

ARCHAEOLOGICAL TESTING IN THE
DEVINE ROAD AREA
NORTH OF OLMOS DAM,
SAN ANTONIO, TEXAS

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I would like to express my gratitude to Mr. Dorian French, Chief Engineer, and the backhoe crew from the San Antonio River Authority. Without their assistance our work would have been very difficult.

Many people from the Center for Archaeological Research have been very helpful. Dr. Thomas R. Hester, Director, and Mr. Jack D. Eaton, Assistant Director, have provided guidance, suggestions and editing for this report. Thanks to Augustine Frkuska for preparing some of the report materials.

INTRODUCTION

During late January and early February 1978, archaeological testing was carried out in an area north of Olmos Dam, San Antonio, Texas (see Fig. 1) by personnel from the Center for Archaeological Research (CAR), The University of Texas at San Antonio. This work was performed under contract between CAR and the San Antonio River Authority.

The area tested consisted of 16 acres bounded by Olmos Dam to the south, Devine Road to the west and Olmos Creek to the north and east. The objective of the testing was to determine whether any historic or prehistoric resources were present and, if so, to evaluate their significance prior to the use of the location as a borrow pit during the planned renovation of Olmos Dam.

During the construction of Olmos Dam in the 1920s, a prehistoric site, 41 BX 1, was uncovered and mostly destroyed. Current testing in this area was designed to determine if any part of the site was left intact and to make recommendations for mitigation or protection.

The archaeological testing was performed under the supervision of Dr. Thomas R. Hester, Director and Mr. Jack D. Eaton, Assistant Director, of CAR. The field work was directed by Cristi Assad with the assistance of Augustine Frkuska, Rebekah Halpern and Robert F. Scott. All notes, maps and materials collected are on file at the Center for Archaeological Research.

Previous Research

Site 41 BX 1 was discovered during construction of Olmos Dam in the 1920s. At that time interested persons collected a variety of artifacts, including Paleo-Indian projectile points, Southwestern and local types of pottery, and faunal remains (some of extinct species).

Various authors have discussed site 41 BX 1. Woolford (1935), in a brief description of the site, made note of the "many examples of fine workmanship" of chert artifacts. Paleo-Indian projectile points and faunal remains from the vicinity of 41 BX 1 are reported by Orchard and Campbell (1954); in another publication by the same authors (1960), sherds of Southwestern pottery from the area are described. Other works providing information on Olmos Basin and Bexar County archaeology include those of Fawcett (1972), Fox (1975), Brown (1977) and Assad (1978).

Prior to the current project, the only controlled archaeological work performed at site 41 BX 1 was that testing carried out by Luke (1974). This initial testing, conducted by the Texas Highway Department, was restricted to the right-of-way of U.S. 281 (the McAllister Freeway). Extensive damage to the site was reported. The areas tested produced lithic waste materials from the initial reduction stages. The right-of-way area tested by the Texas Highway Department is high above the flood plain of Olmos Creek, and the depth of their test units indicated that the limestone walls of the valley were not very far below the ground surface. The current project deals with an area of the site which is much closer to the stream channel.

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Environment and Geology

San Antonio has a relatively mild climate. There is precipitation throughout the year, heaviest in the spring and the fall (Taylor, Hailey and Richmond 1966). Thunderstorms can occur during any month and may cause localized flooding.

Olmos Creek has a drainage of approximately 30 square miles (Metcalf and Eddy 1920). The geologic deposits in the lower channel are alluvial sediments of Trinity and Frio soils (Taylor, Hailey and Richmond 1966). These sediments are usually composed of organic material, clay, silt, sand and gravels. Detailed information about the soils encountered at site 41 BX 1 and vicinity is given in the Test Trenches section of this report.

In the area of the proposed borrow pit, the terrain has been extensively damaged and altered. There have been several floods in San Antonio's recorded history which have ravaged the Olmos Basin, leaving behind reworked soils, organic materials, and building and other modern debris. The surface of the proposed borrow area is littered with bottles, metal cans and other such materials. Vegetation found in these stream valleys consists of elm, hackberry, pecan, oak and mesquite along with several types of tall grasses. Tall weeds and grasses extend from near the dam to the north and west for approximately 10 acres. Thereafter, pecan and other trees are gradually spaced, but within a short distance the trees are very young and closely spaced. The vegetation (during the winter months) is extremely dense throughout the area.

History of the Area

Several streams and springs are located in and around San Antonio. The largest of these streams is the San Antonio River. Runoff from the Edwards Plateau feeds the springs and streams, which fluctuate with the rainfall. Olmos Creek flows southeasterly to join the San Antonio River at Incarnate Word College.

Several floods have scourged San Antonio since 1819 (Metcalf and Eddy 1920). It was after a disastrous flood in September 1921 that the City of San Antonio decided to adopt the flood control plan that had been proposed by the consulting engineering firm of Metcalf and Eddy (status report by San Antonio River Authority 1970).

An unknown portion of site 41 BX 1 was destroyed by the construction of Olmos Dam. Digging for the dam foundations extended to 40 feet in depth (see Fig.2), exposing the Paleo-Indian artifacts found by the several collectors (Orchard, personal communication). Some artifacts collected from the site by a local amateur archaeologist are discussed and illustrated in the Appendix.

TEST TRENCHES

Approximately 16 acres are to be used for the proposed borrow pit (see Fig. 3 for the boundaries), with four feet to be the approximate depth of the borrowing activities (Dorian French, personal communication). With the above information in mind, testing of the proposed borrow pit area was carried out. The San

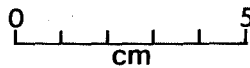
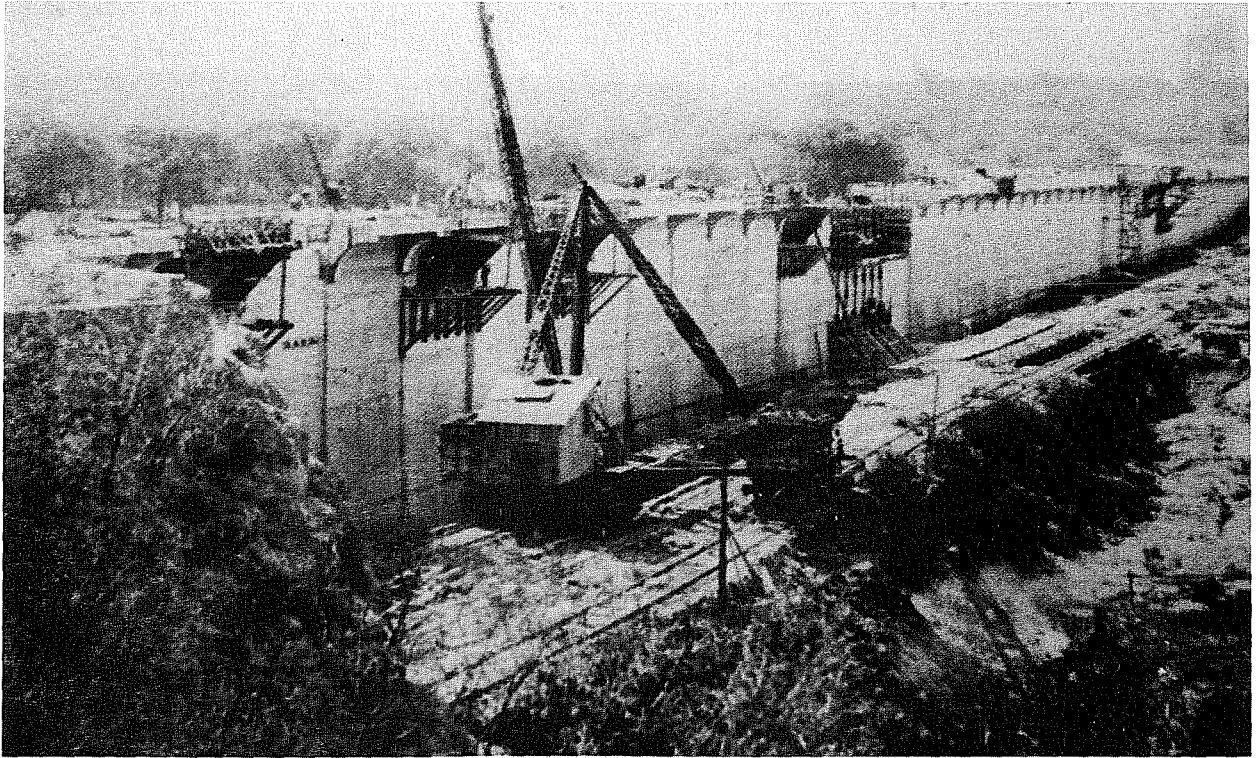


Figure 2. *Olmos Dam Under Construction.* This photograph is from *100th Anniversary Pioneer Flour Mills, San Antonio, Texas 1851-1951.*

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Antonio River Authority provided the Center for Archaeological Research employees with a backhoe and operator for the digging of trenches.

