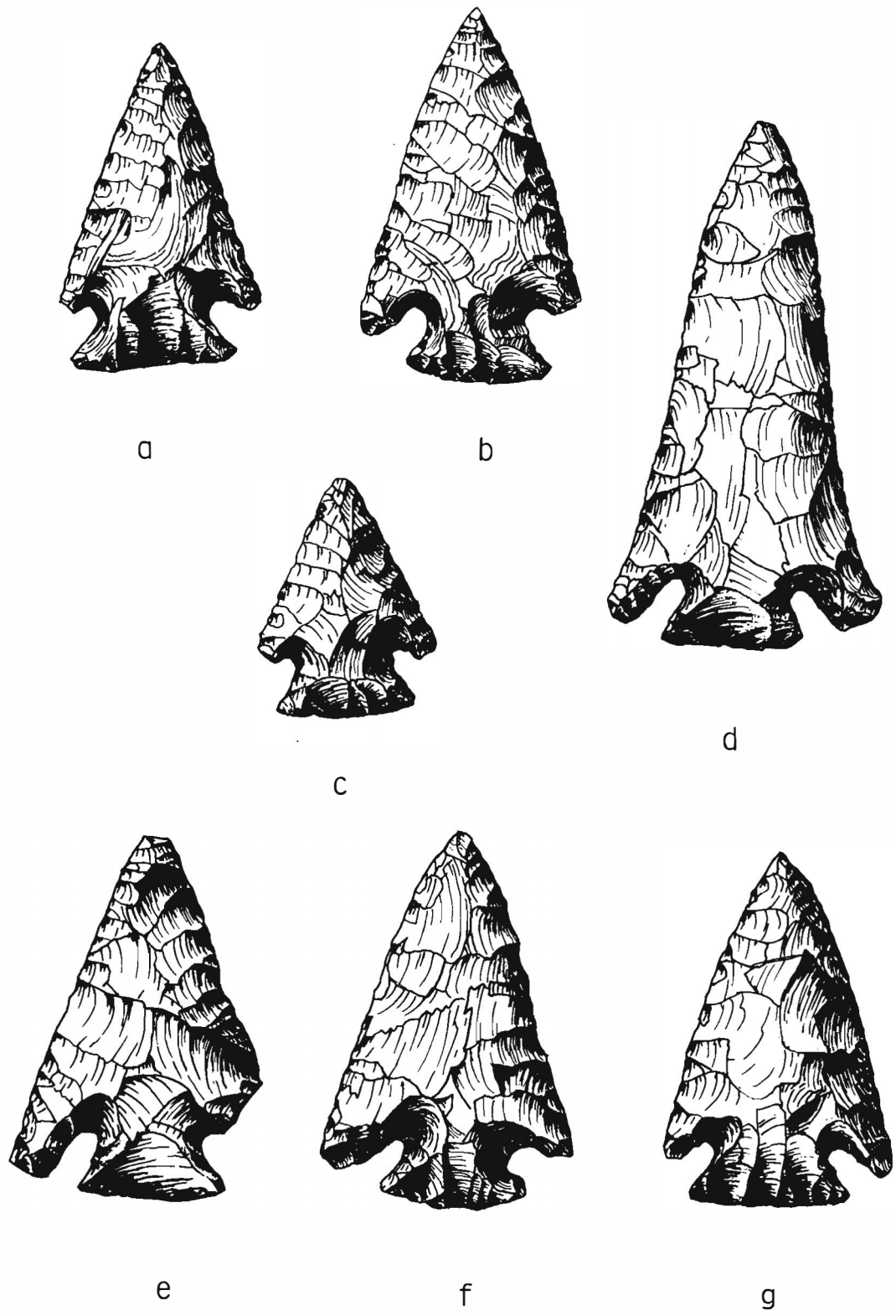


Figure 3. *Marcos* Points from 41 KA 23. Actual size. (Illustration by Richard L. McReynolds.)

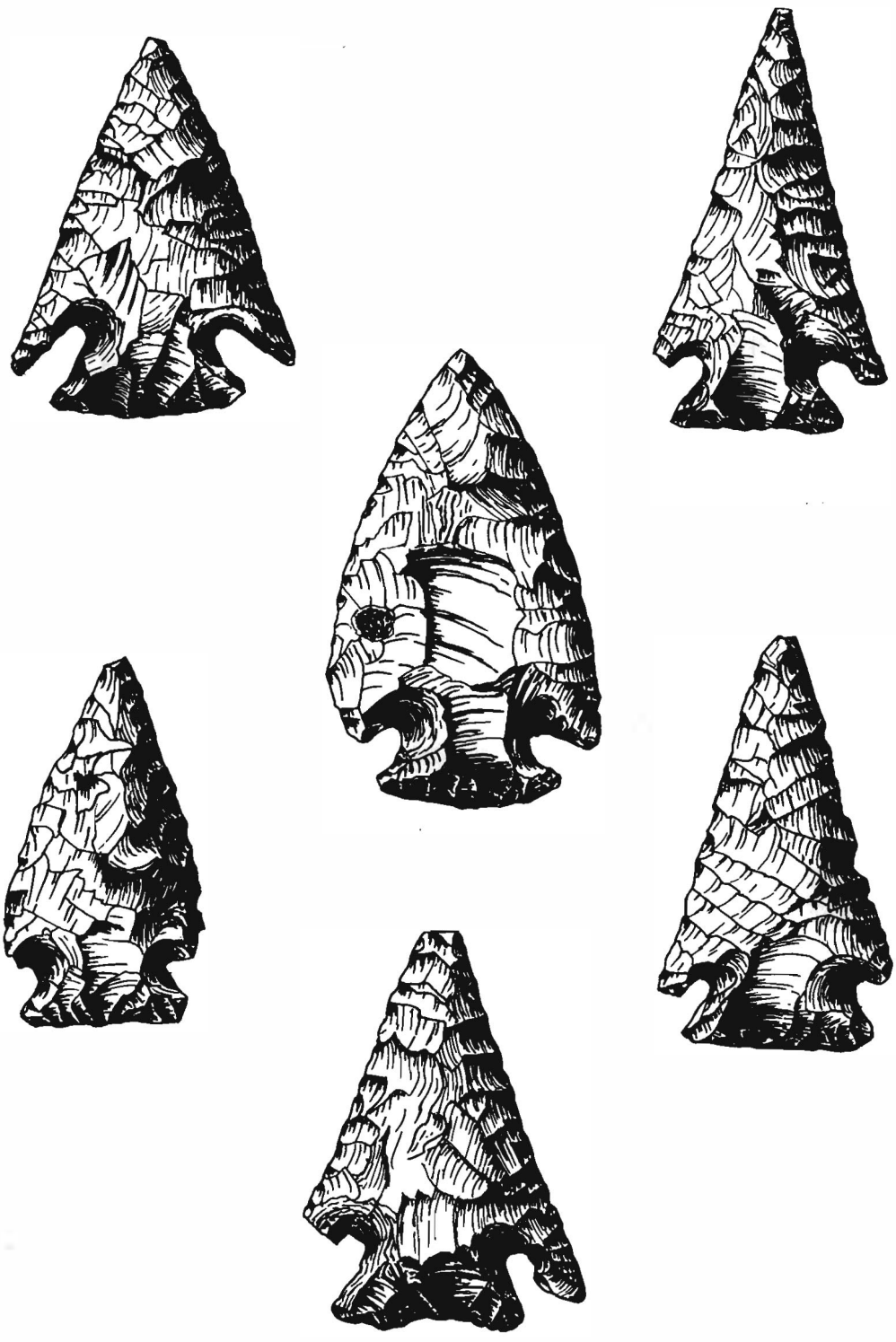


Figure 4. Additional *Marcos* Points from the Rudy Haiduk Site. Actual size. (Illustration by Richard L. McReynolds.)

