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A New Study of the Gruta de Chac, Yucatán, México



Research Year: 1998

Culture: Maya

Chronology: Early Classic

Location: Puuc hills region, Northern Yucatán, México

Site: Gruta de Chac

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Summary

A new study at the Chac cave took place in the summer of 1998. Following E. Wyllys Andrews IV's pioneering work at the water cave and building on a program of research at the nearby site of Chac II, excavation, mapping, ceramic classification, and radiocarbon dating at the Chac cave and its surrounding settlement have been completed. Pending neutron activation analysis of ceramics and clays will help to establish the origin of the enigmatic Chac polychrome and slateware. We now have new information indicating a close relationship between the Chac cave wares and early ceramic wares recently found at Chac II. The program of absolute dating completed is contributing to the construction of a more solid chronology that addresses the Early-Middle Classic (A.D. 500-700) settlement buildup in the Puuc region. These data indicate that Gruta de Chac was an important Classic period ceremonial and pilgrimage site associated with the Maya rain gods (Chacs). The cave played a significant role in attracting early settlers to the water-poor yet agriculturally rich Yucatán hill country. Some of these settlers may have been the founders of an emerging elite class whose substantive and symbolic control of a critical resource like water provided a politico-economic foundation for the dramatic cultural florescence of the subsequent Terminal Classic period.

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Introduction

In summer of 1998, a new study took place at the Gruta de Chac (Chac cave), a deep water cave located within the Puuc hills region of Northern Yucatán ([Figure 1](#)). The Chac cave has been a place of great interest ever since John Lloyd Stephens (1963) wrote about his explorations there in 1841. Although others have investigated and written about the cave since Stephens, including Henry Mercer (1975) in 1895 and Edwin Shook in the 1950s, it was not until the efforts of E. Wyllys Andrews IV in 1962 that any serious archaeological work took place there (Andrews IV, 1965). Andrews IV collected a large sample of pottery from the cave and was able to reconstruct a number of orange ware and slateware water jars, including painted designs on the now famous black-on-red-on-orange Chac Polychrome, stylistically dated to the Early Classic period. Andrews IV, however, he does not discuss any of the nearby ruins (Chac I) including the large "X" building complex reported to be about 100 m to the SW (Sabloff et. al., 1985; Dunning, 1991:175).