A total of 13 test trenches were dug; their locations are shown in Fig. 3. The placement of the trenches was biased, with the intent of getting as even a distribution as possible. Trenches 1, 2 and 3 were placed outside of the borrow pit area for the purpose of ascertaining the slope of the limestone valley walls. Limestone was located less than one meter deep in Trench 1. Trench 2 was located less than 10 m away, but no limestone was encountered in the deepest part of it, a depth of 2.8 m. The depths and lengths of the trenches varied, but they were all excavated from 1.8 to 2.4 m. All of the 13 test trenches were profiled, and eight of these are described in this section. The profiles are of Trenches 2, 3, 4, 5, 6, 9, 10 and 11. Trench 5 was cut into part of site 41 BX 1 prior to knowledge of its location. In an attempt to isolate the remains of the buried site, Trenches 3, 6, 9 and 10 were dug. Each of these trenches was tested from below the disturbed zone by cutting out "levels" of 15 cm in a 50 cm wide by 10 cm deep cut along the trench wall that was profiled. Nothing of archaeological significance was uncovered in the testing. The few artifacts recovered are listed in Table 1.

The soil descriptions for the profiles were taken from the Rock-Color Chart distributed by the Geologic Society of America, Inc., 1975. The numerical terminology is that used in the Munsell System; the color names are from the Inter-Society Color Council--National Bureau of Standards (ISCC-NBS). In describing the attributes of the profiles, the detail was limited to a basic discussion of characteristics such as color, consolidation, texture and miscellaneous content (snail shells, rocks, etc.).

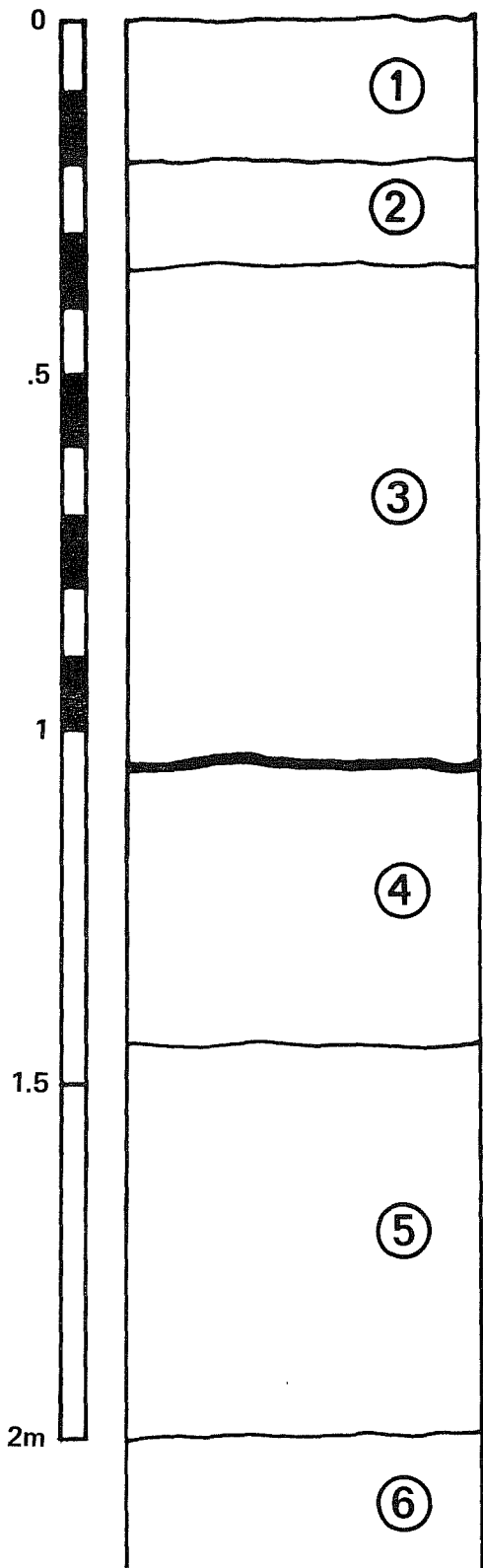
The "disturbed zone," the area where obvious soil mixing and non-native soils are located, is indicated by a heavy line in the profiles. The only two illustrated trenches that had no actual disturbed zone were Trenches 9 and 11. The only visible disturbance of these two trenches was at the ground surface.

Much of the disturbed zone soils is probably a result of the construction activities when Olmos Dam was built and then covered by sediment build-up from later flooding. While the dam was being built, railroad tracks were installed on the north side of the structure to facilitate construction. The material in the disturbed zone of Trenches 2 and 3 (and possibly a few other trenches) most likely was fill which was dumped in the area to alleviate the swampy conditions present at the time (C. D. Orchard, personal communication).

The soils in the undisturbed zones of all the trenches are basically the same. The material is an alluvial deposit which may have been reworked from time to time. Once new sediments are deposited, there is little time for soil development; hence, soil horizons are indistinct (Taylor, Hailey and Richmond 1966).

A description of each trench which was profiled is presented along with the following profile drawings (Figs. 4-11).

TRENCH 2



- 1** ground level–20 cm: Dusky yellowish brown (10YR2/2)
- 2** 20-35 cm: Dark yellowish orange (10YR6/6) mixed with yellowish orange brown (10YR6/4)
- 3** 35-105 cm: Grayish orange (10YR7/4) mixed with pale yellowish orange (10YR8/6)

The soils from ground level to 105 cm are all part of the disturbed zone. The consolidation ranges from loose at the top to medium towards the bottom; soil texture is clayey and sticky when wet. Limestone pebbles are scattered throughout the 35-105 cm level.

- 4** 105-145 cm: Moderate dusky brown (5YR2/4)
- 5** 145-200 cm: Moderate light brown (5YR4/6)
- 6** 200-280* cm: Yellowish orange brown (10YR6/4) blended with moderate yellowish brown (10YR5/4)

The soils from 105 cm below ground level constitute the undisturbed zone. The soil color changes in all of the undisturbed zones grade into each other. Divisions were made where the change was most visible. The consolidation is soft to moderately hard; soil texture is silty clay and sticky when wet. Some land snail shells are found above 200 cm, while limestone pebbles are to be found below 200 cm. The soil is homogeneous in composition.

*The illustrated profile stops at 220 cm.

Figure 4. Profile of Trench 2.

TRENCH 3



1 ground level—15 cm: Pale grayish brown (5YR4/2)

2 15-25 cm: Moderate yellowish brown (10YR5/4)
mixed with yellowish orange brown
(10YR5/6)

3 25-125 cm: Yellowish orange (10YR7/6)

The soils from ground level to 125 cm are all part of the disturbed zone. The consolidation is generally soft and loose. The soils range from a clayey loam at ground level to a calcareous clay. The materials in the 15-25 cm layer are very mixed.

4 125-170 cm: Dusky brown (5YR2/2)

5 170-210 cm: Yellowish brown (10YR3/2)

6 210-265* cm: Dark yellowish brown (10YR4/2)

The soils from 125 cm below ground level constitute the undisturbed zone. The soil color change is gradual. Consolidation ranges from moderately soft to moderately hard. The soil is homogeneous in composition; the texture is clay. A few land snail shells and limestone pebbles are found throughout the zone.

A test column from 125 cm below ground surface to 215 cm below ground surface (90 cm) revealed no evidence of *in situ* archaeological remains.