Table 1*

METRIC DATA FOR *MARCOS* PROJECTILE POINTS FROM 41 KA 31

Spec. No.	Illustr. Reference	Max. Lth	Max. Wdth	Max. Thck	Stem Lgth	Haft Wdth	Base Wdth	Base Conf.	Weight** (gms)	Comments
1	3a	51	(32)	8	10	17	26	+2	8	
2	3b	59	(34)	7	12	15	22	+3	11	
3	3c	39	(28)	5	10	16	22	+2	4.5	Light tan flint; extensively reworked
4	3d	(85)	43	8	10	16	22	+2	17.5	Mottled greyish tan flint; asymmetrical specimen; thinned base; recurved blade edges; unusual length; basal notches
5	3e	(62)	(44)	6	11	17	23	+2	12	Basal notches; thinned base; reworked right edge
6	3f	(61)	39	8	10	16	22	+4	14	Asymmetrical; reworked right edge
7	3g	56	35	6	10	17	25	+1	11.5	Asymmetrical; reworked upper right & left
8	4a	(52)	43	7	12	19	29	+3	12	Wide haft and base
9	4b	(65)	(36)	7	11	17	21	+2	10.5	Asymmetrical; reworked both blade edges
10	4c	68	(39)	6	11	18	26	+4	15.5	Concave blade edges; reworked; left tang broken; fossil inclusion mid-left; thinned from base to upper middle of face
11	4d	(60)	(37)	10	9	19	26	+2	12	Unfinished, incompletely thinned due to node on center right of face; broken; reworked
12	4e	(66)	(38)	6	10	21	28	+3	10	Asymmetrical; reworked right blade edge; note diagonal flaking from lower left blade edge across lower face.
13	4f	(65)	(45)	8	11	20	23	+3	14	Broken tip and tang; thinned base appears convex; reworked right blade edge
Mean		60.7	37.9	7.1					11.7	
Stnd. Dev.		10.3	4.8	1.2					3.1	

* All measures in millimeters except weight (in grams).
** Measured on a double-beamed scale; actual values rounded to nearest half gram (accurate to ± ¼ gram).
( ) Figures in parentheses reflect estimates of the original values based on reconstructed shapes.

Escarpment and the Edwards Plateau, up river or to the west from this Karnes County site. Some of the flint has fossil inclusions (see Figure 4c) which made flintknapping difficult. A number of the specimens show evidence of extensive reworking (note particularly Figures 3c and 4d) which suggests some conservation of lithic materials (as has been suggested as a characteristic of the people of the coastal plain; see Hester 1980). All of the points evidence excellent workmanship with some showing a fine collateral flaking (see Figure 4e). Basal configurations appear to range from concave to straight to convex. While concave bases are generally thought to be more typical of the *Marcos* type, Suhm and Jelks (1962) note this range of variation. A close examination of the bases of these specimens suggests that the straight and slightly concave appearing basal outlines may be the result of difficulty in the process of thinning some bases. Standard measurements (using the widest point of the base as a reference point as recommended by Prewitt) revealed all to be technically concave (see Table 1). In the nearby Central Texas area, *Marcos* points are diagnostic of the Uvalde Phase (ca. 300 B.C. to A.D. 200), based on evidence in a number of multicomponent sites; other related Uvalde Phase point types include *Castroville* and *Montell* (Prewitt 1981; Suhm and Jelks 1962).

Preforms

The collection includes a variety of thick and thin bifaces which might be classed as preforms. Representative types are illustrated in Figure 5 with metric measurements reported in Table 2. The specimens shown appear to represent several stages of biface production; Specimens 5a and b show large percussion flake scars. They are thick in cross section and would be considered by some as "quarry blanks" or Stage 1 bifaces. The specimens shown as 5c through f, while still predominately percussion flaked, also show some trimming, probably through pressure-flaking around the margins of the piece; these might be considereed Stage 2 bifaces. Note that the specimen shown as 5f is of a different material, a fine-grained quartzite. It shows much less pressure flake trimming, probably resulting from the difficulty of pressure-flaking this type of material.

Corner Tang Knives (or Tools)

Included with the burial goods was a cache of five corner tang artifacts of various shapes and configurations (see Figure 6). Such corner tang artifacts are usually considered knives and were presumably a hafted tool (see Patterson 1936:17; and McReynolds 1984, elsewhere in this issue). Corner tang knives are a rare but very typical Central and South Central Texas form considered by some to be diagnostic of the Late Archaic (Hester 1980; Hall 1981). Corner tang knives recovered from controlled excavations include one specimen from the Britton Site (Story and Shafer 1965) where a hearth was radiocarbon dated to 130 B.C. and 380 B.C; two specimens from the Ernest Witte Site dating between 520 B.C. and A.D. 360 (Hall 1981); four specimens from the McCann Site (Preston and Shiner 1969); and seven specimens from the Morhiss Site in nearby Victoria County (Chandler, Knolle and Knolle 1983). Chandler, et al., recently reported a specimen from Jim Wells County on the coastal plain south of the Nueces River (Ibid.) and a number of other southern Texas specimens are reported elsewhere in this issue.

Three of the corner tang knives from the Rudy Haiduk burial appear to be complete pieces (see Figure 6a-c). Very fine pressure retouching is evident on the lower edge of the blades. Specimens 28 and 29 (Figure 6a and b) are Patterson's Type 2 - Diagonal Corner Tang artifacts, where Specimen 30 (Figure 5c) is what Patterson termed a Mid-back Corner Tang (Type 4; see Patterson 1936:17). All three specimens are quite thin (5 or 6mm) and range between 73 and 85mm in length (see Table 2).

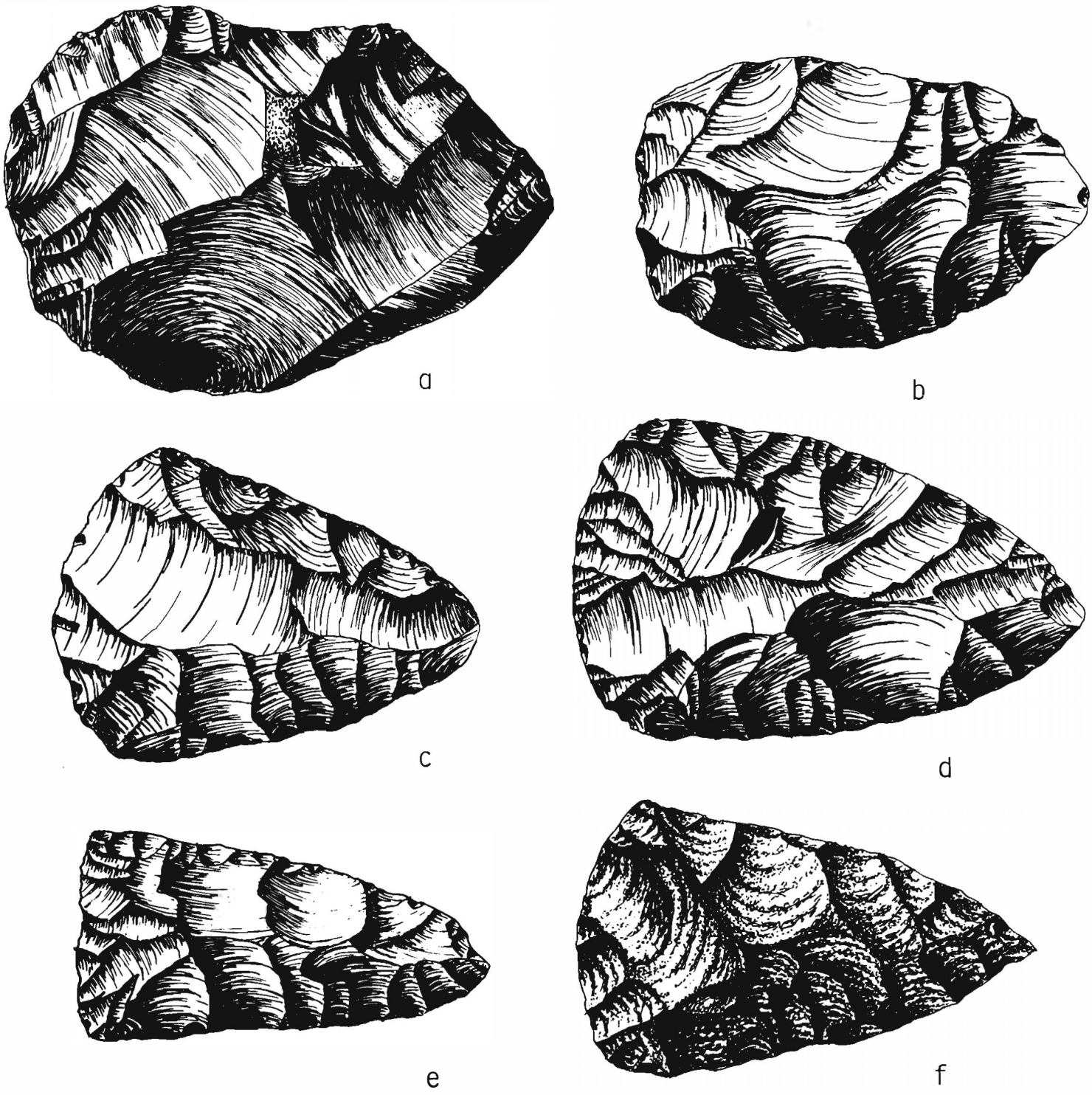


Figure 5. Examples of Thick and Thin Bifaces from 41 KA 23. Actual Size. Drawings by Richard L. McReynolds).