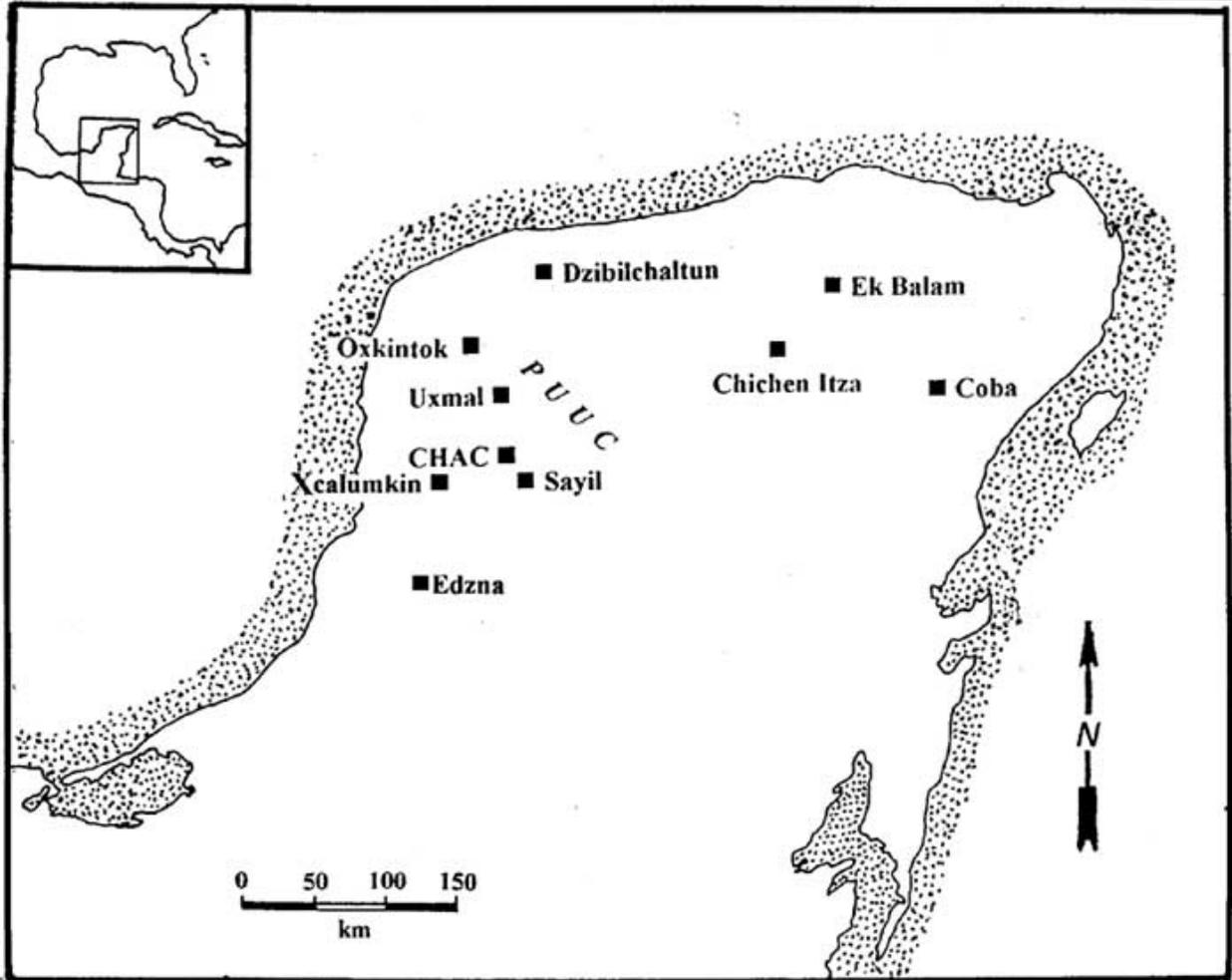


Figure 1. Map of the Northern Yucatán Peninsula showing the location of Chac (the Gruta de Chac and Chac II) and other major Maya centers.

Four seasons of fieldwork at the Maya center of Chac II, less than 1 km south of the Chac cave, are providing exciting new information about a major Puuc region center of the Early-Middle Classic periods (A.D. 300-700) (Smyth *et al.*, 1998; Smyth, 1998). In fact, it is likely that Chac II was the original settlement from which nearby Sayil emerged during the Terminal Classic period (A.D. 800-1000) and probably represents one of the first substantial settlements in the eastern Puuc sub-region. In addition, the evidence for contact with non-Maya groups perhaps reaching to Central México provides a possible answer for the long unexplained presence of non-Maya decorative elements found on Puuc architecture.

The new data from Chac II required a reexamination of the Gruta de Chac to establish the precise chronological and settlement relationships between the cave site and the center of Chac II. Indeed, was the Gruta an important Classic period pilgrimage site

associated the Maya rain gods (Chacs), a role perhaps not unlike that of the Sacred Cenote of Chichén Itzá during the Postclassic? The fame of such a sacred place of holy and life sustaining waters may provide one reason for early settlement buildup in this difficult semi-arid tropical environment.

Study Objectives

In July and August of 1998, we undertook a new program of investigation at the Gruta de Chac building upon the previous research by Andrews IV. Our work also expands upon the research at the nearby sites of Chac II and Sayil (Killion *et al.*, 1989; Sabloff and Tourtellot, 1991; Smyth and Dore, 1994; Smyth, 1998; Smyth *et al.*, 1998; Tourtellot *et al.*, 1989, and others). The Gruta de Chac study had three major goals: First, a program of surface collection and test excavation took place within and adjacent to the Chac cave to augment the sample of pottery and design elements previously collected and identified by Andrews IV. Measurements of the distance to the water source, compass bearings, and a sketch map of the horizontal passage to water were also undertaken. Second, settlement remains around the Gruta were cleared of vegetation, mapped, and classified where possible. Third, type-variety and formal analyses (NAA) were performed on all recovered pottery. Charcoal, ceramic, and clay samples were collected and submitted for radiocarbon dating and neutron activation analysis. These data now allow us to more accurately assess the function of the Gruta, its major period of use, and its relationship to nearby settlements like Chac II.

Cave Exploration and Excavation

Before investigation of the cave could begin, 9 wooden ladders descending the 50 m vertical shaft had to be repaired. It took more than a week to procure, transport, and replace many of the ladder's hardwood timbers so frequent ascents/descents could be made safely. Initially, difficulties were encountered locating the horizontal passage leading to the water. We found that the passage had been covered over either intentionally or more likely naturally by rainwater entering the cave and depositing soil to a depth of more than 1 meter. Obviously, removing the soil buildup took considerable time, a task compounded by the thin oxygen and dust particles raised during the subterranean digging process.

Once the entrance was open we began the long arduous journey to water. As Stephens, Mercer, and Andrews IV accurately relate, the passage winds and narrows, twist and turns, and opens and closes forcing one to crawl on hands and knees then walk upright into more spacious caverns then narrow again before reaching the small pool of permanent water ([Figure 2](#) and [Figure 3a](#)). Our measurements of the distance from the surface to water (428.7 m or 1,415 ft) are close to the half league (ca. 1,500 ft) as measured by Stephens in 1841 and considerably less than the 2,700 ft measured by Mercer. Like Stephens, I was unable to precisely measure the vertical depth to water

but a rough estimate would be about 100 m below the surface. The general direction to the water source is N-NW or approximately 345 degrees magnetic. Along the way, one can see a number of broken water jars and gourds suggesting occasional accidents transporting water out the cave. About 165 m from the entrance are heavy black carbon stains on the overhead low rock ceiling showing where countless torch bearers have passed over the last 1,700+ years of the cave's known utilization. At 10 m and 30 m from water, we noticed a lens of orange-brown, fine-grained clay eroding out of the cave walls. In fact, we also observed narrow vertical scrapings that clearly show that these clays were mined in the past. We suspect that these fine clays were used to produce the bright orange slip so characteristic of the Chac polychrome water jars. Compositional analysis should soon resolve this question (below).

An oval shaped water pool about 3 m in diameter and roughly 1 m deep lies at the end of a small chamber. The fact that water is always present suggests that the pool is fed by the underground water table and not a rain water seep. In addition, the sighting of albino fish and crayfish in the pool indicates a connection to the peninsula's extensive underground hydrology. The water pool and its immediate environs contain thousands of broken potsherds from water vessels of enigmatic Early Classic Chac Polychrome as well as numerous Chemax ceramics, an early slateware decorated with black trickle-down resist painting found in great quantities at Chac II ([Figure 3b](#) and [Figure 3c](#)). One can also see numerous broken gourds and dried faggots as well as old batteries and graffiti from more recent visits to the cave.