*The illustrated profile stops at 220 cm.

Figure 5. Profile of Trench 3.

TRENCH 4

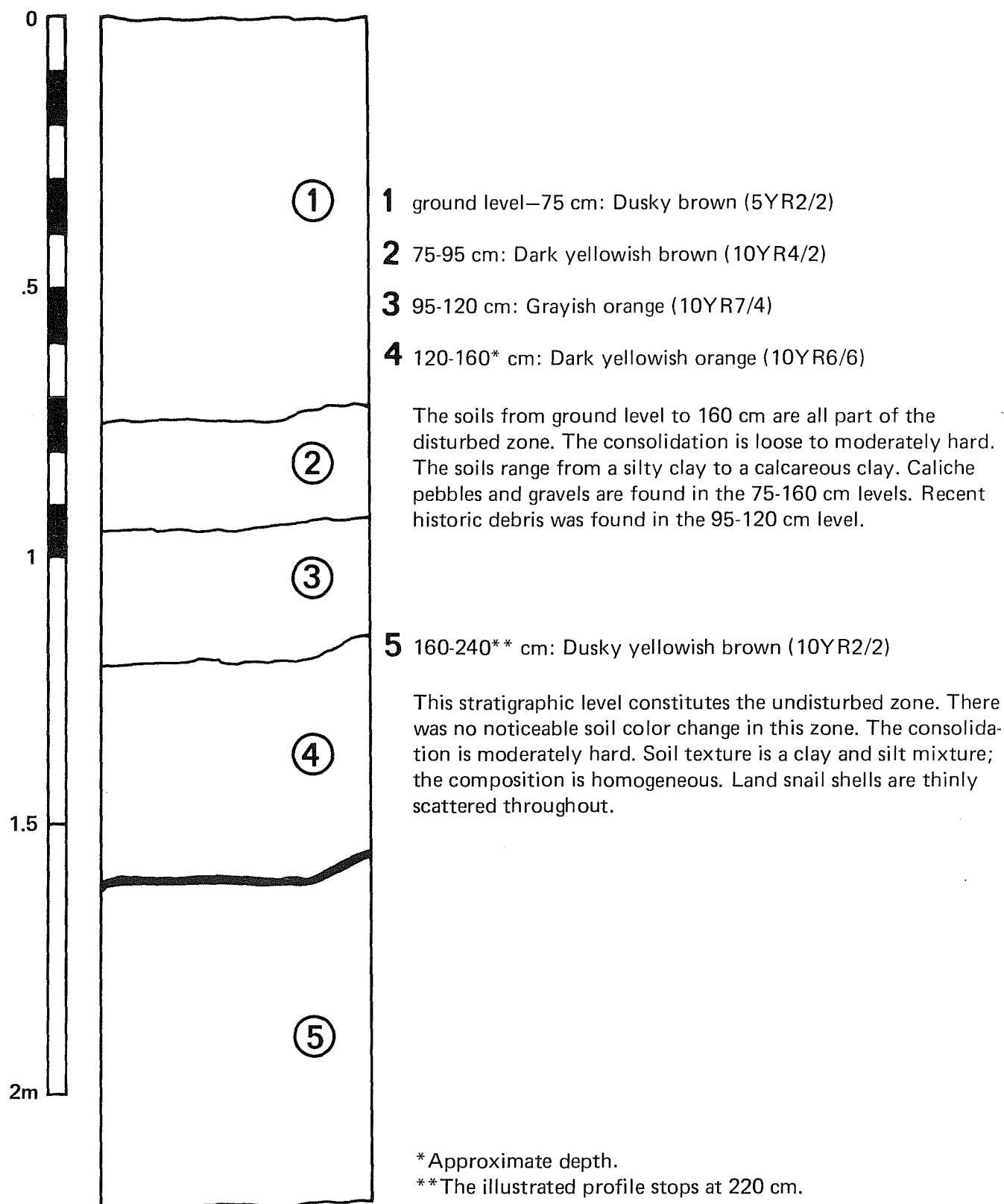


Figure 6. Profile of Trench 4.

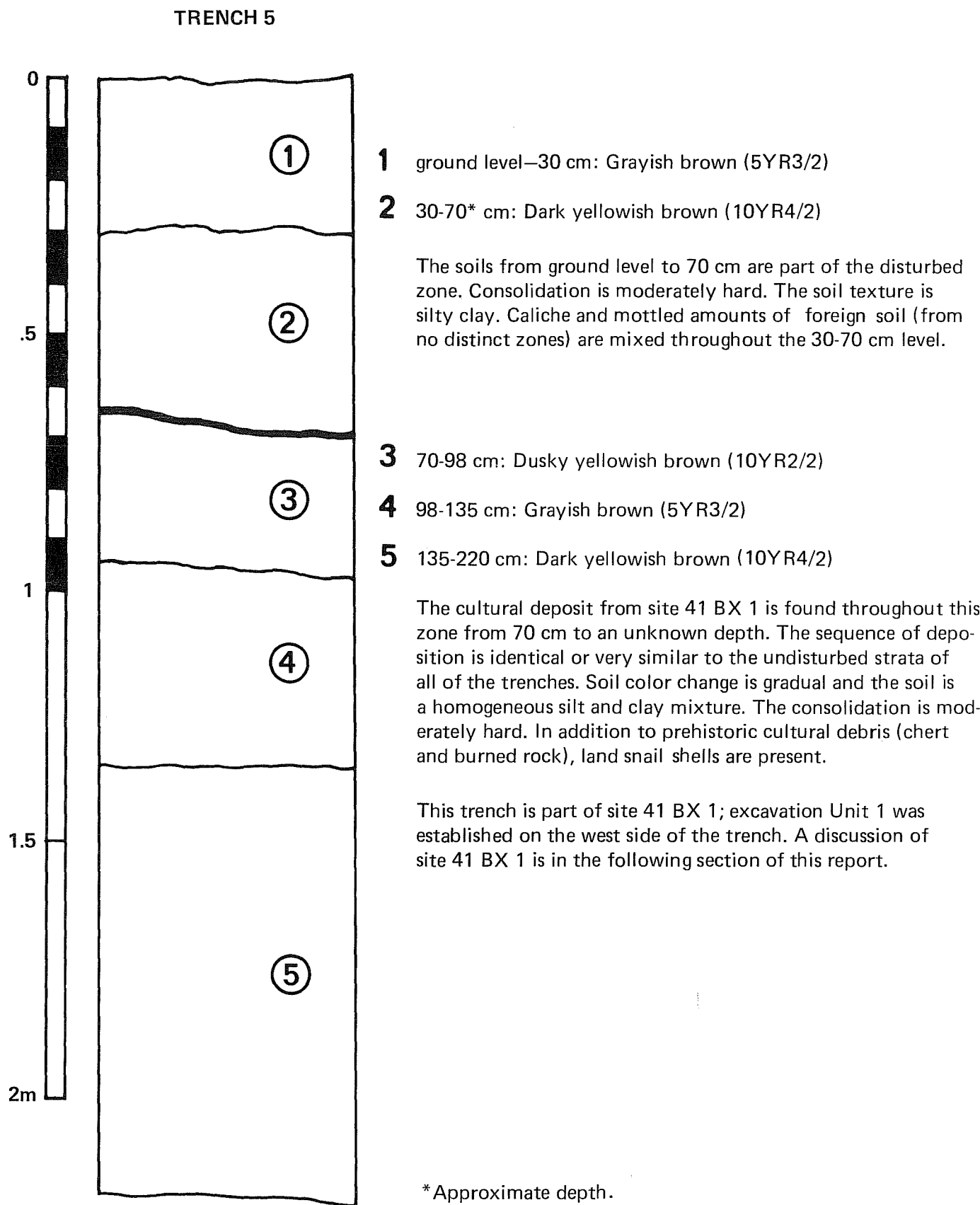
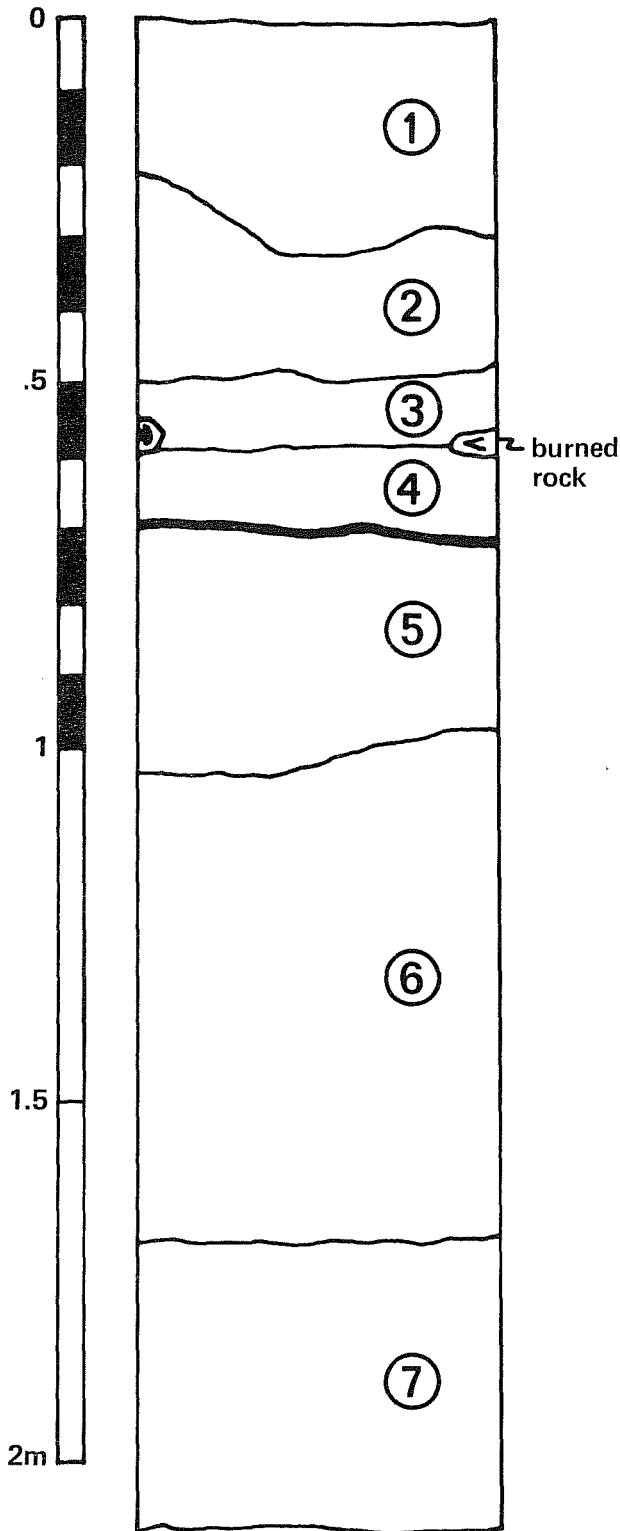


