La Tierra

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The Southern Texas Archaeological Association

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About the cover: View of Rough Enough Rockshelter, Looking West (courtesy of the author)

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Archaeology of Rough Enough Rockshelter, Val Verde County, Texas The 2000-2006 Excavations

Barbara Stillwell

ABSTRACT

Rough Enough Rockshelter is located in a tributary canyon of the Pecos River in western Val Verde County, Texas. Archaeological deposits reach a maximum depth of nearly three meters, and are generally characterized by ashy matrix with abundant fire cracked rocks. Since these deposits are dry, artifact recovery included fragments of basketry, matting, sandals, cordage, wooden dart shafts, artifacts of bone and shell, painted and marked stones, along lechuguilla and sotol debris from artifact manufacture. Five burials, one accompanied by a rabbit fur robe, were found during the fieldwork. Careful excavations between 2000-2006 documented much of the site, which dates from Middle Archaic times through the Late Prehistoric. A radiocarbon date of A.D. 1200-1300 came from a woven mat found with one of the burials

INTRODUCTION

This report covers the 2000-2006 excavations at Rough Enough Rockshelter (41VV1987), located on private property in a tributary canyon of the Pecos River in western Val Verde County, Texas. Excavations at Rough Enough Rockshelter were implemented to recover prehistoric cultural materials in stratigraphic context to build a foundation for future investigations of the site. Excavations began in January 2000 with restricted access required by the land owner for protection of the site and its archeological deposits.

The purpose of this report is to present a descriptive report of the prehistoric artifacts found in the dry rockshelter, as well as to explore environmental conditions, prehistoric economic strategies, and lithic technology in the brushy semi-desert region where this shelter is located. It is my intention to discuss cultural materials recovered from the undisturbed levels, with the hope of adding new information on the ancient human activity in Lower Pecos region of Texas. Indigenous Lower Pecos inhabitants had few material possessions, utilitarian in nature, that were manufactured on or near habitation sites. Basic items were baskets, woven plant fiber mats, milling stones, chipped stone tools, projectile points, scrapers, and knives.Leaves from sotol, yucca and lechuguilla provided the tough fiber that was used to manufacture sandals, basketry, mats, and cordage. These desert succulents were also part of the subsistence base used by prehistoric populations in the Lower Pecos region. Prickly pear cactus was one of the main dietary staples of Lower Pecos groups during the long Archaic period, supplemented by the consumption of mammals and rodent species.

Rough Enough Rockshelter deposits have preserved desert plants, baskets, woven matting, sandals, *Olivella* shell beads, mussel shell, snails (*Rabdotus* sp.), painted stones, bone beads, and chipped stone tools (including projectile points). There are also prehistoric burials preserved in the archeological deposits.

The Lower Pecos region is geographically small in size, but is rich with archeological sites and preserved archeological deposits from the distant past. This area is a rugged landscape where the Rio Grande, Pecos, and Devil rivers form a single large stream drainage basin west of the Edwards Plateau. The Lower Pecos as an archeological area also takes in the Stockton Plateau east of the Pecos River, part of northern Coahuila, Mexico, and all of Val Verde County, Terrell County, and parts of Sutton, Crockett, and Pecos counties.

CULTURE HISTORY

Rough Enough inhabitants engaged in a hunting and foraging way of life covering a time span of several thousand years. Occupation of the Lower Pecos can be readily divided into four stages: Paleo-Indian (9200-6000 B.C.), Archaic (6000 B.C.-700 A.D.), Late Prehistoric (A.D.700-1600) and Historic. The Archaic is further subdivided into Early Archaic 6000-2500 B.C., Middle Archaic 2500-1000 B.C., Late Archaic 1000-300 B.C. and the Transitional Archaic 300 B.C.- A.D. 700 (Turner and Hester 1999) The Lower Pecos chronology consists of 11 prehistoric sub-periods that is derived from over 275 radiocarbon dates. (Turpin 1991: 1-49) The distinctive Lower Pecos chronological sequences help give clarity, vision, and ability to interpret cultural economy, technology and cultural parameters. Selected projectile point types define the Archaic cultural subdivisions. Examination of point types recovered from Rough Enough Rockshelter indicate a time sequence of Early, Middle, Late and Transitional Archaic periods. Evidence to date of Historic occupation for the site is inconclusive. Investigation of cultural practices and recovered cultural materials from the rockshelter has the potential to provide additional information for the Late Prehistoric period marked with the introduction of the bow and arrow during the Austin Phase (A.D. 750-A.D. 1300) and the Toyah Phase (A.D. 1300 to 1700). Perdiz and Sabinal arrow points were found in Rough Enough Rockshelter deposits and a radiocarbon assay date of A.D. 1210-1300 from woven matting reflect shelter occupation during for the Late Prehistoric period.

ENVIRONMENT AND LANDSCAPE

The present day Lower Pecos region landscape is one of sparse vegetation, rolling hills, exposed Cretaceous limestone strata, and deep narrow canyons. Semi-arid desert plants of yucca (*Yucca spp.*), sotol (*Dasylirion texanum*), prickly pear (*Opuntia*), and lecheguilla (*Agava lechuguilla*), are found in the region along with berries, nuts, wild onions, and grass seeds in specific areas. Small desert fauna (jackrabbit, cottontail rabbit, lizards, birds, insects, rodents and snakes) along with white-tailed deer, are frequently observed, while coyote, fox, javelina, porcupine, mountain lion, and bobcat are more elusive. The Pecos River and the Rio Grande are a source for aquatic turtles and many species of fish. Soil is shallow or nonexistent on the limestone hills with some of the canyons floors collecting deeper soil deposits. These canyons provide an environment for the native trees and shrubs to survive in this semi-desert landscape.

Rough Enough Rockshelter is located in the northwest wall of one of the narrow canyons that cut through the landscape. Much of the canyon floor is solid limestone, with open areas where *tinajas* hold water for several days after rainfall. Some of the canyon floor is blocked where large boulders have accumulated to form impressive walls of rock. Side walls of the canyon at floor level have smooth carved channels created over the years from running rain water filtering down through limestone crevasses to lower outlets. The nearest permanent water supply is the Pecos River, located approximately 2.5 km west down-canyon from Rough Enough, with the Rio Grande only a few miles distant, which would also be a reliable source of fresh water. Except for occasional down pours of rain that can cause destructive flooding conditions, the Pecos River is a gentle and slow moving stream with surrounding massive steep cliffs, rock overhangs, and deep canyons, with their limestone faces heavily eroded. The majestic landscape had to be as impressive to the ancient hunters and gatherers as it is to those that view it today.

SITE DESCRIPTION

Rough Enough Rockshelter created by geological solution erosion in a Cretaceous-age limestone canyon wall, is located 2.5 km up a dry canyon that converges with the Pecos River (see view of shelter on cover). Rough Enough's vertical position, at the 27.9 meter level in the canyon wall above the natural canyon floor has also protected it from occasional high water flood damage. Several limestone boulders at the mouth of the shelter support the floor deposits of ash, fire-cracked rock (FCR), and soil inside the shelter cavity. One boulder at the shelter mouth has a single bedrock mortar located near its northeast end. A large talus (more than 27 meters long) in front of the shelter contains firecracked rock and ash, with the lower part of the talus showing signs of ash removed by past flooding.

The shelter entrance (mouth) of Rough Enough is 51.2 m wide with 18.6 m being the greatest distance to the back wall from the drip line. The shelter distance measurements were taken to the back of the shelter, with the drip line used as a reference point due to the floor surface drop to the talus slope.

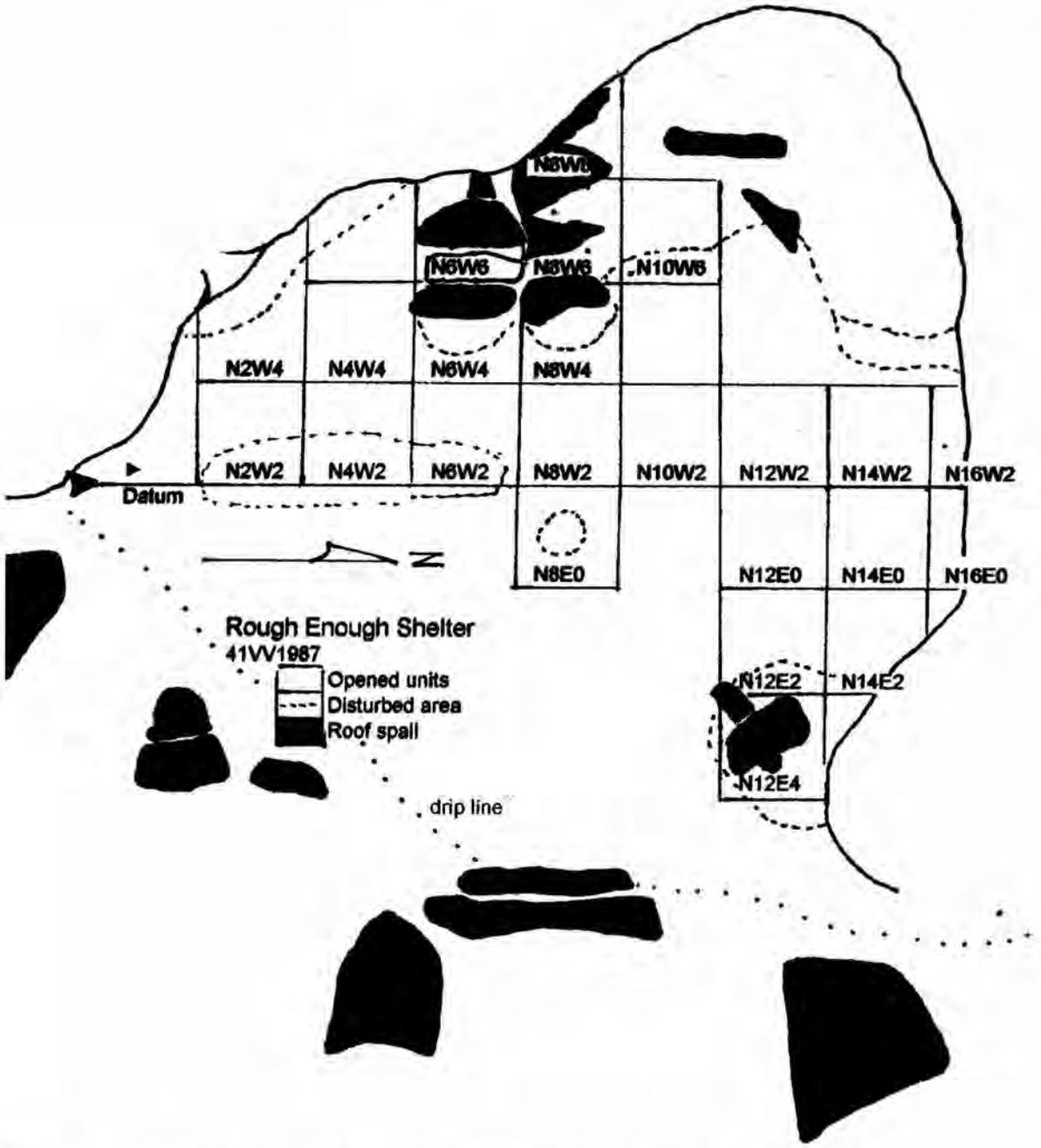


Figure 1. Plan of Rough Enough Rockshelter (41VV1987). Excavation units for 2000-2006 are shown.

Along the northeast side of the shelter wall, on naturally created limestone shelves are more mortar depressions. These naturally formed shelves can only be reached today with the aid of ladders. A narrow path located on the northeast side of the shelter mouth, leads to a lower open level where more bowl-shaped mortars are found. The southwest side of the shelter has a natural crevice with an opening at the top to create a natural chimney. Although the natural crevice was probably not used intentionally as a primary ventilation shaft for smoke residue, there is a natural draw through the crevice.

Soot deposits are visible on the ceiling and walls, but most have fallen away over time as ceiling spalls or cave dust. No pictographs are found at Rough Enough Rockshelter.

The shelter floor surface before excavation was strewn with natural fallen ceiling spalls and an accumulation of ceiling spalls left behind from unsystematic digging. Firecracked rock was also laying among the wind-blown ash deposits which created an upward drift of ash against the north shelter wall and along the narrowing back wall section of the shelter. The back wall is blocked from view due to the drift of ash deposits that reach the shelter ceiling. Sheep and goat feces litter the shelter surface and are found commonly in the first 20 cm of the excavated deposits. Many potholes were found in the ash at the back of the shelter. One pothole was located in what is defined as unit N8E0 on plan map of the shelter. Other disturbed areas were in units N6W4, N8W4 and around larger fallen ceiling spall in unit N12E4. The visible surface feature of gathered organic material lay in the farthest north units of N14W2, N14E0, and the smaller units N16W2 and N16E0 against the shelter wall.