Surface collections and a stratified test excavation took place near the cave's permanent water source. Given the high humidity and thin oxygen levels, it became difficult to work for extended periods in the cave. Ceramics recovered from the water source itself and from the nearby test unit totaled 887 potsherds or greater than 180 pounds of pottery. Because of the difficult working conditions, the lack of other stratified deposits near the water, and the large sample of pottery already recovered, we felt that our sample was adequate and no further test pits were deemed necessary. Three clay samples were taken, however, and have been submitted for NAA along with sherds of Chac Polychrome and Chemax Slateware. The finding of great quantities of broken pottery near the water source, including one partial water jar with a circular puncture at the base, argues that many vessels were offered ritually, or ceremonially "killed," and not broken accidentally as Andrews IV suggests.

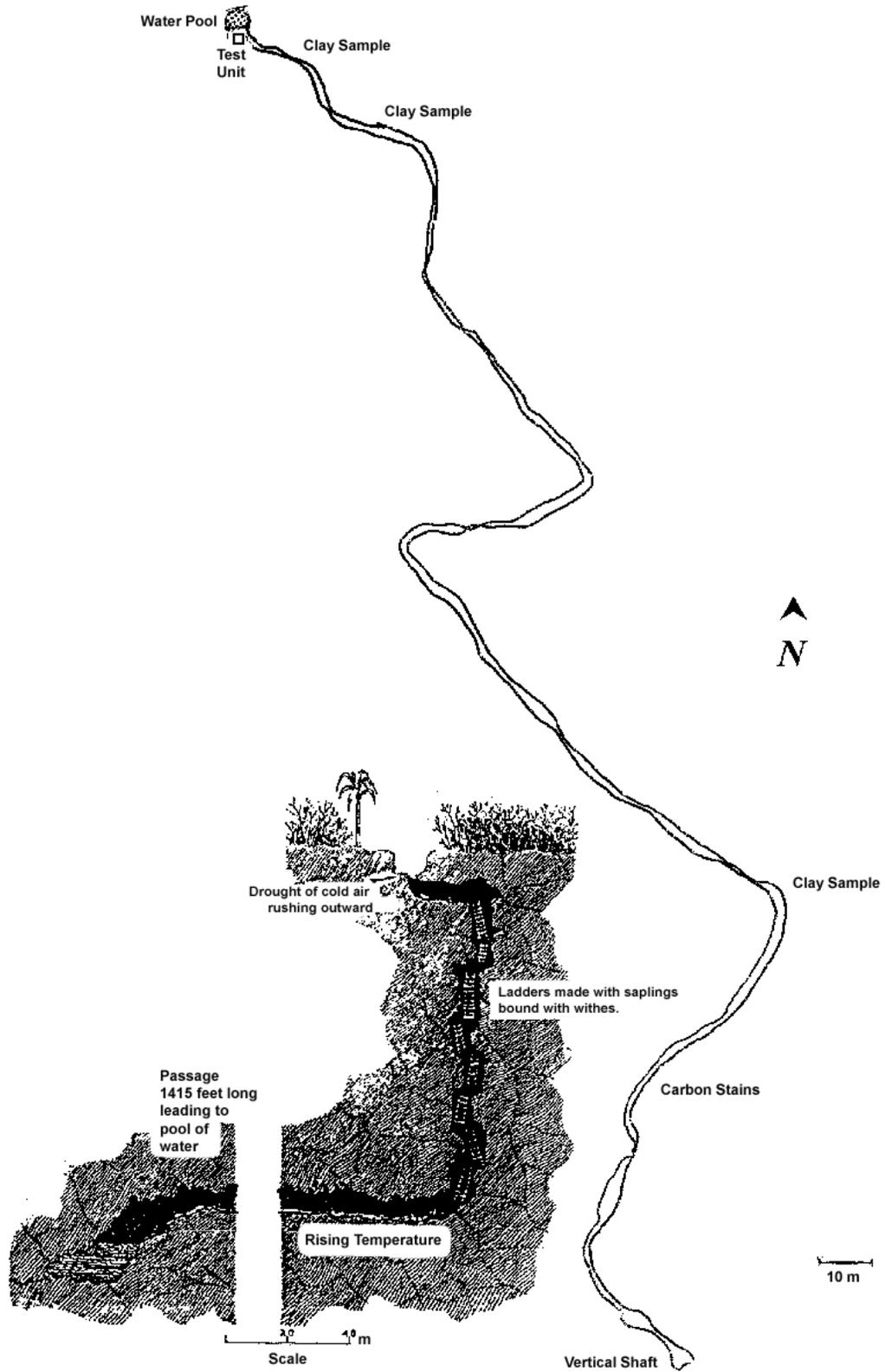


Figure 2. Schematic section of the Gruta de Chac after Mercer 1975 (left) and a sketch map of the route to water based on the 1998 study (right).



Figure 3a. Photo of the cave opening to the Gruta de Chac.



Figure 3b. Photo of Maya workman collecting pottery from the Chac cave water pool (right).