Figure 7. Profile of Trench 5, 41 BX 1.

TRENCH 6



- 1** ground level—28* cm: Grayish brown (5YR3/2)
- 2** 28-50 cm: Moderate yellowish brown (10YR5/4)
- 3** 50-60 cm: Grayish orange (10YR7/4)
- 4** 60-70 cm: Dark yellowish brown (10YR4/2)

The soils from ground level to 70 cm are of the disturbed zone. Consolidation ranges from moderately hard to loose. The 28-50 cm level has material from the top level and the 50-60 cm level mixed in it. The soils range from clay to a clay and silt mixture.

- 5** 70-103* cm: Dusky yellowish brown (10YR2/2)
- 6** 103-170 cm: Grayish brown (5YR3/2)
- 7** 170-210 cm: Moderate yellowish brown (10YR5/4)

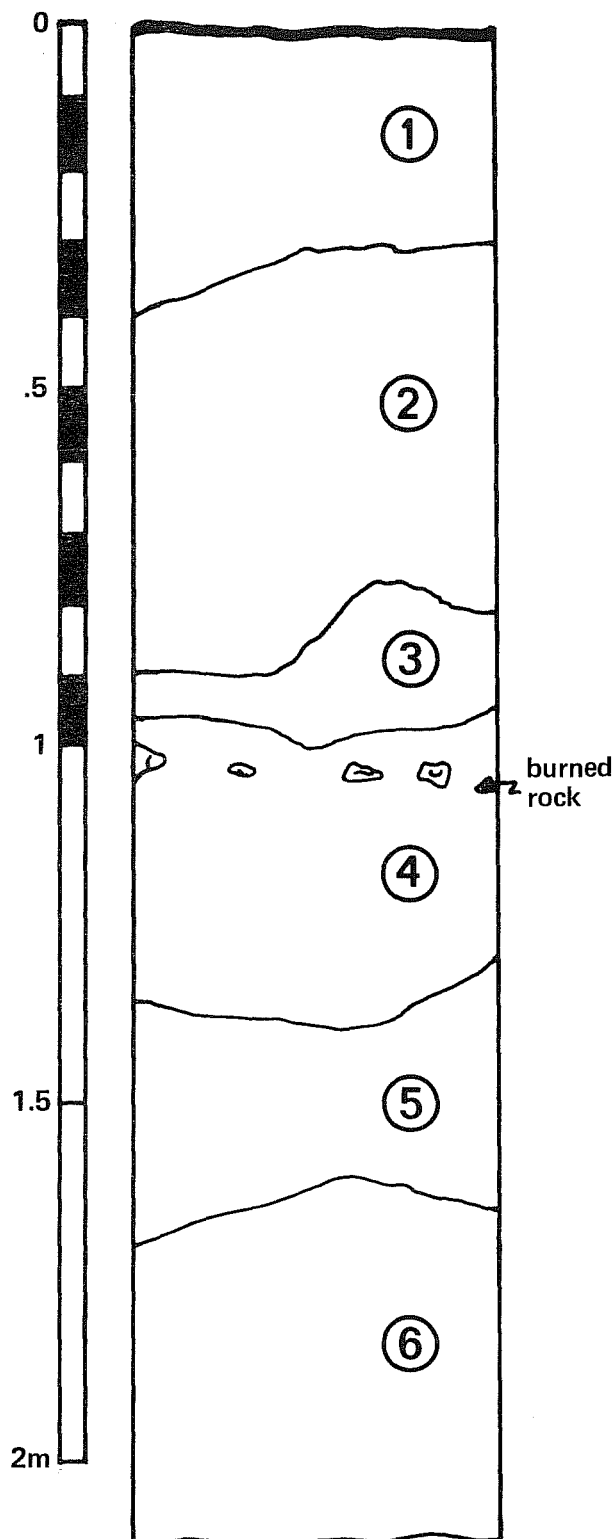
The undisturbed zone starts at 70 cm below the present ground surface. The color change is gradual and the soil is homogeneous in nature. Consolidation is moderately hard; soil texture is a silt and clay mixture.

A test column was excavated from 60 cm below the present ground surface to 140 cm below ground surface. No *in situ* archaeological remains were recovered.

*Approximate depth.

Figure 8. Profile of Trench 6.

