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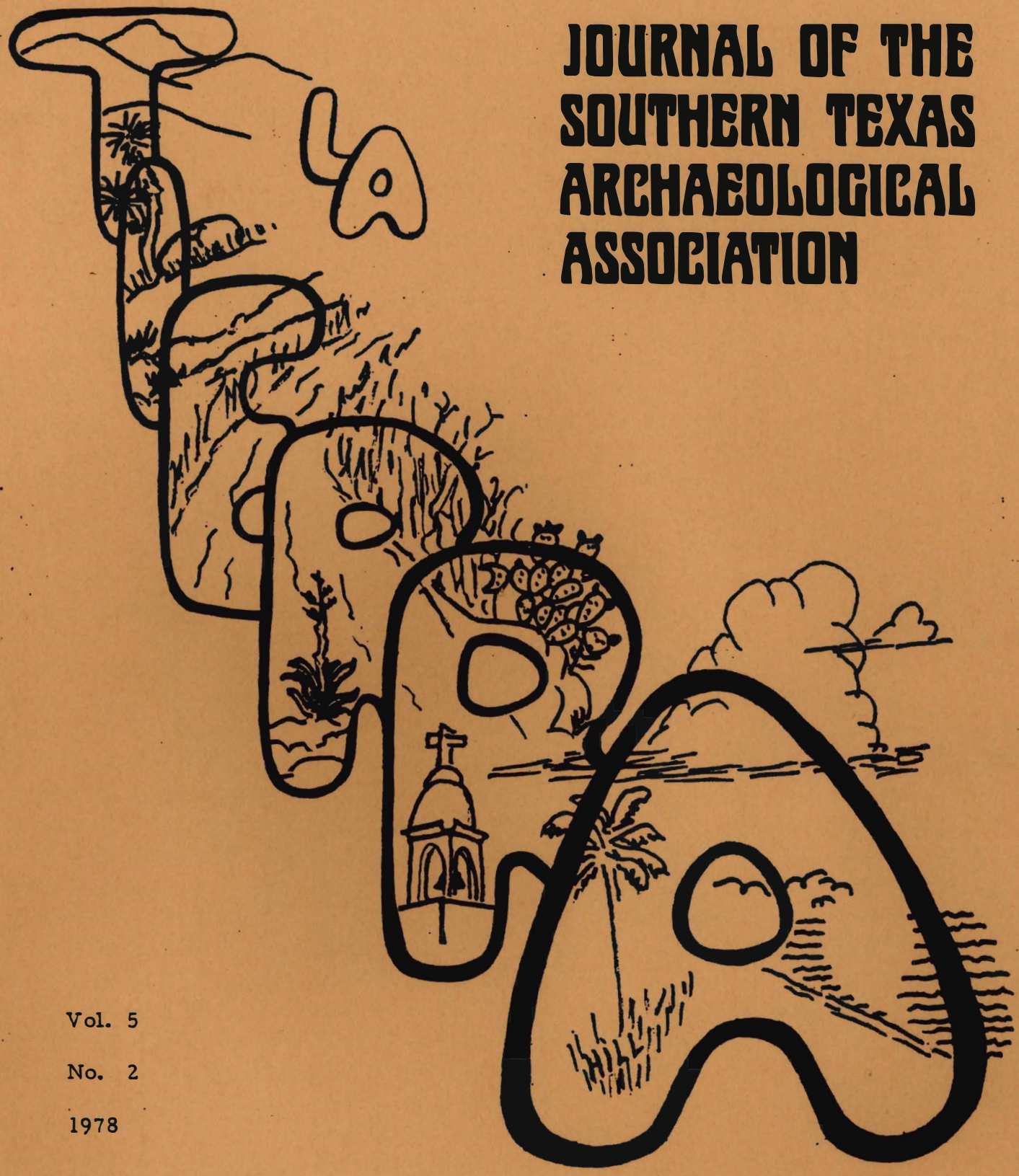
JOURNAL OF THE SOUTHERN TEXAS ARCHAEOLOGICAL ASSOCIATION



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Journal Editor

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Editorial:

PHASES, ASPECTS, COMPLEXES, AND CULTURES

Archaeological theory is in turmoil. The old familiar terms are being challenged and replaced. Gone is the "Edwards Plateau Aspect" - replaced by a series of temporal phases running from the Circleville phase (Hester and Sollberger's Pre-Archaic) to the Twin Sisters phase (which used to be the Late Archaic or Johnson, Suhm, & Tunnell's Transitional Archaic).

The latest Bulletin of the Texas Archeological Society contains a couple of articles which imply that even our most revered name (Paleo-Indian or Paleo-American Stage) is now in doubt. Patience Patterson, writing on lithic reduction, cites Weir and Prewitt as believing that the traditional stage names are no longer useful and implies that there is just one long evolutionary stream which can be broken down into named phases (gone is our Neo-American or Late Prehistoric; now everything appears to be Archaic or "Post Archaic").

The next couple of years may well prove to be confusing as the professional archaeologists try to sort out what should be called what and when. Be warned that many of the names and titles which have become so familiar and comforting in recent years are under attack. Don't get upset - they'll sort it out eventually. For the present just lean back and enjoy the fireworks.

I can't resist, however, making an observation or two to add to the confusion. If we are throwing out the old, comfortable constructs (like Edward's Plateau Aspect and Central Texas Aspect) and replacing them with named Phases, then shouldn't we also look at variations in artifacts and subsistence patterns within the central and southern Texas regions to get a better definition of what areas these newly named phases involve. For example, why is it that Toyah Phase sites along the Balcones Escarpment are defined using Perdiz and Cliffton arrowpoints while in Toyah Phase sites in the western counties of Central Texas the Toyah point is considered diagnostic? Is it possible that we should have an East Toyah Phase and a West Toyah Phase? Or should it be a Plains Toyah and a Balcones Toyah?

Chronological phases are fine but would obviously oversimplify a very complex archaeological record. Perhaps it's good that our terminology is being modified after being frozen and static for the last couple of decades. However, if we're "unfreezing" it to make it more specific, wouldn't it make sense to do it on the basis of both chronological period and on the basis of distributional studies of diagnostic artifacts?

Perhaps we would be wise to recall the advice of Dr. Tom Campbell who, in a 1971 BTAS article and elsewhere, suggested studying the smaller ethnological (and archaeological) units. This implies not regional archaeology (i.e., the Coahuiltecan area) but identifying much smaller units (like the Payaya - see STAA Special Publication No. 1).

Naming and dating such smaller, discrete units can be a problem. But more specific names and dates also have much greater potential to enhance our understanding of the cultural dynamics of Central and South Texas prehistory.

Relax and enjoy it. This next couple of years should be fun!

CONSTITUTION AND BY-LAWS
OF
THE SOUTHERN TEXAS ARCHAEOLOGICAL ASSOCIATION

Article I

The name of this "Association" shall be:
"The Southern Texas Archaeological Association."

Article II

(a) The purpose of this association shall be to bring together persons with an active interest in the archaeology and prehistoric heritage of Southern Texas in an atmosphere conducive to the exchange of information and ideas;

(b) To promote scientific archaeological investigation and documentation;

(c) To preserve the archaeological materials and records of the region;

(d) and to interpret and publish data attendant thereto.

Article III

(a) Membership shall be extended to all persons who are in agreement with the purposes of the association and by payment of the prescribed annual dues.

(b) All members shall agree to abide by the following statement of ethics:

"I pledge that I will not intentionally violate the terms and conditions of any Texas Antiquities Statutes, as same now exist, or shall be hereafter amended or enacted, or engage in the practice of buying or selling artifacts for commercial purposes or engage in the willful destruction or distortion of archaeological data or disregard proper archaeological field techniques."

(c) Meetings shall be held four times per year at a location designated by the board of directors, and the board of directors will be empowered to call special meetings when necessary.

Article IV

The government of the association shall be vested in a board of directors consisting of the following officers: Chairman, Vice-Chairman, Secretary, Treasurer, Newsletter Editor and Program Chairman; and additional board members consisting of the chairmen of appointed committees in existence at time of any regular or special meeting.

A Nominating Committee shall be appointed by the Chairman not less than thirty days prior to the annual business meeting.

Article V

The officers shall be elected by popular vote annually and will serve for one year. The first meeting of the calendar year will be the annual business meeting, at which time officers will be elected and take office. In the event any of the Directors cannot serve after elected, the Board will approint a member to serve the remaining term of office.

BY-LAWS

Article I

Memberships will be as follows:

Supporting	$20.00
Contributing	$10.00
Active	$ 5.00
High School Student	$ 3.00
Institutional	$ 5.00
Family	$10.00

Dues are payable anytime, but if not paid before January 1 of the following year, will be considered delinquent. Delinquent members will not be permitted to participate in association activities.

Article II

Officers must be members in good standing.

Article III

The Chairman shall not authorize any non-budgeted expenditure in excess of $50.00 without approval of the board.

Article IV

The Chairman will appoint committees at such time that committees are deemed necessary. All committees appointed by the Chairman shall cease to exist upon the expiration of that Chairman's term of office unless specifically requested to continue their organization and purpose by the Chairman Elect.

Article V

This Constitution and By-Laws may be amended by a majority vote of the members present at any business meeting, provided the membership has been notified at least thirty days prior to the meeting of intention to amend and the nature of the proposed amendment.

A LATE PREHISTORIC SITE IN WEBB COUNTY, TEXAS

Tom S. Beasley

The site which is the subject of this paper is located in northwestern Webb County, about thirty-five miles north-northwest of Laredo and about twenty miles west-southwest of Encinal. It is approximately 5 miles south of the Upper Santa Isabel Creek sites reported by Saunders and Saunders (1978), and a few miles north of the Archaic sites reported by Shiner (1969). Surface investigation has yielded evidence of a distinct Late Prehistoric occupation, characterized by the presence of numerous Perdiz and other arrow points.

Site Location and Description

The subject site is situated at approximately 27°56'45"N and 99°39'45"W on a 7.5 U.S. Geological Survey Las Tiendas Quadrangle map. It runs along the west bank of the Santa Isabel Creek, which is an intermittent tributary of the Rio Grande River. The various sites on Santa Isabel Creek investigated by the author are characterized by extensive Archaic materials, although at least four of the sites exhibit definite Late Prehistoric affiliations.

The site under discussion here is located on a small rise no more than seventy-five feet in width, bounded to the east by Santa Isabel Creek and to the west by a series of gulleys feeding into the creek. Further west is a large ridge at the 600-foot contour, being a part of the hills and mesas forming the course of Santa Isabel Creek. Archaic occupations, represented by Abasolo, Catan, Tortugas, Matamoros, Frio, Ensor, Refugio, Lerma, Desmuke and Pandora dart points (Suhm and Jelks 1962), Clear Fork tools, unifacial and bifacial lunate scrapers, core-choppers, quartzite manos and hammerstones, and miscellaneous artifacts, predominate in the numerous sites on Santa Isabel Creek, and in fact, Archaic materials are scattered with associated debris on the same rise where the site is located. However, significant concentrations of mussel shell, land snails and bone, along with Late Prehistoric artifacts described below, are confined to an area approximately ninety feet in length and thirty feet in width immediately adjoining and parallel to the creek. Erosion along the creek bank has revealed a cross-section of the soil, showing a culturally fertile zone ranging 15-60 cm in depth. No excavation to determine a valid analysis of sub-surface materials has been conducted at this site or surrounding sites.