Two 2.43 m lengths of steel rod were driven into shelter deposits at the southwest corners of units N14E0 and N4W4 to determine the possible depth of the archeological deposits; the steel rods did not reach the natural rock floor of the rockshelter. The general nature of the excavated deposits in opened units were composed of large amounts of firecracked rock, gray ash with occasional remains of hearths, pockets of white ash, snails, discarded manos, limestone metates, flint debitage and broken projectile points. An excavated depth of 259 cm was obtained in N8E0 test unit, with that measurement the deepest deposit for this site. A slender metal rod was used to probe farther below the 259 cm depth to speculate remaining depth needed to reach the natural floor of Rough Enough Rockshelter. This method produced a 30 cm measurement with the metal rod giving an estimate total depth base of the test unit deposits at 289 cm.

The 259 cm vertical deposit profile of test unit N8E0 reveals continued layers of ash deposits, charcoal, snails, animal bones, projectile points, stone tools, and fire cracked rock throughout the total excavated depth. Color and texture of ash made a change at the 150 cm level from light gray to a darker gray color and a heavier soil texture. At this 150 cm level less amounts of flint debitage, snails and animal bone was recovered although fire cracked rock remained plentiful. Between the 200-259 cm levels a charcoal sample was reserved for a future radiocarbon assay, with a total of 12 charcoal samples and 13 unscreened soil samples collected from unit N8E0.Test unit N8E0 located near the center of the shelter floor was excavated at this central location to provide a vertical representation of the shelter profile and a glimpse of the repeated shelter occupation deposits. Rockshelters tend to have a complex stratigraphy due to occupation activities, earth oven construction and use, digging of burial pits, and burrowing animals, all this complicated by untrained artifact collectors contributing to the mixing of the deposits.

THE EXCAVATIONS

Excavation Methods

All below surface references are to ground level at an established datum point located at the southwest edge of the shelter. Level readings were taken at 2 m intervals starting at the datum point and extending approximately north on a compass heading of 15 degrees. Wide 2 m x 2 m excavation units were necessary to allow light in for better working conditions and for documenting how the shelter space was utilized in the ancient past. These wide units also were needed due to the fine powdery ash, which was nearly uncontrollable, and to keep intact established grid lines between designated units. Units along the northeast shelter wall were excavated in alternating sequence to form a trench from the north-line to the shelter drip line.In the past some of the shelter floor area was unsystematically dug by artifact hunters. Specific shelter floor areas that were not disturbed were the primary focus of this excavation project.

Excavations were in 10 cm increments starting from the surface unless other depths were needed to reveal a feature or expose a specific artifact. Unit levels were taken from the southwest corner marker in the opened units unless otherwise stated in the unit field notes. To separate fine ash from debitage, snails or small cultural material objects recovered from the unit deposits, 1/4 inch hardware screen was used, although occasionally 1/16 inch screen mesh was used for deposits surrounding infant burials to recover the smallest of skeletal remains. Each grid square was assigned two letters and two numbers for provenience and cultural materials control. Letters indicate directions from the datum point and the north line. Numbers indicate distance from the datum point and distance from the north line. All excavations were north of the datum point. All cultural materials, unscreened soil samples (77 each), charcoal samples (61 each), animal bone, mussel shell and *Rabdotus* snails were separated and bagged and retained. These items are recorded in an excavation bag log. Organic material and numerous

unscreened soil samples from the excavations have been collected and stored for future scientific investigations. An extensive note book of the excavation was maintained with photographs, sketched graphs, field notes, bag log and unit log sheets. Detailed data on mapping techniques and grid level reading are on file with the author.

Table 1. Deposits Removed by Volume

In excavation efforts spanning January 2000 to August 2006, 132 m x 2 m units and five smaller units were opened for recovery of cultural artifacts.

	Unit	*Depth*	*Volume*
1.	N2W2	(0-30 cm)	1.2 cu m
2.	N4W4	(0-30 cm)	1.2 cu m
3.	N6W6	(0-50 cm)	2.0cu m
4.	N8W4	(0-24 cm)	0.96 cu m
5.	N8W6	(0-50 cm)	2.0cu m
6.	N10W6	(0-72 cm)	2.88 cu m
7.	N8E0	(0-150 cm)	6.0 cubic meters for 2m x2m unit (150-260 cm) 2.2 cubic meters for remaining 2m x 1m unit, total of 8.2 cu m.
8.	N12W2	(0-120 cm)	4.8 cu m
9.	N12E0	(0-80 cm)	3.2 cu m
10.	N12E2	(0-50 cm)	2.0 cu m
11.	N12E4	(0-50 cm)	2.0 cu m
12.	N14W2	(0-120 cm)	4.8 cu m
13.	N14E0	(0-100 cm)	4.0 cu m

The five small units excavation depths and volumes are provided below.

	Unit	*Depth*	*Volume*
1.	N2W4	(0-30 cm)	1.0 cu m
2.	N8W8	(0-25 cm)	0.5 cu m
3.	N14E2	(0-65 cm)	2.3 cu m
4.	N16W2	(0-130 cm)	1.11 cu m
5.	N16E0	(0-80 cm)	0.68 cu m

The total volume of the 132 m x 2 m units plus the five smaller units equals to 44.83 cubic meters.

EXCAVATION RESULTS

Excavation of cultural materials from Rough Enough gives evidence of how the hunting and gathering bands occupied and used space on the shelter floor. Work areas, hearths, grass bedding and space between large fallen ceiling spalls were used as storage, for burials and work platforms. The opened units and excavated depths at the close of the 2000-2006 projects are recorded in Table 2.

Table 2. Opened units and excavated depth.

1.	N2W2	30 cm	N12E0	80 cm
2.	N2W4	30 cm	N12E2	50 cm
3.	N4W4	30 cm	N12E4	50 cm
4.	N6W6	50 cm	N12W2	120 cm
5.	N8E0	259 cm	N14E0	100 cm
6.	N8W4	24 cm	N14W2	120 cm
7.	N8W6	50 cm	N14E2	70 cm
8.	N8W8	25 cm	N16E0	80 cm
9.	N10W6	72 cm	N16W2	130 cm

Feature Descriptions

Fiber Features

Woven matting from unit N8W6 (0-15 cm depth) is thought to have served the purpose as a utility mat. Several long tree branches lay across the mat along with one stone and two large prickly pear leaf fragments on top of the mat. Depressions in the mat appear to have held several round objects, possible sotol bulbs in the preparation for earth-oven baking. Larger tree branches under the woven mat would give support and perhaps to rest the mat above the ash floor. Woven mat is a one-over-one weaving technique with only a small section still retaining a selvage edge. The "in situ" mat feature measured 58 cm by 55 cm in size (Figure 2).

Fiber materials consisting of prickly pear leaves, grass, twigs, piece of an animal bone and one sandal was excavated in the northwest corner of unit N14E0 at the (60-80 cm depth). The fiber layer

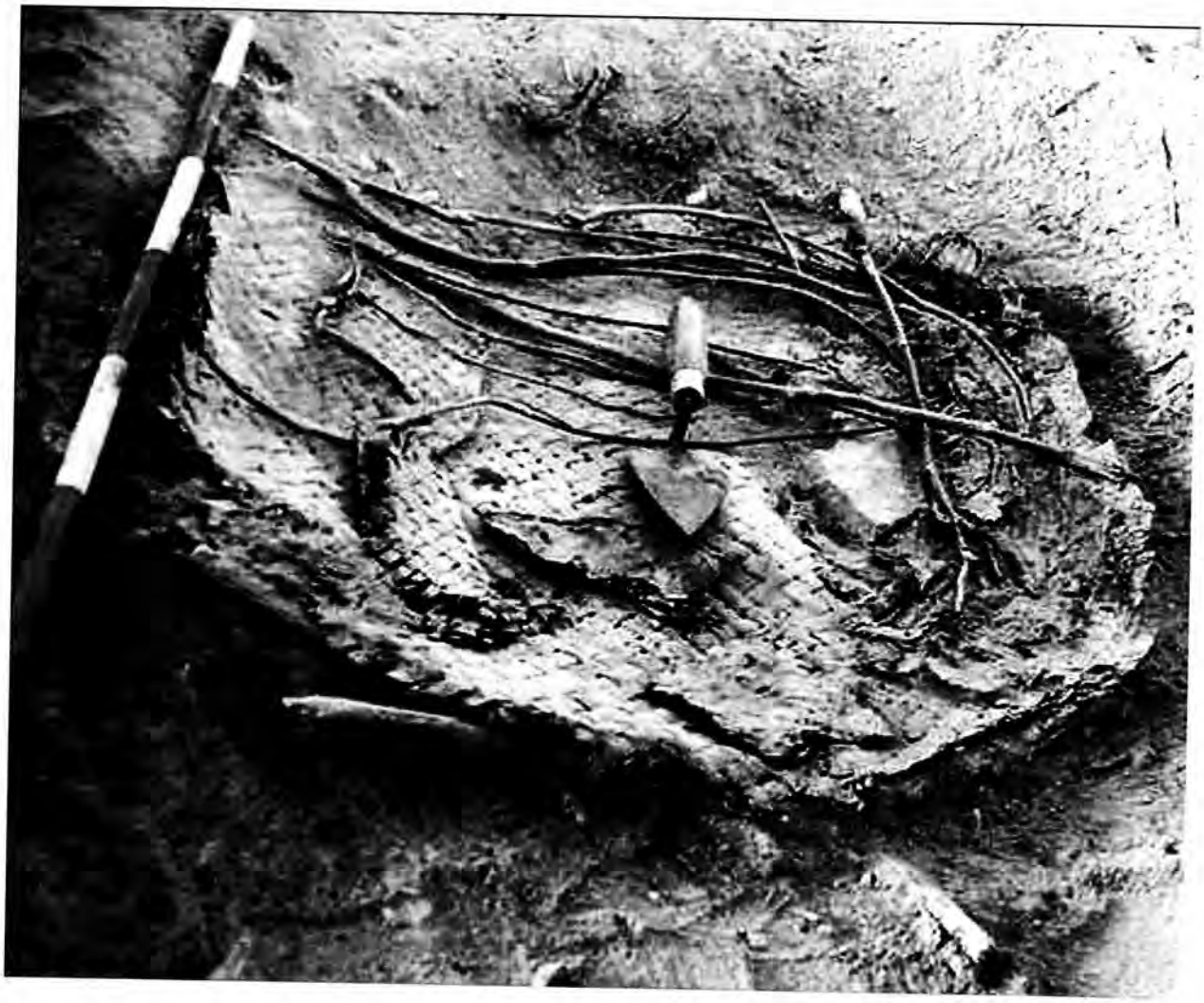


Figure 2. Rough Enough Rockshelter (41VV1987). Woven map, one-over-one weaving technique. Unit N8W6 (0-15 cm depth).

continued west into unit N14W2 and the smaller unit N16W2 against the north shelter wall. See Appendix I, N14W2 profile. The outer south edge of the fiber material in unit N14W2 (10 cm depth) was lined with thin flat ceiling spalls creating a shallow depression into the plant material. Additional prickle pear leaves, larger stems of grass and whole grass bunch with roots gave thickness to the bedding feature. Twisted and knotted plant material and a few woven fragments continued to be recovered to the 50 cm depth of that unit. Note that the fiber material continued to the un-opened unit N14W4. Most of N14W4 is a disturbed unit near in the back section of the shelter. A brown "turtle back" mano and an oblong metate were exposed in the collapsed surface deposits from N14W4. The metate measured 56 cm x 29 cm with a thickness of 5 cm. Red sandy grains compose a large part of the under side of the metate. The metates grinding surface indicates a back and forth grinding pattern rather than the circular motion depression in the other metates recovered from the site (Figure 3). The overall appearance and grinding surface of this flat limestone slab is characteristically different from the other metates recovered from the shelter deposits.

Hearth Feature

A hearth feature with the dimensions of 76 cm wide and 88 cm in length was uncovered in unit N14E0, at a depth of 40-50 cm. The hearth consisted of fire cracked rock, one large piece of chert and one stone tool nestled in the fire cracked rock. Several

Figure 3. Rough Enough Rockshelter (41VV1987). View of a mano and metate set recovered from collapsed deposits of un-opened unit N14W4.

smaller chert flakes were scattered in the ash deposits surrounding the hearth feature. The stone tool, wedge shape, has striation markings on both sides of stone with one side flat and the other rounded. Stone tool dimensions are 10 cm by 9 cm.

Burials

Five burials were excavated during the 2000-2006 excavation.

Burial 1, a disturbed infant burial, was found in unit N16 W2 at 70-80 cm. Pieces of the infant skull was found scattered over a 30 cm radius. A charred fragment of a woven twill plaited mat formed a semi-circle 10 cm away from the other skeletal remains. The small remains consisted of long bones, broken mandible, 9 ribs, 10 vertebrate and two clavicles measuring 48.20 mm and 48.23 mm were recovered. Grass leaves were underneath the skeletal material in ash deposits.

Burial 2 is a partially cremated adult from unit N14E0 at 70 cm. The skull was in large broken fragments as well as a few the other skeleton remains probably due to excavation work and activity in the above level of ash deposits. Two metates were positioned over the skeletal remains (Figure 4). The smaller metate was at shoulder area and a larger marked metate near the pelvic bone. (See section on marked metate in this report) The charred skeleton lay in ash deposits with burned organic material in several different areas positioned around the skeleton. The skull was resting on a small amount of grass fibers. Unscreened soil and grass fiber samples underneath the skull fragments were collected as well as three other areas around the skeletal remains. The skeleton was facing north in a fetal position, lying on its left side. No teeth or mandible was found. Bioarcheological analysis suggests that this individual appears to be a male from 20-35 years in age. A full report on Burial 2 skeletal remains was compiled by Jeffrey Francis, Staff Osteologist and is on file at the Center for Archaeological Research, The University of Texas at San Antonio.