TRENCH 9



- 1** ground level—32* cm: Dusky brown (5YR2/2)
- 2** 32-84* cm: Dusky yellowish brown (10YR2/2)
- 3** 84-96* cm: Grayish brown (5YR3/2)
- 4** 96-135* cm: Moderate yellowish brown (10YR5/4)
- 5** 135-163* cm: Moderate brown (5YR4/4)
- 6** 163-210 cm: Moderate yellowish brown (10YR5/4)

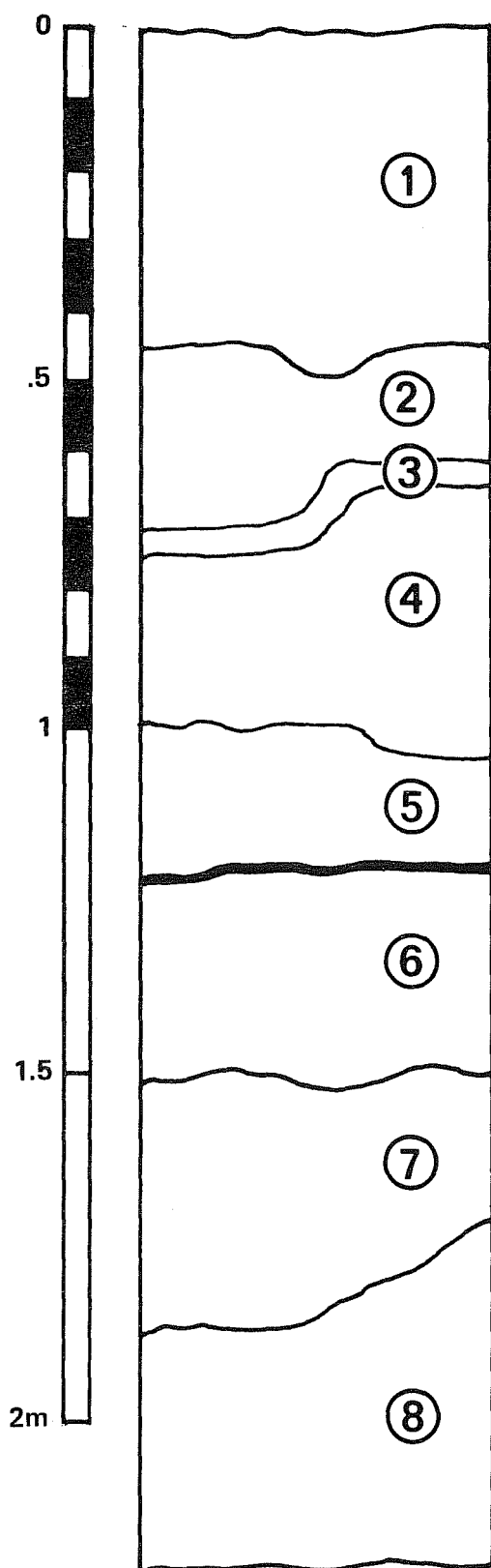
No obvious disturbed zone was present in this trench. The soil color change is very gradual from top to bottom. Consolidation is loose in the top 35 cm and gradually becomes a moderately hard consolidation at the bottom of the trench. The soil is homogeneous throughout. Texture is a silt and clay mixture. Bits of land snail shell and caliche pebbles are found throughout.

A column from the surface to 105 cm deep was tested. The results were negative as to the presence of cultural remains other than as a secondary deposit. There is a line of burned rock across the trench wall at roughly 100 cm; however, this area proved to be sterile of culturally associated materials.

* Approximate depth.

Figure 9. Profile of Trench 9.

TRENCH 10



1 ground level—46 cm: Grayish brown (5YR3/2)

2 46-68* cm: Moderate yellowish brown (10YR5/4)

3 68-74* cm: Dark yellowish brown (10YR4/2)

4 74-100 cm: Dark yellowish orange (10YR6/6)

5 100-120 cm: Moderate brown (5YR3/4)

The soils from ground level to 120 cm are of the disturbed zone. Consolidation from 74-100 cm is loose, but is moderately hard in the rest of the zone. All of the layers are clayey in texture with caliche pebbles and chunks mixed throughout.

6 120-150* cm: Dusky yellowish brown (10YR2/2)

7 150-180* cm: Dusky brown (5YR2/2)

8 180-266** cm: Grayish brown (5YR3/2)

The undisturbed zone starts at 120 cm below the ground surface. The soil is homogeneous in nature and the color change is gradual. Soil texture is a silt and clay mixture. Consolidation is moderately hard. There are a few bits of land snail shell and caliche pebbles throughout.

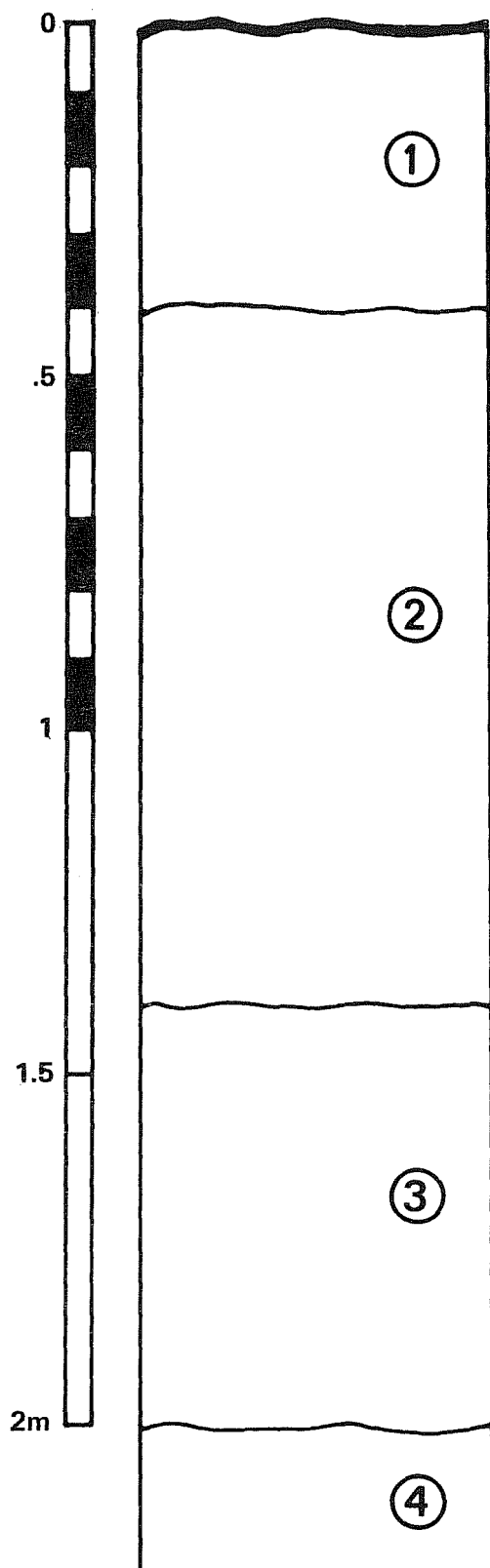
A test column in this trench started at 95 cm below ground surface and extended to 185 cm below ground surface. The results were negative for any *in situ* archaeological remains.

*Approximate depth.

**The illustrated profile stops at 220 cm.

Figure 10. Profile of Trench 10.

TRENCH 11



1 ground level—40 cm: Dusky yellowish brown (10YR2/2)

2 40-140 cm: Yellowish brown (10YR3/2)

3 140-200 cm: Dark yellowish brown (10YR4/2)

4 200-280* cm: Dark yellowish brown (10YR4/2)
mixed with moderate yellowish
brown (10YR5/4)

No soil disturbance is visible in this trench. Consolidation is moderately hard. Soil texture is a silt and clay mixture; soil color change is gradual. The soil is homogeneous to 200 cm, where it changes to a mixed nature with limestone pebbles throughout.

*The illustrated profile stops at 220 cm.

Figure 11. Profile of Trench 11.

TABLE 1. ARTIFACTS RECOVERED IN TESTS OF TRENCHES 3, 6, 9 AND 10

	Flakes	Burned Rock	Animal Bone Fragms.	Land Snail Shells	Historic Items	Total
Trench 3 (50 x 10 x 15 cm)* (90 cm total)	8	2	1	1		12
Trench 6 (50 x 10 x 15 cm) (90 cm total)				6		6
Trench 9 (50 x 10 x 15 cm) (105 cm total)	9	7		16	5	37
Trench 10 (50 x 10 x 15 cm) (90 cm total)	5	2	5	3		15
Total	22	11	6	26	5	70

*(length, width, depth)

SITE 41 BX 1

As mentioned in the previous sections, the remains of prehistoric site 41 BX 1 were uncovered during trenching activities north of Olmos Dam. Trench 5 was cut into the buried site, and its location can be seen in Fig. 3.

Site Description

It is not possible to determine the original dimensions of site 41 BX 1 due to partial destruction and burial. Site 41 BX 1, as seen by C. D. Orchard and J. H. McLellan prior to construction of the dam, is described in Orchard and Campbell (1954). In an area west of the site, they reported a bone bed containing faunal remains from bison, mastodon, horse, deer, peccary, rodents, birds, turtle and fish. The relationship of these faunal materials to the site is unknown since the bone bed has been thoroughly destroyed.