Description of Artifacts

A wide variety of artifacts have been recovered through surface reconnaisance at the site. Some of these artifacts are dart point and probably represent an adjacent site which is predominantly Archaic. Detailed descriptions of the Late Prehistoric artifacts from this site are provided below.

Arrow points - A total of 26 arrow points or arrow point fragments were found, including the Cliffton, Fresno, Perdiz and Side-notched types.

CLIFFTON (2 specimens; Fig. 1 a, b). Crude workmanship, primarily unifacial. May actually be Perdiz preforms.

FRESNO (1 specimen; Fig. 1 c). Unifacially worked basal fragment.

PERDIZ (17 specimens; Fig. 1 d-h). Clearly the dominant point type from this site. Four specimens exhibit unifacial chipping, though all stems are bifacially chipped. Eight have serrated lateral edges.

SIDE-NOTCHED (1 specimen; Fig. 1 i). Typically resembles numerous other Side-notched arrow points from neighboring sites. Side-notched and Perdiz are frequently comingled on the surface of local sites.

MISCELLANEOUS ARROW POINTS (1 specimen; Fig. 1 j). Similar to Fresno, but is highly serrated and slightly notched on one lateral edge.

ARROW POINT FRAGMENTS (4 specimens; Fig. 1 k, l). Not assignable to any point type; may have been broken during manufacture.

ARROW POINT PREFORMS - Advanced Stage (6 specimens; Fig. 1 m-q). Three of these specimens have been shaped to the degree that the Perdiz characteristics are evident (Fig. 1 m-o). Saunders and Saunders (1978) reported very similar forms which they called Alba points and which may also be Perdiz preforms. The other preforms (Fig. 1 p, q) are pointed flakes, probably broken during manufacture.

ARROW POINT PREFORMS - Initial Stage (5 specimens; Fig. 1 r, s). All have been bifacially worked through percussion flaking, and blunted edges were formed to create platforms for pressure flaking. All appear to have been broken during manufacture.

Other Artifacts: Bifaces - A total of 18 assorted bifacial artifacts or artifact fragments were found, and they are classified according to shape and apparent function.

GROUP 1 (4 specimens; Fig. 1 t, u). Fair to good workmanship; generally thin, broad blades indicate use as knives. Two may overlap with the Pandora dart point type (Fig. 1 u).

GROUP 2 (2 specimens; Fig. 1 v, w). Crudely fashioned; oval base, with distal area showing wear.

GROUP 3 (2 specimens; Fig. 2 x, y). Finely worked, with especially sharp distal areas; may have served as knives and/or perforators.

GROUP 4 (3 specimens; Fig. 2 z, aa). Generally good workmanship; formed by the removal of large, thin flakes; considerable wear shown on edges.

GROUP 5 (7 specimens). Not assignable to any particular grouping as all are fragmentary.

Other Artifacts: Unifaces - Six unifaces (Fig. 2 bb-gg), all of which appear to be scrapers, were recovered. Three of these artifacts (Fig. 2 bb-dd) were produced from multi-faceted interior flakes, and fit into the category of what are commonly known as thumbnail scrapers. Two of the others (Fig. 2 ee, ff) are made from small cortex flakes, while the other scraper (Fig. 2 gg) is a thick, double-facet flake showing use on both lateral edges.

Other Artifacts - A total of five other artifacts, comprised of two highly polished mano fragments, one whole mano with wear on both sides and one edge (Fig. 2 hh, ii; Mokry 1976), one small metate, and one pottery sherd of the Leon Plain variety (Fig. 2 jj; Suhm and Jelks 1962) were also found by the author.

Summary of Site Activities

The lithic debris available on the surface of the site (cores, variety of flakes) indicate that all steps in the biface production process were occurring at this site (Hester 1971). Particularly significant are the stages shown in the manufacture of Perdiz arrow points, the dominant point type. It is suggested that there is little difference between the preform shown in Fig. 1 o and the Cliffton arrow points illustrated in Fig. 1 a, b, and that in the archaeological context of northwestern Webb County, the Cliffton arrow point may in fact be a preform of the Perdiz arrow point. Alternatively, it is submitted that the differences between some Perdiz and Cliffton specimens are so minor as to be insignificant.

The manos and metate described above show that grinding and milling of local flora was occurring at the site. As in some other Rio Grande valley sites, erosion zones are filled with large amounts of bone mixed with quartzite and sandstone hearthstones (Newton 1968; Shiner 1969). most of the bone was cracked or split, and some had been charred. While no faunal analysis has been undertaken, most bone appears to be that of small mammals such as rabbits, armadillos, raccoons, etc.

In summary, it appears that a variety of activities were being conducted at this site during the Late Prehistoric period, and that the inhabitants were exploiting all available food resources. As stated earlier, the author has located at least three other Late Prehistoric sites in this vicinity which contain artifact assemblages similar to that described above. Further data are needed to define the parameters of a Late Prehistoric phase in northwestern Webb County, particularly in determining the relationship between Cliffton and Perdiz arrow points.

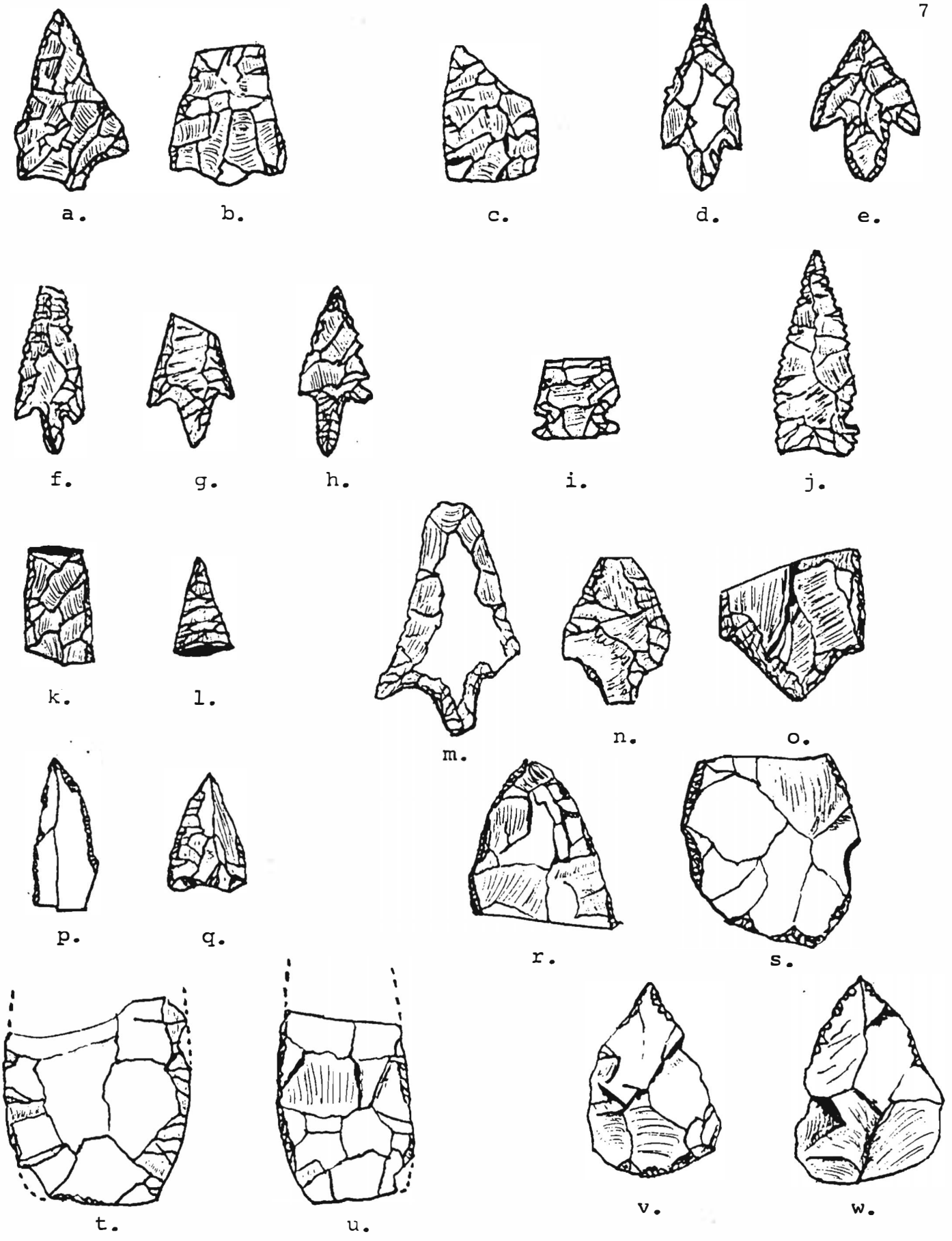

Figure 1. Arrow points and bifaces from Santa Isabel Creek (actual size).