Fiber materials consisting of prickly pear leaves, grass, twigs, piece of an animal bone and one sandal was excavated in the northwest corner of unit N14E0 at the (60-80 cm depth). The fiber layer continued west into unit N14W2 and the smaller unit N16W2 against the north shelter wall. [see Appendix I, N14W2 profile]. The outer south edge of the fiber material in unit N14W2 (10 cm depth) was lined with thin flat ceiling spalls creating a shallow depression

Figure 4. Rough Enough Rockshelter (41VV1987). Two metates found over Burial 2. The larger specimen has been painted or marked. Unit N14E0 at 70 cm.

into the plant material. Additional prickly pear leaves, larger stems of grass and whole grass bunch with roots gave thickness to the bedding feature. Twisted and knotted plant material and a few woven fragments continued to be recovered to the 50 cm depth of that unit. Note that the fiber material continued to the un-opened unit N14W4. Most of N14W4 is a disturbed unit near in the back section of the shelter. A brown "turtleback" mano and an oblong metate were exposed in the collapsed surface deposits from N14W4. The metate measured 56 cm x 29 cm with a thickness of 5 cm. Red sandy grains compose a large part of the under side of the metate. The metate's grinding surface indicates a back and forth grinding pattern rather than the circular motion depression in the other metates recovered from the site (Figure 3). The overall appearance and grinding surface of this flat limestone slab is characteristically different from the other metates recovered from the shelter deposits.

Burial 3, a male infant bundle burial, was located in the southwest corner of N10W6 between 0-72 cm in depth. Most of the unit was previously disturned from past digging by artifact collectors. Only a portion of the southeast quadrant of the unit remained intact.

Loose grass stems and leaves were placed over the top of the bundle burial (Figure 5) with a slab of rock partially covering the top of the burial. During examination of the bundle, it was evident that the skull of the infant was at the downward end of the bundle when it was buried in the shelter. The skull was exposed from its wrappings, and measurements of the skull were taken using methods illustrated Bass (1999).The mummified infant was in excellent preservation and from dental examination, the infant was recognized to have been about one year old at death.

Due to the position of the skull with external occipital protuberance lying against the spinal column and the mandible in a fixed position to the skull, some cranial measurements could not be made. These and the detailed measurements that were made are on file at the Center for Archaeological Research, as well as the Texas Archeological Research Laboratory..

Two types of cordage were used to wrap around and secure the woven mat bundle. One cordage type used had inner multiple continuous fibers covered or wrapped with an outer white soft fiber, probably the soft abdomen fur of a rabbit. The other cordage type is dark brown in color and has 6-8 ply strands in a slight S twist (Figure 28). Woven matting from

Figure 5. Rough Enough Rockshelter (41VV1987). Burial 3 in southeast corner of N10W6, 0-72 cm.

this bundle burial is two-over-two plaited twill giving a herringbone effect. The selvage is 90 degrees and no paint design was found on the matting. In twill plaiting nearly all the fiber elements are split. Woven matting from burial 3 was analyzed by Beta Analytic (Beta-191951) using the 1998 calibration database. The 2 sigma calibrated age range (95% probability) is AD 1210-1300, with carbon isotope ratio (variables C13/C12 = -23.3: lab. mult.=1).

Burial 4 was excavated in unit N8W6 at the 15-30 cm level. This was a disturbed and disarticulated skeleton that was positioned between two fallen ceiling spalls and lying in ash deposits. A large amount of cordage was looped and gathered around the long bones of the skeleton. The skull was tucked underneath a fallen ceiling spall with the mandible 20 cm from the skull. Frontal (anterior) facial skeleton was complete. The mandible was found chin down in the ash deposits and temporomandibular joint up. A few rib bones were also found under the ceiling spall south of the skulls position. In the adjacent unit, N10W6, one rib bone was found next to the woven matting of burial #3 and is believed to be some of the remains from this disturbed burial. A large amount of cordage was looped and gathered around the long bones of the skeleton with scattered vertebrae and ribs tangled in the cordage. Two types of cordage were found with the burial and only a small fragment of woven matting. From all appearances of bone size and with the dental remains this was probably a youth not more than 10 years of age. Cranial measurements for this burial are on file at CAR and TARL.

Burial 5, an infant, was also in unit N8W6, but at 30-50 cm. This burial was placed between two fallen ceiling spalls (Figure 6) that make up a large proportion of the unit north of Burial 4. This infant was lying on a woven mat, body extended, face-up, and with the ends of the matting folded inward to protect the infant.

Figure 6. Rough Enough Rockshelter (41VV1987). View of Burial 5, with folded rabbit fur blanket and woven mat in center between the large spalls.

Skeletal remains are complete with the two clavicle measurements 42.59 mm and 40.53 mm. Three teeth were also found with the tiny skeletal remains. A folded rabbit fur blanket (described later)was placed over the infant and a small amount of grass left on top of the folded blanket. The woven mat is twilled plaited two-over-two, creating a herringbone effect with a diagonal pattern. The rabbit fur blanket measured 53 x 62 cm in size.

MATERIAL CULTURE

The artifact descriptions provided below are intended to provide a summary of significant material culture items found in the Rough Enough Rockshelter archeological deposits. They also provide insights into the technology of the inhabitants that fabricated them. This report does not contain a complete inventory of all artifacts recovered from the site.

Shell Artifacts

Mussel Shell

Mussel shell fragments, umbos (beak section), and a few valves were recovered from the excavated units, although not in great quantity. The valves are from the Tampico pearlymussel (*Cyrtonaias tampcioensis*). Tampico pearlymussels were once more widely distributed and occurred in the Pecos River up stream into New Mexico. Today, sections of the Pecos River in Texas are too salty to support unionids (Howells 2000:49) and in New Mexico the lack of water. Mussels were used for food and the shells were fashioned into beads, pendants, and

Figure 7. Rough Enough Rockshelter (41VV1987). Small black stone (left; N14E2, 20-30 cm) and flat disc shell bead (center; N12W2, 50-60 cm). On right, a dime is included as scale.

utility items; personal adornment trinkets are not numerous at this site.

Freshwater mussels are filter feeders and of the order Unionoida (bivalve mollusks). The innermost layer of the shell, the nacre or mother-of-pearl, visible inside the shell is the thickest of the three major layers. The outer layer, periostracum or epidermis, covers the prismatic layer that comprises the other shell layers. Externally, the shell may be smooth or sculptured in variable degrees, depending upon the species and life stage. Shell sizes range from less than 2 to more than 30 cm in adult mussels, again depending upon species, sex, and age. (Howells et al. 1996:1-50).

Disc Shell Bead

A flat disc-shaped bead (Figure 7) cut from a mussel shell, with a hole nearly centered in the disc, is one of the few adornments found in the shelter. Cordage was tied to the shell bead. The disc bead measures 24.82 x 23.57 mm in length and width, with a hole size of 9.28 mm and was recovered from unit N12W2, at 50-60 cm depth.This same style of disc shell bead was found in Eagle Cave (Ross 1965) in Val Verde County and a cave (Kelly and Smith 1963:166-190) in Brewster County, Texas.

Shell Pendant

One mussel shell pendant was found in unit N14E0 at the depth of 90-110 cm. The shell pendant is triangular in shape (Figure 8) with one perforation at the top of the pendant. The lower and wider section of the pendant has flakes broken off the outer edges of the fragile pendant. The length is 42.81 mm and its width is 34.80 mm, with the periostracum a golden beige color. The mother-of-pearl layer of the pendant has a smooth round and raised feature that appears to be an embedded pearl. This layer also has incised markings that radiate out from the smooth raised feature in a star burst fashion. These are deliberately made marks and not part of a natural dry crack.

Figure 8. Rough Enough Rockshelter (41VV1987). Incised shell pendant, unit N14W2 (90-100 cm depth).

Schuetz (1960) mentions a mussel shell pendant fragment found in Eagle Cave (41VV0167) and one in Jacal Canyon that have random scratch marks. Excavations at Centipede Cave (41VV191) and Damp Cave (41VV189) by Epstein (1963) found perforated mussel shell pieces but they did not have incised markings. Only one engraved mussel shell was found and described by J. E. Pearce and A. T. Jackson from Fate Bell Shelter. This shell had two parallel rows of hatched diamond-shaped figures carved on the interior layer of a small mussel shell. Other mussel shells were described as paint containers, spoons, rattles, and plain pendants (Pearce and Jackson 1933:44-121).

Rabdotus Snails

Rabdotus land snails occur in greater quantities than mussel shells in the shelter site, often in discarded accumulations that are not the results of a natural distribution. Some shells are charred or burned while others show no sign of exposure to a direct fire. *Rabdotus* shells were collected in many unit levels for radiocarbon analysis, environmental interpretations, and to study prehistoric subsistence patterns.

Land snail shells have been fashioned into necklaces strung on grass or plant fiber cordage. At Fate Bell Shelter, Pearce and Jackson (1933) include a photograph of one *Rabdotus* shell necklace strung on grass. In the old Shumla cave, in 1931, the Woolford-Martin expedition found a piece of fiber string with five land snail shells (*Rabdotus sp)*, evidently a portion of a necklace (Martin 1933).

Olivella Shell Beads

Three *Olivella* marine snail shells from unit N6W6 (at 20-30 cm depth) were recovered from the archaeological deposits. These shells were strung on a short broken cord. The *Olivella* shells (Figure 9) are well-worn. The unit where the *Olivella* shells were found is mainly comprised of large fallen ceiling spalls. A space between two of these ceiling spalls contained plant material that appears to be a bedding area. Also there was a large cache of cordage, loop net, and some mussel shells in this same area. The largest of the *Olivella* shells is 15.62 mm in length and 7.4 mm wide.

Olivella marine shells are extremely rare in Lower Pecos archeological sites and, when found, are often in mortuary contexts as strung bracelets or necklaces. Found with an infant burial in Shumla Cave No.1 were *Olivella* shells on a cord with two rodent teeth as pendants (Martin 1933).An infant burial from Horseshoe Cave (41VV171) was accompanied by four freshwater mussel shell pendants and 12 *Olivella* shells (Woolsey 1936).

Sandals

Three complete plant fiber sandals were excavated from Rough Enough Rockshelter, along with an incomplete sandal. Cordage was not used with the sandals and no animal skin sandals have been excavated from the shelter to date. The complete sandals were found at opposite walls in the shelter.

The first sandal (at the north wall) unit N14E0, 60-80 cm depth (Figure 10) was found among plant material, prickly pear leaves, and one animal bone (not identified). This was at the edge of a grass bedding

Figure 9. Rough Enough Rockshelter (41VV1987). *Olivella* shell beads still on cordage fragment. Unit N6W6 (20-30 cm depth).

Figure 10.Rough Enough Rockshelter (41VV1987).Two sandals, the one on the left found in N6W6 (30-50 cm), and the specimen on the right, from N14E0 (60-80 cm depth).

area that extended into the next unit. When that unit was excavated, a large bedding area lined with thin flat ceiling spalls and plant material (whole grass bunches, with roots intact) were among the bedding materials. The sole construction of this sandal cannot be determined without destroying the sandal, due to extensive fiber padding. This sandal has reinforced strip elements woven randomly length-wise into the sole. Loose fibers as padding are woven length-wise and horizontally to reinforce and cushion the sandal frame. Two tie straps of sotol leafs with square knots are secured at the central toe area beneath the frame and another at the heel on the sandal surface. Sandal measurements are 22 cm length and 10 cm width.

The second sandal from unit N6W6, 30-50 cm level (Figure 10) was excavated between large ceiling spalls and found in a cache of plant material, loop netting, cordage, and a couple of mussel shells. Sole construction has more exposed elements and is of the bi-parallel warped frame that doubled back into the center of the frame at the toe end. Weft elements are woven in a figure-eight pattern back and forth across the warp elements to construct the sole. Padding fibers are woven length-wise and horizontal as

reinforcing and as padding for the sandal sole. Two tie straps of sotol leaf with square knots are located at one end of frame and also beneath the frame, with another at the heel position on the surface of the sandal sole. Length of this sandal is 20 cm with a width of 10 cm.

The third sandal has the same appearance as the second sandal, with padding too thick to view the frame construction. This third sandal measures 17.5 cm in length and 10 cm in width was recovered from unit N14W2 at a depth of 110-120 cm.

A fourth partial or incomplete sandal was found in the same unit and level as the third sandal, but has a completely different frame construction. The construction is a parallel warp frame with no middle warp element. The weft elements are flat, wrapped in a 180 degree fashion around the parallel warp element, and then wrapped again to another parallel warp. This continued, adding more elements as needed, until a fiber element was woven length-wise for reinforcing the parallel warp elements. This sandal is not a figure-eight weave. The same sandal construction technique is described by Coffin (1932:45) on sandals found at Bee Cave in Brewster County, Texas, and by Martin (1933) from Shumla Caves in Val Verde County.

