

**THE HUECO MOUNTAIN
CAVE AND ROCK SHELTER SURVEY:
A PHASE I BASELINE INVENTORY IN
MANEUVER AREA 2D ON FORT BLISS, TEXAS**

DOE Project 95-01

by

**Federico A. Almaraz
Jeff D. Leach**

with a contribution by

Darrell G. Creel
Texas Archeological Research Laboratory, Austin, Texas

**Archaeological Technical Reports
Number 10**



**Anthropology Research Center
The University of Texas at El Paso**

1997



Appendix A

CEREMONIAL CAVE: AN OVERVIEW OF INVESTIGATIONS AND CONTENTS

Darrell G. Creel

**Texas Archeological Research Laboratory
Austin, Texas**

Introduction

The project reported in this volume has incorporated an extensive review of previous investigations in the many caves occurring in the Hueco Mountains. As part of that effort, this author was enlisted to assemble available data on investigations in Ceremonial Cave and on the University of Texas at Austin excavations in another cave in the Hueco Mountains (which apparently occurred outside this project area and is not discussed here). This endeavor has involved examination of accession records, excavation records, correspondence, manuscripts, publications, and most of the extant collections. For Ceremonial Cave, the result of this research is the extensive overview of investigations and findings presented below.

Ceremonial Cave, like most others in the Huecos, occurs at the top of the talus slope and at the base of a vertical limestone face. Cosgrove (1947: 34) described its entrance as 27 feet wide and 15 feet high in 1928. Its

maximum width is more than 41 feet and its length more than 90 feet. Even today, its full extent is unknown since some small drifts have yet to be fully opened.

Ceremonial Cave came to the attention of the archeological community following extensive looting of what apparently was a major deposit of prehistoric offerings. As described by Eileen Alves (1930: 64), "Treasure hunters of a most malignant and energetic type have reduced the interior to a state of chaos." Ceremonial Cave stands out as one of the most unusual and interesting sites ever found in Texas, but its story is surely one of the most tragic examples of archeological site destruction in the state. Unfortunately, no amount of future effort seems likely to serve justice to and provide restitution for the damage done to this important site, yet an attempt to assemble and synthesize the information available begun here hopefully will soon come to fruition.

Investigation History

Although the rock art in the caves and shelters at nearby Hucco Tanks was known by the mid-1800s, it was not until the early decades of the twentieth century that the caves in the Hueco Mountains came to the attention of amateur and professional archeologists. Indeed, it was the interest in the large number of pictographs and petroglyphs in the El Paso region that led Eileen Alves, M. L. Crimmins, and others to record, attempt to protect, and disseminate information about these and other archeological remains they had found. These individuals corresponded with such professionals as Clark Wissler (American Museum of Natural His-

tory), Melvin Gilmore (Museum of the American Indian), as well as Frank H. H. Roberts and Jesse W. Fewkes (Bureau of American Ethnology), and even traveled to these East Coast institutions to show artifacts and photographs (Crimmins 1929: 38).

It is possible that Frank H. H. Roberts visited Ceremonial Cave in 1921 when he briefly examined Hucco Tanks and other caves in the Hucco Mountains (Roberts 1929), but the first visits that resulted in any written documentation were in 1926 and 1927 when Robert P. Anderson (then president of the El Paso Archaeological Society) and R. W. Stafford conducted rampant un-

systematic looting. While taking refuge from a storm during a hunting trip, Stafford had discovered that the cave contained unusual remains. He and Anderson amassed a large collection of unusual, well-preserved objects and notified the local news media of their findings. In addition, they contacted Frank H. H. Roberts, Jr. who visited them in May 1927, examined their collection, and conducted minor excavations in the rear of the cave. He recovered a small number of objects now in the collections at the National Museum of Natural history. As a result of this trip, Roberts published a brief article on the findings at Ceremonial Cave and on the pictographs at nearby Picture Cave (Roberts 1929).