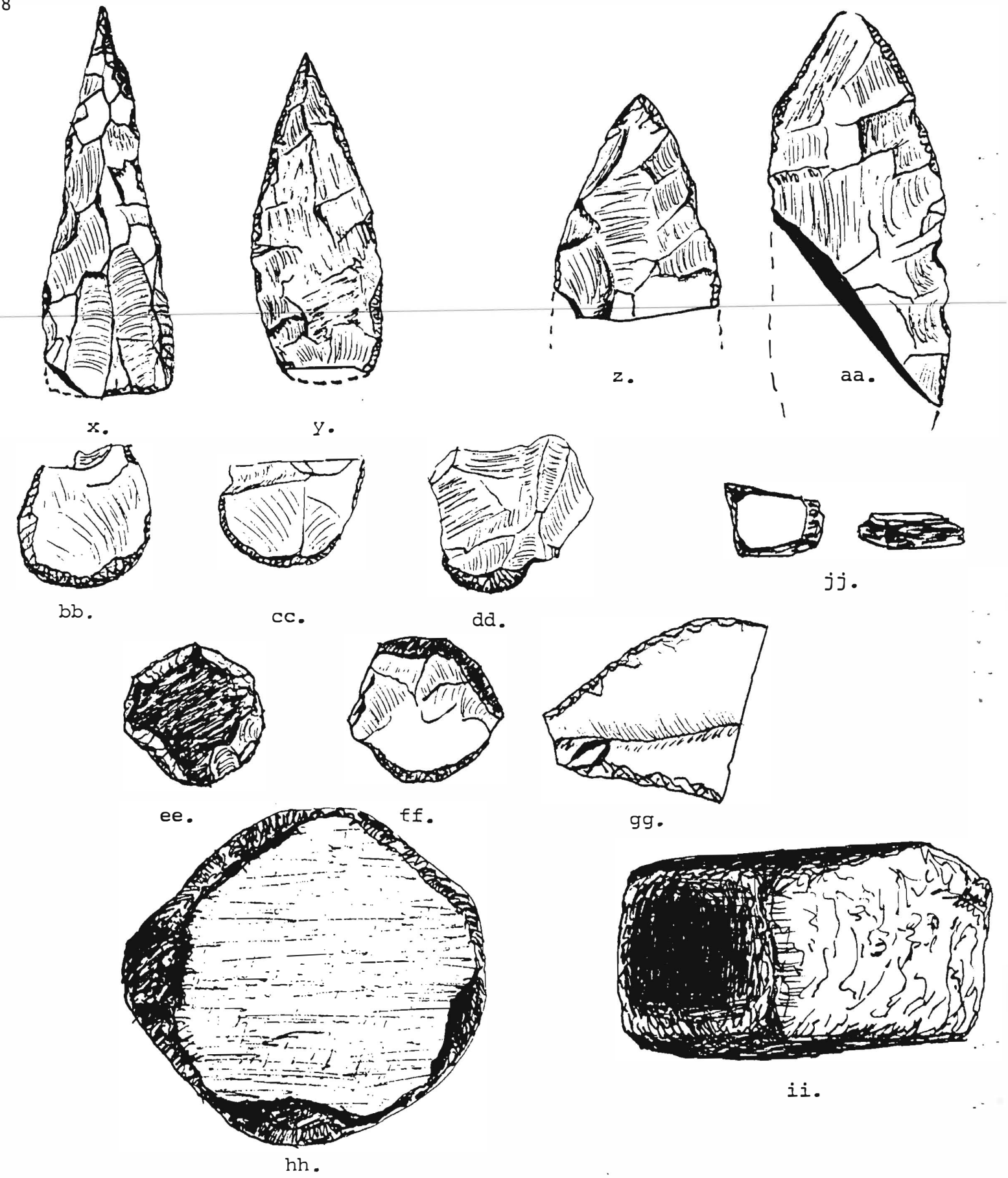

Figure 2. Artifacts from Santa Isabel Creek (actual size).

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41 ME 7: A CAVE SITE IN MEDINA COUNTY, TEXAS

Carol Graves and Lynn Highley

In June and July of 1971, archaeological excavations were carried out at Scorpion Cave (41 ME 7), which is located in northeast Medina County approximately .5 mile downstream from Medina Lake Dam. These excavations yielded abundant evidence of prehistoric occupation.

Participants in the 1971 excavations included George and Ruth Judson, Carol Benson Land, Perry Haass, and the late Maxine Benson. Carol Land kept a diary of excavation proceedings, with site photographs taken during the excavation by Pete Farmer.

In 1975, George Judson loaned the Scorpion Cave artifact collection and excavation records to the Center for Archaeological Research, The University of Texas at San Antonio, for study. Complete results of this study will appear in the 1978 Bulletin of the Texas Archeological Society, co-authored by Lynn Highley, Carol Graves, Carol Land and George Judson.

Archaeological Background

The information gained from the study of Scorpion Cave will add significant data to the meager archaeological record for Medina County. Patterson (1975) has studied the blade technology of quarry site 41 ME 3 and has recorded sites 41 ME 9-17 (Hester and Kelly 1976), all in northern Medina County. The Center for Archaeological Research has tested four sites in southeast Medina County near Natalia (ibid). Campbell's (1975) description of the Payaya Indians includes information about the protohistoric lifeway of tribes living along the Medina River near the Bexar/Medina County boundary. Little else is known about Medina County archaeology.

Natural Setting

The environment of the site area is characterized by a heavy vegetation cover. Along the floodplain are found many large trees, including elm, pecan, poplar, and live oak; willow and cypress are present along the river banks. Cedar, laurel, buckeye, hackberry, walnut and persimmon are representative of smaller trees. Numerous plants, vines, flowers and grasses are also native to the area.

The cave is situated 150 yards west of the present Medina River channel; the mouth of the cave is located approximately 20 feet above river level, and is in the lower section of a steep bluff which rises some 80 feet above the cave (see Figure 1).

The Excavations

Figure 2 is an interior diagram of the cave, showing the placement of excavation units. A "vertically-oriented" strategy was utilized in the excavations, which took place primarily in the outermost room and the first passageway. Excavations outside the cave mouth failed to reveal any evidence of occupation. Units were laid out in four-foot squares wherever possible although the cave contours necessitated variously-shaped pits in

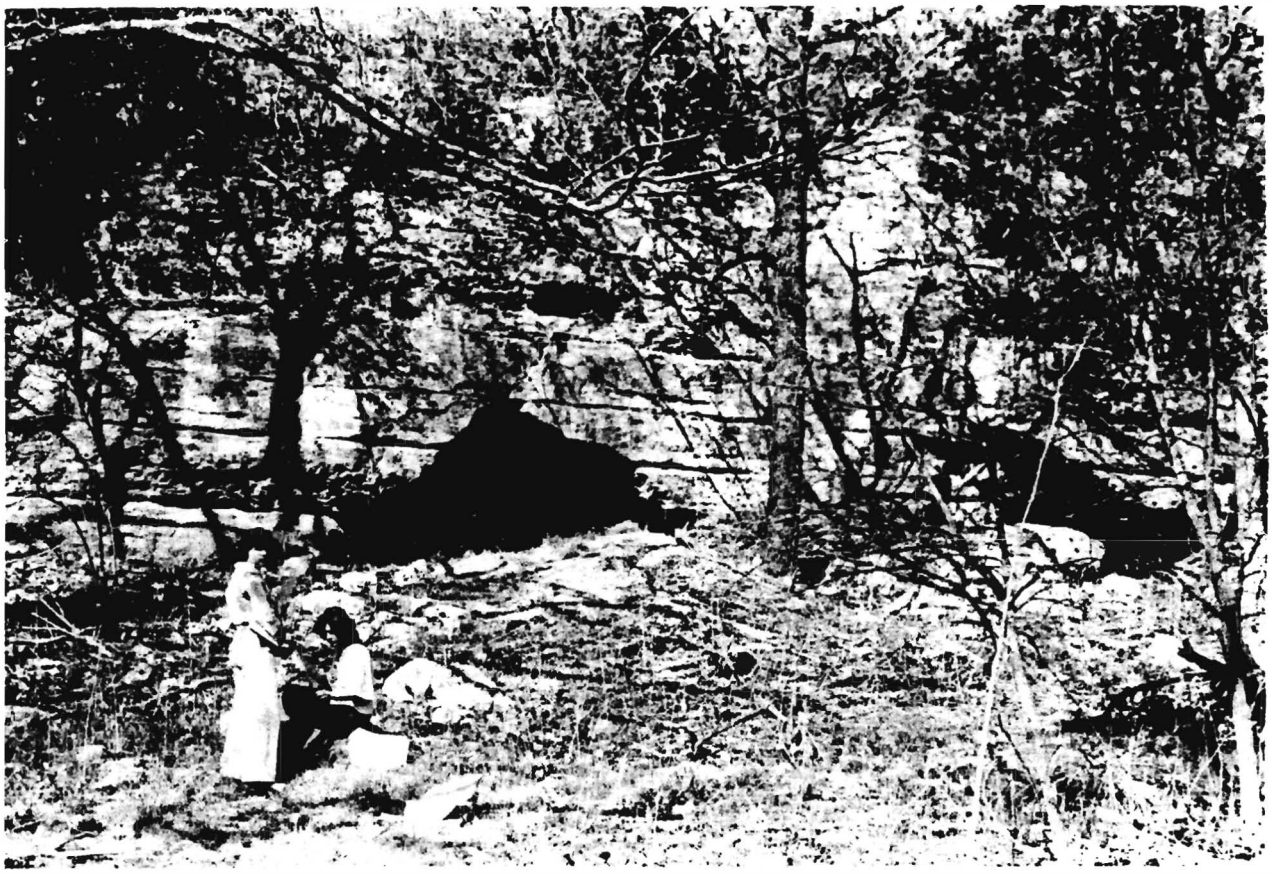

Figure 1. Scorpion Cave (41 ME 7) and the authors.

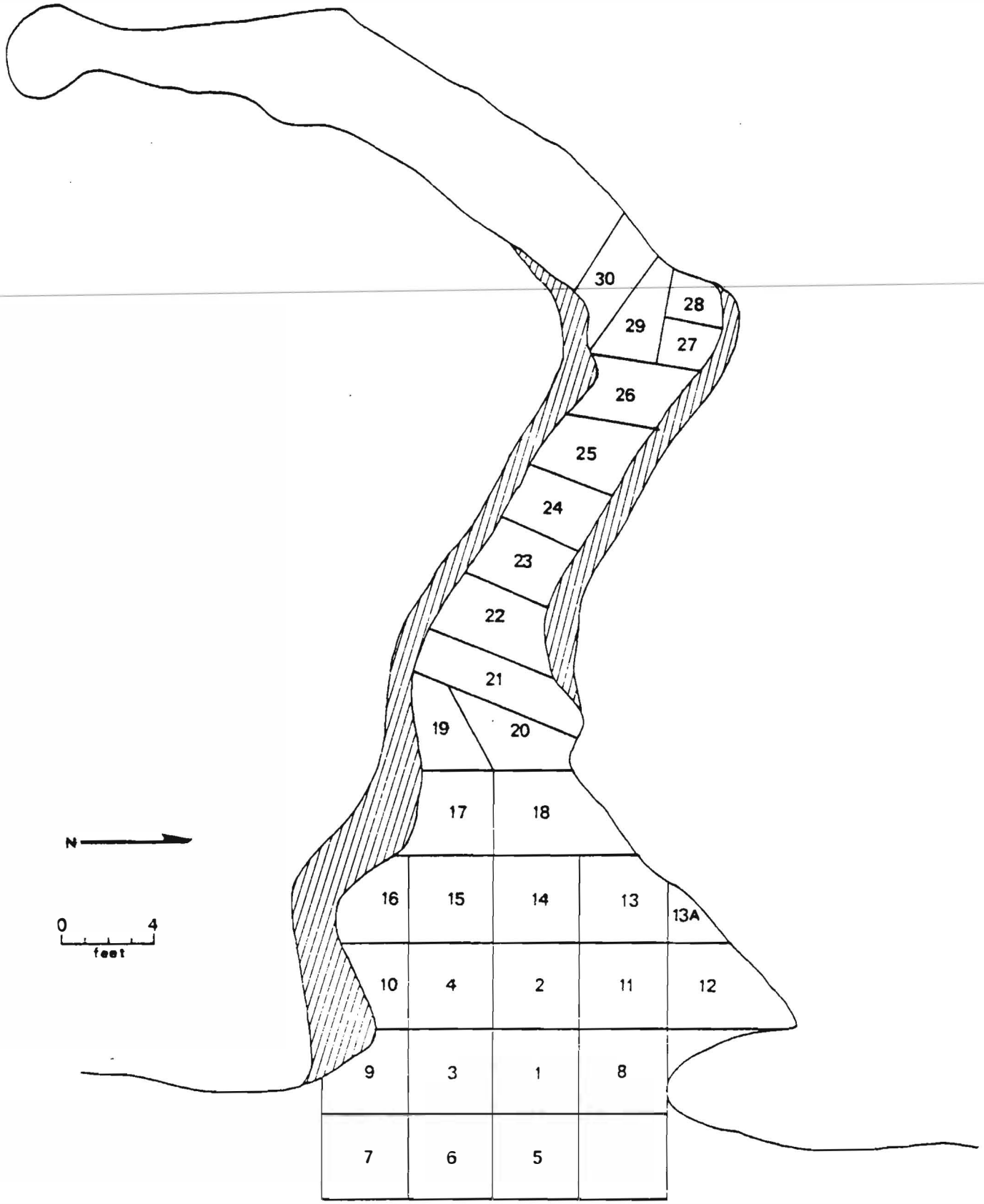

Figure 2. Diagram of the interior of Scorpion Cave, showing excavation units.

some areas. Units were taken down in 6 inch arbitrary levels with all materials screened through 1/4" mesh and bagged according to unit and level. Charcoal, snails, mussel shell, bone, and flint debitage were saved along with the artifacts.