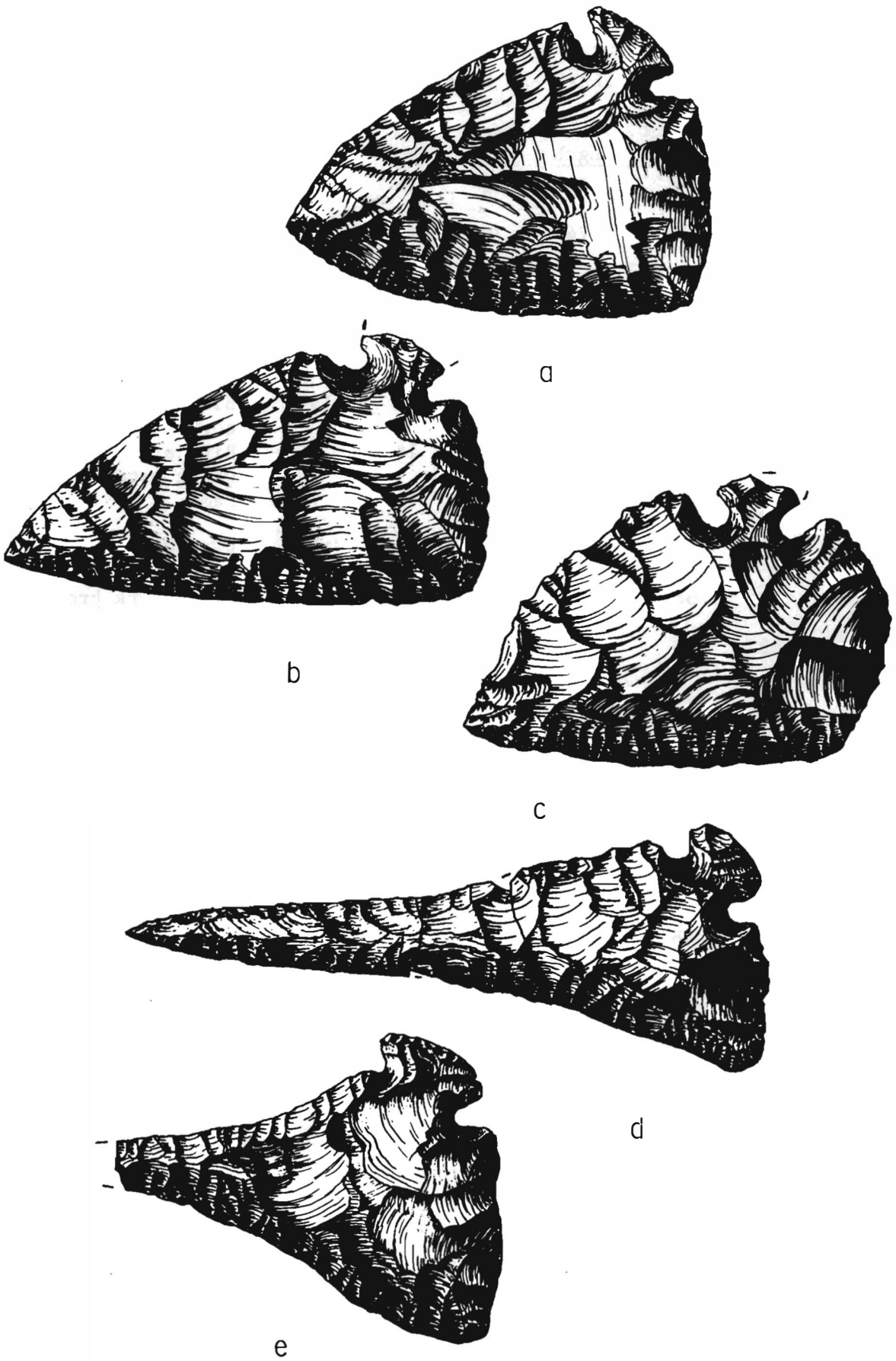


Figure 6. Corner Tang Knives from 41 KA 23. Actual size. (Drawings by Richard L. McReynolds.)

Table 2

FLAKE AND BIFACE METRIC DATA

Category or Class	Specimen No.	Illust. Ref.	Lgth	Max. Wdth	Max. Thck	Weight (gms)	Comments
Thick Bifaces	14	-	75	70	18	82	Unifacial primary cortex flake with evident percussion bulb
	15	-	74	70	13	79	Unifacial primary cortex flake with 8-10 secondary trimming scars
	16	-	79	59	14	65	Primary cortex flake
	17	-	75	36	11	27	Primary cortex flake
	18	-	86	77	23	133	Bifacially worked flake with cortex on edges
	19	-	77	59	19	86	Biface - crudely worked with white patches on edges
	20	-	81	65	12	75	Same
	21	5a	99	70	20	159	Very dark, glossy flint with whitish inclusions; thick
	22	5b	79	53	14	57.5	Shiny dark brown flint with whitish edges
Thin Bifaces	23	5c	77	57	8	39.5	Dull, light tan
	24	5d	91	59	8	52	Dull; pinkish grey tan
	25	▬	70	45	9	34	Dark brown with white edges
	26	5e	75	38	7	23	Greyish light brown
	27	5f	82	50	8	39	Sparkling, dark purple quartite
Corner Tangs	28	6a	73	55	7	29 ▪	Dark mottled flint with whitish edges and tang
	29	6b	85	47	6	29	Greyish brown mottled with whitish butt
	30	6c	75	50	5	25	Greyish brown
	31	6d	111	43	9	24	Dark grey with white inclusions
	32	6e	(88)	55	20	26*	Tip broken (length reconstructed from shape of Specimen 31)
Distal Fragments	33	▬	77*	46	6	25*	Fragment of large, thin biface
	34	▬	61*	27	7	11*	Thin biface fragment; very dark glossy flint with white incl.
Drills	35	7a	88	44	8	24	Pinkish tan
	36	7b	82	47	7	15	Light tan flint, cortex on reverse face

* partial value as a result of fragmentary state of artifact

The other two specimens (31 and 32) are what Patterson termed "Reworked Corner Tangs" (his Type 6) which are often considered "drills"; these are illustrated as Figure 6d and e. The upper and lower edges of both specimens are finely retouched suggesting that the edges were used as a knife blade (see McReynolds 1984, elsewhere in this issue). Specimen 31 (Figure 6d) was recovered in three pieces; two were rejoined and ended up in Mr. Haiduk's collection, and the tip or point ended up with Mr. Kramer. The artist who prepared the illustrations for this article, Richard McReynolds, while studying the flaking of the specimen, noted matching flakes on the separate tip, and rejoined the fragments. The breaks are visible as notches on both sides of the bit in Figure 6d; note that tiny chips are still missing.

Drills or Awls

Two additional "drills" are shown as Specimens 35 and 36 (Figure 7a and b); both have a rounded base and generally symmetrical "bits." The two specimens are quite similar in length, width, and thickness. Specimen 36 (Figure 7b) is somewhat lighter in weight (15 versus 24 grams) and has cortex on the lower base of its reverse side.

OTHER MATERIALS

Gorget

A fragment of a conically drilled, ground stone gorget was also recovered (see Figure 7c and Table 3). The drilled surface of this artifact is convex, which is an unusual feature for ground stone gorgets, although it is sometimes seen in shell gorgets (see Hall 1981). The material is a very light tan with a mottled whitish appearance like one might expect in very weathered, long-buried shell. A test with weak acetic acid suggested this material was limestone rather than shell; a close examination of the break revealed two fossil inclusions which may have been the cause of breakage (see the two tab-like protuberances at the left along the break in Figure 7c).

Ground stone gorgets have been recovered from several Central and South-central Texas sites including the Crumley Site (41 TV 86) in Travis County (Kelly 1961:263 and Fig. 9m), the McCann Site in Lampasas County (Preston and Shiner 1969, Preston 1971), and the La Jita Site (41 UV 21) in Uvalde County (Hester 1971). Specimens are usually limestone or siltstone and are typically biconically drilled with two or more holes. Interestingly, at the McCann Site, seven corner tang knives were also recovered (Preston and Shiner 1969:Fig. 12; Preston 1971:12) and two burials with prepared graves (stone-lined, fine white caliche fill), although no artifacts were directly associated with the graves (Preston 1971:2).

Asphaltum

A hard, dark lump of material was found which proved to be dried asphaltum (see Figure 7d, and Table 3); a fresh break was made revealing a glistening, crystalized interior structure with a jet black color. Asphaltum occurs naturally along the Texas coast where it washes up on the beach in oily patches; it was used prehistorically for hafting artifacts and for decorating pottery (Hester 1980).

Abrading Stones

Specimens 39 and 40 are very grainy, sparkling dark brown quartzitic stones which show some evidence of use or modification. The parallel grooves on the surface of Specimen 39 (see Figure 7e) suggest that it was used as an abrading stone.