In his report on the 1927 season of the Peabody Museum (Harvard University) Mimbres Valley Expedition, A. V. Kidder summarized the discovery and initial looting of the cave, emphasizing the remarkable materials found there. In that report, Kidder (1927: 9) also presented important details on the early investigations at Ceremonial Cave, details that are not elsewhere recorded. Referring to the initial looting, he noted that "Mr. and Mrs. Alves bought the collection from the cave, thereby saving it from dispersal and ultimate destruction; carried out excavations on their own account; and invited the Cosgroves to visit the site with them and to make further explorations" (Kidder 1927:9). Fortunately, C. B. and H. S. Cosgrove were then excavating at Chavez Cave near Las Cruces, New Mexico, and were able to respond quickly and made their initial excavations that year (1927).

[They] secured a representative series of prayersticks, sandals, darts, pieces of matting, cordage, and textiles. To this Mr. and Mrs. Alves most kindly

added specimens from their own collection; and also permitted the Cosgroves to study and photograph for their final report the material found by the hunter (Kidder 1927: 11).

The Cosgroves' excavations at Ceremonial Cave and other nearby caves in the Hueco Mountains continued in 1928 and were an important part of their more general study of caves of southwestern New Mexico and adjacent Texas. C. B. Cosgrove provided a more specific description of that project in the introduction in *Caves of the Upper Gila and Hueco Areas in New Mexico and Texas*:

The Peabody Museum's archaeological campaign in southern New Mexico was inaugurated during the years 1924-27 by the complete excavation of a large classic Mimbres ruin on the Swarts Ranch in the Mimbres Valley The work yielded valuable data on the architecture and burial customs of the period and produced a representative collection of artifacts, particularly rich in the beautiful Mimbres mortuary pottery. But it of course contained no specimens of cloth, basketry, or wood; and the desirability of recovering such perishable materials as these, in order to round out our knowledge of the ancient material culture, led to the cave explorations with which the present paper is principally concerned. That caves and rock shelters containing well-preserved remains are abundant in this general region was known from the stories of early settlers and from the results of recent lootings. It was, in fact, evident that unless immediate action were taken all such deposits would be destroyed by vandals. In addition to these incentives,

it was believed, because of the nature of finds made in the neighborhood and of objects from caves near Las Cruces, New Mexico, and El Paso, Texas, that there was likelihood that information might be had regarding still older cultures (Cosgrove 1947: 3).

The Cosgroves' work at Ceremonial Cave is summarized in the well-known report that stands as the single best source of information on the site. It presents a basic description of the cave, its deposits, and the cultural remains, and it includes a map of the cave as it was known in 1928 (Cosgrove 1947: 34–37). More specifically, their map depicted the main chambers and only those drifts visible at that time. Since then, looters have discovered others, and it is possible that additional small drifts have yet to be detected. The Cosgroves described the stratigraphy of the deposits as they were preserved in 1927–28, but the fill of the cave was already much disturbed when they began work. As a result, it seems unlikely that we will ever have an understanding of the deposits significantly better than that presented by C. B. Cosgrove (see below), although there are important observations in the field notes that are not presented in the published report.

Cosgrove completed his report on the cave explorations in 1934, but it was not published until 1947. Thus, it was Roberts' article in 1929 and an article by Eileen Alves in the 1930 *Bulletin of the Texas Archeological and Paleontological Society* that first brought Ceremonial Cave to the attention of the wider archeological community. By then, the Alves had purchased the collection acquired by Anderson and Stafford in 1927 to prevent its being sold, possibly divided, and moved out of the area. After the death of Eileen Alves, her husband, Burrow Alves

transferred most of the collection to Gila Pueblo in Globe, Arizona, from which it and all other Gila Pueblo collections were transferred to the Arizona State Museum. The collection from Ceremonial Cave was transferred to the Texas Archeological Research Laboratory (TARL), The University of Texas at Austin in 1990 where it is now permanently curated under the site number 41EP19. Other, much smaller portions of the Alves collection are at the Maxwell Museum of Anthropology at the University of New Mexico and at the Museum of Northern Arizona.

Another significant collection of objects from Ceremonial Cave, at least most of which were acquired by Gertrude Windsor Smith, a close associate of Eileen Alves, is curated at the Centennial Museum at the University of Texas at El Paso. The circumstances of its acquisition are unknown, but it was probably acquired in 1926–1927 since at least some of it was in Smith's possession when photographed by C. B. Cosgrove that year (Photos on file at Peabody Museum, Harvard University).