In order to facilitate excavation, many large rocks were removed from the cave mouth. Large rock spalls from the cave ceiling were also removed from various units as excavation proceeded.

Composition of deposits from units located across the cave mouth was that of a fine gray powder, derived from spalling of the cave ceiling. Burned rock and a dark humus soil came from the front of these units. In some of the lower levels, a red clay gravel was encountered.

Several hearths were uncovered in the outermost circular room at depths of approximately 36 inches. Associated artifacts found nearby may represent knapping activities carried out next to the hearths; perhaps the raw materials were heat-treated prior to knapping.

The Artifacts

The excavations at Scorpion Cave resulted in the recovery of 679 artifacts. Cross-dating of temporally-diagnostic projectile points with other Central Texas sites indicates that Scorpion Cave was occupied from the Pre-Archaic through the Late Prehistoric periods. The depositional mixing common to cave and rockshelter sites makes it difficult to determine the chronological sequence for many of the other prehistoric artifacts.

The Pre-Archaic is minimally represented by the presence of two Martindale (or "Early Corner Notched") points and one "Early Triangular" specimen. Bulverde, Nolan, Travis and Wells are types frequently appearing in the Early Archaic in the area; one specimen of each of these types was present at Scorpion Cave. Pedernales (13 specimens) and Langtry (1 specimen) are representative of the Middle Archaic, with the former apparently continuing into the Late Archaic at Scorpion Cave (see Hester 1971: 79, 120). Occupation evidence from the Late and Transitional Archaic is dominated by the presence of Ensor points (19); also present are Castroville (2), Frio (7), Kinney (1), Marcos (2), Marshall (2), Montell (5), and Palmillas (1). Dart point specimens are illustrated in Figures 3 and 4. Other evidence of the Archaic occupation period is in the form of 134 dart point preforms, along with 10 miscellaneous and unfinished dart points.

The presence of 85 Edwards arrow points dominates the Late Prehistoric period at Scorpion Cave. The Edwards type represents the earliest arrow point form in the Edwards Plateau region (see Sollberger 1967; Hester 1970, 1971), with the collection from Scorpion Cave one of the largest yet noted. Other types represented include Cuney (1), Fresno (5), Perdiz (5), and Scallorn (16). Arrow point fragments totalling 116 specimens, along with 40 arrow point preforms and several unfinished points, are also representative of the Late Prehistoric. A medial fragment of a beveled knife, along with a complete specimen unavailable for analysis, can probably be dated to this period (Hester and Parker 1970).

Bone artifacts, including beads, awls, and one flaking tool, probably also date to the Late Prehistoric period. One of the four beads is incised.

The grooves are filled with asphaltum, probably an indication of trade with coastal groups. Eight awls or awl fragments were also recovered. A sample of artifacts from the Late Prehistoric period is illustrated in Figures 3 and 5.

Other chipped stone artifacts which are not temporally-diagnostic include 34 retouched blades and flakes, 6 scrapers, 1 perforator, 1 chopper, 3 thinned bifaces, 23 crude bifaces, and 12 cores. Ground stone artifacts include 2 manos, 4 pitted stones, and 2 hammerstones. See Figures 4, 5, and 6 for illustrations.

Three painted pebbles, decorated with black paint, are very rare for this part of Texas. One has three parallel black lines; another has two parallel black lines. The third specimen appears to have several intersecting lines (Figure 6).

Three stone specimens have a slight central depression with red stains. Red hematite was found within the cave, and these specimens probably represent grinding stones for red pigment (Figure 6).

One modified land snail (Rabdotus sp.) was found. A rectangular groove was cut into the snail shell; the specimen was probably used as a bead.

Historic artifacts include ceramic, glass, metal, leather, and plastic specimens. None of these can be attributed to a historic Indian occupation of the cave. The earliest items date to the late 1800s or early 1900s and include majolica fragments, Meyer's pottery fragments, one Spencer rim-fire cartridge case, and one .50-.55 Springfield cartridge case (Figure 5). These were probably left behind by campers or hunters and do not represent a long-term historic utilization of the cave.

Faunal Remains

A total of 8,718 bone fragments was recovered from Scorpion Cave; 285 (3%) were identified by Billy Davidson. The faunal remains suggest that the prehistoric inhabitants of Scorpion Cave were hunters and gatherers who relied on hunting wild game and small mammals. They supplemented their diet with birds, reptiles, and fish. White-tail deer and cottontail rabbit were most numerous in the faunal record. Turkey and turtle also seem to have been preferred food items. ((Ed. Note: A more detailed faunal list can be found in Hester 1975:118)) We cannot evaluate the relative importance of wild plant foods in their diet due to the lack of preservation of floral materials.

Snail Remains

Large quantities of land snails, particularly the Rabdotus species, suggest food gathering activities of the prehistoric inhabitants of the cave. In an analysis of snail remains from the St. Mary's Hall site (41 BX 229), Guntharp (1978) concluded that the Rabdotus species had been collected as a food item. The snails were found in such large concentrations and of such a large size that natural occurrences seem improbable. Rabdotus snails were found throughout the deposits of Scorpion Cave and are undoubtedly evidence of aboriginal food gathering activities. Mussel shell fragments were also found in the deposits, but not in the quantity one would expect, given the proximity of the Medina River.

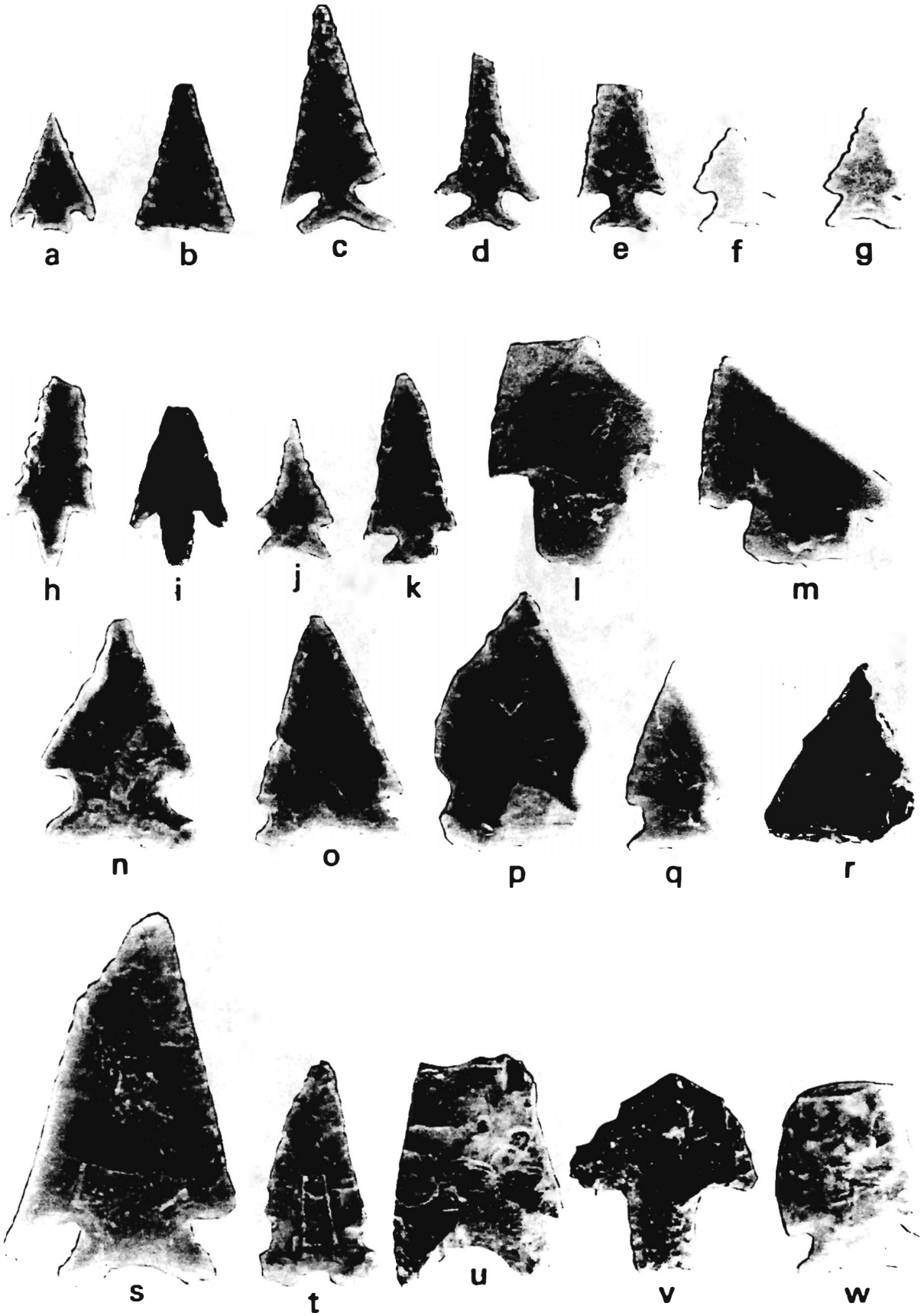

Figure 3. Scorpion Cave Artifacts. a, Cuney; b, Fresno; c-g, Edwards; h-i, Perdiz; j-k, Scallorn; l, Bulverde; m, Castroville; n-q, Ensor; r, Early Triangular; s-t, Frio; u, Kinney; v, Langtry; w, Marcos.

