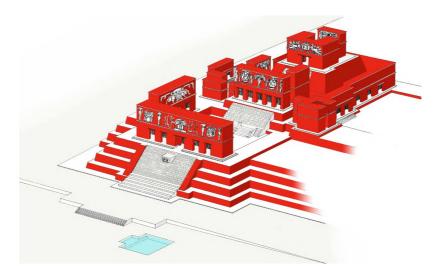
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Hydraulic Systems in Central Cancuén: Ritual, Reservoir, and/or Drainage?

Translation of the Spanish by Eduardo Williams



Research Year: 2005 Culture: Maya Chronology: Late Classic Location: Sayaxché, Petén, Guatemala Site: Cancuén

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Abstract

The Cancuén Archaeological Project's 2005 field season included research of several hydraulic systems, thanks to funds provided by FAMSI. These features are important not just for the interpretation of water management at the site, but also to revise and criticize several theories and general models on this subject.

Hydraulic systems in Cancuén consist of small-scale canals and water reservoirs, which had different functions, such as supplying water for domestic use, the drainage of plazas, and performing ritual activities. Among these features stands out the discovery of a pool located at the Royal Palace's main entrance which has unique characteristics for the whole Maya area. Its function was linked with ritual, political, and diplomatic activities, which could have been performed in the palace. Excavation of the royal pool also included an important discovery, consisting in the skeletal remains of over 30 people, as well as a great amount of flint points and personal ornaments of shell and green stone. Archaeological analysis of these artifacts and of the deposit's context, as well as the assistance provided by forensic analysis, indicate that this was a massacre that took place at the end of Cancuen's occupation, probably the violent murder of the royal family.

The data gathered in Cancuén during the 2005 season show that the use and meaning given to water among the Prehispanic Maya were varied, therefore they must be interpreted according to the conditions pertaining to each settlement. We have to take into account the scale of hydraulic features, their context within the site and their possible function according to water availability for the inhabitants.

Resumen

La Temporada de Campo 2005 del Proyecto Arqueológico Cancuén incluyó investigaciones de varios sistemas hidráulicos, gracias a los fondos proporcionados por FAMSI. Estos son rasgos importantes para la interpretación no solo del manejo de agua en el sitio, sino también para revisar y criticar algunas teorías y modelos generales sobre este tema.

Los sistemas hidráulicos en Cancuén consisten de canales y reservas de agua de escala pequeña, los cuales tuvieron distintas funciones, que incluyen abastecimiento para uso doméstico, drenaje de plazas y uso para actividades rituales. Dentro de estos rasgos destaca el descubrimiento de una piscina ubicada en la entrada principal del Palacio Real, la cual tiene características que son únicas para toda el Área Maya. Su función esta relacionada con las actividades rituales, políticas y diplomáticas que se pudieron llevar a cabo en el Palacio. La excavación de la Piscina Real también incluyó un importante descubrimiento, consistente en los

restos óseos de más de 30 individuos, así como una gran cantidad de puntas de pedernal y ornamentos personales de concha y piedra verde. El análisis arqueológico de los artefactos y contexto de este depósito, así como la ayuda de análisis forenses, indican que se trata de una masacre ocurrida durante el final de Cancuén, posiblemente el asesinato violento de la familia real.

Los datos recabados en Cancuén durante la temporada 2005 demuestran que el uso y significado del agua por parte de los mayas prehispánicos fue variado, y por lo tanto se debe interpretar de acuerdo a las condiciones propias de cada asentamiento. Se debe tomar en cuenta la escala de los rasgos hidráulicos, su contexto dentro del sitio y su posible función de acuerdo a la disponibilidad de agua por parte de los habitantes.

Submitted 07/18/2006 by: Tomás Barrientos, Director Departamento de Arqueología Universidad del Valle de Guatemala tbarrientos@uvg.edu.gt

Introduction: Cancuén and the Alto Pasión Region

The region of the upper basin of the La Pasión River is in the south of the Petén department and in the north of Alta Verapaz, Guatemala, between the following sites: Tres Islas, Cancuén, and Raxruha (Figure 1). This region was of great importance, since it was located in a key position for controlling the La Pasión and Usumacinta route, the main route for communication and exchange in the Maya Lowlands during the Classic period (Figure 2).