The next documented visit to Ceremonial Cave was in 1931 when Eileen Alves took George Dennis of Gila Pueblo to it and several sites in the El Paso area (Unpublished site survey form, October 9, 1931, on file in Archives, Arizona State Museum; copy on file at TARL). The site was at that time designated as Texas-11. No excavations are recorded, but a few objects apparently were collected (Gila Pueblo accession records, Arizona State Museum).

A subsequent visit was made in March 1932 by E. B. Sayles during Gila Pueblo's archeological survey of Texas. He documented Ceremonial Cave as site El Paso:3:7 in Gila Pueblo's site survey files (Unpublished

site survey form and notes, March 2, 1932, on file in Archives, Arizona State Museum; copy on file at TARL). Sayles tested four areas in the back of the main chamber, two of them drifts not shown on the Cosgrove map (presumably because they were not then exposed), and excavated the undisturbed portion of one of the two drifts. Evidently, unsystematic digging, attributed to guano hunters by Sayles, occurred between the Cosgroves' excavations and his own. Sayles' recovery of artifacts was modest, but he did record limited observations on the stratigraphy in the drift and immediately adjacent main chamber.

Sayles discovered what he referred to as a "grass mat" and what he showed on his plan and profile as a concentration of charcoal and ashes. A few artifacts and animal bones were near, perhaps stratigraphically associated with, these features. Among them was at least one bone of an extinct Pleistocene antelope that Sayles later described as:

in an undisturbed hearth level containing fragments of "fish tail" yucca-leaf sandals, bone awls, apocynum, and yucca fiber cordage. This association of Pleistocene animal bones with artifacts was found during the progress of this survey, while guano hunters were opening up parts of the cave that had been filled with stone that had fallen from the ceiling (Sayles 1935: 67).

The reality of this association is not supported by the primary records, but neither is it necessarily refuted by Sayles' rather limited notes. It is, however, an issue that can be addressed by radiocarbon dating of the organic artifacts said to have been associated with the Pleistocene faunal remains.

Sayles made one other interesting observation that is worthy of mention. He noted, as had most others before him, that no ceramics were present in Ceremonial Cave; but he did find pottery from a site below the mouth of the cave. Exactly where this site was and how it may have related to Ceremonial Cave are uncertain, and the whereabouts of the pottery and scraper he found, if collected, are unknown.

In 1936, A. M. Woolsey of the Department of Anthropology, The University of Texas at Austin visited a number of sites in the El Paso area and excavated at two caves in the Hueco Mountains, one of which he referred to as Ceremonial Cave (Woolsey 1936). It is clearly not the same cave that earlier investigators referred to as Ceremonial Cave. In contrast, the site referred to as Twin Caves has been confidently equated with Ceremonial Cave on the basis of Woolsey's description, particularly the fact that three other, smaller caves are located nearby, accessible by a ledge from the larger cave. At the time of Woolsey's visit, the culture-bearing deposit in the larger portion of the cave was mostly covered by spoil from excavation of a mine shaft. He (Woolsey 1936: 12) noted that "only enough digging was done in this cave to see that there was a midden deposit under the rock which had been hoisted out of the mine shaft."

In the smaller north portion of the cave, Woolsey (1936: 12) observed that "A midden deposit ran from the back 12 or 14 feet toward the front, and was 10 feet wide and from 1 to 2 feet deep." This deposit consisted of "fibrous material, dirt and ashes and some rock." Woolsey excavated the entire deposit and recovered a modest collection that includes sandals, cordage, knots of bear grass, a corn cob, a bone awl, a section of

cane (arrow?), three wooden objects that may be dart shaft fragments, animal bones, and sticks. This collection is curated at the Texas Archeological Research Laboratory, University of Texas at Austin.

Undoubtedly, many other individuals visited, dug in, and collected objects from Ceremonial Cave in the 1930s, 1940s, and 1950s; but the first documented visit since Woolsey in 1936 was by Tom O'Laughlin in the 1960s (Tom O'Laughlin, personal communication, November 22, 1994). He did no excavating but did collect sandals and a fragment of a twined bag from looters' back-

dirt piles (Collection at Wilderness Park Museum, El Paso, Texas).