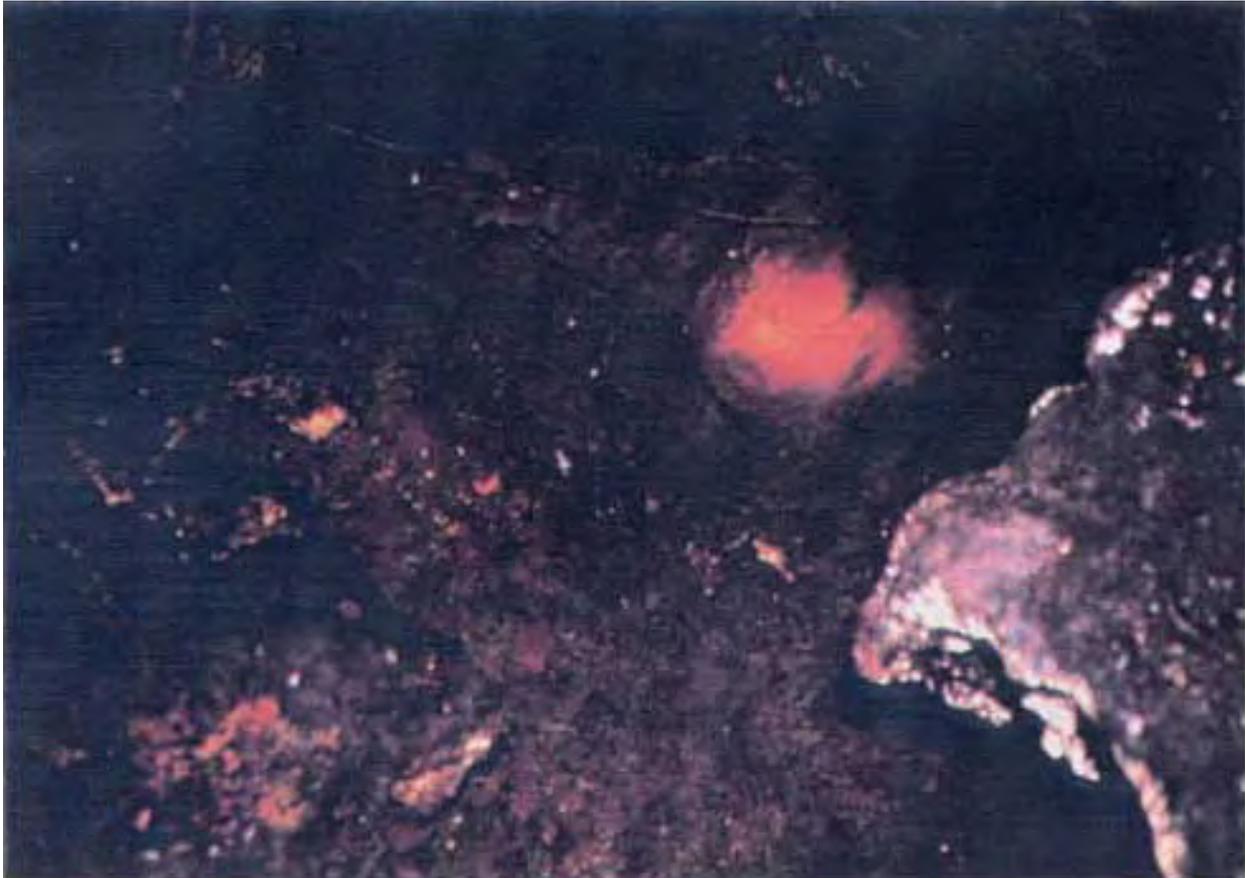


Figure 3c. Photo of the south wall profile of the test unit excavated near the Chac cave water source. A nearly complete Chac Polychrome orange slipped water jar is seen in situ (center right).

Settlement Survey

One of the major questions that this study sought to address relates to the spatial and temporal relationship between the settlement at Chac II and at the Gruta (Chac I). Northern settlement at Chac II reaches to within 800 m of Chac I. Reconnaissance survey at Chac I has located a number of platforms and residential groups reaching more than 600 m south of the cave, with only a series of high hills breaking the continuous settlement distribution. Based on these spatial data, it appears that Chac I and Chac II is one and the same site. Although the historic Rancho Chac visited by Stephens lies about 500 m to the E-NE and overlies a number of prehispanic settlement remains (Sabloff *et al.*, 1985; Dunning, 1991), we were unable to investigate this area.

Settlement immediately around the Gruta was cleared of vegetation and mapped ([Figure 4](#)). The largest settlement investigated is a plaza group made up of 3 stone vaulted buildings and several low platforms adjacent to the cave opening oriented about

60° east of magnetic north. This plaza orientation is the same as the internal causeway at Chac II. The NE plaza structure is classified as an Early Puuc style building with two central columns leading to an undivided building interior. A four-step staircase and platform of megalithic stone work underlies the vaulted building. These architectural characteristics are identical to early style buildings excavated at Chac II dated to the 6th century A.D. (Smyth, 1998; Smyth *et al.*, 1998). The largest building on the plaza is on NW side and unfortunately has been looted to such an extent that it is impossible to accurately reconstruct the building's configuration without full excavation. In addition, we were unable to locate the X-shaped plan building mentioned by Sabloff *et al.* (1985) and Dunning (1991) as being 100 m SW of the Gruta. It seems likely that the Gruta Chac Plaza is the X-plan group which is actually located in the opposite direction less than 50 m NE of the cave.