Excellent preservation of organic material in dry rock shelters in the Lower Pecos, Big Bend region, and Cuatro Cienegas basin of Coahuila, Mexico, have provided cultural material for analysis to establish three basic sandal typologies checker pad, braided and plaited, for each of the regions. Plaited two-warp sandal frame construction is the most common types in Coahuila and the Lower Pecos regions with sandal terminology and subtype classification differing between published analyses (Turpin 2003). Although sandals recovered from Rough Enough are few, the sandals with sole fiber padding thin enough to view the warp frame construction and the overall similar appearance of sandals #2 and #3 of this report, points to the two-warp or two parallel frame construction. These sandals conform to Type A described by Schuetz (1956:130-131) and Type Flaii a subtype by Taylor (1988:76), with the two warp elements converging at the toe and bend toward the center and downward to form the sandal frame. Fiber sandals are culture-sensitive artifacts that provide cultural information by the type of materials and construction technique preferred in the different regions over time (Taylor 2003).

Painted and Marked Stones

Painted Stones

Four painted stones, or painted pebbles,were excavated from different units of Rough Enough Rockshelter. Three of the stones (Figure 11) have markings or motifs in black paint while the fourth stone has markings in red paint. Only one of the stones with the black markings has paint on both sides. None of the four painted stones were found in direct association with other artifacts or in features, and thus their use or function is unknown.

The double-sided painted stone is broken, has a polished flat surface, and one rounded edge. It was removed from unit N8W4 (0-24 cm depth). One side of the stone has a chipped flake scar. The edge around the depression from the facet created by the chipped flake is worn smooth from handling. On the other side of the stone at the rounded edge are striation marks. Below the striation marks is a dull red splash of color. This is either red paint on the stone, with the black painted lines over the red paint, or a natural color in the stone. The black painted lines are diamond-shaped, with a larger diamond surrounding the smaller centered diamond design. On both sides above the larger diamond are V-shaped parallel lines pointing inward with another V-shaped line pointing down, toward the larger diamond shape. The reverse side of the stone has one zigzag line running through the center of the stone from the rounded to the broken edge of the stone. More fragmented V-shaped lines parallel each other and follow in a ripple fashion the centered zigzag line on both sides. This painted stone measures 57.2 mm in length, 49.1 mm in width, and 9.5 mm in thickness.

The second painted stone from N12W2 (20-40 cm depth), does not have a smooth surface and is complete except for a small chip missing on the side opposite the painted side. Parallel painted lines at one edge of the stone extend to a small circle element on the opposite end that has four longer loop elements that radiate out from the circle. This stone is 47.7 mm in length, 35.6 mm width, and 10.5 mm in thickness.

The third painted stone has an irregular shape with a flat side painted, but not smooth or polished. There are several straight black lines of varying length on the stone, with all lines coming together that resemble a clump of tall grass growing from the ground. The measurements are 73.3 mm in length, 43.7 mm in width, and 14.7 mm thick and was recovered from unit N16W2 (0-30 cm depth).

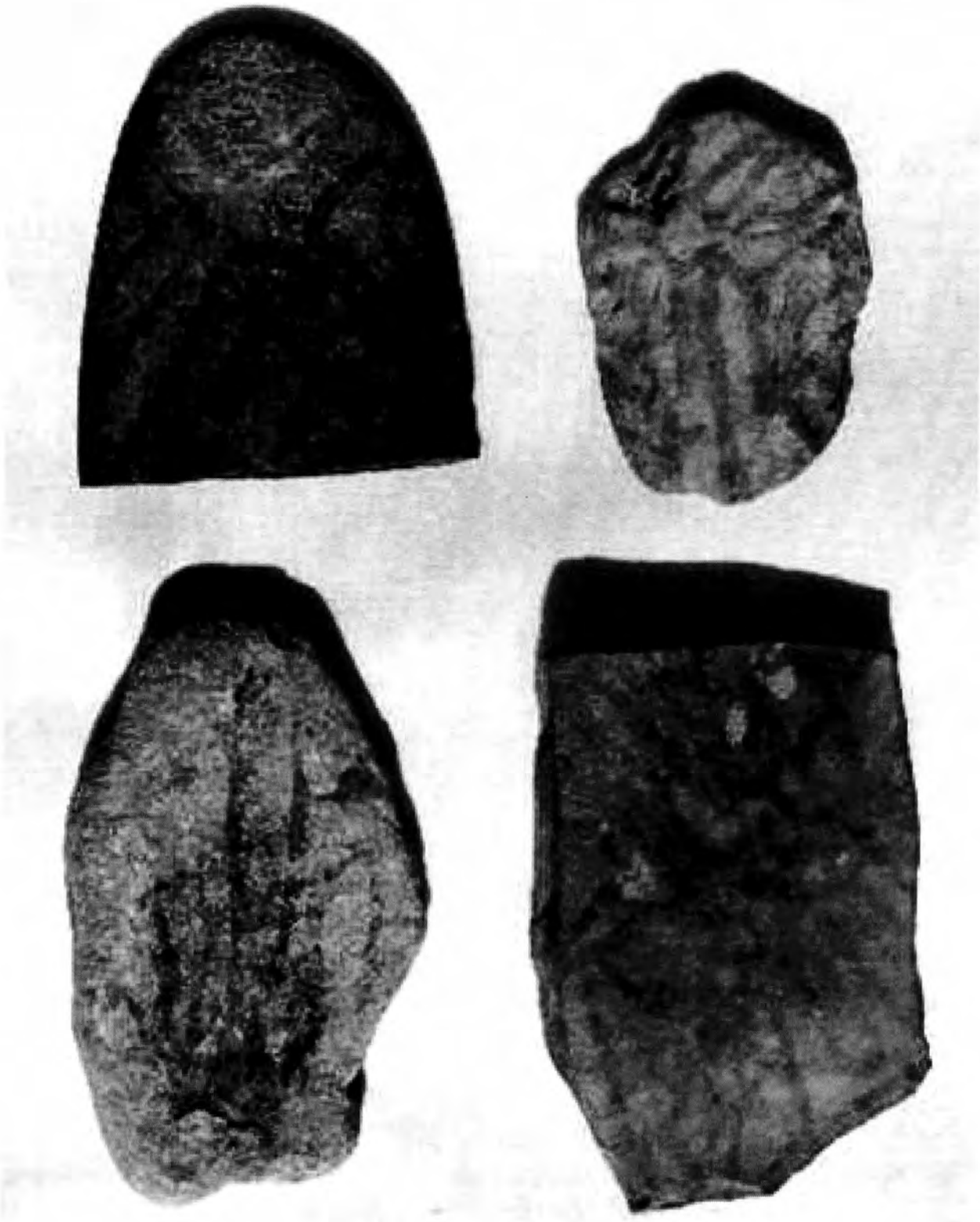


Figure 11. Rough Enough Rockshelter (41VV1987). Painted stones, or pebbles. Top left, N8W4 (0-24 cm), top right, N12W2 (20-40 cm); bottom left, N16W2 (0-30 cm), bottom right, N14E0 (20-40 cm).

The fourth stone, with red paint markings, is rectangular in shape. Multiple red paint markings randomly criss-cross each other over the flat surface, with a series of connecting loops that nearly form a X across the center of the stone. This stone was excavated from unit N14E0 (20-40 cm depth) and measures 66.9 mm in length, 46.5 mm in width, and 18.8 mm thick.

Smooth stones and black paint were the most frequently used in the Lower Pecos region for painted stones. Unpainted polished stones were found in some of the burials at Fate Bell shelter (Pearce and Jackson 1933). No painted stones have been found with burials in the Lower Pecos (Davenport and Chelf 1950). The earliest radiocarbon-dated context for painted stones in the Lower Pecos region is 6000 B.C., from Eagle Cave and Fate Bell shelter (Ross 1965).Painted pebbles have been found at all major shelter sites, except Baker Cave (41VV213), located in the Devil's River drainage (Mock 1987:58).

Marked Metate

One metate excavated from unit N14E0 (50-60 cm depth) has black markings. Two sets of three nearly straight black strokes (Figure 12) constitute the art work. Both sets of strokes are only a few centimeters apart near one edge of the metate. This level of deposits produced debitage, plant material, snails, mano, stone tool and charcoal samples.

Fig. 12. Rough Enough Rockshelter (41VV1987). Metate with painted markings. Found over Burial 2 (N14E0, 50-60 cm depth). See also Figure 4.

The thick limestone metate weighs 29.0 kg, and has a shallow circular grinding basin on both sides. The metate was discovered with a smaller one at basically the same depth. Both lay at a slight angle between unit N14E0 and N12E0 in fine ash deposit. The larger metate has burned black residue across one edge opposite the markings and across the reverse side. The smaller metate has the same type of black residue, but only on one side and more concentrated on the underneath side. This smaller metate also has shallow grinding basins on both sides. During excavation of the next level (60-60 cm) of ash deposits in unit N14E0, it was discovered that both metates lay partly covering a partially cremated adult burial. (See Burial 2).

Mano and Metate Stone Tools

Nineteen manos were recorded in the bag log from Rough Enough Rockshelter. Nine are intact or unbroken, 4 have chipped edges and 6 manos are listed as broken in half. One intact basalt mano, 156.17 mm length, 69.79 mm width from unit N16W2 at the 0-30 cm depth was recovered in a grass bed area against shelter wall. Also found in the grass bed was woven matting, knotted plant material, a piece of antler, a cactus bulb base and a painted stone (Fig. 11).

A second basalt mano, broken in half from unit N12W2 at the 0-20 cm depth was recovered near another mano, not basalt, other stone tools and a metate at the opposite corner of the unit. This 0-20 cm level was trashy with mixed surface debris and sheep droppings. Both basalt manos general characteristics are cylindrical in form and are the only basalt artifacts recovered from Rough Enough Rockshelter.

General characteristics of the 9 "intact" manos are round shape stones with a flat smooth grinding surface and on the opposite side of stone a "turtleback" shape for easy grasping of the mano. Exception to this description is a mano from unit N14E0, 40-50 cm depth. This "turtleback" mano has a slanted angle grinding surface forming a "wedge" shape appearance with striations on grinding surface.

The four chipped manos are characterized as "turtlebacked,"(cross section) and are oval, round and tear-drop in shape and have a flat smooth grinding face.

All manos (intact, chipped or broken) were recovered at depths ranging from the surface to 130 cm level and recovered throughout the established unit grid system. The larger concentration of manos came from units N12 and N14 on the north side of shelter. This is probably due to those units having the greatest excavation depths with the exception of unit N8E0 test pit. The manos are of a "one-handed" grip for usage determined from their dimensions and size. The stones are round, oval and tear-drop in shape with a flat smooth grinding face and with some manos having a charred or burned surface.

Nearly all manos seem to be discarded or not in direct association with a metate with the exception of a mano and metate from unit N14W4, 0-30 cm level. This metate stone slab is 3-5 cm in thickness and the dimensions of 56 cm in length and 29 cm wide, with one area on smooth grinding face blackened or burned. This thin oblong metate is the only one of this style recovered from Rough Enough Rockshelter (Figures 13a and 13b). Other metates are from thick limestone slabs of stone varying in size, and have a circular grinding basin.

Eight mano samples were submitted to Davis Rohr, Professor of Geology, at Sul Ross State University for lithology analysis. Rohr's lithologies suggest the eight samples are from several different areas. Descriptions of the eight samples are listed, by specimen number,below:

#208 Light gray limestone. N14E2,40 cm level.

#274 Weathered surface fragment with black desert varnish on one side. Tan, orthoclase feldspar rich volcanic rock with some calcite. N4W4 0-30 cm level.

#382 Black feldspathic sandstone with silica cement. N12E040-55 cm level.

#390 Black chert. N14W2 surface.

#506 Calcareous volcanic lithic sandstone or tuffaceous sandstone. N8E0 110-130 cm level.

#523 Black vesicular basalt. N12W2 0-20 cm level.

#645 Fine-grained quartz sandstone with silica cement, minor feldspar. N14W2 70-80 cm level.

#723 Quartz sandstone with minor calcite. N12W2 90-100 cm level.