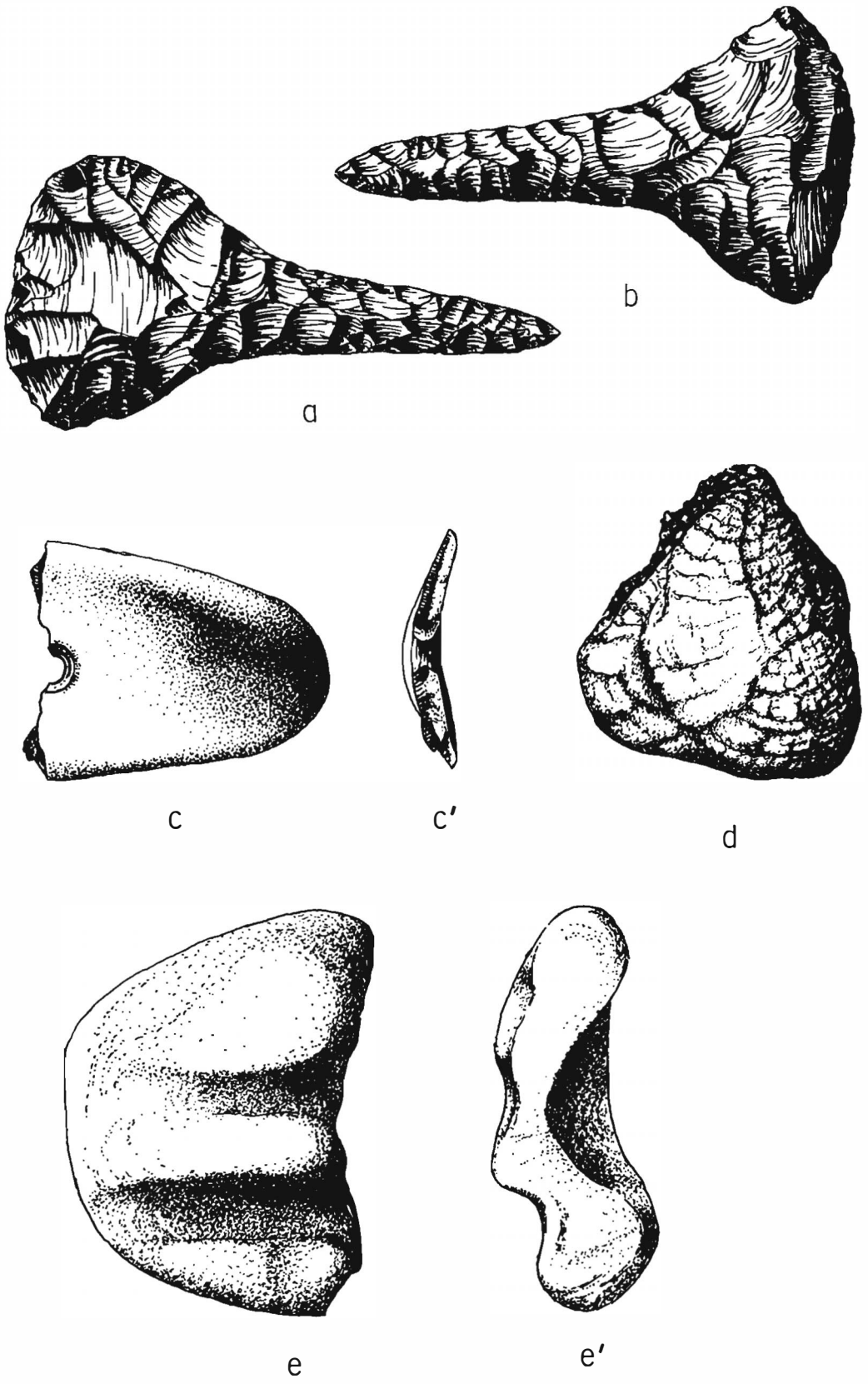


Figure 7. Other Artifacts from 41 KA 23: a-b. Flint "drills"; c-c'. Ground Stone Gorget; d. Lump of Asphaltum; e-e'. Quartzitic Grooved Abrading Stone. Actual size. (Drawings by Richard L. McReynolds.)

Table 3

OTHER ARTIFACTS AND MATERIALS

Category or Class	Specimen No.	Illust. Ref.	Lgth	Max. Wdth	Max. Thck	Weight (gms)	Comments
Gorget	37	7c	45*	38*	5	13*	Conically drilled from inner surface; concave inner face; very light tan with whitish mottling
Asphaltum	38	7d	51	45	28	36	Very dark grey lump; black crystals visible in recent break
Abrading Stone	39	7e	65	47	21	72.5	Very grainy, sparkling brown quartzite; shaped, grooved
	40	-	56	52	25	63	Similar quartzite stone, light grooving
Ironstone	41	8a	94	61	10	76	Rusty, reddish brown stone with multiple scratches, concave face
	42	8b	56	42	19	36	Dark red with scratches on both surfaces; very concave central face
	43	-	85	38	15	41	Dark red, rusty stone; scratches on concave surface
	44	-	55	41	15	30	Same
	45	-	47	47	18	32	Same
	46	-	38	20	21	13	Same
	47	-	37	28	19	13	Fragment; center worn through
Quartz Crystal	48	8c	27	25	16	15	Translucent crystal
Pebble	49	8d	52	33	20	44	Highly polished river pebble
	50	-	72	29	13	28	Dull, very dark grey pebble with parallel scratches on 2 faces
	51	8e	41	16	11	14	Loaf shaped, dark brownish purple stone with scratched faces and flattened on one side
	52	-	-	-	-	21	Seven red ochre fragments
Faunal	53	-	12	11	-	@ 1	Very worn human molar
	54	-	26	7	-	@ 1	Shovel-shaped human tooth
	55	-	-	-	-	@ 1	Tiny bone fragment; unidentifiable

The deep pit on the reverse of this stone (visible in Figure 7e' profile) may have also been a cultural rather than natural modification. The second specimen (not illustrated) has light grooving but no pitting.

Ironstone (Ochre) Pallettes

Specimens 41 through 47 are flattened pebbles of reddish brown ironstone which show numerous scratches (see Figure 8a and b) and occasional grinding wear (see Figure 8b). All these specimens and the ironstone fragments labeled Specimen 52 (see Table 3) may have been used as a source of red ochre used as a form of paint or ceremonially. Mr. Kramer, who excavated the burial, reported finding fragments of red ochre in the chest area of the skeleton.

Quartz Crystal

A glittering, translucent pebble of quartz was also recovered from the burial cache. The crystal shows no sign of modification or use. Orchard (1983) recently reported a quartz crystal which he obtained from the Ponca Indians traveling through San Antonio in 1926. He cites Myerhoff as associating rock crystal with "deceased relatives who have returned as rock crystals" and "grandparents, also are kept...as rock crystals" (Myerhoff 1974:109,181).

Polished or Utilized Pebbles

Figure 8d and e illustrates Specimens 49 and 51, which are pebbles which have been used. Specimen 49 shows no modification but has a very bright polish. Its presence with the grave goods suggests it was a utilized object rather than a chance inclusion; the surrounding alluvium does not contain water-polished river gravel. Specimen 50 (not illustrated) is an unpolished river pebble which has two flattened surfaces and a number of parallel scratches. Specimen 51 (Figure 8d) is a loaf-shaped pebble with one flattened side; the pebble is covered with scratches which suggests extensive use. One end of the pebble is also flattened, as might occur from use as a tiny pestle; some of the ironstone pallettes show some evidence of grinding (see Figure 8b, for example). Close examination of the blunted end of Specimen 51 failed to produce any red staining.

Faunal Material

Mr. Haiduk and Mr. Kramer reported that they also found deer antler sections and tines with the other grave goods. They believe that these deer remains represent part of a flintknapping kit which was interred with the body; this seems a very reasonable supposition.

Additionally, two teeth and one small bone fragment were recovered mixed among the artifacts down the slope from the remainder of the skeleton. Specimen 53 (not illustrated) is a very worn-down human molar with fragmentary roots. Only about 7mm of crown remains above the notch between the roots of the tooth. The upper surface of the tooth is an 11 by 12mm rounded square shape with some of the internal structure of the tooth showing through. The second tooth (Specimen 54) is reasonably intact and the upper end of the tooth has a characteristic shovel shape. The third bone is a tiny fragment weighing less than one gram; it is too small to be identified. These bone remains, particularly the two teeth, confirm the association of the artifacts found down the slope with the remainder of the skeleton which was excavated *in situ*.