The last documented investigation was in 1976–77 when survey crews from the Centennial Museum at the University of Texas at El Paso revisited Ceremonial Cave and other previously investigated caves in the Huecos as part of a large survey of lands used by the US Army for maneuvers in the eastern Hueco Bolson (Whalen 1977). Other than an assessment of the condition of the cave, no substantive observations were made, if indeed any were possible after several decades of digging.

Deposits

As a result of the extensive disturbance, limitations in documentation, and the nature of the controlled excavations, it is difficult to craft much beyond a very simple and no doubt incomplete reconstruction and description of the deposits in Ceremonial Cave. The only meaningful data were recorded by the Cosgroves and by E. B. Sayles and are discussed below.

Although the Cosgrove excavations were quite extensive, the massive disturbance and often great size of pothole backdirt piles, and the fact that some drifts were even then unexposed inevitably resulted in an incomplete map of the cave and an incomplete understanding of the deposits. Cosgrove's published and especially the unpublished descriptions of the deposits and stratigraphy nonetheless stand as the single best sources of information and all pertinent statements are quoted here in full. The published description is quoted first.

The roof of this cave, as in nearly all in this district, was smooth, showing no recent falls of heavy stone. Below the

refuse and lying on a yellow sandy fill were blocks of a friable, crystalline formation that had sloughed from the roof long ago. . . . The fill of the cave rose gradually, and at the back was 8 to 10 feet higher than at the entrance, where previous digging had uncovered so many artifacts. At the rear, because of the great quantity of cactus thorns brought in by rats, this disturbance was not so great. Our excavations varied from 1 to 5 feet in depth, reaching to points below blocks fallen from the roof. The only definite stratum found was a layer of packed grass directly above the barren cave floor. The grass layer, which had been burned in places, extended over the middle third of the cave floor, and above it grass, dirt, and loose trash became progressively deeper and more compact toward the back, where rats had nested and had literally cemented the surface together with their droppings. Scattered throughout the fill, and particularly in the deeper parts, were fragmentary and worn fiber sandals to the surprising

number of 935. On the surface, and slightly below it, 1 party had previously gathered 100 sandals, and other people had also made collections; so it can safely be stated that a slow accumulation of no less than 1,200 to 1,300 sandals had been deposited in the cave. . . . The entire absence of artifacts for domestic use, of well-established fire hearths or pits, and of any accumulation of food bones was convincing evidence that it had not been a dwelling place. Grass bedding that had been carried in by transient visitors and carelessly fired left a stratum of ash over parts of the cave, but this residue was easily recognized as not being from wood fires used for warmth or cooking (Cosgrove 1947: 35-36).

In his field notes for the 1927 excavations at Ceremonial Cave, Cosgrove commented that:

As a result of taking discarded and broken material left by. . . others, we were able to gather a number of ceremonial staffs, broken atlatl darts that had been decorated with yucca fibre, hair ornaments and feathers and had been deposited as offerings with the staffs. Also in the cave were found several rabbit sticks, numbers of yucca sandals, quantities of cordage, pieces of basketry, some fragments of fur cloth and a piece of twined woven Basketmaker fabric. The cache of ceremonial offerings was at the front of the cave while most of the cordage, sandal etc. were found at the back of the cave, showing that the place must have been used at times as a camp (C. B. Cosgrove, unpublished field notes on file, Accession 27-11, Peabody Museum, Harvard University).

In the notes for July 9-24, 1928, Cosgrove described the deposits much as pre-

sented in his publication but with the additional important detail that appears to pertain to the deposits in the back portions of the cave. According to Cosgrove, "throughout the entire fill was encountered great quantities of human excrement, as well as the usual number of worn fibre sandals, 880 fragmentary and complete sandals being gathered this year." In contrast, "near the front of the cave, as discovered by others who had previously dug there, was a cache of ceremonial objects, a few of which had been overlooked and were recovered this year" (C. B. Cosgrove, unpublished field notes on file, Accession 27-11, Peabody Museum, Harvard University). Curiously, the presence of coprolites, none of which were collected, is nowhere mentioned in the published report; their occurrence in such quantity, however, leaves one somewhat nonplussed but more inclined to accept Cosgrove's suggestion that the back portions of the cave may have been a habitation area.