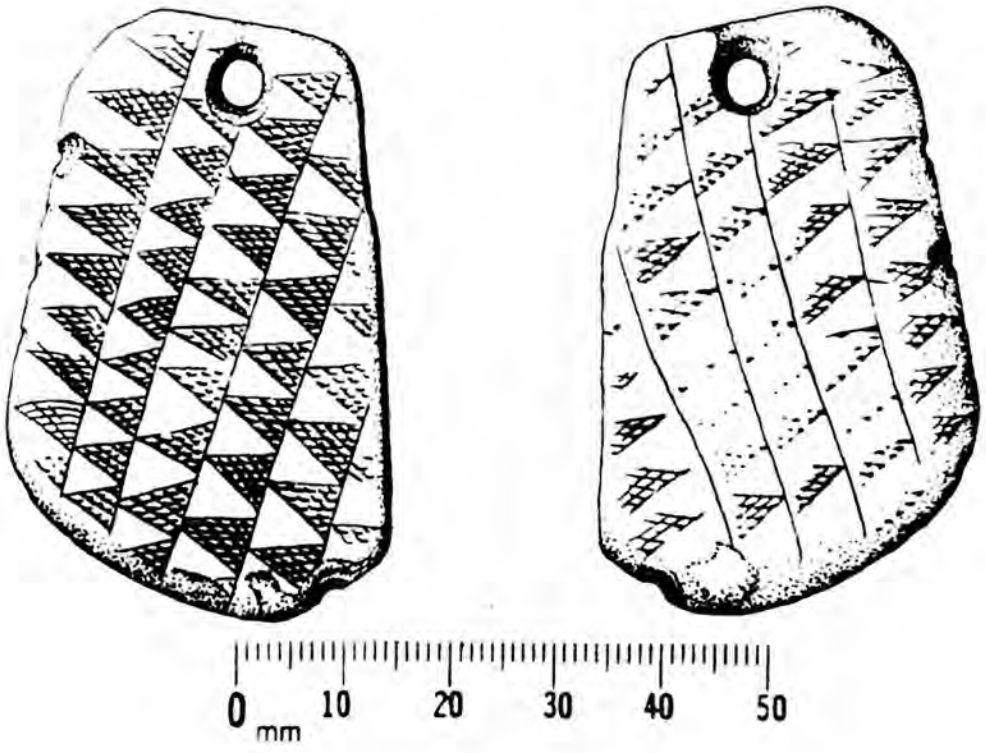
Incised Stone

An exceptional incised stone pendant (Figures 13 a and b) was recovered from Rough Enough Rockshelter by the landowner. The fossilized limestone pendant has all surfaces polished. It was probably used for personal adornment.

The surface of the pendant has several parallel lines on both sides of the stone with cross-hatched triangles that are connected at their base in a repetitive fashion between each of the parallel lines. This design is extravagantly engraved over both flat surfaces. At nearly all intersections of the cross-hatched lines is a small nick made in the stone as if to designate a tally mark. This amount of detail and artistic work has not been found in other stone or shell artifacts recovered in the Lower Pecos. The detail in design, along with the tiny nick marks at the cross-hatched lines, may indicate a form of record tabulation for moon cycles or possible seasonal ceremonial rituals.

A single drilled hole of 5 mm diameter was used for suspension with a cord. The stone measurements are 55 mm in length and 37 mm wide with a 6 mm thickness. This stone specimen was probably not made by local Lower Pecos inhabitants. Triangle design in art work is more prevalent in the Trans-Pecos area, and is rare in the Lower Pecos art. C. K. Chandler's

Figures 13a and b. Rough Enough Rockshelter (41VV1987) Incised pendant made on limestone with fossil inclusions. a, view of one face; b, illustrations of both sides, drawn by Richard M. McReynolds (from Chandler 1991).



(1991:29-32) report on this stone pendant also mentions finding a similar design on another smaller stone pendant that was recovered from Squawteat Peak site in Pecos County, Texas.

Round Stone

A round black metallic stone measuring 15 mm in diameter was recovered from unit N14E2 at a depth of 20-30 cm (Figure 7). A second round stone measuring 32 mm diameter was recovered from unit N4 W4 between 0-30 cm.

Other Modified Stone Artifacts

Stone Slab

A flat slab of stone with a thickness of 6.9 mm and two well rounded worked edges (Figure 14) was recovered from unit N8W4 at 24 cm. There was no residue adhering to the stone other than dry ash deposits. The slab of stone is 78.0 mm in length and 60.9 mm in width.

Wedge-Shaped

A broken oblong modified stone measuring 103.45 mm in length, 34.45 mm wide and 18.78 mm at greatest thickness is "wedge" shaped in its characteristics. This artifact was found in unit N8E0 at the 150-200 cm depth.

Figure 14. Rough Enough Rockshelter (41VV1987).Flat stone slab with curved edges found in N7W4 (24 cm depth). Length, 78 mm; width, 60.9 mm.

Round Limestone

A round-shaped limestone tool was found in unit N12W2, at the 40-50 cm depth. The hand size blackened stone has flat sides although not smooth and appears it was pecked or battered to form the two flat sides.

Stone Pipe

A broken tubular-shaped stone pipe was found in unit N12E0 at 20-40 cm. It appears to be soft sandstone with a hollowed-out inner center that has a thin gray residue inside the hollow pipe bowl (Figure 15). The broken specimen measures 22.7 mm in length and 39.5 mm wide. Martin (1933) reports findings stone pipes and pipe fragments at Shumla Caves with "tobacco" remaining in the form of cedar foliage.

Figure 15. Rough Enough Rockshelter (41VV1987). Fragment of a tubular stone pipe from unit N12E0 (20-40 cm depth). Made of sandstone. Length, 22.7 mm; width, 39.5 mm.

Bone Implements

Rabbit Mandible

One wrapped rabbit mandible (Figure 16) in exceptional condition was found in N12E0. Arrangements of the wrappings next to the mandible are slender plant fibers with intricate knotted netting entangled through the plant fibers. The plant fibers and netting created padding that covers and cushions the mandible molar cheek teeth and the cleft space, leaving the incisor exposed for use.

Rabbit mandibles, both wrapped and unwrapped, are found in other lower Pecos sites, including Perry Calk rockshelter (41VV87) (Collins 1969:20-74) and Horseshoe Cave (41VV171; Woolsey 1936), both located on the Rio Grande. Rabbit mandibles bound for reinforcement has also been found at archeological sites in northern Mexico (Taylor 1966:78-82). The use of these implements has predominantly been described as gravers and scarifiers for blood-letting rituals and tattooing.

Bone Awls

Several complete bone awls and fragments are among the artifacts from Rough Enough Rockshelter. Some of the bone awls show evidence of special care and crafting with polished surfaces, well-developed tapered tips, and carved grooves down the length of the awl with a hole at the distal end to allow cordage to pass through. Most are made from split mammal long bone.

The first bone awl specimen (Figure 17, right side of photo) is cream-colored, with a polished surface, and was recovered from surface inspection of a disturbed area of the shelter. Length is 14.8 cm and has a width of 2.3 cm at the distal end.

The second bone awl (middle) came from unit N14E2 at 50-60 cm. The distal end of the awl has single decorative zigzag incised line from side to side, with zigzag marks incised on both sides. One side has two incised zigzag marks, while the other has three. A length-wise carved groove near the center of the awl extends through the distal section

Figure 16. Rough Enough Rockshelter (41VV1987). Net-wrapped rabbit mandible. N12E0, 42 cm depth.

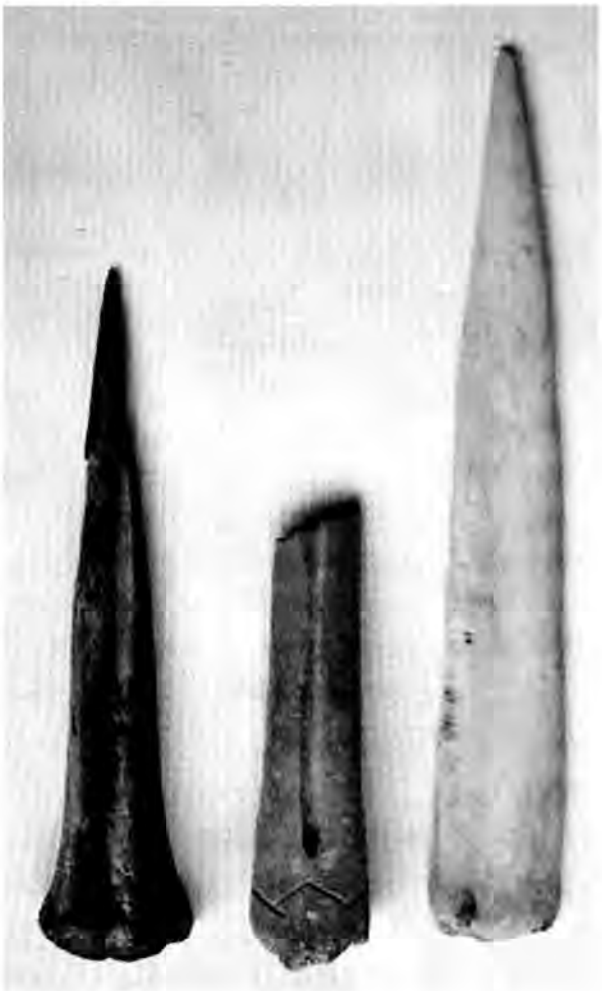


Figure 17. Rough Enough Rockshelter (41VV1987).Bone Awls. Left, N14W2 (90-110 cm);middle: N14E2 (50-60 cm depth); right, disturbed area.

to allow cordage to be passed through the bone. This is not split bone, and the reverse side of the bone is hollowed, leaving the curved sides of the bone along with the distal section of bone. The awl is 7.5 cm length and 2.5 cm wide at the distal end. (Figure 17, middle of photo).

The third bone awl (left) was recovered from N14W2 between the 90-110 cm level. It measures 11.5 cm in length and 3 cm wide at its distal end. This split bone awl has some polished surface remaining.

A fourth bone awl from unit N16W2 (100-110 cm depth) measures 89.48 mm in length, 32.00 mm width at base joint and has a well tapered point similar to bone awl from unit N14W2.

Bone Pin

A thin sliver of polished mammal bone with tapering points (Figure 18) on both ends of the bone was recovered from unit N8W4, from the 0-20 cm level. Similar double-pointed specimens discovered at other Lower Pecos archeological sites are considered to be bone pins. One side of the polished bone specimen is flat while the other side is rounded. This specimen is 72.3 mm in length, 5.7 mm width, and 3.5 mm thick.

A split and hollow mid-section from a mammal long bone was recovered in unit N8W6 (15-30 cm depth) in association with burial 4. It has one end cut at an angle, leaving a U-shaped notch (Figure 19) forming two pointed prongs. The opposite end of tool also has bone cut at an angle but without the fashioned prongs. The tool is 75.5 mm in length and 18.4 mm in width.

Figure 19. Rough Enough Rockshelter (41VV1987). Bone artifacts. Left, U-shaped notched bone fragment (length, 75.5 mm) ; right, split mammal bone cut to form handle at top (length, 24.4 mm. Both are from N8W6 (15-30 cm depth).

Also found with burial 4 is a split mammal long bone with bone cuts removed from the distal end to form a handle. Residue covers part of the distal handle. The split long bone below the distal handle has a wide but tapered point. The distal end of the tool is 24.4 mm wide and 71.3 mm in length.

Figure 18. Rough Enough Rockshelter (41VV1987). Polished bone pin implement. N8W4 (0-20 cm depth).

Bone Fragment Tied to Twig

A small 55 mm length of plant twig was found with Burial 4 (15-30 cm in depth) that has a thin bone fragment tied to the twig (Figure 20) by a strip of plant fiber. The plant fiber is criss-crossed in a figure eight fashion to hold the bone fragment to the twig.

Polished Blade Bone Implement

An interesting bone implement was recovered from unit N8W8 between 0-25 cm (Figure 21). The thin blade is polished with a tapered smooth and round end. The handle section is comprised of cut bone that reveals the porous marrow middle section. Overall length of the bone implement is 88.2 mm and it is 11.7 mm wide. The blade is 39.4 mm in length with a blade base thickness of 4.0 mm.

Bison Bone Implement

A large piece of animal bone from Rough Enough Rockshelter may be part of a bison rib (Figure 22). It came from a depth of 60 cm in unit N14E2. One end of the rib bone is beveled and worn from use as a digging implement, and it was probably used as a digging tool to extract or lift sotol and lechuguilla bulbs from the ground or from limestone crevices.

Other large bone fragments have been recovered from Rough Enough Rockshelter. One large fragment measuring 63.73 mm in length, 16.52 mm thickness and 39.41 mm wide was recovered from unit N8W4 at the 0-20 cm depth. From unit N8W8, depth of 0-25 cm, two large bone fragments were found with the largest measuring 88.93 mm in length, 66.49 mm width and 7.62 mm in thickness. Two large bone fragments were recovered from unit N16W2 (0-30 cm depth), no measurements provided. Bison bones are scarce in Lower Pecos sites with the exception of Bonfire shelter (Shafer 1986:46-82), Eagle Cave, Castle Canyon, Skyline Shelter, and Arenosa Shelter (Turpin 1995).

Split Antler Tool

A split antler tool from unit N8W6, 30-50 cm depth, measures 88.08 mm in length, 26.92 mm wide and 14.42 mm thickness at the base of the tool. The antler base is smooth, with the tool having an over all slight S shape that fits and grasps well in the palm of the hand while the opposite end of the base is well worn from usage.

Bone Beads

Four tubular bone beads were recovered from the ash deposits in units N8W4 (0-20 cm depth), N8W6 (15-30 cm), N12W2 (20-40 cm depth), and N12W2

Figure 20.Rough Enough Rockshelter (41VV1987). Bone fragment tied to plant stem. N8W6 (15-30 cm depth), Burial 4. Length, 55 mm.

Figure 21. Rough Enough Rockshelter (41VV1987). Bone artifact with highly polished and rounded end (left area in illustration). Possible tool.N8W8 (0-25 cm depth); length, 88.2 mm.

Figure 22.Rough Enough Rockshelter (41VV1987). Animal Bone Implement, Unit N14E2 (60 cm depth).

(40-50 cm). One bone bead has a polished surface while the other beads have a dull matte finish.