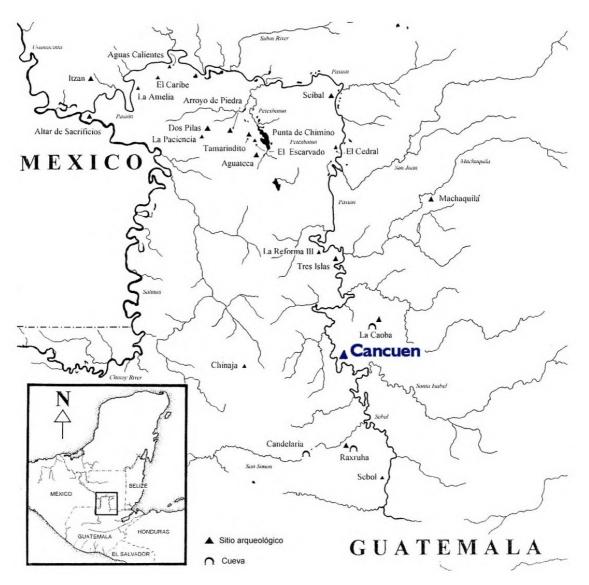


Figure 1. Map of the Rio La Pasión, showing the Cancuén site (Luis F. Luin).

Research carried out by the Cancuén Project in the Pasión River's Upper Basin has given continuity to a series of studies about ancient Maya trade routes (Thompson 1964; Hammond 1972; Tourtellot and Sabloff 1972; Adams 1978; Andrews 1984; Arnauld 1990), including revisions and critiques of older theoretical models, in particular the ones proposed by Rathje, who defines trade as the main cause for the rise of Maya states (Rathje 1971, 1973), as well as for their collapse (Rathje 1972; Webb 1975; Lowe 1985).

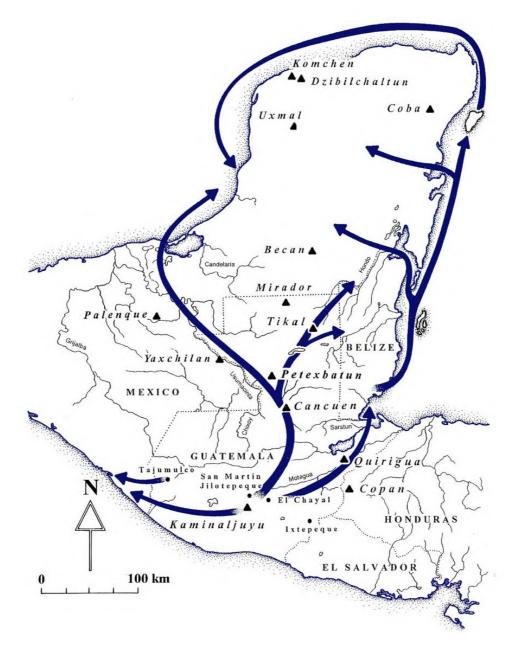


Figure 2. Map of the main communication and trade routes in the Maya area (Luis F. Luin).

The main site in the area is Cancuén, which served as regional capital during the Late Classic. This city is located precisely at the start of the navigable course of the La Pasión River, and to the south are the beginning of the Highlands (the Sierra de Chinajá and the Candelaria cave system) where rivers are not navigable because they have small currents and rapids (Figure 3). This border zone between both regions was the place where products from the Highlands could arrive through land routes for their further distribution via the river toward the northwest, where sites like Seibal, Altar de Sacrificios, Yaxchilán, Piedras Negras, and Palenque were located.