Just south of Gruta Plaza is a low platform with the remains of two monolithic stelae in situ roughly facing towards the cave opening ([Figure 4](#)). The stelae appear to be similar in form to ones found near the entrance of Loltún cave dated to the late Preclassic-Early Classic periods. A large, bare (dance?) platform to the south suggests that this area was designated for special ceremonies. About 100 m SE of the cave entrance is a residential group with two low foundations for perishable buildings and an underground water cistern (*chultun*) built along the north edge of a long limestone ridge. In fact, on reconnaissance survey we have located numerous other platforms and house foundations along this ridge extending south over a distance of some 500 m.

The finding of two *chultuns*, one collapsed and one intact, associated with ceremonial and residential architecture suggests that the Gruta itself was not a primary source of daily water. Serving vessels such as hemispherical bowls and out-flaring dishes so common from residential contexts at Chac II and Sayil are virtually absent from the excavation unit placed within the Gruta Chac Plaza (below). These observations indicate a special function for this settlement group suggesting a sacred place for ritual, pilgrimage, and the procurement of the holy waters associated with the great rain gods. These preliminary data support the idea that the Gruta de Chac was an important Classic period ceremonial site that attracted early settlers to the water-poor but agriculturally rich Yucatán hill country.

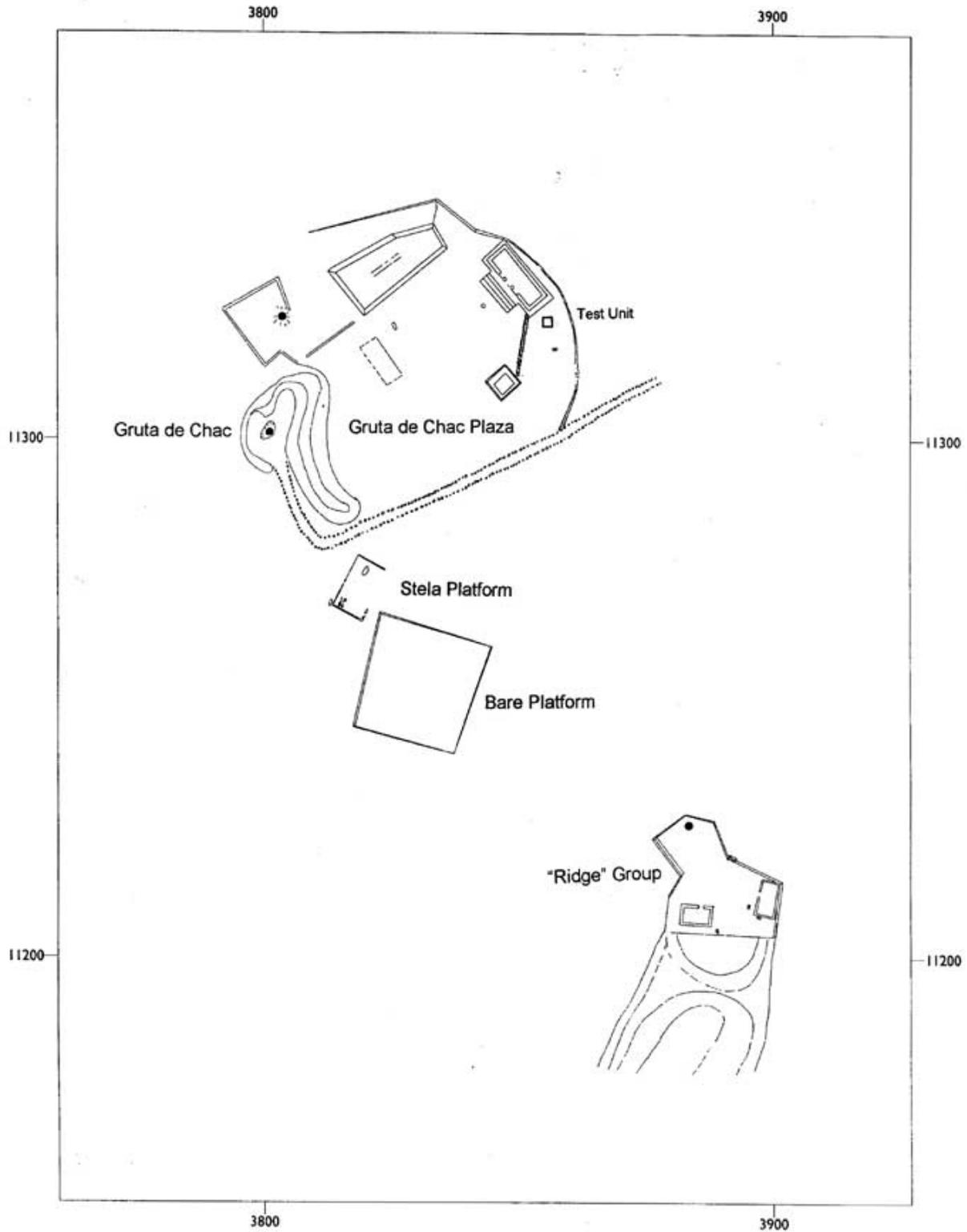


Figure 4. Digitized map of the Gruta de Chac settlement showing the Chac cave plaza, the stela and bare platforms, and the south residential "ridge" group. The stone alignments are believed to be historic. North is at the top.