Apparently based at least in part on observations made during the Cosgrove excavations, Eileen Alves noted that "it has been possible to trace two or more former occupations by the layer of ashes, fiber, and grasses under the guano and rats' nests" (Alves 1930: 64). Exactly what is meant by "two or more former occupations" is unclear, although it is possible that this refers to Cosgrove's belief that Ceremonial Cave had been used during both Basketmaker and Pueblo times.

Given the disturbance between 1928 and 1932, Sayles, of course, faced even more formidable obstacles to discerning the nature of the deposits at Ceremonial Cave. As noted previously, he excavated the undisturbed portion of a drift in the back of the main chamber and found it to have a sloping

bedrock floor overlain by roof fall near its mouth and extending into the main cave (this summary based on Sayles' field notes, previously cited). Above this was "cave dust" 2-5 feet thick, apparently with a lens of charcoal and ash at the mouth and about a foot above the roof fall. In addition, he found a "grass mat" against the wall of the drift, near the charcoal and ash lens and apparently at about the same relative position in the "cave dust." Sayles found artifacts including sandals, bone awls, and animal bones adjacent to the "grass mat," but his notes do not record their stratigraphic position relative to either the mat or the lens of charcoal and ash. As quoted previously, however, Sayles (1935: 67) does say in his published report that (at least) the bones of extinct Pleistocene antelope were in the same "undisturbed hearth level containing sandals, bone awls, and cordage."

In regard to this assertion, and commenting on his, too, having found bones of extinct animals, Cosgrove (1947: 46) said,

Our investigations simply show that prehistoric animal bones were found with human remains but not in position to prove that such animals and man were contemporaneous; however, as research continues there seems to be increasing evidence that such may have been the case.

He then discusses the findings of Howard (1935) in Burnet Cave in the nearby Guadalupe Mountains. In short, the putative association of Pleistocene vertebrate remains and artifacts such as sandals, while possible, can be evaluated today only through radiocarbon dating of the artifacts. It is also possible, though unlikely, that Ceremonial Cave still contains undisturbed deposits relevant to this question.

One is tempted to assume that the grass mat found by Sayles in the rear drift is stratigraphically later than the grass layer found by the Cosgroves since the former was in fill a couple of feet above cave floor and the latter on the cave floor. There is no way to verify this assumption with published data, and since precious few of the artifacts have any specific provenience, it seems improbable that the matter can ever be resolved (although small areas of intact deposits may still remain).

In sum, a very tentative, preliminary overview of the deposits in Ceremonial Cave reveals that the bedrock floor of the cave was at least in places covered with a yellow sandy fill that was in turn overlain by rock spalls from the roof. Over much of the main chamber, the middle third according to the Cosgroves' findings, a layer of grass lay directly on the cave floor and was in places burned to ash. Above this was from one to perhaps four or five feet of cave dust and artifacts. The source of this dust is presumed to be a combination of weathering of the exposed rock in the cave and influx of aeolian sediment. Within this deposit of cave dust, in the drift excavated by Sayles, was a so-called grass mat that may or may not be equivalent in age to the grass layer found by the Cosgroves below the cave dust. Above this, particularly in the rear portions of the cave, was a deposit of organic material comprised primarily of plant parts brought into the cave by rodents and their excrement.

There is at present little tangible evidence bearing on the age of the deposits in Ceremonial Cave. On the one hand, the finding of bones of several extinct Pleistocene animals suggests that some of the deposits date to that time. On the other hand, published information and the unpublished data

now available do not indicate anything definitive about the provenience or context of these megafaunal remains. Although Sayles believed the Pleistocene faunal remains he found were associated with artifacts, he evidently did not consider taphonomic processes, prehistoric cultural mixing of deposits, and even the possible use of bones from long-dead animals as possibly complicating determinations of association. Indeed, Cosgrove (1947: 46) said "In gathering the bones scattered through the refuse of different caves there was no possible way of associating those of extinct birds or animals with the food bones left by the aboriginal visitors." Therefore, it seems prudent at this point simply to leave open the questions of how and when the remains of Pleistocene animals got into Ceremonial Cave.