Animal Skulls

Though they are not artifacts, two skull fragments from Rough Enough Rockshelter warrant brief mention. One nearly intact animal skull from disturbed unit N4W4 at 0-30 cm depth was identified as a striped skunk. A large broken skull fragment from a deer was recovered from unit N16W2 at 75 cm depth, was 30 cm west of Burial 1.

Wood Implements

Until around A.D. 700-1000, when the bow and small arrow points began to appear in the Lower Pecos archeological record, the main hunting weapon consisted of wood spears or darts and the atlatl or spear thrower. A usually soft wood main shaft and a separate hardwood fore shaft, when assembled, formed the propelled section of the atlatl weapon. The proximal end of the main shaft was grooved or notched to hold the fore shaft that had either a hafted stone projectile point or a simple tapered wood point. The main shaft was placed in the hand-held atlatl, and then ejected when the atlatl was cast by a hunter toward the animal being pursued.

Five wood implements for use with an atlatl were excavated from several unit levels. The longest (32 cm in length) from unit N4W4 (0-30 cm depth) has tapered points on both ends of a foreshaft. One of the other foreshafts appears to be broken, is from unit N8W8 (0-25 cm depth), has only one point and measures 21 cm in length. A similar single pointed wooden implement was recovered from unit N16W2 (30-50 cm depth) is 16 cm in length. Another wooden shaft implement from N14E0 (40-50 cm depth) is 99 mm in length and 7.2 mm in thickness and has a round wood element inserted into one end of the larger wood shaft that is wrapped and bound with a thin fiber to secure the inserted smaller element (Figure 23).

The fifth wood implement 29 cm in length was recovered at a depth of 90-110 cm depth in unit

Figure 23. Rough Enough Rockshelter (41VV1987).Dart shaft fragment? N14E0 (40-50 cm depth).Length, 99 mm.

N14W2 has a small u-shaped indentation at the tapering end of that implement.

Bows were not recovered from shelter deposits, although Sabinal and Perdiz arrow points have been found.

Rabbit Fur Blanket

A rabbit fur blanket, associated with the infant found in Burial 5, was recovered from N8W6 at 30-50 cm. This blanket (Figure 24) is made of 2-ply cordage folded back onto itself with a Z twist loose construction frame. Rabbit fur hide strips are also twisted with the fur side out and woven between the loose cordage framework. The rabbit fur blanket is 53 x 62 cm in length and width.

Fiber and Basketry Materials

Knotted Fiber Net Basket

A knotted plant fiber net basket (Figure 25) was recovered from a disturbed area in the rock shelter. The net basket was found lying in a powdery fine ash, folded in half with all elements and the handle slightly twisted into it as if set aside while not in use.

Twelve knotted elements form the body of the net basket. Each element is composed of multiple fiber strands that are tied to loops on both ends of the

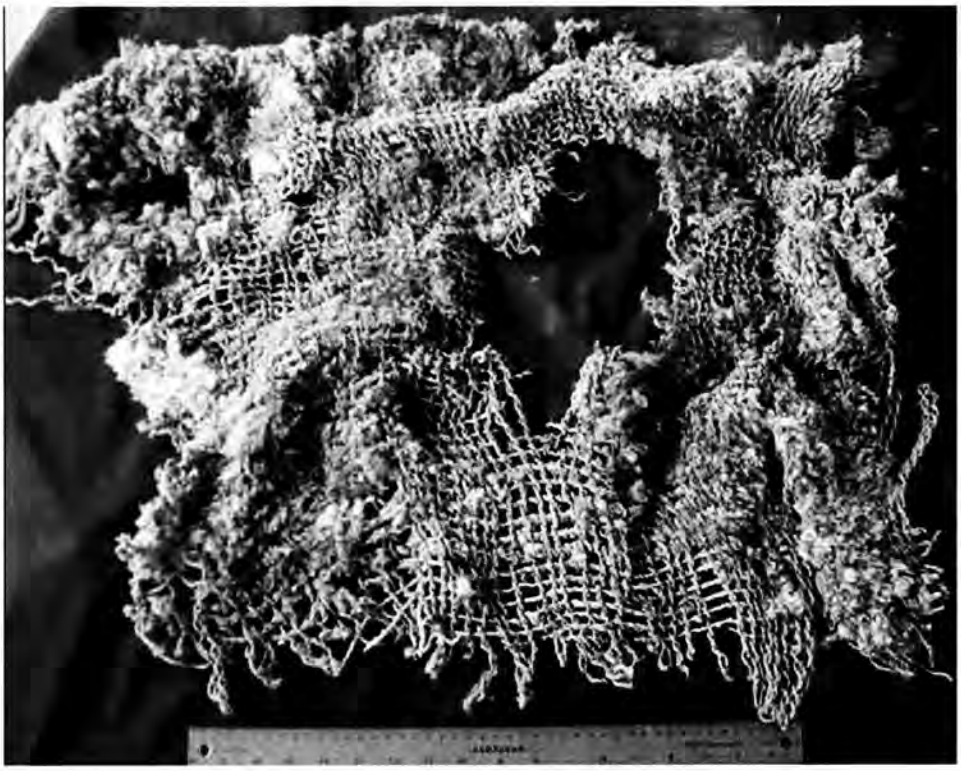


Figure 24. Rough Enough Rockshelter (41VV1987). Rabbit fur blanket associated with Burial 5, N8W6 (30-50 cm depth).

Figure 25. Rough Enough Rockshelter (41VV1987). Knotted plant fiber basket. From a disturbed area.

Coiled Basket Fragment

Unit N6 W6 had a short (6 cm) slender foundation grass bundle warp with the weft a spiraling plant fiber strand the full length of foundation(Figure 26). This coiled basketry fragment having a sewn stitch (weft) with a left to right slant work direction. Yucca strands are the most common weft material used by Lower Pecos basket makers (McGregor 1992:42).

Woven Mat Specimens

Two different structural types of woven matting were recovered from several of the excavated units. Simple plaiting (checkerweave), with elements woven in an alternating over-one-under-one fashion (Refer to Figure 2) was used for mat fragments or larger mats reserved for bedding, work areas, and for food preparation or food consumption trays. The simple plaited mats, or fragments of mats with any remaining edge, had 90 degree selvage type constructions. Mat elements were constructed from whole sotol leaves with thorns removed.

Figure 26. Rough Enough Rockshelter (41VV1987).Coiled basket fragment. Grass bundle warp with spiraling plant fiber weft strand. N6W6 (0-20 cm depth).

fiber handle. At some point, the handle was repaired with fiber strands to form a new loop at one end of the handle;
these were braided and knotted to other fibers on the handle element.The handle is 23 cm in length with the twelve knotted elements 27 cm in length.

Knotted Plant Fiber

Numerous specimens of knotted, twisted, wound, and looped plant leaves or fiber were found in Rough Enough Rockshelter. Some specimens still have the outer fleshy plant residue while others have only the inner tough plant fibers.

The second type of woven matting is of twill plaiting construction. Mat elements are varied in an over-two-under-two sequence, offsetting a row from the preceding one and the following row to create a herringbone effect (Figure 27). The elements in the mat are flat and equal in width and more flexible than the simple plaiting specimens. Each of the twill mat specimens found had 90 degree selvage construction and were with infant burials. Twill plaiting construction is the stronger of the two mat structural types (McGregor 1992:47-64).

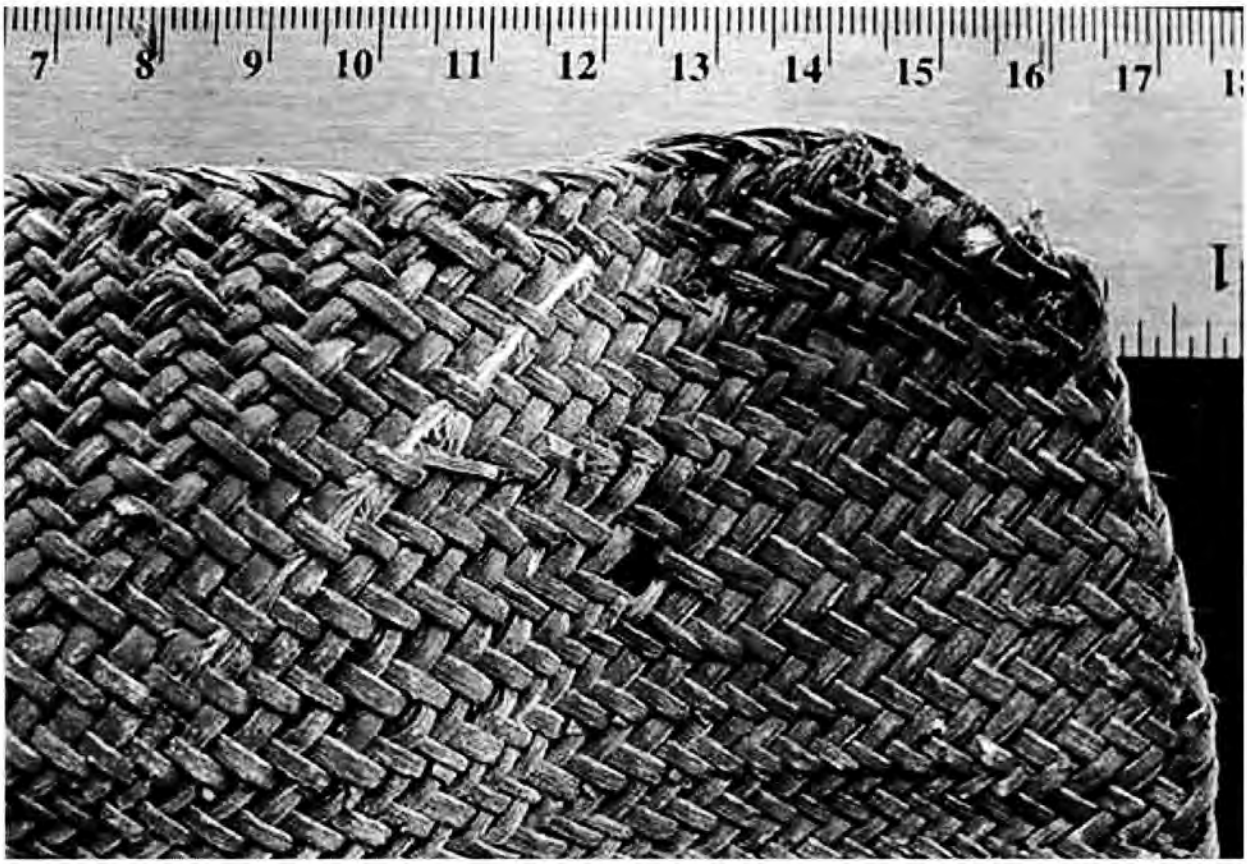


Figure 27. Rough Enough Rockshelter (41VV1987).Twill plaited mat. Note feather in woven elements.N8W6 (30-50 cm depth).

Intentionally placed layers of plant fiber are found in limited areas of the shelter floor ash deposits. Matting or mat fragments, discarded sandals, cordage, grass, and prickly pear leaves were used to construct activity layers for bedding or work areas. Once the layers were no longer used, they were abandoned and became lost in the ash deposits.

Cordage

Preserved perishable artifacts such as cordage provide the opportunity to interpret the social, ritual, and daily traditions of the prehistoric Lower Pecos peoples. Plant fibers from lechuguilla, yucca, and sotol were constructed into cordage or string; knotted and unknotted elements were extensively used in the Lower Pecos for basketry, nets, bags, sandals, rabbit-fur blankets, and aprons.

A variety in size, construction, and quality of cordage was found at Rough Enough Rockshelter (Figure 28). Cordage ranged in size from the smallest

Figure 28. Rough Enough Rockshelter (41VV1987). Examples of cordage found with Burial 3.

string knotted net (19 mm in width) wrapped around rabbit mandible to nearly rope-size associated with a bundle burial (Burial 3). Construction of most of the cordage was by the Z twist, with others in 2-ply multiple continuous bunched fibers with only a slight twist in construction. One cordage specimen associated with the bundle burial had multiple continuous fibers covered with an outer white soft fiber. This outer white fiber is probably the soft abdomen fur of a rabbit. The other larger cordage from the bundle burial was dark brown and had 6-8 ply strands in a slight S twist. Shumla cave excavations (Martin 1933) recovered fur-wrapped cordage only wound around matting in bundle burial context.

Chipped Stone Artifacts

Due to pit-oven construction and sotol bulb baking by the inhabitants of Rough Enough Rockshelter, the archeological deposits are not in a stratified sequence and consist of concentrations of burned rock mixed with debitage, material objects and different projectile point types from the controlled excavations. At best the recovered dart and arrow points provide an indication of the age of the site and a guide to when the shelter was inhabited based on previous research on the age of projectile points in the Lower Pecos area (Turpin 1991, 1995). Tabulation of points from Rough Enough Rockshelter deposits are derived from whole and identifiable fragments of dart and arrow points. Totals for arrow points and dart points are shown in Table 3. While the horizontal and vertical provenience of the projectile points are individually listed for the different excavated units and shown by variable increment depths in Appendix V.