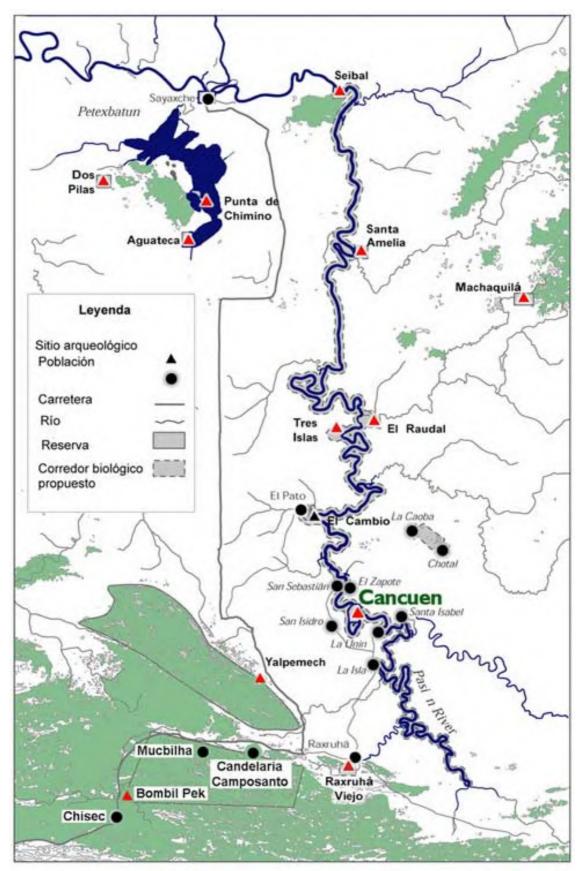


Figure 3. Map of the main sites in the Upper La Pasión River Basin (Tomás Barrientos and Arik Ohnstad).

Background: Previous research at Cancuén

The discovery of the site

During the 20th century Cancuén was the only site identified in the Upper Pasión region, but it was regarded as an unimportant site. Explorer Teobert Maler was the first person to make a report of it (Maler 1908), and Sylvanus Morley visited the site ten years later, publishing it in his important work *Inscriptions of Peten* (Morley 1937).

The explorations carried out by Maler and Morley focused on the search for monuments with inscriptions, so their maps show Cancuén as a site of very modest dimensions. This site remained virtually unknown until 1967, when archaeologists from the Seibal Project made a short visit, which included the elaboration of a more complete map, as well as the excavation of several exploratory pits. These data were included as an annex to the Seibal Project publications (Tourtellot III, Sabloff y Sharick, 1978).

The Petexbatun Project

Cancuen's importance began to be appreciated from work and discoveries at Dos Pilas, performed by the Petexbatun Regional Project of Vanderbilt University (Demarest 1997), including the discovery of the Palace (*el Palacio*), the Funeral Throne (*el Trono Funerario*) and the grave of Cancuen's Lady (*la Mujer de Cancuén*), wife of Ruler 3, *Toh K'in K'awil* (Wolley and Wright 1990). The marriage and alliance between Cancuén and Dos Pilas was also seen in Panel 19, which is a portrait of Ruler 3 and Cancuén's queen, witnessing the first self-sacrifice ritual performed by their heir *K'inich Chan K'awil*, or Ruler 4 (Houston and Stuart 1990; Martin and Grube 2000: 60-1).

The Cancuén Project: 1999-2004

The multidisciplinary studies of the Archaeological Cancuén Project were started in 1999, including the elaboration of a new map, exploratory excavations, and regional surveys. Ceramic information was very important, since it defined a new region in the Maya area (Demarest and Barrientos 1999, 2000). In the following seasons (Demarest and Barrientos 2001, 2002; Demarest *et al.* 2003, 2004; Barrientos *et al.* 2006a) a formal sampling and intensive excavations program was carried out throughout the site's residential area, where clear evidence was found of areas of artisan production, especially lithic materials. Excavations in the monumental Palace and the site's Epicenter have also given important data for the interpretation of Cancuén's political role, especially its control of the La Pasión River region between A.D. 761and 800. On a regional level, work performed in the area of Tres Islas, Raxruhá, and the Candelaria cave system has been of the utmost importance.

During the seven years of work in the Alto Pasión, the Cancuén Archaeological Project has also been involved in several social aspects, defining new alternatives for interaction between the government, the communities and the scientists in matters dealing with conservation, sustainable tourism and research of Guatemalan cultural heritage.