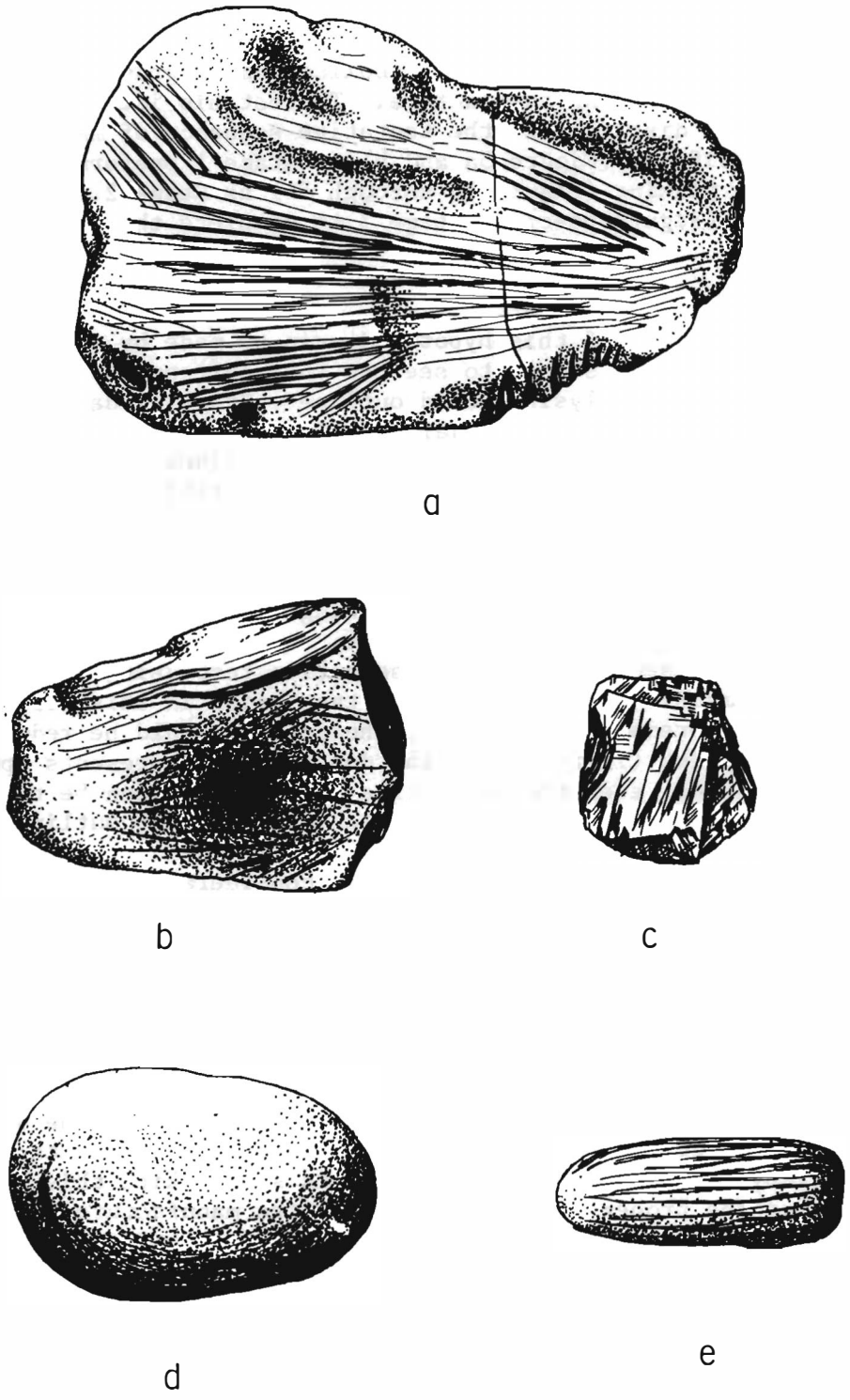


Figure 8. More Artifacts from 41 KA 23: a-b. Flattened pebbles; c. Quartz crystal; d-e. Utilized pebbles. Actual size. (Illustrations by Richard L. McReynolds.)

ANALYSES

CORNER TANG MANUFACTURING SEQUENCE

Mr. Haiduk hypothesized that this collection of grave goods contained the primary stages of corner tang manufacture. To test his idea, the illustrations of bifaces have been displayed in the tentative sequence of manufacture: large percussion-shaped bifaces (Figure 5a and b) as Stage 1 preforms; thin preforms with some pressure flaking (Figure 5c through 5f) as Stage 2 preforms; and whole Corner Tang Knives (Figure 6a-c) as Stage 3 to complete the process.

Outline Analysis

A preliminary test of this hypothesis can be made by overlaying the outlines of examples of these three shapes to see how they correspond. Figure 9 displays several results of this analysis (solid outline = Stage 1, dashed outline = Stage 2, dot outline = Stage 3). The initial test is to superimpose the largest of each type of specimen as has been done in Figure 9a (Outlines = Figures 5a, 5d, and 6b). As can be seen, this appears to be a very plausible hypothesis.

Figure 9b is a more conservative test using a smaller Stage 1 preform (Outlines = 5b, 5c, and 6a). Although the Stages 2 and 3 forms exceed the Stage 1 outline a small bit in two places toward the basal end, this test gives credence to the hypothesis in terms of minimal reworking required to develop a percussion preform into a finished corner tang artifact.

Figure 9c represents the most conservative test using the smallest Stages 1 and 2 biface specimens. No Stage 3 corner tang knife in this collection would fit the smallest Stage 2 reduction; however, the preform could be reduced to become a *Marcos* projectile point (in this case the dot outline represents Specimen 12 shown as Figure 4e). Indeed, even the projectile point itself can be reduced further to produce a reworked or resharpened projectile (dash and dot outline = Specimen 3 shown as Figure 3c).

This rather simplistic procedure gives considerable evidence in favor of the proposed manufacturing sequence for corner tang artifacts. However, it also demonstrates with specimens from a single burial cache (and thus a discrete component) that some of the smaller Stages 1 and 2 preforms were most likely used for manufacturing *Marcos* projectile points instead. Indeed, any of the larger preforms could have also been used to manufacture such points. One implication of this result is that both corner tang knives and *Marcos* points were probably manufactured from the same type of thinned preform biface. Further, the two drills or awls shown in Figure 7a and b could also have been made from the same Stage 1 thick preform (5a) and Stage 2 thinned preform (5d) as were both points and corner tang knives. Thus, by carrying such preforms in his supply kit, this Late Archaic flintknapper had the proper material handy for the manufacture of a variety of tools.

Cluster Analysis

Another approach to the problem is to determine how all of the lithic specimens relate to one another in terms of their metric attributes (Tables 1, 2, and 3). One procedure for accomplishing this goal is to assess the similarity of their common attributes and cluster the specimens on the basis of some systematic function (in this case, D^2, the minimum squared differences summed across variables). The results can be graphically displayed to show the relationships among the specimens in the data set (Ward and Hook 1963; Mitchell 1979). Since the only common attributes shared by all specimens are length, width, thickness, and weight, these were the variables used in this analysis; thus, the assessment of similarity in this case is based on the relative size of the artifact.