Site Investigation

While Trench 5 was being cleaned for profiling, two bifaces were found in the trench wall. One of the bifaces was identified as a *Nolan* dart point; the other is unclassifiable. A large charcoal sample was also recovered from the trench wall and is discussed in the Radiocarbon Dating section later in this report.

The soil in Trench 5 was disturbed from the ground surface to approximately 70 cm in depth. Prior to excavation, an area on the west side of the trench was cleared to the undisturbed soil zone by backhoe. A 1 m² excavation unit was laid out next to the trench wall and excavated by shovel and trowel in 10 cm levels. All soil was screened through a 1/4-inch screen. The artifacts recovered from Unit 1 and from the backdirt of Trench 5 are listed in Table 2.

Unit 1 was excavated to determine whether any portion of site 41 BX 1 remained undisturbed. After excavating 40 cm into the undisturbed zone, it was evident that unaltered remains of site 41 BX 1 were still present in the area.

The most productive level from Unit 1 was the 20-30 cm level. The southern half of the level was carefully excavated; a *Castroville* dart point along with several flakes and animal bone fragments (possibly bison) were noted *in situ*; in the northern half of the level, which was excavated more quickly, only some animal bone and an associated *Montell* dart point were mapped in place (see Fig. 12). The trenches, excavation unit and site (Fig. 3) were surveyed and mapped utilizing a Brunton compass and a 30-meter tape, with the assistance of a San Antonio River Authority surveying crew. The measurements of the survey crew were converted into meters for archaeological use. The trenches were plotted as carefully as possible in areas of thick brush cover. In Fig. 3, the elevations are in feet to correspond with USGS (United States Geological Survey) topographic maps and maps provided by the San Antonio River Authority. All other measurements are given in meters to correspond with general archaeological techniques. Surface surveying for artifacts was carried out wherever there were open areas; however, little of archaeological importance was noted.

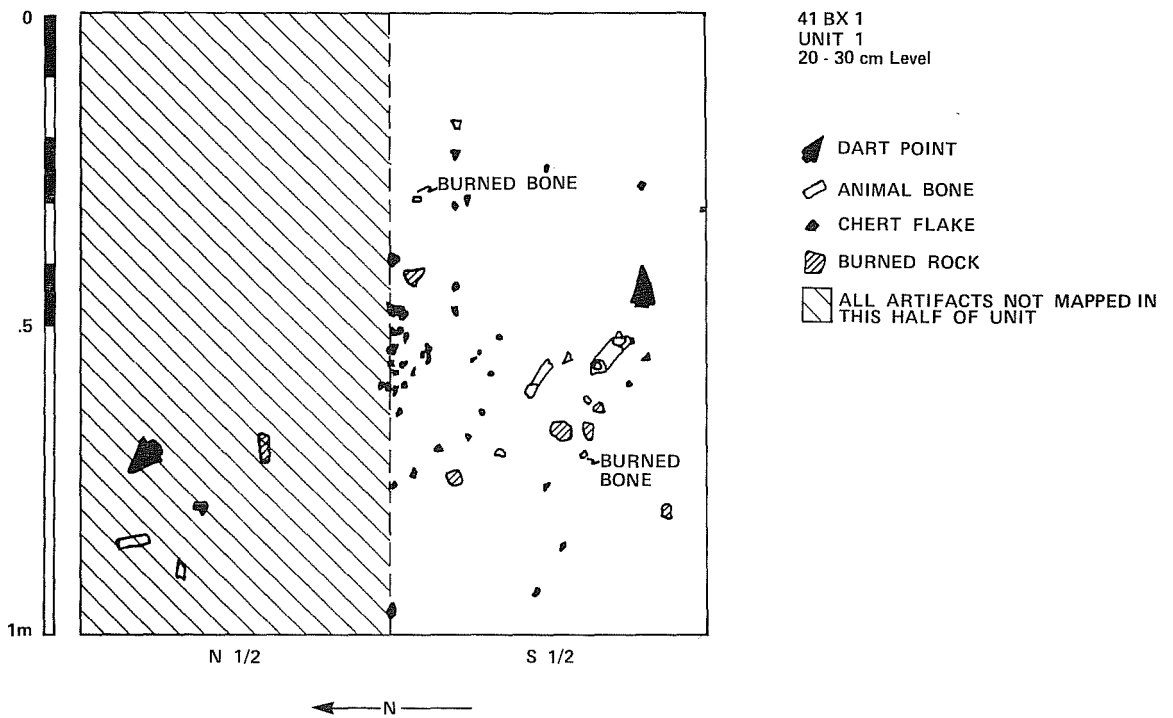
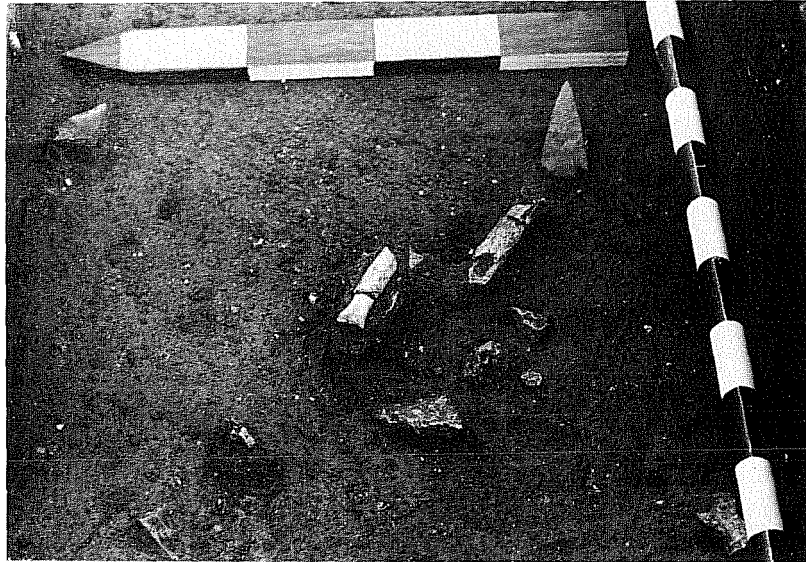


Figure 12. 41 BX 1, Unit 1, 20-30 cm Level. a, photograph showing the *Castroville* dart point, flakes and animal bone *in situ*; b, map of the 30 cm floor of Unit 1 showing the *Montell* and *Castroville* dart points and associated artifacts.

Lithic Artifacts

Very few lithic artifacts were recovered from the trenching operations and the surface survey. The majority of the lithic artifacts were from Unit 1 and are listed in Table 2.

The categories used for the description of chert artifacts include *projectile points*; *bifaces*; *trimmed flakes*; and *primary*, *secondary* and *interior flakes*. The descriptions of the lithic artifacts are basically the same as those found in the artifact description for site 41 BX 291 (Assad 1978), a site which is just south of Olmos Dam and probably closely related to site 41 BX 1.

The *projectile points* and *bifaces* categories include any whole or fragmented specimens exhibiting flake removal from both faces. The *projectile points* also show a refined degree of reduction and shaping (see Fig. 13,c-f).

The majority of the lithic debitage is separated into *primary*, *secondary* and *interior flakes*. The *primary flakes* are any specimens which have 90% or more dorsal cortex. The *secondary flakes* are specimens exhibiting less than 90% cortex. The *interior flakes* category includes specimens with no cortex present. No distinction of flakes based on platform or bulb of percussion was attempted.

The *trimmed flakes* category includes specimens which exhibit intentional edge shaping or retouch (see Fig. 13,a,b).

Other Artifacts

The artifacts recovered from the trenching activities, surface survey and the excavation unit are listed in Tables 1 and 2. The majority of the artifacts were of chert and have been described previously.

The remaining types of artifacts are *historic debris*; *animal bone*; and *mussel* and *land snail shells*. The *historic debris* category is composed of items such as glass, wire nails and metal scrap of Anglo-European origin. The *animal bone* category is composed of fragmented pieces of bone from both large and small animals; none of the bone is complete enough for positive identification. The *mussel shell* category includes fragmented, occasionally burned and unidentifiable freshwater mussel shell. The *land snail shell* category is composed of several genera of land snails. It includes *Rabdotus* sp., *Mesodon* sp., *Polygyra* sp., *Helisoma* sp., *Succinea* sp., *Practicollela* sp., and one specimen of *Rumina decollata*. All of these types are native to central Texas with the exception of *Rumina decollata*, which is a European import.