Figure 4. Map of Cancuén (Tomás Barrientos, Luis F. Luin and Marc Wolf).

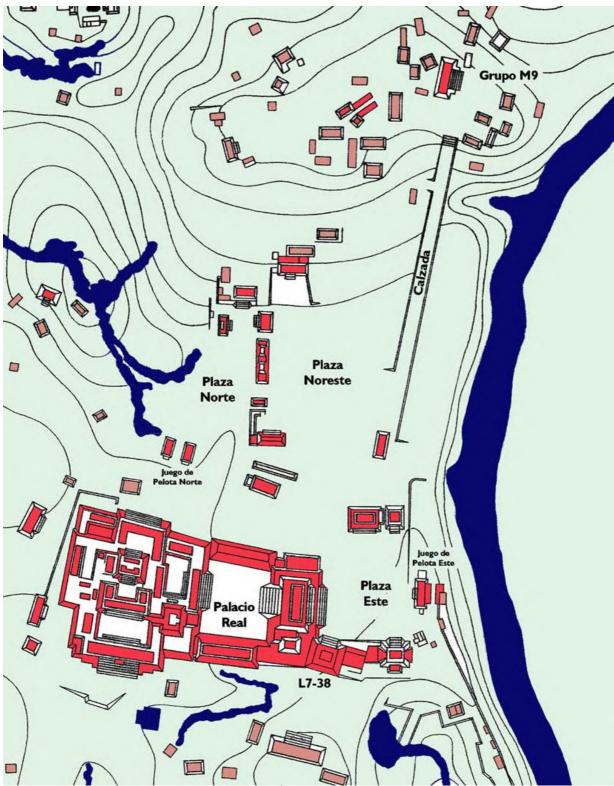


Figure 5. Map of Cancuén's epicenter (Tomás Barrientos, Luis F. Luin and Marc Wolf).

The site of Cancuén is located in a peninsula formed by the La Pasión River, therefore it was in a good position to function as port and to control the flow of products through this important route (Figure 4). Its ceremonial center is dominated by the Acropolis or Royal Palace, where most buildings were concentrated and which surely functioned as political-administrative centers. To the palace's north and

east there are three plazas: the East Plaza contains several uncarved monuments and shrines or small temples, as well as the only monumental pyramid (L7-38) and the East Ball Court, dedicated by ruler *Taj Chan Ahk*. The North Plaza includes the ball court of the palace and a series of residential and ceremonial buildings of sub-monumental size. To the east the Northeast Plaza is bounded by a causeway in its eastern end, which links the epicenter with the residential areas and artisans' workshops located to the north (M9 and M10 groups) (Figure 5).

Previous research in Cancuén had provided us with very important data regarding the economy, trade and political relations of this ancient city (Kovacevich *et al.* 2001, 2002, 2003), but no specialized studies had been carried out dealing with ritual aspects, such as water use and symbolism. However, since the start of the project in 1999 we had noted a settlement pattern strongly linked with water management, since this is one of the main factors that defined the location of the structures. The residential groups are generally found in elevated and well-drained areas, surrounded by water springs, streams, and areas prone to flooding or *bajos* formed by the rise of the river's level during the eight months of the rainy season (Figure 6).

Initial surveys by O'Mansky and Barrientos identified the zone of bajos to the north, west, and south of the peninsula where the site is located, as well as two main streams which drain the epicenter toward the south and the west (O'Mansky 2001; Woodfill *et al.* 2002). Among the features associated with floods caused by the La Pasión River, it was very important to identify five natural bays which may have been utilized in ancient times as docks. Outstanding among these is the area known as "El Puerto" (the port), whose association with Palace M9-1 and the site's main causeway indicates its possible function for transport of goods and for other commercial activities (Alvarado *et al.* 2003; Alvarado 2004).