Ceramic Analysis

Type-variety classification and modal analysis was completed on all pottery recovered from the Gruta de Chac. Although the final report on the pottery from the Chac cave is pending, 887 potsherds were classified as being from triple stirrup-handle water jars and comprise only three wares: Chac Polychrome, Chemax Slateware, and Chac Redware. No sherds from any other ceramic ware were recovered. Greater than 90 percent of all pottery was from the enigmatic Chac Polychrome water jars, 7 percent came from Chemax Slateware, and 1 percent was Chac Redware. Although Chemax sherds were on average larger (135 g) than sherds of Chac Polychrome (90 g), there was only slight tendency for the polychrome to be more frequent in the lower stratigraphic levels. Chemax Slateware and Chac Redware together, however, are more common in the upper strata suggesting that Chac Polychrome is earlier but that there is considerable chronological overlap among the wares. All vessel forms were identified as water jars with triple strap handles, two parallel handles on the vessel lungs and one handle centered near the base on the opposite side, designed to be suspended from a tumpline for transport through the narrow cave passages ([Figure 5a](#)).

The most distinguishing characteristic of Chac polychrome, of course, is the black and red painting on a bright orange slip forming the ware's typical decorative motifs, presumably symbolizing water. We were able to reconstruct completely or partially the design motifs on more than a dozen water jars. Although we have found the same range of design elements reported by Andrews IV, including "celestial bands", stylized frogs, water birds, medallion patterns, and flower motifs; there are a few unusual designs such as a stylized mask resembling Chac imagery found as mosaics on Puuc style architecture ([Figure 5b](#)). Covering the rear area of the vessel body between the two upper strap handles, the design resembles a rain cloud and falling water with black and red amorphous zones and vertical and horizontal bars bordered above by a chain of four dashed lines and open circles. A small bird measuring 9 cm long located just below the neck of a fairly large jar outlined in black and painted orange-red is one of the complete figures recovered ([Figure 5c](#)). The long tail, short wings, and long, narrow beak drinking from a cup-like object identify the figure as a hummingbird, a bird not reported for Andrews IV's sample.

The Medium Slateware water jars reported by Andrews IV are in fact the same Chemax Slateware that we have found in great quantities both in the Gruta and at Chac II. Comprising 7 percent (10 percent by weight) of our cave sample, Chemax water jars are tempered with volcanic ash and coated with a gray to brownish-red waxy, slate-like slip and decorated with thick black lines of trickle down paint. Being the same general size and shape with triple handles as the polychrome jars, Chemax necks are longer and more conical in shape with beaded or thickened rims. Although Andrews IV indicates that the Medium Slateware is not local, we believe this to be unlikely given the finding of 683 Chemax sherds including a number of triple handle water jars from Early-Middle Classic contexts at Chac II.

An early date for Chemax ceramics is largely consistent with the Chac Polychrome-Chemax ware overlap documented in our stratigraphic test pit within the Gruta. The

question of the geographical origin of Chemax ceramics is now being addressed by NAA.

The only other ceramic ware encountered in our excavations was the Chac Redware. Representing less than 1 percent (14 sherds) of our sample, we have little to add to the excellent description of a partially restored small, hemispherical redware jar with two strap handles recovered by Andrews IV (1965:16-18). Chac Redware sherds, however, were found in the middle and lower levels of the test unit suggesting that there is probably more than one redware vessel represented in the cave. These data indicate that the use of Chac Redware vessels was not an anomaly in the cave as suggested by Andrews IV but may have been part of the ritual activity performed near the water source. In fact, our Chac Redware sherds look very similar to a number of unidentified redware sherds found at Chac II.

There were 820 potsherds recovered from a 2x2 m stratigraphic test excavation located 3 m SE of the Early Puuc Building within the Gruta Chac Plaza. Interestingly, no Chac Polychrome or Chemax Slateware was recovered. All ceramics were classified as Cehpech complex ceramics traditionally dated the Terminal Classic period (A.D. 800-1000). However, our ceramic studies at Chac II now show that certain common Cehpech wares such as Yocat Striated and Muna Slate were in use by the 6th century A.D. (Smyth 1998; Smyth *et al.*, 1998). Therefore, the mere presence of Cehpech ceramics at the Gruta Chac Plaza does not necessarily mean that the architecture is Terminal Classic. Indeed, the early style architectural characteristics of the NE building imply a pre-Terminal Classic date of construction between the 6th and 8th centuries. The abnormally high number of lithic remains (n=22), high frequency of sherds from water jars (n=401) and basins (399), and low incidence of serving vessels (n=19) argues against normal domestic, residential activity but in favor of special ritual-ceremonial activity for this settlement complex.