Dart points and arrow points recovered from Rough Enough Rockshelter (Figure 29) represent a long continuum of cultural activity from Early Archaic to Late Prehistoric periods (cf. Turner and Hester 1999). Perdiz and Sabinal arrow points were

Figure 29. Rough Enough Rockshelter (41VV1987).Lithic artifacts. Top row, left to right, Sabinal, Perdiz?; arrow point perform; Montell, Castroville; Bottom row, left to right, Frio?; Pedernales, Pandale, dart point perform; and perforator/drill.

recovered from the surface and upper level archeological deposits. While the Sabinal point dates to the earlier part of the Late Prehistoric period (ca. A.D. 1120-1250) and found in the southwestern Edwards Plateau, the Perdiz arrow point was made as early as A.D. 1300 to as late as ca. A.D. 1700 and found statewide.

A total of 94 Pandale, 118 Langtry, and 50 Ensor projectile points are the primary quantities of point types recovered from the shelter deposits. Pandale points are common to the Lower Pecos and mark the Early Archaic period (ca. 4000-2500 B.C.), (Turner and Hester 1999). Also an Early Archaic dart point, one Andice was recovered at the 150 cm level from the test pit. Langtry points are hallmark of the Middle Archaic, ca. 2500-1000 B.C. in the Lower Pecos. The Ensor along with the Frio and Figueroa points date to the Transitional Archaic period (ca. 200 B.C.–A.D. 600).

Additional points found at Rough Enough Rockshelter, the Val Verde projectile is from the Middle Archaic (ca.2500-1000 B.C.), while the Shumla projectile points date from Late Archaic (ca. 1000 B.C.-200 B.C.) and the Castroville (800B.C.- 400B.C.). The Montell projectile points date from the Late to Transitional Archaic period (ca. 1000 B.C. - A.D. 200) (see Turner and Hester 1999). Of the Late Prehistoric period arrow points, the Perdiz (A.D.1200 – A.D.1500) were the greatest figure tabulated, a total of 26, with Sabinal (A.D.1120 –A.D.1250) a total of 12, about half the quantity of the Perdiz. The bipointed Lerma projectile points might date from the Paleo-Indian Period but are usually in Archaic contexts in south Texas (Turner and Hester 1999:145).

Perforators/drills, scrapers, preforms, and quarry blanks (Figure 30) are also common among the lithic materials recovered. The category of "scraper" is broad and briefly described in this initial effort to summarize the lithic materials recovered from Rough Enough Rockshelter deposits. Further lithic analysis to evaluate the physical aspects and use-wear of the lithic "scraper" would provide evidence to clarify the specimens and how each stone artifact was used.

Chert nodules in limestone outcroppings are plentiful and are located down canyon near the Pecos River, approximately 1.6 km from the shelter. These nearby natural chert resources supplied lithic material as needed for tool manufacture. Lithic debitage recovered from units in ample amounts indicate that the manufacture of lithic tools was also a major activity at the shelter site.

Coprolites

Very small amounts of coprolites (dried human feces) have been found in the ash deposits at Rough Enough Shelter. Because such small amounts of coprolites were recovered, no samples have been analyzed. In the site description provided above, as mentioned is a narrow natural path located on the northeast side of the shelter mouth. The narrow path leads to a lower and small open area where ceiling spalls and cave dust has accumulated. It is possible that this lower level was used, in part, as a latrine area by the shelter inhabitants since only small amounts of coprolite are found in the shelter itself. Quick and easy access to this lower level away from the living area and hearth oven may explain the shelter occupant's choice for a latrine. With substantial amount of deposit remaining in the shelter it is likely a latrine area has not been located.

Figure 30. Rough Enough Rockshelter (41VV1987). Lithic artifacts. Preforms and quarry blanks; scraper in upper right.

SUMMARY AND CONCLUSIONS

Excavations at Rough Enough Rockshelter from January 2000 – August 2006 were designed to recover prehistoric cultural materials in stratigraphic context with the intentions to preserve ancient human activity in the dry prehistoric rockshelter located in the Pecos river region in western Val Verde County, Texas.

Wide 2x2 meter grid systems were established across the shelter floor to provide better working conditions in the soft ash deposits. Grid units with undisturbed deposits were selected for excavation to give a clear insight to indigenous habitation, prehistoric economic subsistence, activities and functions of the site. Two 2.43 meter length steel rods were driven into the shelter floor to determine the possible depths of the ash deposits. The natural rock floor of the shelter was not obtained with this procedure.

A plan grid map was created that provides shelter measurements, drip line, unit grid system, and talus feature. Unit grid N8E0, central location on shelter floor, was designated as "test unit" to provide a depositional profile and glimpse into occupational activity of site.

Excavation was in 10 cm increments unless greater depths were required to reveal a feature or expose specific artifacts. A 1/4 inch hardware screen was used with occasionally 1/16 inch mesh in the screening process. All cultural materials, unscreened soil samples, charcoal samples, animal bone, mussel shell and *Rabdotus* snails were separated, bagged per unit and level then recorded in the bag log. An extensive note book of the excavation was maintained with photographs, sketched graphs, field notes, bag log and unit level log sheets.

This report presents introduction, cultural history, environment, landscape, site description, excavation methods and excavation results. Cultural materials descriptions and tabulation of artifacts in each category give insight in the technology of the ancient inhabitants that fabricated them and how Rough Enough Rockshelter may be interrupted. Due to pit-oven construction and sotol bulb processing by the inhabitants the archeological deposits are not in a stratified sequence, although many features were discovered "in situ."

Lithic artifacts from Rough Enough Rockshelter represent a long continuum of cultural activity from Early Archaic to Late Prehistoric phases. The time periods represented by Rough Enough Shelter are derived mainly from recovered projectile and arrow points. Perdiz and Sabinal arrow points as index lithics for the Late Prehistoric (ca. A.D.700-1500) period were found in Rough Enough shelter deposits intermixed with projectile points that are characteristic of older time periods. The Sabinal arrow points date (A.D. 1120-1250). The Perdiz point type (A.D. 1300-1700) is characteristic of the Late Prehistoric Period in Central Texas, referred to as the Toyah Phase. Pandale points are hallmark lithics for the Early Archaic period (ca. 4000-2500 B.C.; Turner and Hester 1999). One Andice, also an Early Archaic dart point, was collected from the 150 cm level of the test pit. The Langtry and Val Verde projectile points represent the Middle Archaic (ca. 2500-1000 B.C.) period. The Shumla points date to the Late Archaic (ca. 1000 B.C.-200 B.C.) as do the Montell and Castroville (800 B.C.-400 B.C.) points. Also recovered were Frio, Figueroa, and Ensor points that date to the Transitional Archaic period (ca. 200 B.C.-A.D. 600). Due to unsystematic digging in the past in the upper deposits, substantial loss of important Late Prehistoric period data has taken place.

The radiocarbon date of A.D. 1210-1300 from the twill plaiting herringbone style woven matting in Burial 3, unit N10W6 provides an insight in the occupation and mortuary practices that continued to the Late Prehistoric period (ca. A.D.700-1700) for the Lower Pecos region of Texas. Additional radiocarbon assays from cultural materials recovered from Rough Enough Shelter might well provide a series of dates and give clarity beyond projectile point chronological sequence for shelter occupation. Meaningful change in technology and economics visibly mark the Late Prehistoric period with the appearance and use of the bow and arrow, in some sites pottery and agriculture, for this cultural period in Texas.

Approximately 90 percent of Rough Enough Rockshelter deposits remain unexcavated. These deposits may reveal details of the Early Archaic (6000–2500 B.C.) phase of the Lower Pecos river region of Texas. The Sabinal and Perdiz arrow points are evidence of another Late Prehistoric locale site in the Lower Pecos region, the Perdiz being a diagnostic of Toyah Phase of central and south Texas.

Additional analysis of from charcoal samples collected would aid in cultural period interpretation of Rough Enough Rockshelter. Occupational debris, deep ash deposits, fire-cracked rock accumulation inside shelter and a large talus provide evidence to the site as an upland intensive cooking site and no doubt a retreat from harsh environmental elements.

Ancient burials interred at the shelter designate formality beyond habitation and food preparation.Skeletal remains excavated during the 2000-2006 projects seem to have been buried with respect inside Rough Enough Rockshelter.

Future excavations at Rough Enough Rockshelter are not scheduled at this writing. Investigation and analysis of material culture objects from Rough Enough shelter support links to, and interaction with, with contemporary groups from northeastern Mexico, the Texas Big Bend and Central Texas. Further in-depth study and comparison of neighboring cultural traits from collections and review of literature would emphasize the specific cultural-territorial traits within the Lower Pecos region and possible outside influence in the region.

As stipulated before field work began, all culture material recovered from the site is the private property of the landowner. The project records, notes and photographs remain with the author for future research.

Finally, based on the scope and size of the lithic artifact assemblage recovered from Rough Enough Rockshelter, it is highly likely that further research with the lithics could provide significant knowledge beyond the brief overview provided in this site report..

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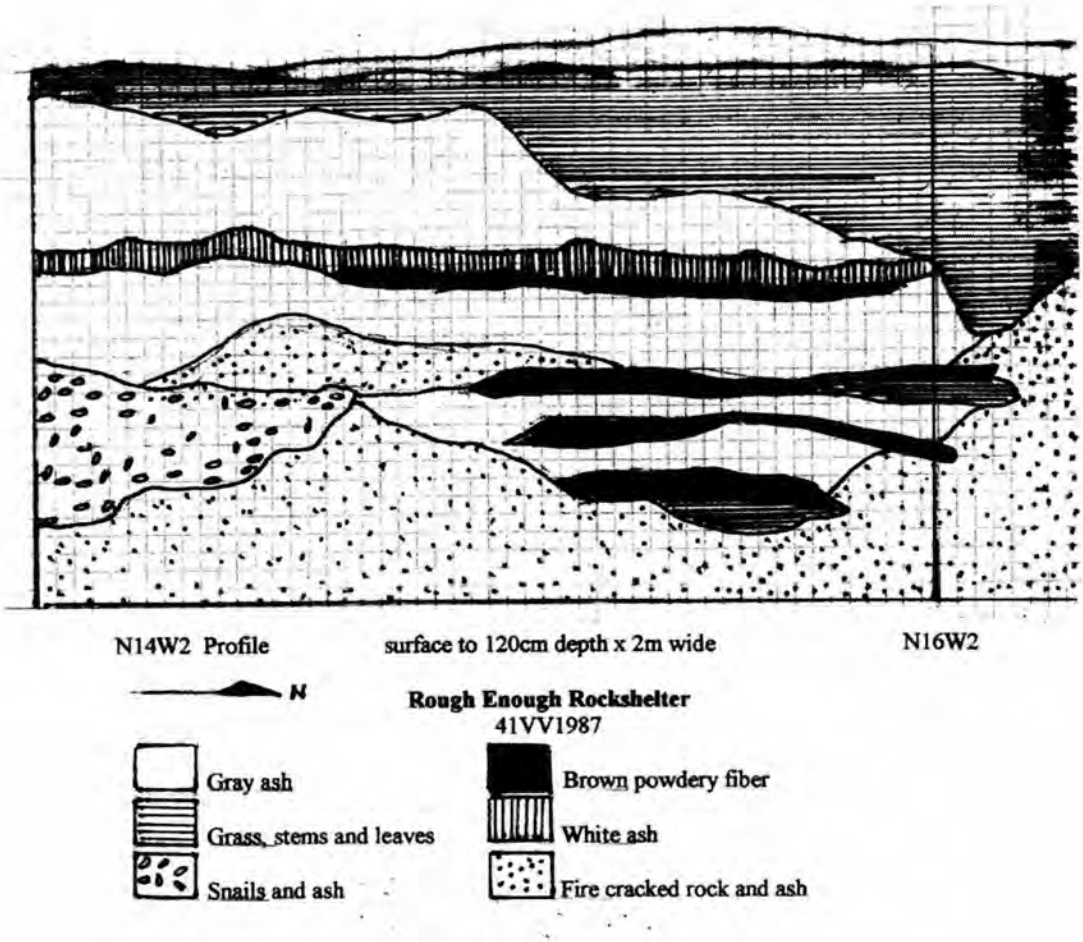
Appendix I
Profile of West Wall N14W2



Appendix II
Arrow Point and Dart Point Summary

	N2W2	N2W4	N4W4	N6W6	N8E0	N8W4	N8W6	N8W8	N10W6	N12E0	N12E2	N12E4	N12W2	N14E0	N14W2	N14E2	N14E4	N16E0	N16W2	Totals
Perdiz		1			1					3	6	6		3	3	1	2			26
Sabinal	1									2	1	4	1	1		1		1		12
Caracara													1							1
Catan													1							
Ensor	4	2		1	2	2	2			2	4	6	2	8	10	1	1	2	1	50
Figueroa														2						2
Frio		1			3		3	1			2	5	5	6	3		1	1		31
Palmillas				1								2			1					4
Castroville					1					5			3							9
Marcos														3						3
Montell				1	4	1				9	2	2	5		1		1			26
Abasolo					2															2
Almagre													1	3				1		5
Arenosa															2					2
Langtry	3	3	6		13	5	5	1	3	20	6	1	20	9	10	5	1		7	118
Pedernales					1					1			1							3
Tortugas					1												1			2
Shumla				1	4		2	1	1	3			5	3	2					22
Val Verde					8			1		4			7	1	5				1	27
Uvalde					2															2
Andice					1															1
Pandale					14		10	3	3	2			30	4	18	2		1	7	94
Nolan													3		2					5
Lerma					1									1						2
Preform	3	3	3	3	15	2	6	3	1	2	9	2	25	12	10	3	1	2	5	110
Drill					1								1					1		3
Quarry Blank			4		14	3	5	3		4	2			3	12	1		1	2	54
Scraper	2			1	3				2		1		5	1	3					18
Untyped point	2	2		5	7	1	4	2	1	8	4	4	7	7	4				3	61
Untyped stem	2	1	1	3	5	2	5			4		3	14	1	5		1	1	5	53