The most secure dating of the deposits is based on the age of artifacts as determined by cross dating. The presence of an El Paso

Polychrome sherd indicates use of the cave sometime in the period from perhaps A.D. 1100 to 1400 or so (Whalen 1981: 223–227). The bow and arrow are known to have been introduced to the region sometime around A.D. 800 and, since arrow fragments as well as atlatls and numerous darts were recovered from the cave, we may infer that it was used by that date. The presence of dart points of presumably earlier styles suggests even more ancient use of Ceremonial Cave, although given the nature of the assemblage, one must consider the possibility that these earlier style projectile points were curated and thus give a false indication of antiquity. If this is so, there are no collected objects necessarily inconsistent with an age range of roughly A.D. 700 to 1450, perhaps somewhat earlier and later. Obviously, a systematic program of radiocarbon dating is the only feasible way to begin clarifying the history of use of the cave.

Features

In terms of features, one of the most interesting published observations made by Cosgrove (1947: 36) was that "The entire absence of artifacts for domestic use, of well-established fire hearths or pits, and of any accumulation of food bones was convincing evidence that it had not been a dwelling place" (however, see the earlier discussion of coprolites). Indeed, few features of any sort have been documented at Ceremonial Cave. Those for which evidence has been found are the grass layer observed by the Cosgroves and Alves, the grass mat and lens of charcoal and ash found by Sayles, the burials excavated by the Cosgroves, and the less well defined but still very important deposit of so-called ceremonial offerings extensively looted in 1927.

Ceremonial

The early discovery of a large number of objects in a nondomestic context led, of course, to the naming of Ceremonial Cave. The astonishing number of sandals, darts (both complete with foreshafts and broken), throwing or fending sticks, tablitats, ornaments, textiles, snares, reed cigarettes, pipes, prayer sticks with attached fiber bolls containing tobacco, basketry, and many other kinds of objects rather clearly distinguish this assemblage from any other known in the region. Indeed, if the range and quantity of such objects is any measure, Ceremonial Cave has no known equal in its part of the Southwest. As C. B. Cosgrove (1947: 36) observed, these objects indicate that Ceremo-

nial Cave was for many centuries a shrine of importance.

Unfortunately, there is little specific information on the nature of this ceremonial deposit; and in fact, there is no known record of which specific objects were recovered from it. The only artifacts that Cosgrove specifically mentioned as coming from the cache were the prayer sticks or ceremonial staffs (yucca stalks with attached yucca fiber bolls), darts, and so-called hair ornaments. Given the nature of the early looting, it is likely that many of the items purchased by the Alves were also from the ceremonial deposit (including the ornaments and tablitas).

Most accounts indicate that this ceremonial deposit was concentrated toward the mouth of the cave, its location indicated on Cosgrove's published map; but some dart shafts were found in the rear portions by Roberts and Sayles. It is, of course, quite possible that these relatively few objects were moved to the rear of the cave by rodents, a possibility supported by the presence in collections of extensively gnawed wooden artifacts. On the other hand, the deliberate placement of individual objects in back portions of the cave in no way detracts from the reality and significance of the far more substantial concentration near the mouth. What is perhaps a more acceptable interpretation of this cave is one offered by C. B. Cosgrove in his field notes for the 1928 excavation:

As work progressed it became apparent this place had not been extensively used as a domicile for there was not material of that nature found; also there was a complete absence of fire pits or ash strata to indicate its occupation for an extended period. A shrine it appears to be, with a suggested curious custom of the purging of the bowels and

leaving of worn out sandals when the objects were deposited there as offerings (C. B. Cosgrove, unpublished field notes for July 9–24, 1928, on file, Accession 28-3, Peabody Museum, Harvard University).

It seems clear that an extensive program of AMS dating of individual artifacts will prove critical in any attempt to resolve the age of the ceremonial deposit as well as those remains in back portions of the cave.

Burials

In their excavations, the Cosgroves found skeletal remains of two individuals, one young child and one adult female. The child, 28–32 months of age at death (determination presumably made by George Woodbury who also analyzed the adult remains), was represented by cranial fragments apparently found scattered in the fill (Cosgrove 1947: 161). A few bones of the adult female (age 21–35) were also found loose in the fill, evidently scattered by animals from the interment in a bay on the south side of the cave. The body was buried on its back with the legs drawn up to the body, judging from the published photograph (Cosgrove 1947: Figure 63B). The head was to the south. A seed necklace, a mussel shell pendant, and three basketry disks were near the skull, while one chipped stone projectile point was in the pelvic cavity and another was at the right side of the body (Cosgrove 1947: 161). Among the bones were a fish-tail sandal and a "pad of yucca fiber containing 2 pieces of a wide woven band." The woman had been wrapped in a blanket made of strips of rabbit hide.