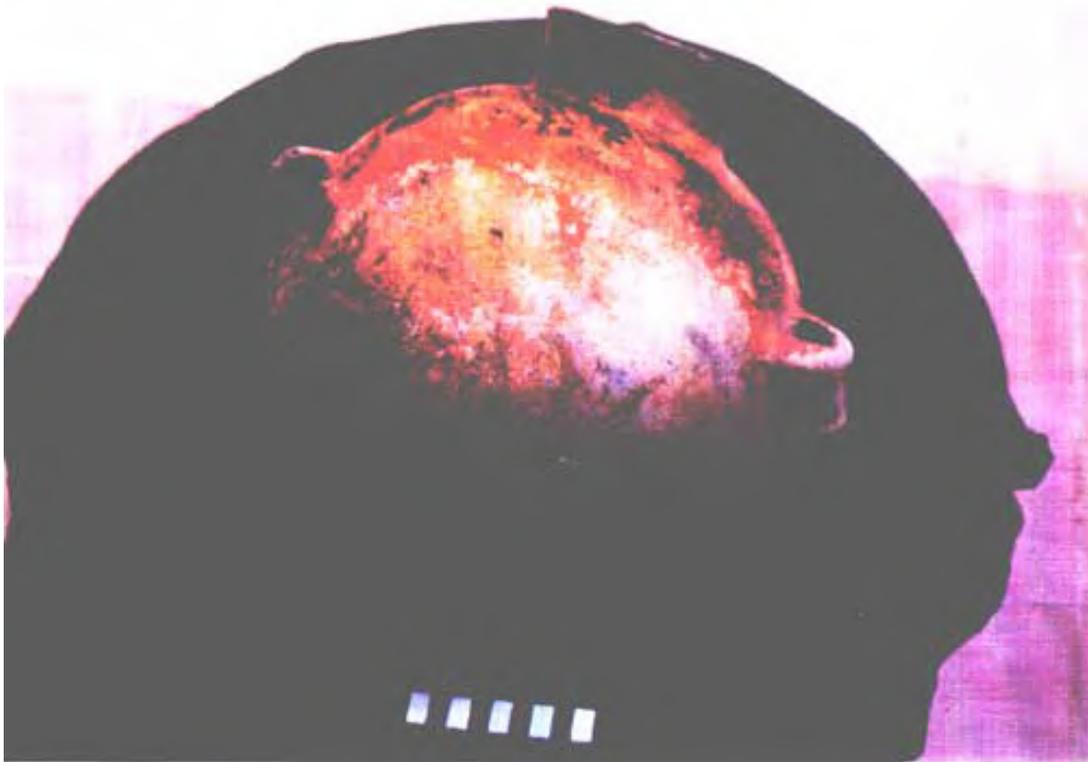


Figure 5a. Photo showing a partially complete Chac Polychrome water jar recovered from the Gruta.



Figure 5b. Photo of a black and red on orange mask-like design element from a Chac Polychrome water jar.



Figure 5c. A hummingbird-like figure (9 cm long) from a Chac Polychrome water jar outlined in black and painted orange-red.

Neutron Activation Analysis (NAA)

Eighty potsherds and three clay samples were submitted to the University of Missouri Research Reactor for NAA. Twenty sherds each of Chac Polychrome, Chac Cave-Chemax Slateware, Chac II-Chemax Slateware, and Dzibiac Redware also from Chac II are now undergoing analysis. The basic idea is to define the chemical composition of these ceramics and clays. Also, we wish to compare the cave ceramics to the cave clays to determine whether these clays are the sources for the pastes and/or slips. In addition, we seek to compare the Chemax Slatewares from the Chac cave and Chac II to establish compositional similarity/difference to address the question of local versus non-local production.

Finally, there were not enough sherds of the Chac Redware recovered for NAA so we decided to submit a sample of Dzibiac Redware (Sotuta complex) from Chac II since it is being found in great quantities and from early contexts. We wish to know if Dzibiac red

is compositionally divergent from Puuc pottery, as traditionally assumed, and whether we can determine a Chichén Itzá or Gulf Coast origin for this important ceramic ware. Results of this analysis are expected to be complete in the spring of 1999.

Radiocarbon Dating

Five charcoal samples were submitted to Beta Analytic Inc. for radiocarbon dating services. Only one charcoal sample was recovered from a stratigraphic context associated with the cave ceramics. This sample came from the 2nd level of the test excavation within the Chac cave. To provide additional indirect dating of the cave ceramics, 2 charcoal specimens from excavated contexts at Chac II with Chemax Slatewares and 2 samples of paint pigments from an Early Classic style molded stucco mask found on the lower south tier of the Great Pyramid were submitted for dating. All samples are associated with early style architecture similar to the one diagnostic building at the Gruta Chac Plaza.

Unfortunately, the Gruta charcoal sample turned out to be intrusive dating to A.D. 1800 ([Table 1](#), Beta-122985). However, two carbon samples from sealed stucco floors contexts containing Chemax Slatewares and early architectural contexts date to A.D. 620 and A.D. 720 ([Table 1](#), Beta-122986 and Beta-122987). These and other dated contexts at Chac II suggest that Chemax ceramics at the Gruta de Chac date to the late Early Classic and Middle Classic periods (A.D. 500-700). This chronological placement accords well with Ball's (1978:108) estimated dates for Ticumuy Orange Polychrome: Chac Variety to A.D. 300-550 and the suspected chronological overlap between Chac Polychrome and Chemax Slateware suggested by Andrews IV's. The dates for the paint pigments on the stucco mask are Terminal Classic (A.D. 830 [Beta-122988] and A.D. 850 [Beta-122989]). The Early Classic style of the stucco mask, the associated early style architecture, and the presence of Chemax ceramics, conversely, indicate that these radiocarbon dates are too late and must reflect the last of many re-paint

Table 1
Radiocarbon dates from Chac II and the Gruta de Chac^a, Yucatán.