As part of the residential sampling program, in the 2002 season John Tomasic investigated a group of residential structures in the site's K9 quadrant, known as "Grupo Los Patos" (Tomasic 2003). This group is located 460 m to the northwest of the epicenter, and is characterized by having a small round *aguada* (i.e. a water source in a small depression in the landscape) 10 m in diameter, located in its northeast end, and fed by a small drainage canal (Figure 7). The following year Arik Ohnstad carried on with the excavations in this group, revealing another small water reservoir in the center of the main patio (Ohnstad *et al.* 2004). The excavations conducted by Tomasic and Ohnstad in the Los Patos group revealed the first data on water use in Cancuén, indicating that the small aguada was an intentional modification with a domestic use. However, inside the aguada we found evidence of some ritual activities, especially an offering containing an inverted bowl and a human mandible (Figure 8).

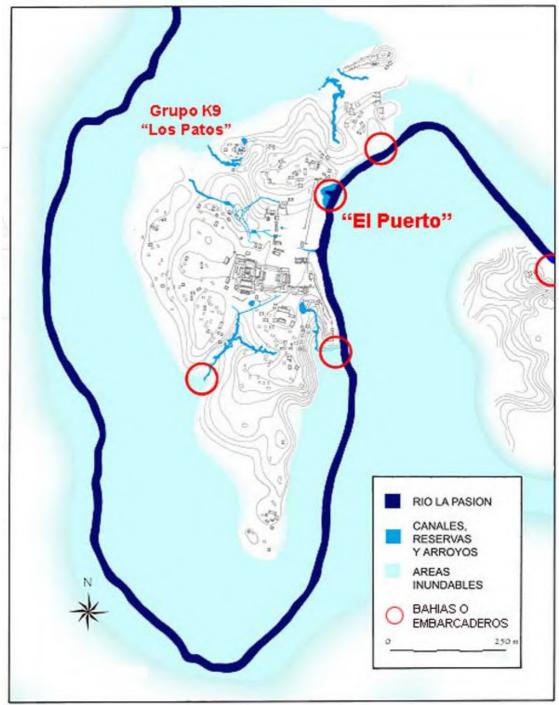


Figure 6. Map of Cancuén showing flooded areas and docks (Tomás Barrientos, Luis F. Luin and Marc Wolf).

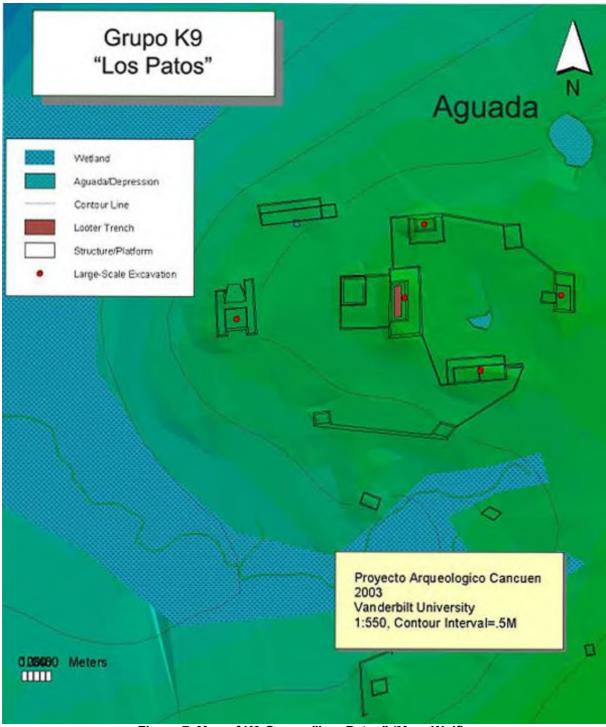


Figure 7. Map of K9 Group, "Los Patos" (Marc Wolf).