Cosgrove believed that both the adult female and the child were interred during the Basketmaker use of Ceremonial Cave (Cosgrove 1947: 162), a conclusion for the

former based on her undeformed mesocephalic skull and what Cosgrove believed was an early type of fur-cloth blanket in which she was buried. His reasons for believing the child to date to approximately the same time were not specified but apparently depended on the predominance of so-called Basket-maker artifacts in the cave. These inferences are plausible but need to be reassessed, perhaps with direct dating of the blanket.

It should also be noted that the Cosgroves found "a very young infant buried at the head of an adult in a shallow grave near the front" of Cave 1, which is only a few meters from Ceremonial Cave and easily accessible from it along a ledge. These two individuals, the child and an older male, were also considered by Cosgrove to be Basket-maker in age and thus more or less contemporaneous with the burials in Ceremonial Cave.

In their article on Feather Cave in Lincoln County, New Mexico, Ellis and Hammack (1968: 38) refer to Ceremonial Cave as:

not only a major shrine but also the burial place of a male, undoubtedly priestly, accompanied by exceptionally fine offerings: an arm band of coiled basketry encrusted with turquoise mosaic, a mosaic-encrusted comb and hair ornaments, "ceremonial staffs," fragments of tablitas, pahos, reed cigarettes, throwing sticks, and a great many other items.

In conducting this research on Ceremonial Cave, I have found no evidence whatsoever supporting the attribution of these objects to a burial, male or female. The basis for their statement is unknown.

Grass Layer

The layer of grass observed by Alves and the Cosgroves lay directly on the cave floor and was believed by Cosgrove to have been bedding brought in by transient visitors. The Cosgroves found this grass layer in the middle third of the cave, and the description of it in the report implies that it extended no further. Whether or not it was related to the large ceremonial deposit shown on the published map (Cosgrove 1947: Figure 18) is unknown, although its apparent size and the lack of domestic features suggest that the grass layer was related to the use of the cave for special purposes.

Grass Mat

The so-called grass mat found by Sayles may have been a prepared bed, but it was so minimally described and recorded that a more definitive interpretation is impossible. It was against the cave wall and is shown on Sayles plan and schematic cross-section as being roughly oval, some five feet long, three feet wide, and perhaps one foot thick. The question of its age and possible association with artifacts, bones of extinct Pleistocene fauna, and a lens of charcoal and ash have already been discussed.

Charcoal and Ash Lens

In his field notes, Sayles showed the charcoal and ash lens on both his plan and cross-section, but only the latter depicts it in such a way that dimensions can be derived. On this basis, it appears to have been about one foot thick and some four to five feet across; its shape is unknown. Sayles (1935: 67) referred to this as a hearth in his *An Archaeological Survey of Texas* and noted the association with Pleistocene megafaunal remains. So far as is known, Sayles took no photographs of this feature.

Artifacts and Other Remains

A relatively large number of artifacts recovered from Ceremonial Cave are in repositories around the country, and many more are probably in undocumented private collections. No effort is made here to describe these artifacts in any detail, rather the objective is to provide a very general characterization that may be helpful in planning for a comprehensive analysis of the extant, available collections.

The bulk of the material consists of generally well-preserved perishable items, by count, most of them of wood, fiber, or shell. Some clearly have been damaged by rodents, and it is quite likely that many objects complete when placed in the cave were reduced to constituent parts by deterioration, movement, and/or by rodent gnawing. Unfortunately, numerous objects reportedly were broken by relic collectors in 1926 and 1927.

At least three broad categories of remains can be noted: the apparently ceremonial objects, the artifacts associated with the burials, and the possibly noncultural and/or nonceremonial items. Since the first two categories have already been discussed, the following comments pertain to the third group:

In the larger collections, a few chipped stone bifaces and unifacial tools may be nonceremonial and could predate ceremonial use of the cave. They could, however, fit comfortably into the ceremonial assemblage. One of the bifaces in the collection at TARL, for example, is made of clear quartz crystal.