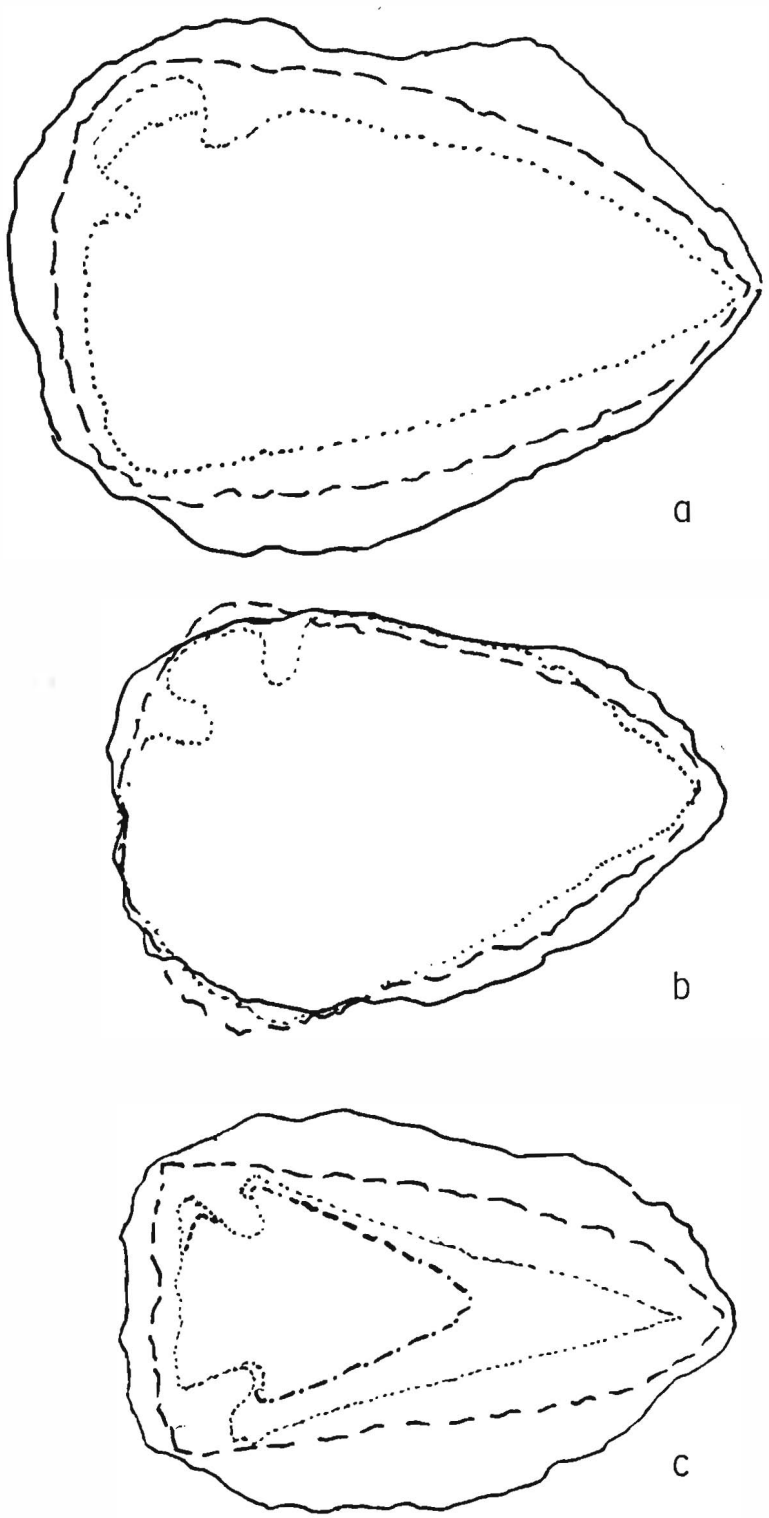


Figure 9. Analysis of a Possible Corner Tang Manufacturing Sequence: Upper Panel - Superimposed outlines of largest thick and thin bifaces and corner tang knife; Middle Panel - Smaller thick and thin bifaces and corner tang knife; Lower Panel - Smallest thick and thin bifaces with complete and reworked *Marcos* points.

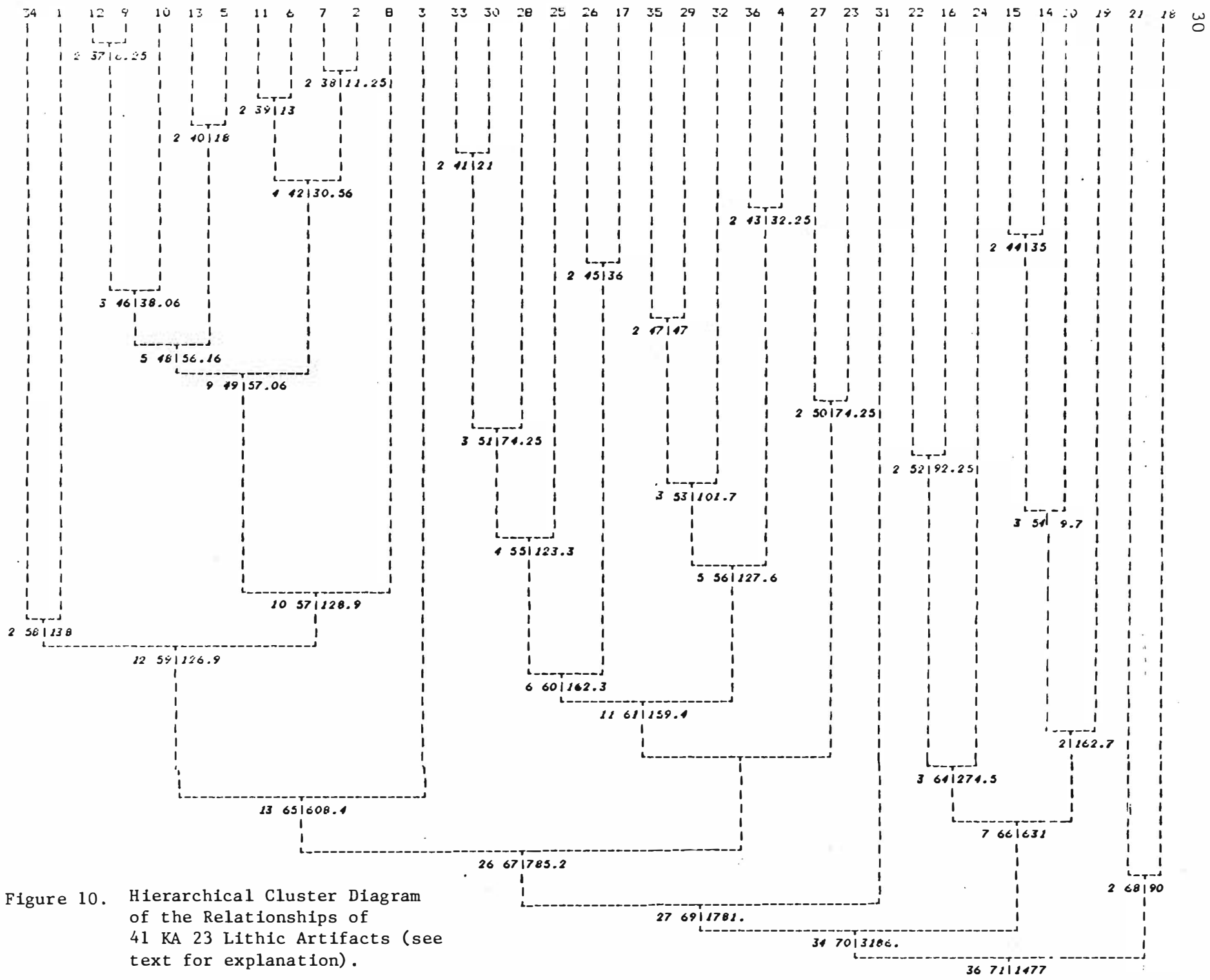


Figure 10. Hierarchical Cluster Diagram of the Relationships of 41 KA 23 Lithic Artifacts (see text for explanation).

The resulting hierarchical clusters are shown in Figure 10. The numbers across the top of this chart are the specimen numbers given in Tables 1 and 2. Three numbers are shown for each clustering stage: the first number is the group size, the second number is the clustering stage number, and the third number to the right of the stem is the squared difference value. Specimens 12 and 9, for example, grouped at the top of the diagram, indicating that they are the two most similar artifacts in the entire collection. For this pair, the group size is 2, the stage number is 36 (the number of artifacts being clustered plus one, as a convenient control number for succeeding stages), and the squared difference value is 6.25 (the minimum or lowest D^2 value of all possible pairs).

Obviously, the complex clustering diagram requires some interpretation. The results can be highlighted as follows:

1. Twelve of the 13 *Marcos* points plus one thin biface fragment form the first cluster, giving some credence to the projectile point category. Note that Specimen 4, the largest point (Figure 4d) is not included in this cluster. Nine specimens form a tight group within the cluster at Stage 49 (Specimens 12, 9, 10, 13, 5, 11, 6, 7, and 2) with average values of Length = 62.4mm (SD = 3.6), Width = 38.5 (SD = 3.5), Thickness = 7.1 (SD = 1.3), and Weight = 12.3 grams. These values are very consistent with the dimensions (or ranges) given by Suhm and Jelks (1962:209).

2. The second cluster included all the corner tang artifacts, thin bifaces, the drills, a small cortex flake, and Specimen 4 (the largest point). Specimen 33, a large fragment of a biface, and two corner tang knives (30 and 28) form a group (Stage 51). One corner tang knife (Specimen 29, Figure 6b) grouped with the very large drill (Specimen 35) at Stage 47, where the second drill (Specimen 36) paired with the very large *Marcos* point (Specimen 4, Figure 3d) at Stage 43. These combine with an additional corner tang (Specimen 32) at Stage 56; this corner tang-drill-largest point group appears significant and has some interesting implications. This result indicates that this large *Marcos* biface is more like the drills and corner tang knives in terms of size, than it is similar to the projectile points. This finding hints that Specimen 4 and the flint drills may have functioned as knives. The fifth corner tang (Specimen 31) does not cluster with other artifacts until the *Marcos* cluster (1) has merged with the corner tang-drills-thin biface cluster (2), at Stage 69, which makes a super cluster of all the thin bifaces. This result implies that the categories are not completely discrete, a finding already obvious from Specimen 34 grouping with the points and the large point (Specimen 4) with Cluster 2.