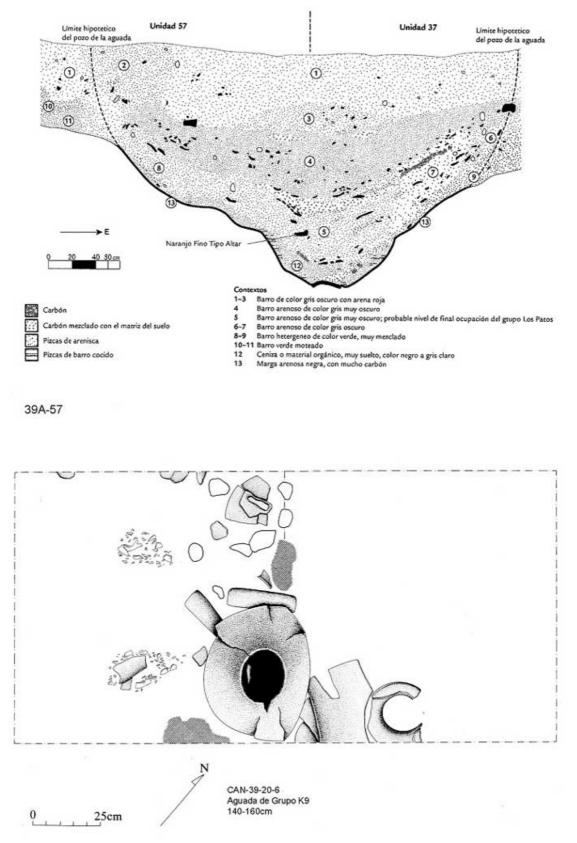


Figure 8. Side view of Group K9's aguada and plan of associated offering (Luis F. Luin and Arik Ohnstad).

Research in 2005: Northeast Aguada, North Drain and North Aguada

Background

The elaboration of the detailed map of Cancuen's epicenter was started in 2004 by Marc Wolf, and resulted in the discovery of three important hydraulic features (Wolf 2006). The first feature was identified initially by the existence of a water spring under the west structure of the Palace's Ball Game. The spring is connected with a series of streams and stone canals which were called North Drain. The second feature is a water reservoir called North Aguada, which is directly linked with the north drain. Lastly, the third feature was the presence of a *bajo* in the Northeast Plaza, which fills up with water during the rainy season. However, it was seen that this bajo, initially called Northeast Aguada, is not located in a very convenient place, since it blocked the course of the site's main causeway. This called into doubt the existence of an aguada, as well as the causeway's function (Figure 9).

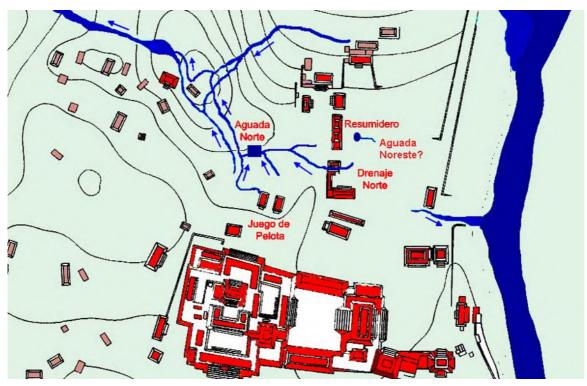


Figure 9. Map of the hydraulic systems located to the north of the epicenter (Tomás Barrientos, Luis F. Luin and Marc Wolf).

Excavations in the Northeast Aguada and the Main Causeway

Because of the doubtful definition of the Northeast Aguada, as well as its relation with the site's main causeway, we decided to investigate both areas through Operation 48, performed by Tomás Barrientos and Silvia Alvarado. Methodology was based mainly in 1 x 1 m exploratory pits, although some trenches and extensions were excavated as well. Altogether 64 excavation units were carried out (Figure 10).

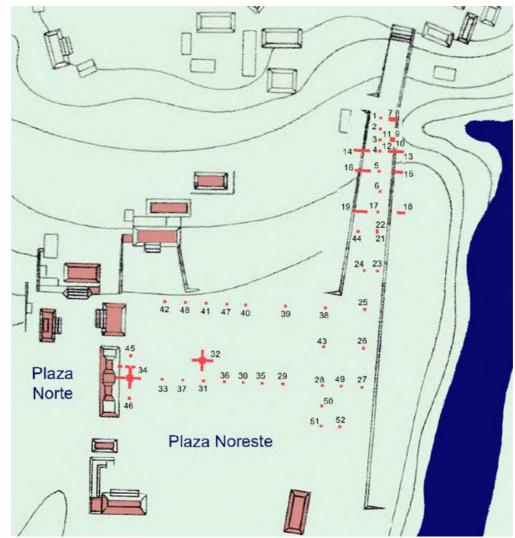


Figure 10. Location of the excavation units of Operation 48 (Tomás Barrientos, Luis F. Luin and Marc Wolf).