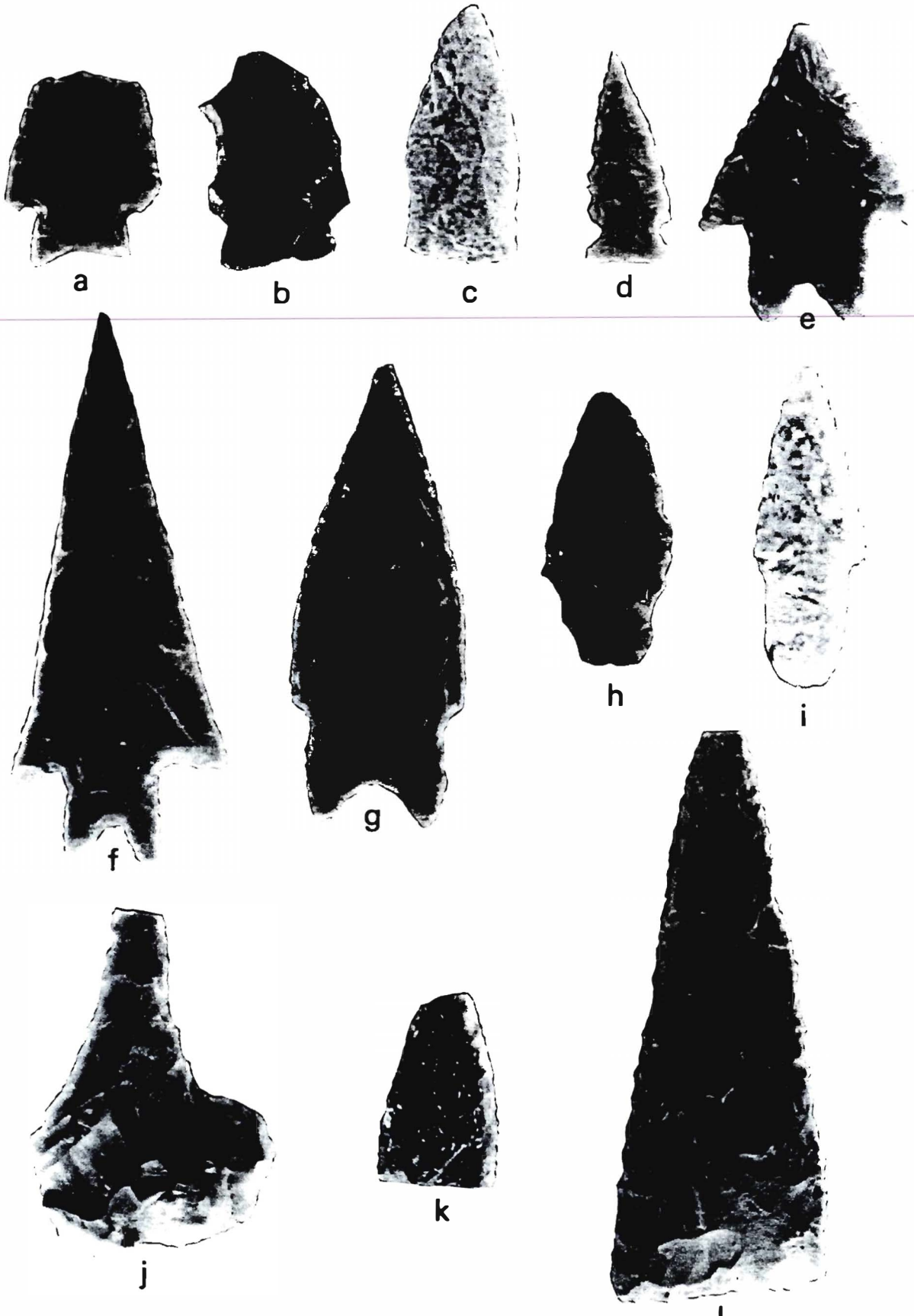

Figure 4. Scorpion Cave Artifacts. a, Marshall ; b, Martindale; c, Nolan; d, Palmillas; e-g, Pedernales; h, Travis; i, Wells; j, perforator; k, beveled knife fragment; l, thinned biface.

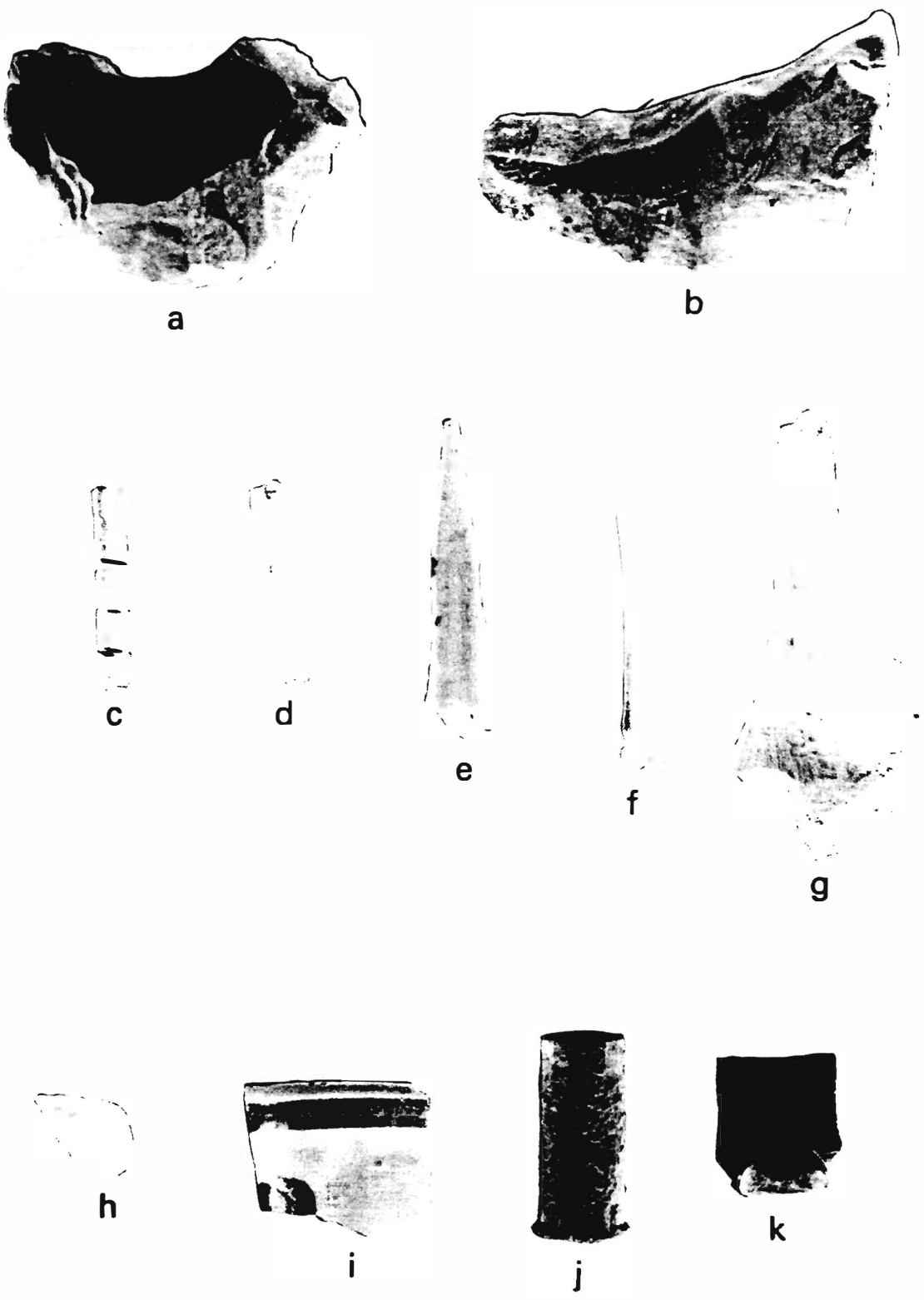

Figure 5. Scorpion Cave Artifacts. a-b, scrapers; c-d, bone beads; e-f, awls; g, flaking tool; h, snail with groove; i, majolica pottery fragment; j-k, cartridge cases.

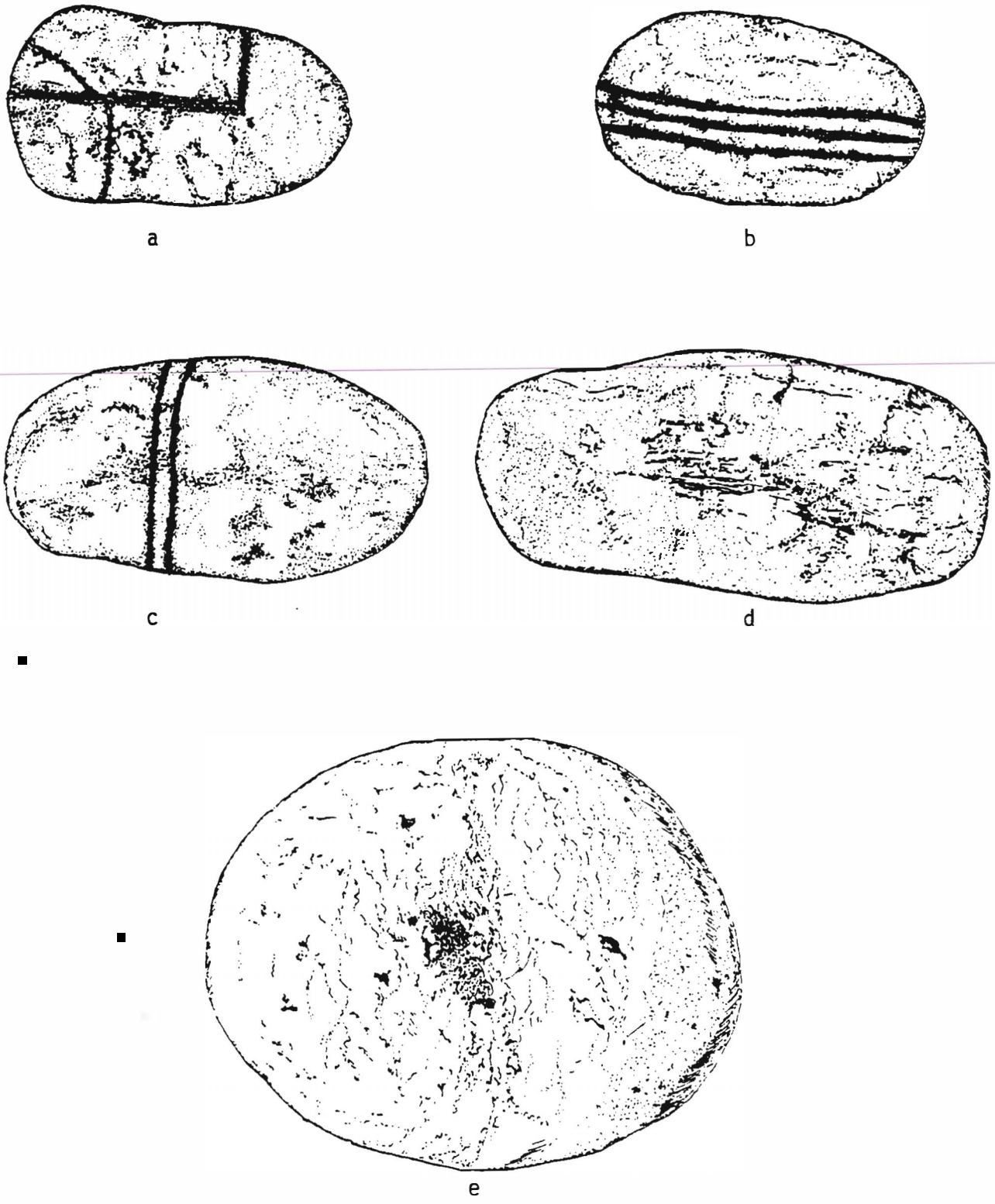

Figure 6. Scorpion Cave Artifacts. a-c, painted pebbles; d, stained pebble; e, pitted stone.