3. The thick bifaces and large primary cortex flakes (quarry blanks) form the third major cluster based on their large size. The very largest, heaviest pieces (Specimens 21 and 18) are the last artifacts to merge into the total sample, reflecting their substantial difference from the other artifacts.

4. Overall, the hierarchical clustering on the basis of size tends to confirm the *a priori* grouping of the artifacts into the classes of projectile points; thin bifaces, drills, and corner tang knives; and thick bifaces, with a few exceptions. The admixture of corner tangs, drills, and thin bifaces is not surprising in light of Figure 9b, where it was demonstrated that minimal work would have been required to convert the smaller bifaces into corner tangs. With slightly more work, they could become points (as in Figure 9c). Thus, the results of the cluster analysis tend to support the earlier conclusions on a manufacturing sequence of thick to thin biface and then to corner tang, drill, or projectile point. The anomaly of Specimen 4 grouping with the drills and corner tang knives results in a hypothesis that these artifacts may have functioned as knives. This is a hypothesis which can easily be tested through microscopic inspection of wear patterns on the specimens to determine how they were used.

Wear Pattern Analysis

A sample of the artifacts, including all five corner tang artifacts, were examined microscopically for evidence of use and wear. The results of this analysis are summarized below:

Specimen 4 - Largest Point (Figure 3d). There is a light wear polish over all surfaces; it is a little more pronounced on flake ridges (arrises) and edge high spots but occurs over all flake scars. The wear polish also occurs on the barb and stem. While there are no visible striations, this artifact appears to have been used as a knife to work a soft, yielding material such as meat. This result confirms the hypothesis resulting from the cluster analysis; it also suggests, however, that other "points" also need to be examined.

Specimen 10 - Convex Blade Point (Figure 4c). There is heavy wear polish over all surfaces, all edges, and flake ridges. All high points are heavily rounded and polished. One blade edge shows much more minute nibbling than the other with polish over these tiny scars. It appears this edge was used more than the other. Thus, this artifact appears to also have been used as a knife but with frequent contact with a hard substance such as bone. This type of edge nibbling does not occur in meat processing unless contact is made with bone.

Specimen 13 - Concave Blade Point (Figure 4f). Light wear polish occurs along both blade edges and on the one remaining barb as well as across the base. The flake scars on both faces have medium wear polish but this does not extend into the deeper areas of the scars. The more prominent ridges and high points are rounded and polished. Wear polish does not extend into the corner notches. There is almost no evidence of microflaking of blade edges. While this type of artifact is normally classified as a dart point, this specimen has also received considerable use as a knife.

Specimen 28 - Diagonal Corner Tang (Figure 6a). This corner tang knife has two light patina patches; such patina must have originally covered all surfaces. It has been heavily reworked to the extent of removing almost all the patina except for two small patches on one side. Flake scars and ridges on both faces are without any wear polish. The small areas of patina on one side do show wear polish and striations. Evidence of heavy wear on other areas was removed when the artifact was reworked. There is medium wear polish across the basal edge of the tang and to a lesser degree along the edge of the heel. There is also very light wear polish along both the upper and lower edges that converge to form the point. This artifact has received very little use since it was reworked.

Specimen 29 - Diagonal Corner Tang Knife (Figure 6b). A portion of the tang was broken and reworked; this appears to have been done in the original manufacturing process. Across the blade of this specimen, all flake ridges and flake scars are polished, but not extensively. Light polish occurs in both notches on the tang, which is evidence that the knife was hafted. All edges have use polish; the edge opposite the tang has been resharpened. It has use wear polish to one side only accompanied by microflaking to that side. This edge appears to have been used in a scraping manner after resharpening. The upper edge has use wear polish and microflaking to both sides, which is quite pronounced. Thus, both blade edges show use as a knife and the lower edge was also used as a scraper.

Specimen 30 - Mid-back Corner Tang (Figure 6c). Flake ridges on this specimen show very minimal wear polish and no striations. Flake scars are not worn or

polished. The blade edge opposite the stem is beveled from one side and this edge shows medium wear polish and microflaking. The opposite edge has more extensive wear polish and some microflaking. There is some polish on the tang edges and base; this polish extends into the deepest part of the notches. This artifact does not appear to have been extensively used. The microflaking and resharpening of the beveled edge may be due to use against an anvil or other hard surface. The edge of the heel also has wear polish.

Specimen 31 - Corner Tang Drill (Figure 6d). This specimen was broken in three pieces; the distal portion has patina on both sides, the medial fragment and basal portion with the tang has patina on one side only. There is medium wear polish on each edge of the corner tang and this extends into the bottom of the notches which form the tang. This wear polish may be due to wear from the hafting lashings but could also be due to the artifact having been suspended on a thong around the neck or wrist as a means of keeping up with it (see McReynolds, elsewhere in this issue). The outer edge (base) of the tang is heavily abraded and polished; this area is so heavily abraded and polished it appears to have been done deliberately to dull it. The heel and both edges of the bit have heavy wear polish on all high points but not as much so as the tang. All of the flake ridges have heavy wear polish and this extends well onto the flake scars; however, the deeper areas of the flake scars are not polished. The end 20mm of the drill bit is more heavily polished than the other edges. Striations are not visible anywhere on this artifact.

Specimen 32 - Corner Tang Drill Fragment (Figure 6e). This artifact is extensively polished over all surfaces and edges. This polish is so extensive it is difficult to believe it is all due to use; it may have been sand blasted or water worn. Bit edges are extensively battered, abraded, rounded and polished. This wear extends onto the heel and stem and the heaviest polish is on these areas. Near the broken end there are circumferential striations on the bit edges, definitely indicating use as a drill. The drill bit appears broken due to a twisting fracture. This artifact has the waxy feel and glossy appearance usually associated with heat treatment; however, this appearance and feel may be due to its extensive polish. Patina is beginning to form on one surface.

Specimen 33 - Thin Biface Fragment (not illustrated). This specimen is a broken distal portion of a thin biface which grouped with the projectile points in Cluster 1. Its edges are alternately beveled from resharpening. It shows heavy wear polish along both edges, in the surface flake scars, and on the flake ridges. Wear on the flake ridges and other high spots is sufficient to round them off and reduce their height. There are no visible striations but wear polish is quite heavy. This broken artifact appears to have been used extensively to process a soft yielding material such as meat.

Specimen 34 - Large, Thin Biface Fragment (not illustrated). This is the distal portion of a large, broken biface which grouped with larger corner tangs and drills in Cluster 2. There is heavy wear polish over all surfaces and edges. The flake ridges and blade edges are rounded and polished. Both blade edges show extensive microflaking and polish. The broken edge also shows wear polish on both sides but no microflaking. The microflaking along both edges is much greater toward the opposite sides and is more extensive on the sinuous edge than on the straight edge. This fragment appears to have been used primarily as a scraper, after it was broken. There are some light striations at right angles to the blade edges; these occur mainly on the highest points and are more visible toward the point. The broken edge is a snap fracture; it does not appear to have been broken in manufacturing. Thus, this specimen appears to have been manufactured as a

projectile point and knife but was broken after some use; after being damaged, it was used more extensively. The tool was used in hide processing, primarily as a hand-held scraper and, from the configuration, by a left-handed person.

Specimen 35 - Rounded Base Drill (Figure 7a). This specimen has heavy wear polish along medial ridges of the bit, flake ridges and bit edges. The bit averages 4mm wider than thick. The heavy wear on its flake ridges extends well up on the expanding edges of the base near its maximum width. The wear on bit edges includes heavy circumferential striations indicating definite use as a drill. There are no visible longitudinal striations, casting doubt on any extended use as a perforator or awl. There is noticeable wear polish on the flake ridges of the base and on all the base edges, but these are not as pronounced as on the bit edges and without striations. Overall, this tool appears to have received extensive use as a hafted drill with some use as an awl or perforator. All of the high points of the bit edges and flake scars show extensive use wear and polish to the point of reducing these contact points and rounding them off. There is very little evidence of wear or polish on the flake scars. It appears this tool was used primarily on a hard, unyielding material, such as wood or bone, with very minimal use on a soft, yielding material, such as hide or meat.

Specimen 36 - Expanding Base Drill (Figure 7b). The blade edge shows medium wear polish on the higher points with minimal polish on the flake ridges. There is minimal evidence of any use wear on the bit edges and no wear polish at all on the bit longitudinal ridge. There is, however, medium wear polish all across the base. This artifact appears to have been used as a scraper with the basal edge as the working surface; it is doubtful that it was ever used as a drill.

Overall, this wear analysis has yielded some surprising results. While it confirmed the hypothesis that the largest point (Figure 4d) was used as a knife, it also revealed that other points also functioned as knives. This result gives considerable credence to Kelly's recent comments about Paleo-Indian points, mounted in a short foreshaft, having a secondary use as a field butchering tool (i.e., a knife; see Kelly 1983:27). Apparently this use of the foreshaft-hafted point as an expedient knife is a cultural characteristic which extended from Paleo-Indian times until at least the Late Archaic period.