Perhaps most likely to be unrelated to the ceremonial use of the cave, and some possibly not even cultural, are various bones from mammals and birds. Few quantitative data have been published, but a list of taxa

recovered by the Cosgroves and Sayles is presented in Table 1. Identification of the faunal remains collected by the Cosgroves was made by Glover Allen (Cosgrove 1947: 4), with a confirmation of the California condor identification by Alexander Wetmore of the U.S. National Museum (Letter from Wetmore to Donald Scott, February 10, 1933, on file, Accession 26-7G, Peabody Museum, Harvard University). The remains found by Sayles were identified by W. H. Burt (Letter to Emil Haury, October 20, 1933, in Sayles Collection files at TARL). More specific details can be found in these two sources.

Table 1. Vertebrate Taxa Identified from Ceremonial Cave.

Taxon	Collector
Artiodactyl	Sayles
Antelope (<i>Tetrameryx</i> sp.)	
Deer	
Ground squirrel	
Jackrabbit	
Pronghorn antelope	
Badger	Cosgroves
Bighorn sheep	
California condor	
Cottontail rabbit	
Coyote	
Domestic dog ("Indian dog")	
Extinct camel	
Extinct horse	
Great Horned owl	
Ground squirrel	
Hawk (intact leg)	
Mule deer	
Pronghorn antelope	
Tortoise	

Summary and Suggestions for Future Research

The principal use of Ceremonial Cave, as a shrine, probably occurred during the period A.D. 700 to 1450, perhaps beginning earlier and possibly continuing somewhat later. During this time, large numbers of objects were placed in the cave, presumably as offerings, much as the Pueblo peoples have done in other caves since before the arrival of the Spanish in the mid-1500s. The deposits containing these offerings were much disturbed by early looting, but important collections of artifacts and information have been acquired from looters and from excavations by professional archeologists. For better or worse, these artifacts and records are curated in at least seven museums and research laboratories. Many types of artifacts are duplicated in the various collections, but other artifacts are unique or are of types concentrated in one collection or another. Precious few artifacts have provenience information of any sort.

Although C. B. Cosgrove made an admirable attempt to synthesize what information was available in the mid-1930s, no one has yet analyzed the accessible collections as a whole. Moreover, pertinent analytical techniques commonly used today were still to be developed when Cosgrove conducted his analysis. Any future effort to analyze the collections must, for example, include a comprehensive program of radio-carbon dating to clarify the age of the remains. Preferably, this dating would be done in tandem with an effort to recover, date, and analyze coprolites even from disturbed fill. In addition, chemical characterization of the turquoise and obsidian artifacts as well as identification of the shell species represented in ornaments are certain to yield important information. Until a complete analysis is accomplished, the story of Ceremonial Cave, as best it can ever be reconstructed, will remain untold.

Acknowledgments

Several institutions and individuals have been of critical importance in providing assistance during this effort. Fred Almaraz, Jeff Leach, Jim Bowman, and Chris Ihorn of the Fort Bliss Directorate of Environment, Cultural/Natural Resources Division were instrumental in arranging for this background research. At the Fort Worth District of the US Army Corps of Engineers, Jay Newman graciously handled the financial arrangements. In addition, the following institutions and individuals merit acknowledgment and thanks for access to collections and records:

- National Museum of Natural History, Smithsonian Institution: Dennis Stanford and James Krakker
- Peabody Museum of Archaeology and Ethnology, Harvard University: Gloria Greis
- Maxwell Museum, University of New Mexico: Brenda Dorr
- Museum of Northern Arizona: David Wilcox and Paul Drummond
- Arizona State Museum: Mike Jacobs and Alan Ferg
- Centennial Museum, University of Texas at El Paso: Scott Cutler
- Wilderness Park Museum, El Paso, Texas: Tom O'Laughlin

- Texas Archeological Research Laboratory, University of Texas at Austin: Carolyn Spock, Thomas Hester

To all of these individuals and institutions, I offer my most sincere thanks for kindness and assistance.

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