The 1 x 1 m test units located in the causeway were distributed according to a northsouth axis, with a distance of 5, 10 or 20 m between them (Figure 11). Apart from the test pits, we dug trenches in the causeway's eastern and western limits, as well as in the southern limit of the defensive wall located at the start of the causeway. Each pit and trench was taken as an excavation unit.

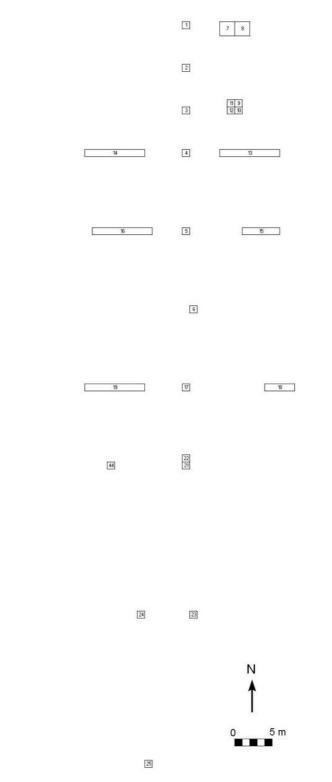


Figure 11. Drawing of the excavation units in the causeway (Tomás Barrientos).

The following units were located within the causeway: CAN 48-1 to CAN 48-6, CAN 48-17, and CAN 48-21 to CAN 48-28. The upper humus stratum was removed to an approximate depth of 20 cm, exposing the causeway's surface. This consisted of a floor or stone pavement with small yellow and orange sandstones, small limestones and river cobbles (Figure 12). In some cases the cobblestone paving was not found, because of perturbation by tree roots. Units CAN 48-49 to 48-52 were located in the

south end of the causeway, where the same pavement was revealed as in the previous units. This showed that the causeway runs without interruption from the M9 group to the north limit of the East Plaza.

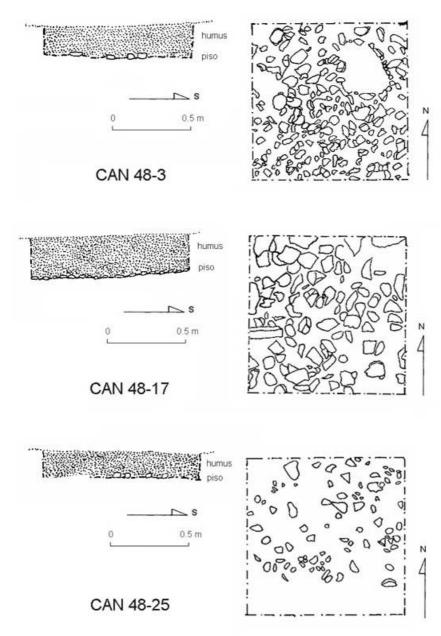


Figure 12. East profile and plan of some test pits that discovered the causeway's floor (Oswaldo Cuc)

CAN 48-7 and CAN 48-8 units exposed the southern end of a defensive wall running parallel to the causeway's northern limit. This wall had already been investigated in previous seasons. We confirmed its width of approximately 1 m (Figure 13). Units CAN 48-9 to CAN 48-12 exposed a possible side entrance precisely where the defensive wall ends and in the starting point of the terrace bordering the causeway on its eastern side. It is important to point out that the causeway is not elevated, but rather of the sunken kind, since it is bordered by a terrace on each side.

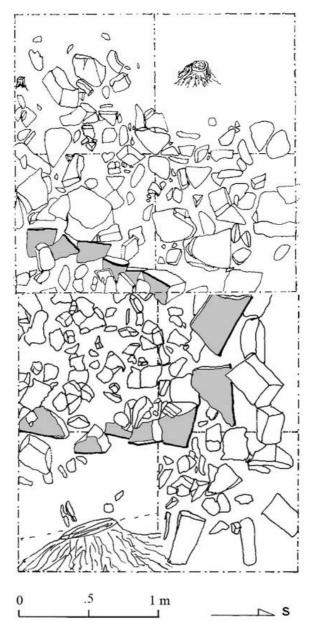


Figure 13. Plan of CAN 48-7 and CAN 48-8 units, showing the southern end of the causeway's defensive wall (Oswaldo Cuc and Tomás Barrientos).