The corner tang artifacts were also apparently multiple use tools. Several show signs of use on both blade edges as knives and often on the "base" as well. Several were used as scrapers as well as knives. The corner tang drills were used first as knives and later as drills or awls (perforators). In almost every case, the artifacts show signs of multiple use.

The expanding base drills without stems or tangs reveal a contradictory pattern; one was very obviously used as a drill, but the other, with a similar shape, was apparently only used as a scraper with what we would consider the base as its working edge.

Even the biface fragments show multiple use or reuse. The larger biface fragment was first used as a point or knife and after fracturing on impact, was retrieved and was used as a scraper.

Function apparently does not always follow form. Rather, the wear on these artifacts reveals that almost any tool that was handy was used for whatever purpose needed at the time.

DISCUSSION

The cooccurance of *Marcos* points and corner tang knives in this single burial demonstrates a strong relationship between the two types of artifacts. This very discrete *Marcos* component is thus a singularly important discovery.

The *Marcos* point type has been associated with the Uvalde Phase in Central Texas (Prewitt 1981:81). Other projectile types associated with this phase include *Castroville* and *Montell* points. If this isolated Karnes County burial is related to the Uvalde Phase of nearby Central Texas, then it would be necessary to expand the set of Uvalde Phase representative artifacts to include: corner tang knives, flint drills, ground stone gorgets, ironstone paint pallettes, abrading stones, asphaltum, deer antler tools and quartz crystal. Several of these types of artifacts have been recovered in representative Uvalde Phase components at various Central and Southcentral Texas sites, including Crumley (41 TV 86), La Jita (41 UV 21), and McCann (41 LM 3), but not in direct association. Radiocarbon dates cited earlier for corner tang artifacts tend to confirm the estimated dates for the Uvalde Phase. It is also interesting to note that *Marcos* points are reported from many of these same sites, although in relatively small numbers (103 *Marcos* points out of 5,505 projectile points recovered at the McCann Site; see Preston 1971:10-11) but again, these were not documented as being in direct association with the corner tang knives.

Prewitt (1981:81) noted that data were lacking on mortuary practices of the Uvalde Phase, although isolated flexed burials were reported for the succeeding Twin Sisters Phase, and cremations with interment in a shaped basin were characteristic of the preceding San Marcos Phase. On the basis of the data from the Rudy Haiduk Site, Karnes County Late Archaic mortuary practices can be said to include isolated terrace burials, prepared burial pits (white sand below the skeleton), interment with grave goods including exotic artifacts (ground stone gorget, corner tang knives), and a flexed burial position.

There is some question whether the grave goods recovered with this burial are grave "offerings" in the classic sense, or are simply the interment of the possessions of the individual. Rudy Haiduk and Erwin Kramer, who salvaged this burial, remarked that the artifacts all appear to be the contents of a flintknapper's kit; they presume the materials were probably the contents of a leather pouch which was placed in the grave above the chest area. This supposition stems from the artifacts having been bladed away, along with a portion of the skull, and tumbled down the slope. Given their observation of the burial *in situ*, and after analysis of the artifacts, their idea is probably correct. It is likely the grave goods in this burial are the contents of a single flintknapper's kit.

In some of the observed burial traits (such as inclusion of ground stone ornaments and corner tang knives), the Rudy Haiduk Site is more similar to the Ernest Witte Site on Allens Creek in the Brazos River area (Hall 1981) than to sites along the Balcones Escarpment in Central Texas. A major difference, however, is that burials at the Ernest Witte Site were in a large cemetery, where 41 KA 23 is an isolated burial. At the Rudy Haiduk Site, head orientation was to the southwest, toward the river; this is more characteristic of Late Archaic coastal Indian groups along the lower Nueces River as recently noted by Mokry (draft manuscript on the Berryman Site in Nueces County). This is a potentially diagnostic burial characteristic which should be examined at other southern Texas burial sites. In general, it appears that the burial traits of the Rudy Haiduk Site are a mixture of traits showing influence from the Brazos River area to the east, the Coastal Bend area to the southeast, and from Central Texas to the west and northwest.

The probable areal relationships at 41 KA 23 are not entirely consistent with some of Prewitt's conclusions on the external relations of the Uvalde Phase. He noted that the phase "represents a more widespread adaptation" (Prewitt 1981:81). However, he went on to state that "Marine shell artifacts noticeably are lacking and indicates a discontinuation of the earlier apparent trade system" (Ibid.). The Edwards Plateau flint, ground stone gorget and other characteristics shared with Allens Creek, and the asphaltum which probably came from the Texas coast all suggest inhabitants of the Rudy Haiduk Site were involved in a fairly widespread trade network.

The corner tang knives from the Rudy Haiduk Site represent a significant discovery. None have previously been documented from Karnes County although Patterson (1936:20) reports a number from surrounding counties including 4 from Atascosa, 5 from Bexar, 4 from Wilson, and 6 from DeWitt Counties. Grant Hall recently summarized distributional information on corner tang knives, noting that at least 608 specimens have been reported in Texas, with the "area of maximum availability" being Central Texas (Hall 1981:Figure 55, p.291). The greatest frequencies outside Texas are Wyoming (33) and Nebraska (18). The general distribution within Texas is shown in Figure 11 (courtesy of Grant Hall). While the figure is very cluttered, it clearly reflects a cultural area (Skinner 1974:182; Mitchell 1978:33) which would include Karnes County, and, indeed, much of Central and Southcentral Texas. Whether this cultural area represents the Uvalde Phase as defined by Prewitt or a more general Late Archaic cultural phenomena is unclear. We suspect, however, that corner tang knives were in use in more than one phase; this is suggested by the patina and later reworking of Specimen 28 at the Rudy Haiduk Site.

Indeed, the widespread reports of corner tang knives suggest a farflung network of trade or influence in the Late Archaic. A quick tabulation of recently reported corner tang knives (including those in this issue) would bring the known distribution to 651 for Texas and over 760 nationwide (mostly in Texas and the Great Plains). Undoubtedly, with more complete recording of private collections in Texas and elsewhere, these totals would be much higher.

Careful analysis of corner tang and other thin bifaces recovered from the Karnes County site tend to confirm Mr. Haiduk's hypothesis of a manufacturing sequence for corner tangs, demonstrated with artifacts from a single, discrete component. The analysis also suggested, however, that the thin bifacial preforms included with this burial were probably also used to manufacture *Marcos* points and flint drills as well.

Wear pattern analysis confirmed the use of corner tang artifacts as knives and documents the use of such knives on relatively soft plant or animal tissue. Analysis of the very large *Marcos* "point" (Figure 4d) revealed that it was most probably a hafted knife rather than a projectile point. This finding suggests that extra large "points" should be checked for wear patterns before being indiscriminately labeled projectile points. Such a finding does not, however, rule out the use of such a specimen for both functions; indeed, wear analysis of two projectile points from this collection confirm that they were also used as knives. Kelly has recently also demonstrated that *Golondrina* points hafted on atlatl

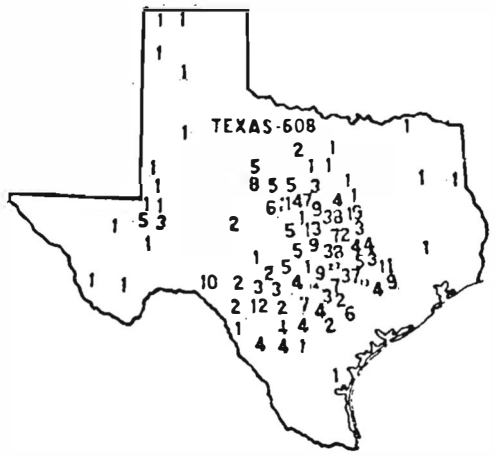


Figure 11. Distribution of Documented Corner Tang Knives in Texas (adapted from Patterson 1936 and Hall 1981; map courtesy of Grant Hall, UTSA-CAR).

foreshafts were probably used both as spear points and as hand-held knives (Kelly 1982:17). The current finding from the Rudy Haiduk Site tends to suggest that Kelly's finding is probably generalizable to Late Archaic as well as Paleo-Indian phases, thus suggesting a degree of cultural continuity in this technology.

Overall, the Rudy Haiduk Site must be considered an important and significant discovery. Analysis of materials from the site have resulted in a more complete documentation of the attributes of the *Marcos* projectile point type, and an examination of the technology of corner tang knives. It has demonstrated wide areal or trade relationships during the Late Archaic in this region. Careful excavation and documentation of more Late Archaic burials in Central and southern Texas are needed to confirm the findings noted in this report.

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