Field Specimen	Lab Number	Conventional C-14 Age B.P	Calibrated C-14 A.D. (2 sigma, 96% probability)
30056	Beta-91913	1100±60	800-1030
30057	Beta-91914	1120±60	785-1020
30511	Beta-98318	1190±100	655-1025
30513	Beta-98319	1610±60	340-600
30522	Beta-98320	1860±110	60 B.C. - A.D. 420
30533	Beta-98321	11,920±120	not calculated
30539	Beta-98322	1250±60	665-905 and 920-950
30545	Beta-98323	1430±60	540-690
30533	Beta-114546	1330±50	640-790
30711	Beta-114547	1250±50	670-890
30713	Beta-114548	1330± 50	640-790
30702	Beta-114551	140±50	1660-1950
30724	Insufficient Charcoal		
30727	Beta-114549	1460±70	440-685
30730	Beta-114552	1580±60	380-620
32034	Beta-114553	390±90	1660-1950
30903 ^a	Beta-122985	150±50	1655-1950
30750	Beta-122986	1330±50	640-790
30753	Beta-122987	1230±50	680-905 and 920-950
32133	Beta-122988	1130±50	790-1010
32133	Beta-122989	1100±40	880-1015

Conclusions

The excavation, survey, and related analyses at Chac now provide enough information to draw a number of preliminary conclusions regarding the relative importance of the cave and its surrounding settlement for understanding Puuc region prehistory. First, it is clear from our settlement data that the sites of Chac I and Chac II are one and the same. Chac II was one of the major early centers in the eastern Puuc sub-region dating to the Early and Middle Classic periods. Ceramic and radiocarbon dating indicate that the Gruta de Chac was contemporary with Chac II and that the cave was integral both substantively and symbolically to settlement buildup and evolving complexity in the Puuc region.

Many of the earliest settlements within the Puuc region are associated with permanent water sources. Of these sources in the region most are deep caves reaching the subterranean water table that in some cases exceed 100 m below solid limestone bedrock. It is interesting to find that other sites in the Puuc zone and beyond have yielded Chac Polychrome and to a lesser extent Chemax Slateware. Besides the Gruta de Chac, the caves at Kiuic and X-Kukican and the site of Oxkintoc of the Puuc zone as well as the cenote-cave at Maní and the Cenote Xlakah at Dzibilchaltún of northwestern Yucatán have all produced Chac Polychrome pottery. These places appear to have been the foci of a powerful water cult worshipping the ancient Maya rain gods (Chacs), a cult that must have evolved early in the settlement history of the Puuc region. In fact, during the Early Classic period, the Gruta de Chac may have been one of the most sacred places in Northern Yucatán, the abode of the powerful gods of life sustaining rainwater.

As Eric Thompson points out in his introduction to Mercer's *Hill Caves of Yucatán* (1975:xli):

"...in ancient times this cave was primarily devoted to worship of the rain gods (Chacs), as its name implies: that it was chosen for that cult because the difficult approach would keep out women and other intruders; that these handsome and probably imported polychrome jars were for use in the cult and were replaced by less ostentatious jars at a later date; that at the end of given periods, the jars were ritually broken and their fragments piled up; and that if water for ordinary drinking purposes was taken from the pool, then it was probably brought up, as in Stephens' day, in gourds, not in jars."

Thompson was challenging Andrews IV's argument that the formation of the refuse heaps in the cave was produced by the accidental breakage of polychrome vessels transporting water out of the cave. This situation, Andrews IV (1965) argues, changed when someone about a thousand years ago had the bright idea of substituting heavy, breakable pottery with lighter, more portable gourds. Our conclusion follows Thompson's interpretation which proposes that these beautiful polychrome jars were broken within the water cave as part of rituals related to the worship of the Maya rain gods. The fact that no Chac Polychrome has been found nearby the cave may be a product of limited sampling. The more likely scenario, however, is that these vessels

were produced exclusively for cave ceremonies and that these elaborately painted water jars once brought into the cave were rarely removed; that is, offered ceremonially or ritually broken. This behavior better explains why there is so much broken pottery near the water source and why the Maya did nothing to prevent the buildup of refuse heaps in what was clearly one of their most sacred and holy places. In addition, the presence of substantial nonresidential architecture such as a plaza group, stone stelae, and a possible dance platform immediately adjacent to the cave entrance strongly support the sacralized nature of the Gruta.

The specialized architecture around the cave including the large bare platform and open plaza area indicate that large numbers of people were accommodated. These observations support the idea that the cave site was a place for religious gatherings and may have been a site for pilgrimages, perhaps functioning not unlike the Sacred Cenote of Chichén Itzá during the Postclassic period. Indeed, the Gruta de Chac must have contributed significantly to the initial population buildup in this part of the Puuc region by supplying a secure water supply for pioneering settlers. During the Early-Middle Classic periods, large settlements appeared at Chac II and at about the same time ceremonial architecture grows up around the Gruta itself. These patterns suggest that access to the cave's water supply became much more restricted and strictly controlled. The use of chultuns at Chac II beginning by the 4th century A.D. ([Table 1](#), Beta-98319), however, enabled widespread settlement away from permanent water sources making it possible to exploit the vicinity's rich agricultural soils. It was at this time, we argue, that the Gruta became highly sacralized and associated with a water cult worshipping the Chacs. This cult provided a powerful symbolic and perhaps institutional means for attracting settlers to the agricultural rich yet water-poor Puuc hills region.

Some of these early settlers must have become the founders of an emerging elite class whose substantive and symbolic control of a critical resource like water provided a politico-economic foundation for social stratification. The less fortunate settlers, of course, eventually became subjects under the political sway of an elite class. These and other conditions and circumstances such as foreign influence from as far way as Central México set into motion a complex process that would eventually lead to explosive Late-Terminal Classic growth and produce the region's famous Maya cultural florescence. Whether this scenario will hold true in the future, of course, will require continued research and analysis at Gruta de Chac, Chac II, and vicinity.

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