Concluding Comments

Analysis of archaeological materials from Scorpion Cave indicates that the site was occupied intermittently from Pre-Archaic through Late Prehistoric times, with heaviest occupation occurring from the Mid-Archaic through the Late Prehistoric. Abundant floral and faunal resources from the Medina River area would have provided for the various subsistence needs of hunting and gathering groups.

The authors would like to acknowledge the assistance of the following persons: Thomas R. Hester for advice and criticism; Thomas C. Kelly, Anne Fox, and Sam Nesmith for assistance with artifact identification; W. R. Van der Veer for artifact photography; and the 1971 excavation participants.

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THE HITZFELDER BONE COLLECTION

Lang Scruggs, Joel Gunn and Norman Hitzfelder

The purpose of this study is to assess and re-examine the Hitzfelder Cave skeletal collection. In addition, a brief summary of the previous excavations of the cave is included. It is hoped that the osteological study presented will be of assistance in comparative studies with other osteological information from burials within the area.

History of the Hitzfelder Cave Excavation

The Hitzfelder ranch is located 30 miles north of San Antonio and five miles east of Highway 281 North, on Farm Road 1863 in Bexar County. The cave is situated on a rounded limestone hill rising approximately 175 feet above and 100 yards to the west of Cibolo Creek. The limestone shaft drops 79 feet into the southern edge of the Edwards Formation (see Figure 1).

In 1962 Mr. Norman Hitzfelder, in hopes of discovering a water source, began removing rock and soil that blocked the shaft of the cave until he had penetrated to about 30 feet. At this point, according to R. D. Givens, Mr. Hitzfelder encountered a soapstone boulder blocking access to the remainder of the shaft. The boulder was then removed revealing human skeletal material (Givens 1968). Mr. Hitzfelder says there was an alternating sequence of dirt and rock for 10 levels until terminated by the boulder. Each level of dirt was approximately 2 feet thick and capped by a 6 to 8 inch layer of rock.

In 1967, a group of student volunteers from Trinity University led by R. Dale Givens began excavation procedures to remove the skeletal material. The remains were disarticulated and scattered throughout the lower part of the shaft and possibly represented as many as 30 individuals (Givens 1968). R. A. Benfer then visited the site and assigned it the number 41 BX 26. Benfer collected a carbon sample from the cave fill and obtained a radiocarbon date (TX334) which associates the fill and the skeletons at about AD 950 $\pm$ 190 years (Collins 1970).

The human skeletons were associated with faunal remains and artifacts. Most of the faunal material collected is from small animals and deer. Artifacts included bone awls, bone beads, shell, a stone pendant, and three points from middle to late Archaic periods (Givens 1968; Collins 1970). The last entrance into the cave in December, 1976 by Logan McNatt and a team of speleologists aided by Max Witkind revealed only a few human skeletal fragments in poor condition.

There still exist questions as to whether this shaft burial represents a particular type of burial indigenous to this region. Controversy has also been evident as to whether some characteristics of the skull fragments can be interpreted as a unique Pre-Sapiens population (Collins 1970).

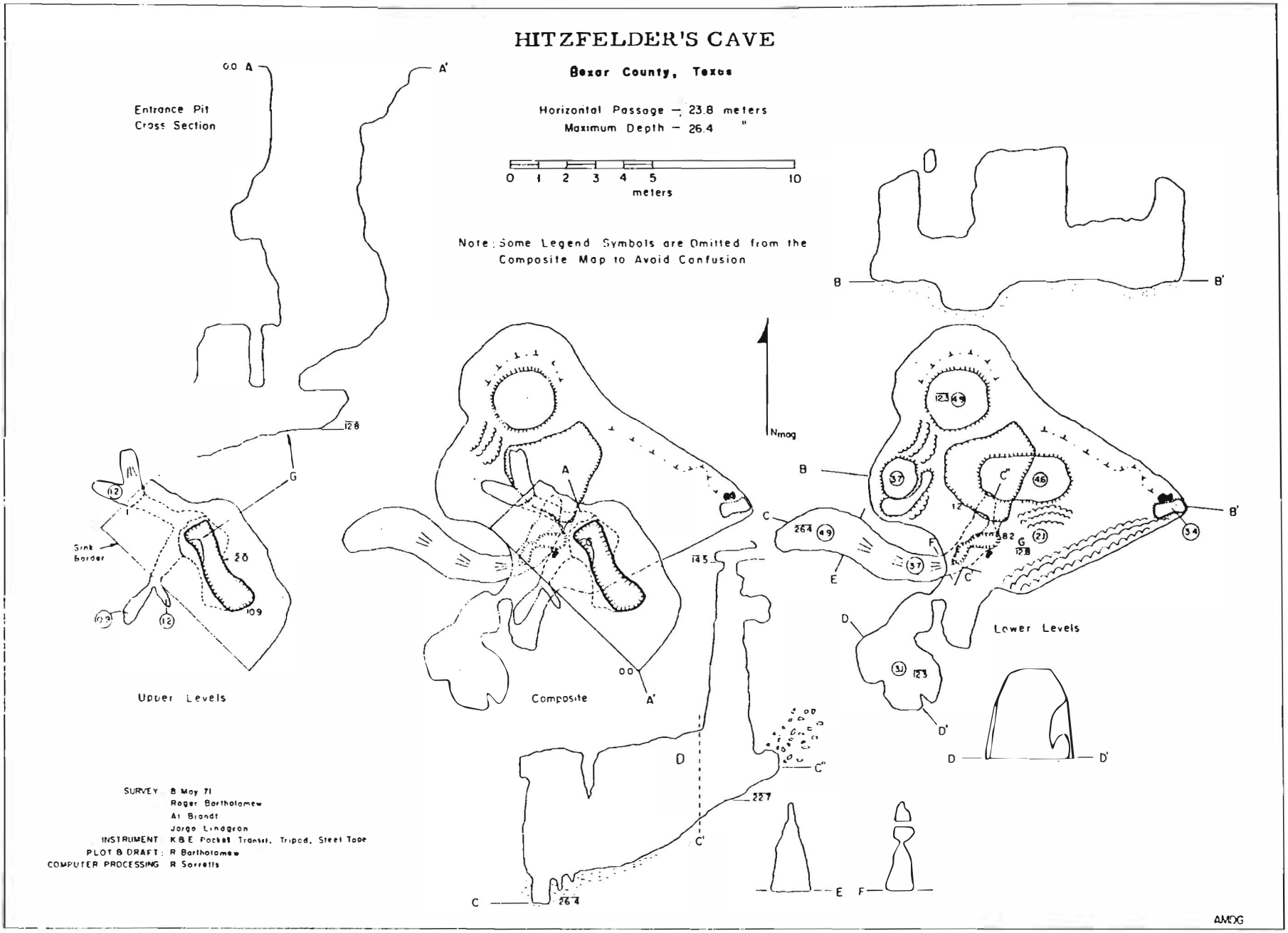

Figure 1. Composite Map of Hitzfelder's Cave. (Adapted from Bartholomew, 1973; courtesy of the Texas Speleological Society.)

Osteometric Study

Osteological analysis of the Hitzfelder skeletal collection was initiated by Dr. Joel Gunn of the University of Texas in San Antonio, aided by Raymond Fisher, Mary Smith and Edwin Scruggs.

Attempts to analyze the osteological material from Hitzfelder Cave were constrained by three factors:

1. Skeletal material was disarticulated
2. Excavation lacked adequate control
3. Moisture in the cave often caused the bone to be friable during removal

Under this analysis, the bones: femur, humerus, radius, and ulna were examined to gain possible insights of particular characteristics of this population.

Lower Extremity (Femur)

This section will attempt to give clues to the populations, gender and age through analysis of the femurs. The measurements taken on the femur are shown in Figure 2.

Bass (1971:166) indicates that the epiphysis at the proximal end of the femur unites with the diaphysis between the age of fourteen and nineteen, and ossification is usually complete by the 22nd year. Ossification is therefore progressive with age.

Two femoral head specimens from the collection were separated from the femur shaft. The epiphyses appeared to be disunited rather than broken, indicating that the epiphyses did not have sufficient time to unite. One femur was identifiable as a left, while the orientation of the other femoral head was questionable. Therefore, we suspect that at least one and perhaps two of the individuals were juveniles. Diameters of these femoral heads could, for the most part, be considered as average. One was 40.0 mm, and the other 42.9 mm. These dimensions indicate that the individuals were approaching maturity. It should also be mentioned that one infant femur shaft was observed.

The sex of femurs is determined by measuring the vertical diameter of the femoral head (Bass 1971:173). Generally femoral heads measuring less than 41.5 mm are female, while males are usually greater than 45.5 mm. Femoral heads measuring between 41.5 mm and 44.5 mm are questionable female, and the questionable male range is from 44.5 mm to 45.5 mm.

Measurements of the six fully adult left femoral heads with united epiphyses (see Table 1) indicate that two are probably male (48.8 mm and 47.1 mm), two are female (38.0 mm and 41.3 mm), and two are questionable.

Therefore, these data suggest that the adult population was equally divided between the sexes.