Radiocarbon Dating

A large charcoal sample was collected from the west wall of Trench 5, just north of Unit 1. The sample was 90 cm below the undisturbed soil zone; a *Nolan* point and an unclassified dart point were noted 20 cm above the charcoal.

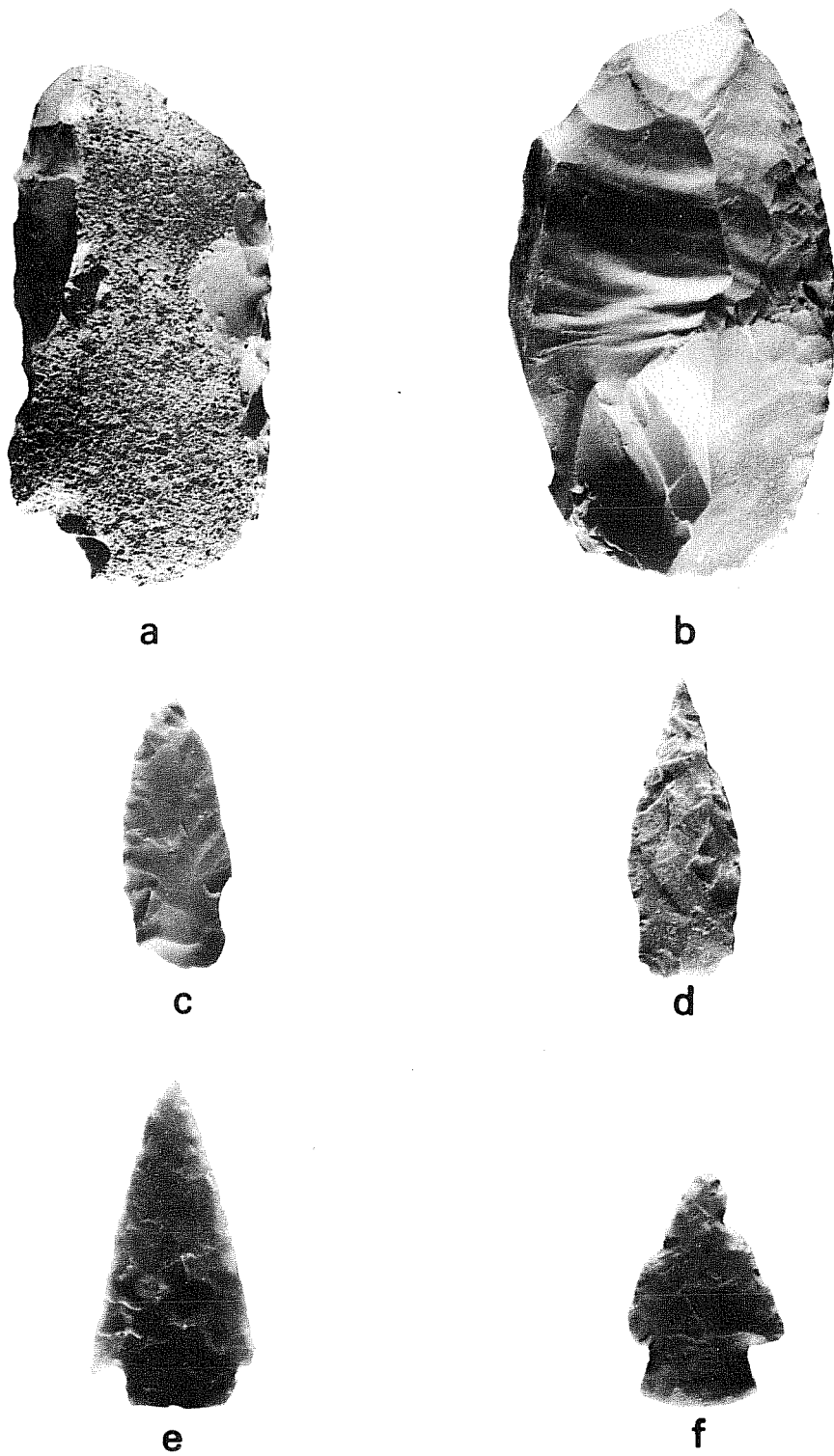


Figure 13. *Artifacts from Unit 1 and the General Area.* a,b, trimmed flakes; c, Nolan; d, unclassified; e, Montell; f, Castroville.

TABLE 2. ARTIFACTS FOUND IN UNIT 1 AND TRENCH 5

Artifact	UNIT 1				TRENCH 5	Total
	0-10 cm	10-20 cm	20-30 cm	30-40 cm	No Location	
Projectile points			2		2*	4
Bifaces			1	1		2
Trimmed flakes				1	2	3
Primary flakes				2		2
Secondary flakes		3	49	18		70
Interior flakes	4	19	196	47	4	270
Animal bone fragments	1	10	81	23	1	116
Land snail shells	59	64	57	37		217
Mussel fragments			8		2	10
Wire nails					1	1

*The provenience of these artifacts was 70 cm below the undisturbed soil level and in the west wall of Trench 5.

The charcoal sample was processed by the Radiocarbon Laboratory, The University of Texas at Austin (sample number Tx-2927). The sample date is 3560 ± 70 B.P. or 1610 B.C. MASCA conversion tables (Ralph, Michael and Han 1973) indicate a date of 1920-1950 B.C.

The date for Tx-2927 is one of the oldest radiocarbon dates produced in central Texas (see Gerstle, Kelly and Assad 1978). The sample is indirectly associated with a *Nolan* dart point, which is usually placed in the Early Archaic period. Sample Tx-2927 is below the *Nolan* point in stratigraphic depth; however, the radiocarbon date is within the Middle Archaic period as defined in the chronologies of Weir (1976), Prewitt (1974) and Gerstle, Kelly and Assad (1978). Possibly the *Nolan* dart point type continued in use in central Texas later than previously noted.

SUMMARY AND RECOMMENDATIONS

Testing north of Olmos Dam was undertaken to determine whether or not any significant historic or prehistoric archaeological resources were present in the 16 acres proposed as a borrow area for Olmos Dam renovation. Portions of site 41 BX 1, which was largely destroyed by the 1920 dam construction, were found to be intact. No other significant archaeological resources were noted.

The precise boundaries of site 41 BX 1 could not be located by the testing. However, an area north of the dam and partially within the proposed borrow pit boundaries was marked off for protection; the protected area extends west to the right-of-way of Interstate Highway 37 (see Fig. 3).

On February 22, 1978, a survey party from the San Antonio River Authority met with the author at the borrow pit area to survey the protected area. The Chief Engineer, Mr. Dorian French, stipulated at that time that this area would be designated as inaccessible for borrowing activities.

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APPENDIX

While Olmos Dam was under construction in the 1920s, several people collected artifacts from the backdirt piles and exposed sections of site 41 BX 1. Mr. Brentano C. Harnish has allowed a sampling of his artifact collection from 41 BX 1 to be illustrated here (see Figs. 14 and 15).

One of the specimens, a *Golondrina* projectile point (Fig. 14,g), is considered to be a common form of Paleo-Indian projectile point in south Texas (Hester 1977). This type of Paleo-Indian point has also been found several miles from Olmos Basin at site 41 BX 229 on St. Mary's Hall property (Hester 1978). Hester (*ibid.*) dates the *Golondrina* form to 7000 B.C., based on radiocarbon dates from Baker Cave.

Another 41 BX 1 specimen, a *Carrizo* dart point (Fig. 14,e), probably dates to the Archaic Period and is found in central, southern and southwest Texas (House and Hester 1967).

The remaining artifacts illustrated include four dart points, [three of which are possible *Castroville* points (Fig. 14,f; Fig. 15,a,b) and one unclassified point (Fig. 14,d)]; two crude bifaces (Fig. 15,c,d); a perforator (Fig. 14,h); and three finely-worked bifaces (Fig. 14,a-c), which may have functioned as knives. One biface specimen (Fig. 14,b) is oval in outline with parallel flaking; another (Fig. 14,c) is triangular and not as finely worked; and the last specimen (Fig. 14,a) is a curved and sickle-like biface, shaped from extensive reworking and use.