Appendix III
Provenience Data for Projectile Points and Other Lithic

N2W2		
Level in cm	**Point Type**	**Quantity**
0-10 cm	none	0
10-20 cm	Ensor	2
	Langtry	1
	untyped point	1
	untyped stem	1
20-30 cm	Ensor	2
	Langtry	1
	Sabinal	1
	Scrapers	2
	Preforms	1
	untyped point	1
	untyped stem	1
N2W4		
Level in cm	**Point Type**	**Quantity**
0-10 cm	Frio	1
	Langtry	1
	Preforms	2
	untyped point	1
10-30 cm	Langtry	2
	Ensor	2
	Perdiz	1
	untyped point	1
	untyped stem	1
	Preform	1

N4W4		
Level in cm	**Point Type**	**Quantity**
0-30 cm	Langtry	6
	Preform	3
	untyped stem	1
	Quarry Blanks	4
	butted biface	1
N6W6		
Level in cm	**Point Type**	**Quantity**
0-20 cm	Frio	1
	Shumla	1
	Montell	1
	Scraper	1
	Preform	1
	untyped point	3
	untyped stem	3
20-30 cm	Ensor	1
	Preform	2
	untyped point	3
30-50 cm	none	0
N8E0 Test Pit		
Level in cm	**Point Type**	**Quantity**
0-10 cm	Perdiz	1
	Preform	1
	untyped stem	1
10-20 cm	untyped stem	1
20-30 cm	Montell	2
	Pedernales	1
	untyped stem	1
	Preform	1
30-40 cm	Montell	1

	Bulverde	1
	Langtry	2
	Preform	1
	Quarry Blank	4
40-50 cm	Langtry	4
	Montell	1
	Val Verde	1
	Pandale	1
	Drill	1
	Preforms	2
	Quarry Blank	2
	untyped stem	1
	large biface tip	1
50-60 cm	Ensor	1
	Pandale	6
	Langtry	4
	Val Verde	3
	Preforms	2
	untyped point	2
60-70 cm	Pandale	2
	Val Verde	1
	Langtry	1
	Shumla	2
	Lerma	1
	Preforms	2
	untyped point	1
70-80 cm	Pandale	2
	untyped point	2
80-90 cm	Pandale	1
	Scraper	2
	Quarry Blanks	2
90-100 cm	Ensor	1
	Langtry	1
	Pandale	2
	Tortugas	1
	Preforms	2
	Quarry Blanks	1
100-110 cm	untyped points	1

	Quarry Blanks	1
110-120 cm	Langtry	1
	untyped points	1
110-130 cm	Pandale	1
	Preforms	1
130-150 cm	Ensor/Frio	1
	Pandale	1
	Quarry Blanks	1
	Preforms	4
150 NW Q	Pandale	1
	Andice	1
	Quarry Blanks	1
150-200 cm	Frio	1
	Langtry	1
	Val Verde	1
	Uvalde	1
	Scraper	1
184 cm	Uvalde	1
190-200 cm	Abasolo	1
	Tortugas	1
200-259 cm	Frio	1
	untyped stem	1
N8W4		
Level in cm	**Point Type**	**Quantity**
0-24 cm	Ensor	2
	Montell	1
	Langtry	5
	untyped point	1
	untyped stem	2
	Quarry Blank	3
	Preforms	2
N8W6		
Level in cm	**Point Type**	**Quantity**
0-15 cm	Pandale	3

	Langtry	2
	Ensor	1
	Frio	2
	Shumla	1
	untyped points	2
	untyped stems	2
	Preforms	5
	Quarry Blanks	3
15-30 cm	Ensor	1
	Langtry	1
	Pandale	3
	Shumla	1
	Preforms	1
30-50 cm	Frio	1
	Langtry	2
	Pandale	4
	untyped points	2
	untyped stems	3
	Quarry Blanks	2
N8W8		
Level in cm	**Point Type**	**Quantity**
0-25 cm	Frio	1
	Langtry	1
	Shumla	1
	Val Verde	1
	Pandale	2
	Preforms	3
	Quarry Blanks	3
	untyped points	2
N10W6		
Level in cm	**Point Type**	**Quantity**
0-72 cm	Langtry	3
	Shumla	1
	Pandale	3

	Scraper	2
	untyped point	1
	Preform	1
	Quarry Blanks	2
N12E0		
Level in cm	**Point Type**	**Quantity**
0-10 cm	Perdiz	2
	Ensor	2
	Sabinal	1
	Montell	2
	Langtry	1
	Val Verde	1
	Pandale	1
	Quarry Blanks	2
10-20 cm	Perdiz	1
	Sabinal	1
	Castroville	1
	Langtry	1
	untyped point	1
20-40 cm	Montell	4
	Shumla	3
	Castroville	2
	Pedernales	1
	Val Verde	1
	Langtry	2
	untyped point	3
	Quarry Blanks	1
40-60 cm	Langtry	10
	Montell	2
	Castroville	1
	Val Verde	1
	Pandale	1
	untyped point	2
	untyped stem	2
	Preforms	1
50 cm	Quarry Blanks	1

55-60 cm	Langtry	3
	Castroville	1
	Val Verde	1
	Langtry	3
	Preforms	1
	untyped point	1
60-70 cm	Langtry	4
	Langtry preform	1
	untyped points	1
	untyped stem	2
	large tip	1
70-80 cm	none	0
N12E2		
Level in cm	**Point Type**	**Quantity**
0-10 cm	none	0
10-20 cm	Langtry	1
	Perdiz	1
	Ensor	2
	Preform	1
20-30 cm	Perdiz	3
	Ensor	2
	Frio	1
	Langtry	2
	untyped point	1
	Preforms	2
30-40 cm	Perdiz	2
	Sabinal	1
	Frio	1
	Scraper	1
	untyped point	1
	Preform	1
40-50 cm	Langtry	2
	Montell stems	2
	Pandale	1
	Preforms	4
	Quarry Blanks	2

N12E4		
Level in cm	**Point Type**	**Quantity**
0-28 cm	Sabinal	2
	Perdiz	1
	Preforms	1
	Quarry Blanks	1
	untyped point	1
0-10 cm	Ensor	2
	untyped point	1
	untyped stem	2
10-20 cm	Perdiz	1
	Sabinal	1
	Ensor	2
	untyped point	2
20-30 cm	Perdiz	1
	Frio	3
	Palmillas	2
	untyped stem	1
30-40 cm	Perdiz	2
	Quarry Blank large	1
40-50 cm	Perdiz	1
	Sabinal	1
	Ensor	2
	Frio	2
	Montell	2
	Langtry	1
	Preforms	1

N12W2		
Level in cm	**Point Type**	**Quantity**
0-20 cm	Shumla	2
	Sabinal	1
	Frio	2
	Catan	1

	Pedernales	1
	Val Verde	1
	Langtry	1
	Caracara	1
	untyped point	1
	Preform	1
	Scraper	2
20-40 cm	Montell	2
	Drill	1
	Pandale	2
	Langtry	2
	Frio	3
	Ensor	1
	Preform	2
	untyped stem	1
40-50 cm	Langtry	2
	Val Verde	1
	Pandale	2
	Montell	1
	untyped stem	2
50-60 cm	Shumla	2
	Val Verde	3
	Pandale	2
	Scraper	2
	Preform	2
	untyped point	2
60-70 cm	Castroville	2
	Montell	1
	Langtry	4
	Val Verde	1
	Pandale	6
	Preform	4
	untyped point	1
	Pandale stems	6
70-80 cm	Castroville	1
	Shumla	1
	Langtry	1
	Pandale	4

	Preform	4
	untyped stems	3
80-90 cm	Langtry	1
	Pandale	5
	Preform	2
	untyped stems	1
90-100 cm	Langtry	4
	Montell	1
	Pandale	7
	Nolan	2
	Scraper	3
	Preform	4
	large proximal base	1
	untyped points	2
100-110 cm	Langtry	2
	Pandale	4
	Preform	2
	untyped stem	1
110-120 cm	Ensor	1
	Almagre	1
	Nolan	1
	Pandale	6
	Preform	2
	Scraper	1
	untyped points	2

N14E0

Level in cm	**Point Type**	**Quantity**
0-10 cm	Ensor	3
	Pandale	1
	Quarry Blank	1
	Preform	2
	untyped point	1
10-20 cm	Perdiz	1
	Sabinal	1
	Ensor	2

	Langtry	1
20-40 cm	Perdiz	1
	Val Verde	1
	Frio	6
	Marcos	1
	Preform	3
	untyped point	2
	Scraper	1
	Quarry Blank	2
40-50 cm	Shumla	1
	Langtry	1
	Preform	1
50-60 cm	Ensor	1
	Preform	1
	untyped point	1
60-80 cm	Ensor	1
	Langtry	3
	Almagre	1
	Figueroa	2
	Shumla	2
	Lerma	1
	Marcos	1
	Pandale	1
	Preform	2
	untyped point	2
80-90 cm	Perdiz	1
	Ensor	1
	Almagre	2
	Langtry	2
	Marcos	1
	Preform	1
	untyped point	1
90-100 cm	Langtry	2
	Pandale	2
	Preform	2

N14E2		
Level in cm	**Point Type**	**Quantity**
0-10 cm	Perdiz	1
	Quarry Blank	1
10-20 cm	Sabinal	1
20-30 cm	Ensor	1
30-40 cm	large distal tip	1
40-70 cm	Langtry	3
	Langtry stems	2
	Pandale	1
	Pandale stems	2
	Knife	1
	Preform	3
N14E4		
Level in cm	**Point Type**	**Quantity**
0-50 cm	Perdiz	2
	Ensor	1
	Frio	1
	Montell	1
	Langtry	1
	Tortugas	1
	Preform	1
	untyped stem	1
N14W2		
Level in cm	**Point Type**	**Quantity**
Surface	Langtry	1
	Arenosa	1
	Quarry Blank	1
0-10 cm	Perdiz	2
	Ensor	2
	Frio	1
	Arenosa	1

	Langtry	1
	Scraper	1
	untyped stem	1
	Preform	1
	Quarry Blank	1
10-20 cm	Ensor	2
	Langtry	1
	Preform	1
20-30 cm	Perdiz	1
	Ensor	1
	Scraper	1
	Preform	2
	Quarry Blank	4
30-40 cm	broken tip	1
40-50 cm	Frio	3
	Ensor	1
	Shumla	1
	Val Verde	1
	Pandale	1
	Preform	1
50-60 cm	Ensor	2
	Ensor/Frio	1
	Val Verde	1
	Preform	1
	Quarry Blank	2
	untyped point	1
60-70 cm	Palmillas	1
	Shumla	1
	Langtry	4
	Pandale	3
	Scraper	1
	untyped stem	2
	Preform	1
	Quarry Blank	3
70-80 cm	Val Verde	1
	Langtry	2
	Pandale	1
	Nolan stem	2

	Preform	2
	Quarry Blank	1
	untyped point	2
	untyped stems	2
	Pandale stems	2
80-90 cm	Ensor stem	1
	Langtry	2
	Val Verde	2
	Pandale	2
90-110 cm	Montell stem	1
	Pandale	3
	Pandale stems	1
	Preform	1
110-120 cm	Pandale	4
	Pandale stem	1
	untyped point	1
N16E0		
Level in cm	**Point Type**	**Quantity**
0-20 cm	Ensor/Frio	1
20-40 cm	Ensor	2
40-60 cm	Sabinal	1
	Pandale	1
	Preform	1
60-80 cm	Quarry Blank	1
	Drill	1
	untyped stem	1
	Preform	1
N16W2		
Level in cm	**Point Type**	**Quantity**
0-30 cm	Langtry preform	1
	Preform	2
	untyped points	1
30-50 cm	Langtry	1
	Quarry Blank	1

50-60 cm	Ensor stem	1
	Almagre	1
	Langtry	1
	Quarry Blank	1
60-70 cm	Pandale	1
	untyped points	1
70-80 cm	Langtry	3
	Drill	1
	untyped stem	2
80-90 cm	Val Verde	1
	untyped point	1
90-100 cm	Langtry	1
100-110 cm	Langtry	1
	Pandale	1
	untyped stem	3
110-120 cm	Pandale	2
120-130 cm	Pandale	3
	large tip	1
	Preform	3

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Book or monograph:

Waters, M.
1992 *Principles of Geoarchaeology.* The University of Arizona Press, Tucson.

Chapter or paper in book or monograph:

Collins, M .B.
1975 Lithic Technology as a Means of Processual Inference. In, *Lithic Technology: Making and Using Stone Tools*, ed. by E. Swanson, pp. 15-34. Mouton, The Hague.

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