We noted that the obliteration of the epiphysis union or seal (see Figure 2) varied considerably among the specimens, suggesting that a large segment of the population was less than 22 years of age (Bass 1971): 166). While it would be impractical to measure the rate of ossification of the epipheses, there seems to be a correlation between the depth of the

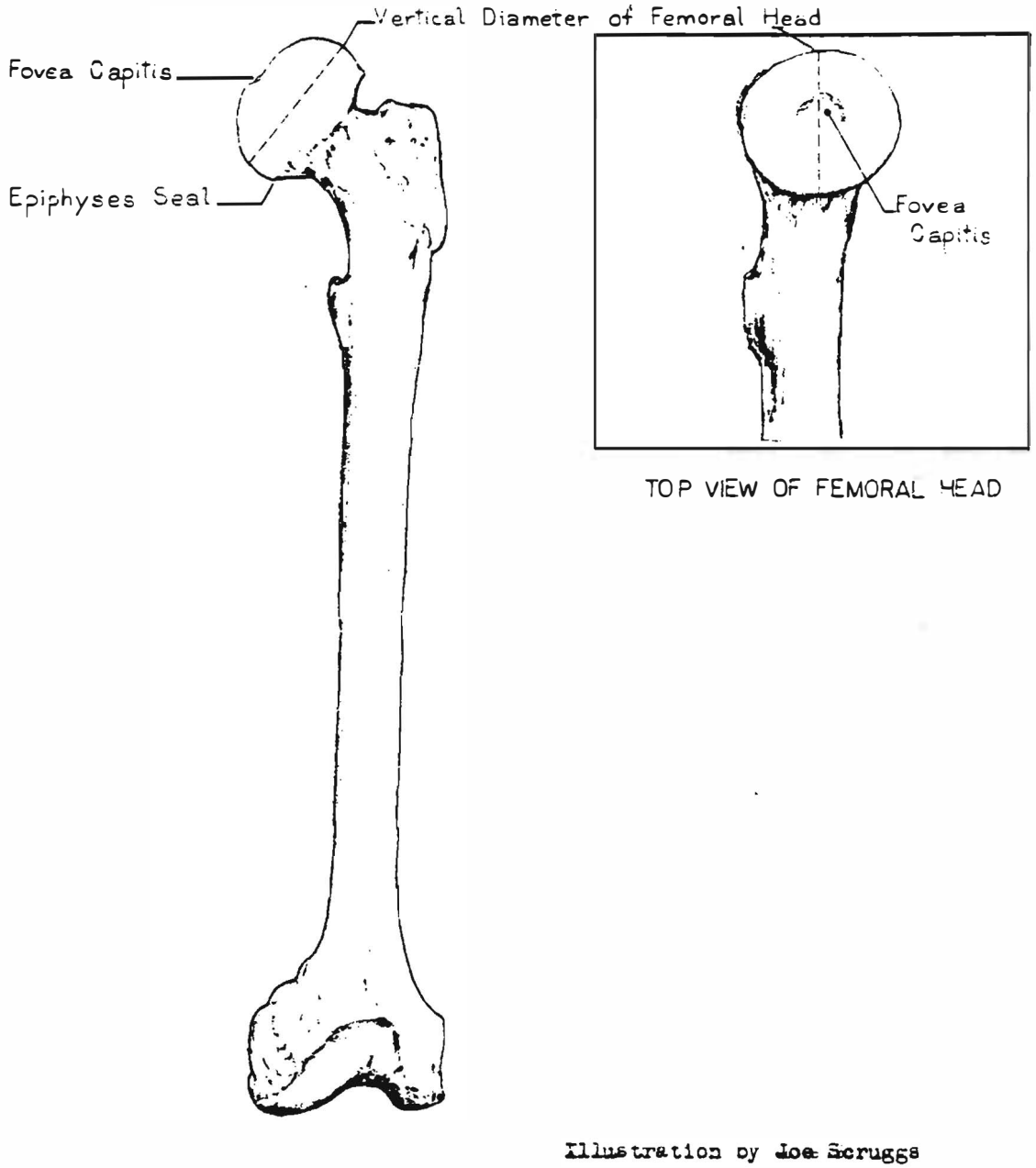

Figure 2. Femur (Left Anterior).

fovea capitis (a small depression on top of the femoral head) and the degree of obliteration of the epiphysis union or seal. Assuming such a correlation, we measured the depth of the fovea capitis in hopes of gaining further information on the relative age of the population (see Table 1).

The depth of the fovea capitis of the two juveniles measured at 4.6 mm while the depth on the other bones ranged from one to 0.0 mm, the point of obliteration. Since the epiphyses seals were obliterated on the specimens with the shallowest fovea capitis, we assume that these measurements of the fovea capitis reflect the age distribution of the population (see Figure 3).

Upper Extremities (Humerus, Ulna, and Radius)

In this section we again attempt to determine the sexual characteristics of the population. In addition, we attempt to determine the amount of functional variation that exists in the population. Typical measurements taken on these three upper limb bones are shown in Figure 4.

Several statistical tests were run on these measurements of the humerus, ulna, and radius from the Hitzfelder collection to determine if the specimens were all from the same statistical population.

In general, measurements on the more basic parts of the bones such as shaft diameters, main parts of articulations, etc., seemed to show that the bones were from the same statistical sample. More extreme parts of the bones such as the diameters of the capitulum and trochlea (surfaces that articulate to the radius and ulna respectively) appeared to be from different populations. We surmise from this that we are dealing with a single morphological population which is somewhat variable in functional characteristics.

Bass states that sex determination can be accomplished by analysis of certain diagnostic areas of the long bones. He also says that sex differences in typical long bones is a matter of size (Bass 1971:117). Hrdlicka, according to Brothwell, shares this same viewpoint and also contends that the sexual differences lie in the regions of articulation (Brothwell 1965:65). Brothwell also states that bones in general become thicker and stronger as greater demands are made on them due to the bone tissue adapting to the needs of the individual (Brothwell 1965:21).

Bass believes that more massive bones in males is an expression of dimorphism. He also states that the septal aperture in the olecranon fossa at the distal end of the humerus can be useful as a sex indicator (Bass 1971).

Hrdlicka (cited in Bass) says that this septal aperture or supratrochlear foramen occurs more frequently in females than males (Bass 1971:117). The bones of the forearm (radius and ulna) are more difficult to use in determining sex than the humerus because there are virtually no diagnostic features on which to differentiate.

If we assume that the further a long bone is from the trunk of the body the more functional its morphology, then the humerus should be more dimorphic and less functional than are the radius and ulna in their morphology. In fact, Hrdlicka and Bass felt that the overall size and articulating surfaces of the upper limb bones reflect variation due to function. Our model simply localizes function in the forearm and sexual dimorphism in the upper arm.

Due to the fragmentary nature of the bones, the only criteria available for sexing the humeri of the Hitzfelder collection was the presence of a

RIGHT FEMUR		LEFT FEMUR		QUESTIONABLE	
VERTICAL DIAMETER OF HEAD	DEPTH OF FOVEA CAPITIS	VERTICAL DIAMETER OF HEAD	DEPTH OF FOVEA CAPITIS	VERTICAL DIAMETER OF HEAD	DEPTH OF FOVEA CAPITIS
44.4 mm	3.2 mm	48.8 mm	2.1 mm	43.2 mm	0.9 mm
46.3 mm	0.0 mm	47.1 mm	2.6 mm	42.9 mm	4.6 mm
43.2 mm	2.2 mm	41.3 mm	0.0 mm	38.0 mm	1.4 mm
40.0 mm	4.0 mm	40.0 mm	4.6 mm	—	1.7 mm
46.25mm	3.3 mm	44.2 mm	0.0 mm	—	—
—	—	43.0 mm	0.0 mm	—	—
—	—	38.0 mm	0.0 mm	—	—

Table 1. Measurements of Six Adult Femoral Heads With Sealed Epiphyses.

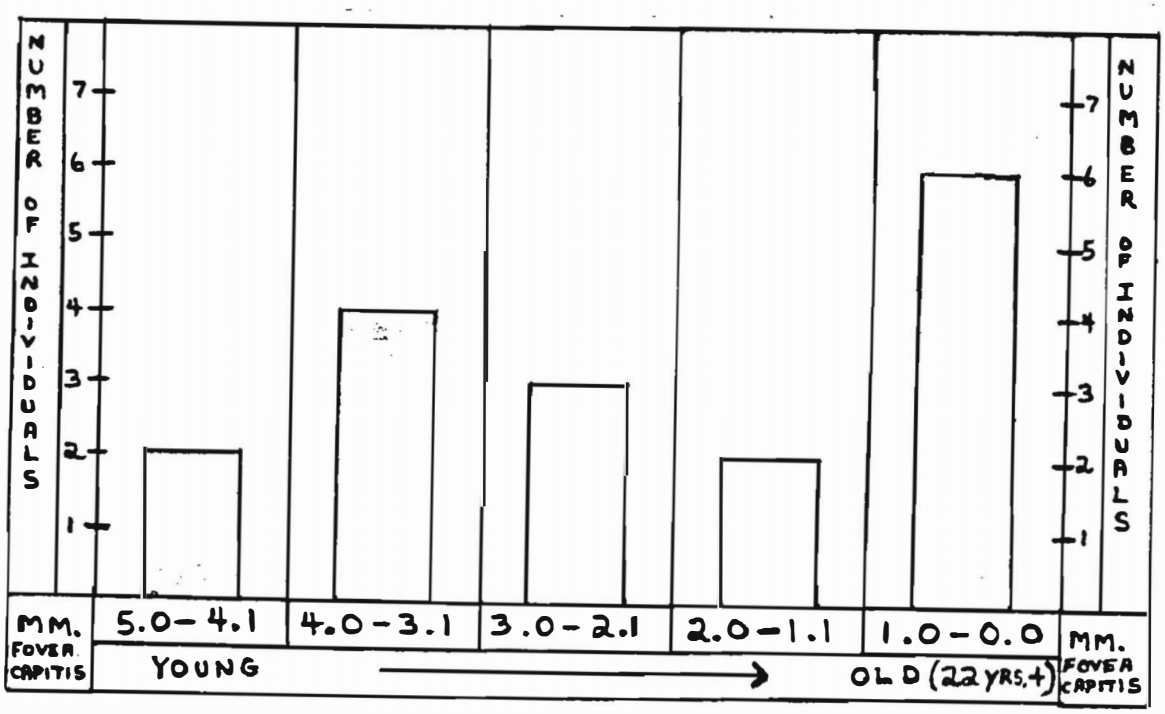

Figure 3. Age Distribution as Indicated by Depth of Fovea Capitis.

septal aperture in the oledranon fossa. Proceeding from this determination, we can infer graphically by extrapolation the sex of the ulna and radius from the robusticity of articulating surfaces of the humerus, the trochlea (articulates to ulna) and the capitulum (articulates to radius).

Figure 5 shows the extrapolated determination of sex for the right radius on the basis of size through the articulation with the capitulum of the right humerus.

The full range of measurements taken on the right radius heads and right humerus capitulum are plotted on a vertical and horizontal line respectively. The points at which these measurements were placed was derived in this manner: each square on the grid represents 5 units on a side, therefore the vertical and horizontal lines represent 100 units each. The difference between the two extremes of measurements for each line was divided by 100 to determine the value of each unit resulting in .0255 and .073 for the vertical and horizontal lines respectively. Proceeding from this, the point at which each measurement was plotted was determined by taking the differences between the lowest measurement on its respective line and the measurement itself, then dividing that result by the value of a unit previously determined.

After each point is plotted, a correlation between the two articulating bones was projected by extending lines from the points to a mean represented by a line bisecting the grid at an angle of 45°. ((Editor's note: This assumes a perfect correlation.))

Since the division of sex can be determined for the humerus by using robusticity and the septal aperture as indicators, this point of division can be extended as a broken line to the mean or correlation line and then to the vertical line resulting in an extrapolated division of sex for the radius bone.

Three additional graphs identical to this one were constructed to determine in the same manner the division of sex for the remaining bones of the forearm, left radii and ulnas, and right ulnas. On the basis of this analysis, each bone of the upper extremities was labeled as to sex.