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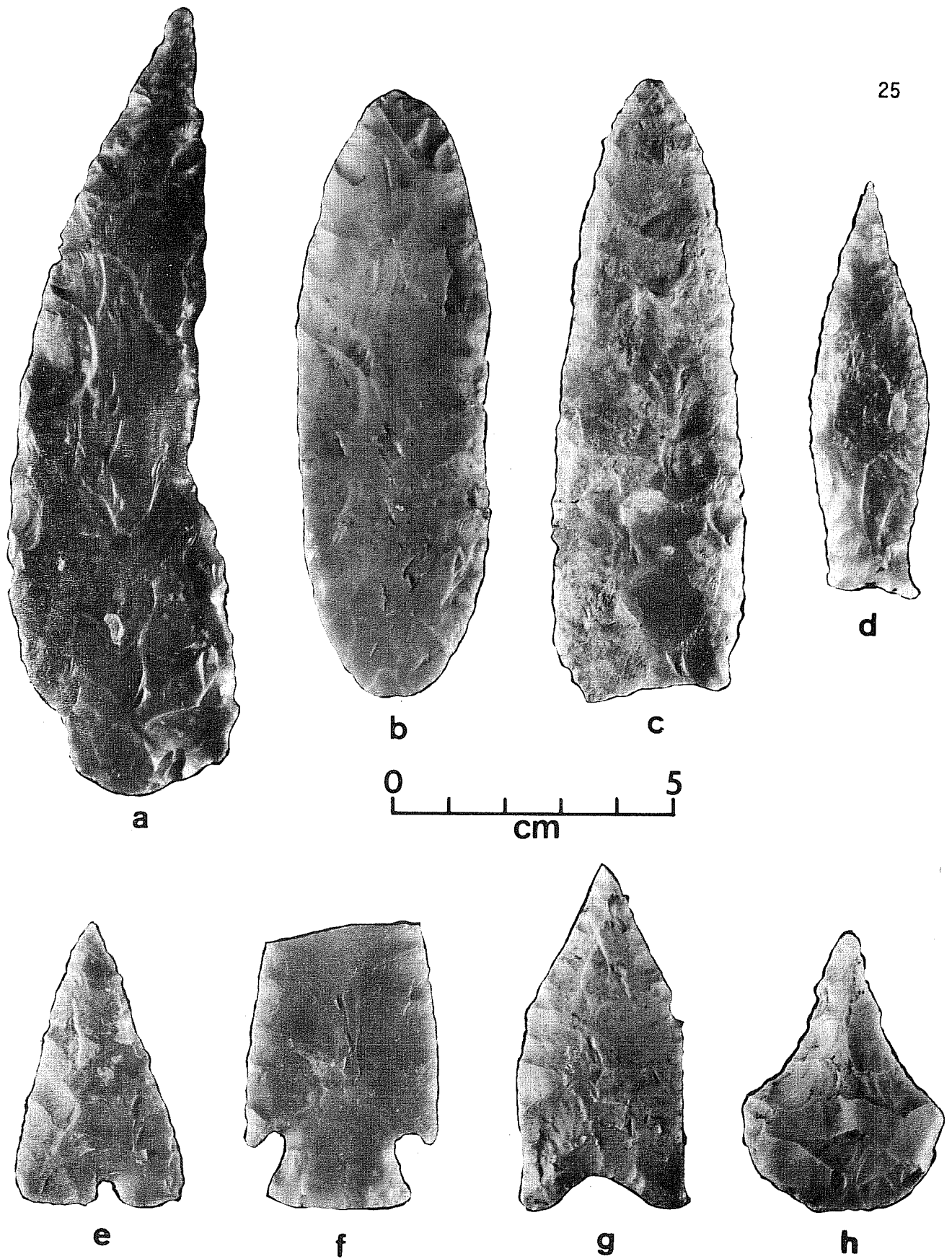


Figure 14. *Artifacts from 41 BX 1. a-c, bifaces; d, unclassified dart point; e, Carrizo; f, Castroville; g, Golondrina; h, perforator.*

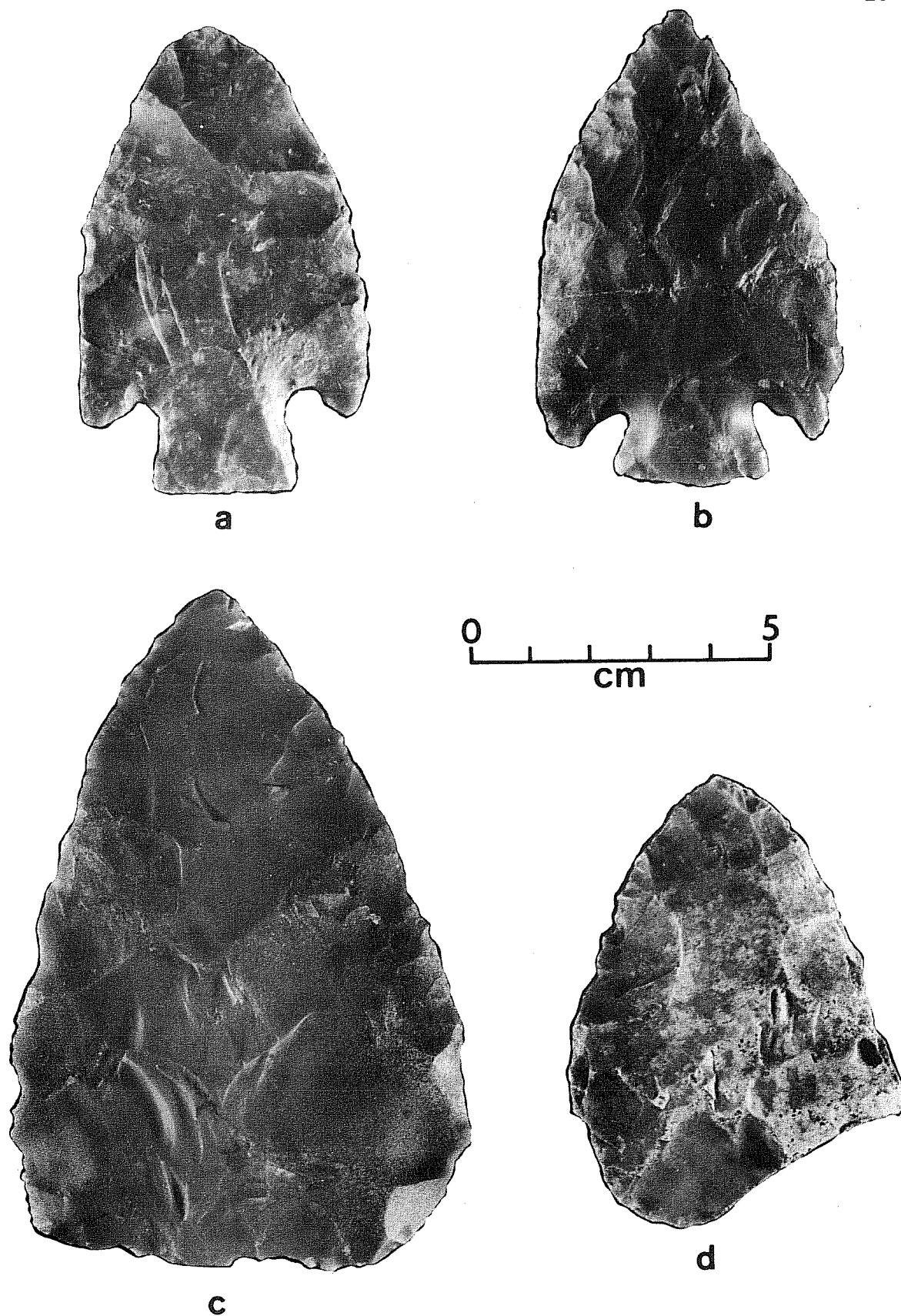


Figure 15. *Artifacts from 41 BX 1. a,b, Castroville; c,d, crude bifaces.*