If we assume the division of labor among the Hitzfelder population to have been that of typical hunters and gatherers, then we might expect females to be relatively unspecialized and males to be relatively specialized. The consequence of this should be more variation in male functional morphology than in female.

Table 2 shows the coefficient of variation (standard deviation divided by the mean) for all of the measurements not on the articulations between the humerus and the radius and ulna. In all cases except one, the amount of variation in the presumed male population is less than in the female (see direction of arrows in the table). While the sample sizes are small and our method of sexing the radius and ulna tenuous, the results seem to clearly show that our hypothesis of greater male variability is incorrect.

Conclusions

This study of the Hitzfelder bone collection is intended to contribute to osteological knowledge of prehistoric Texas. Archaeological investigations such as this may provide information necessary to infer characteristics of the cultures once indigenous to the area. Although the Hitzfelder

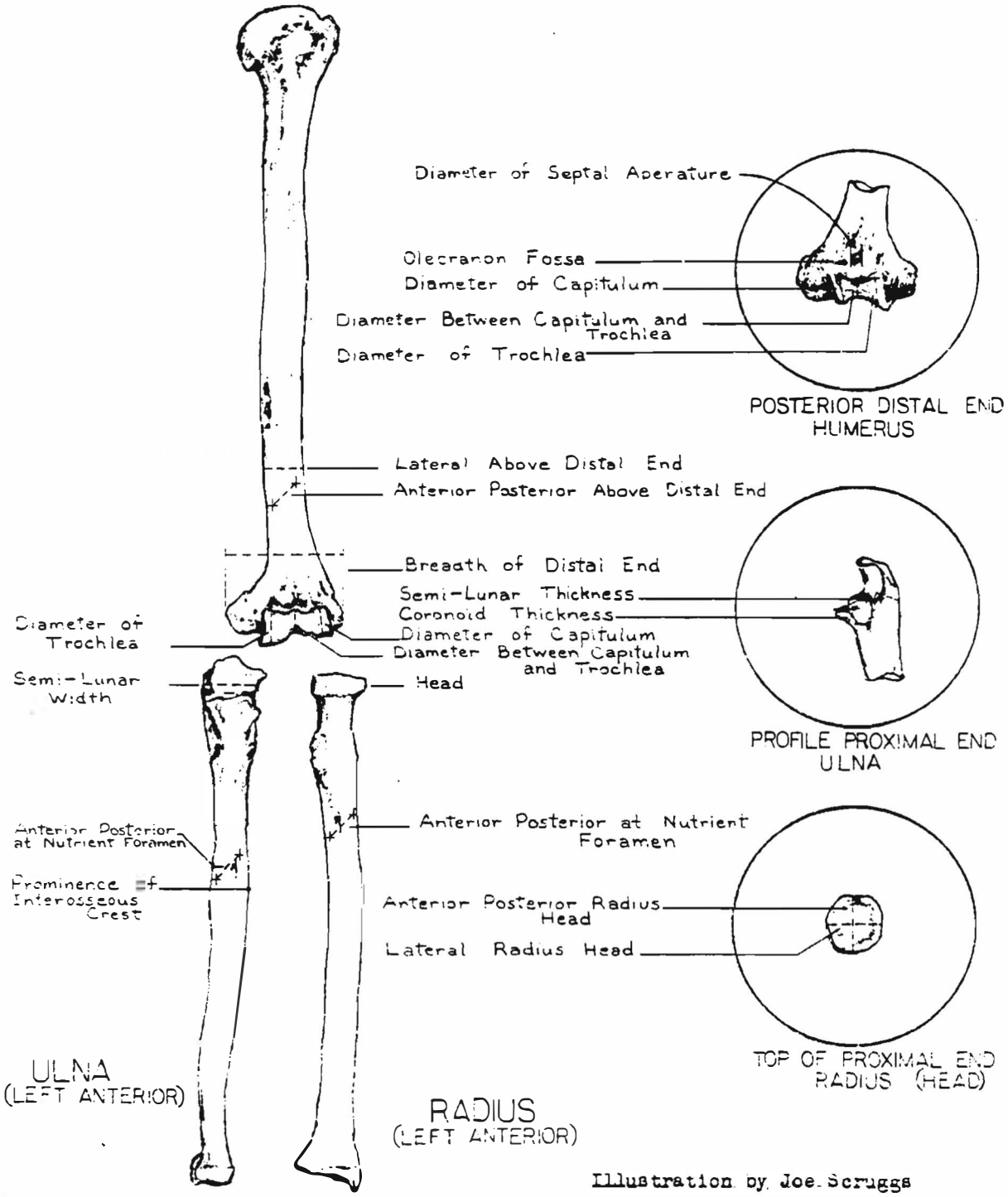

Figure 4. Humerus. (Left Anterior).

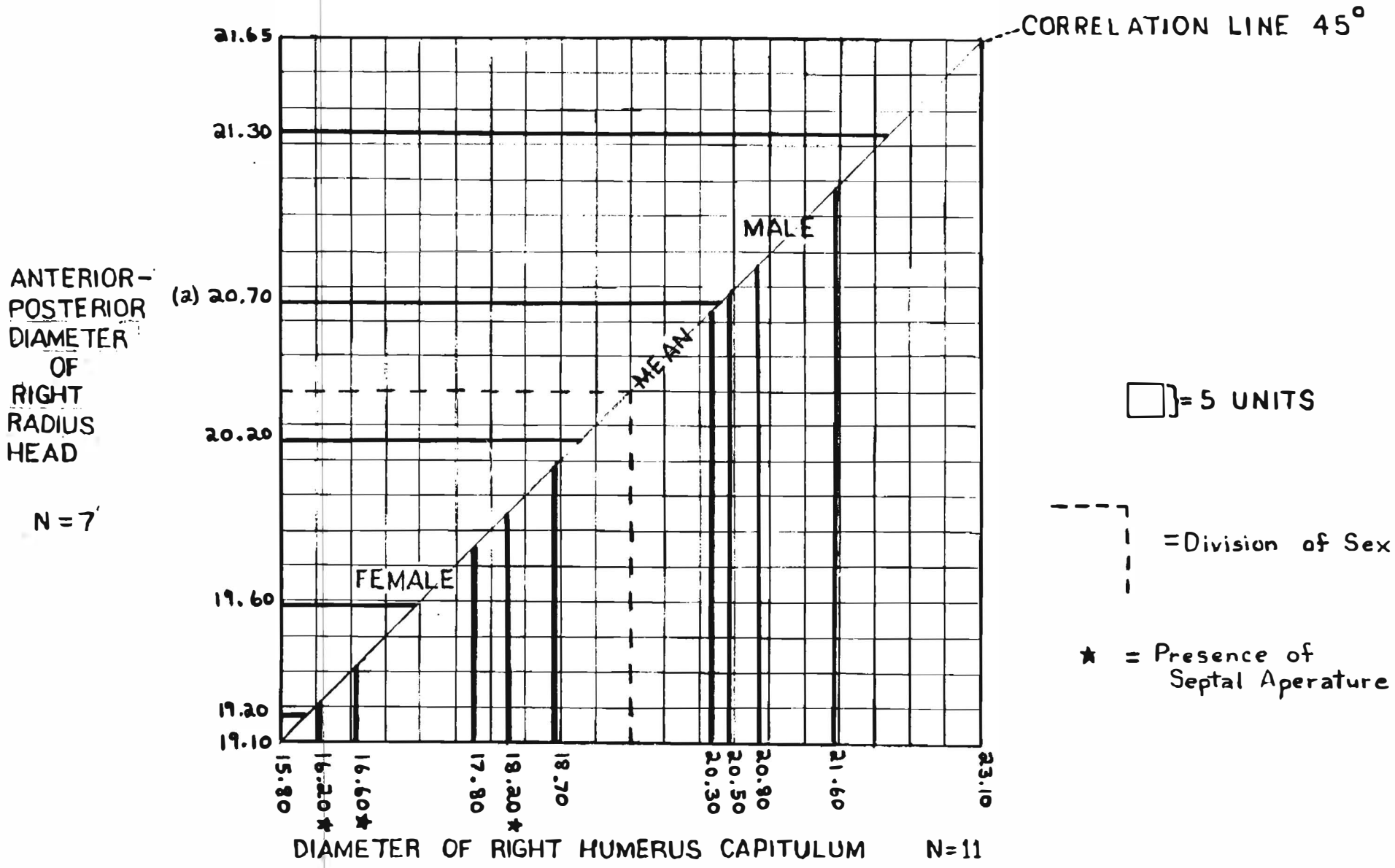

Figure 5. Graphic Extrapolation of Sex of Individual. (Assumes r = 1).

ULNA (ANTERIOR–POSTERIOR AT NUTRIENT FORAMEN)					
RIGHT			LEFT		
N= 7	MALE	.011861	N= 6	MALE	.012248 ↓
N= 1	FEMALE	⊖	N= 10	FEMALE	.017107 ↓
RADIUS (ANTERIOR–POSTERIOR AT NUTRIENT FORAMEN)					
RIGHT			LEFT		
N= 3	MALE	.000840 ↓	N= 2	MALE	.012295 ↑
N= 2	FEMALE	.011810 ↓	N= 2	FEMALE	.004045
HUMERUS (ANTERIOR–POSTERIOR ABOVE DISTAL END)					
RIGHT			LEFT		
N= 7	MALE	.008919 ↓	N= 3	MALE	.003725 ↓
N= 6	FEMALE	.012384 ↓	N= 12	FEMALE	.011445 ↓
HUMERUS (LATERAL ABOVE DISTAL END)					
RIGHT			LEFT		
N= 7	MALE	.008475 ↓	N= 3	MALE	.005027 ↓
N= 6	FEMALE	.011187 ↓	N= 12	FEMALE	.013855 ↓

Table 2. Coefficient of Variation of Male and Female Upper Extremities.

burial site may not be a rare type of site, the peculiarities of shaft burials still raise many unanswered questions about prehistoric burial practices.

Accuracy in osteometric analysis is due in part to the condition of the skeletal remains involved. Since no articulated skeletons were available for study, we attempted to devise a method to make use of disarticulated collections of bones. Perhaps in a more developed form this methodology will allow us to make sound inferences from the many similar bone collections in the Texas area.

It is our hope that the model engineered for this analysis will allow a further understanding of past cultures and the effect those lifeways had on osteological remains found by archaeologists.

Acknowledgments

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Norman Hitzfelder is a rancher who resides in northern Bexar County. He was the discoverer of the Hitzfelder Cave and brought it to the attention of local archaeologists. Mr. Hitzfelder has repeatedly been gracious enough to allow archaeological investigations on his ranch to aid in furthering the Texas archaeological record.

Lang Scruggs is an active STAA member who has presented papers at the quarterly STAA meetings. He is also a student at UTSA who is majoring in archaeology. Although not a native Texan, he is very actively interested in the future of Texas archaeology.

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Please Note:

The Membership List, formerly published in La Tierra No. 2 issue each year, will hereafter be published in the Newsletter No. 2 issue.