Units CAN 48-13 to CAN 48-16 and CAN 48-18 to CAN 48-19 were trenches to define the sides of the causeway, formed by terraces that modified the natural landscape (Figure 14). We found some features of informal architecture which may have formed retention walls for the terraces, although we did find the remains of a formal wall in CAN 48-18 unit (Figure 15).

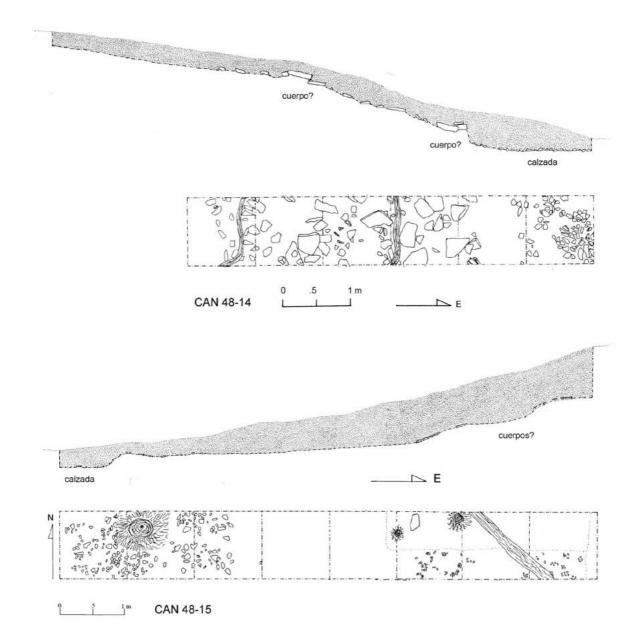


Figure 14. North profile of CAN 48-14 and CAN 48-15 units, showing the stepped terraces defining the causeway's sides (Oswaldo Cuc).

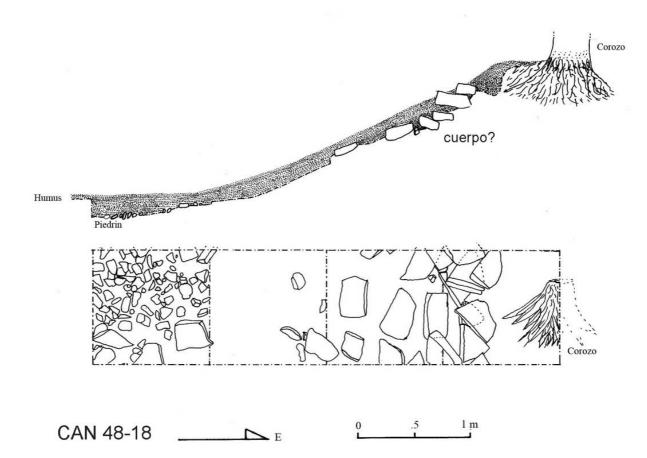


Figure 15. North profile of CAN 48-18 unit, showing the wall forming the terrace that defines the eastern side of the causeway (Oswaldo Cuc).

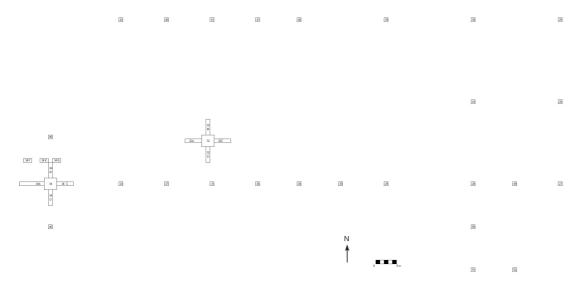


Figure 16. Drawing of the excavation units in the Northeast Plaza (Tomás Barrientos).

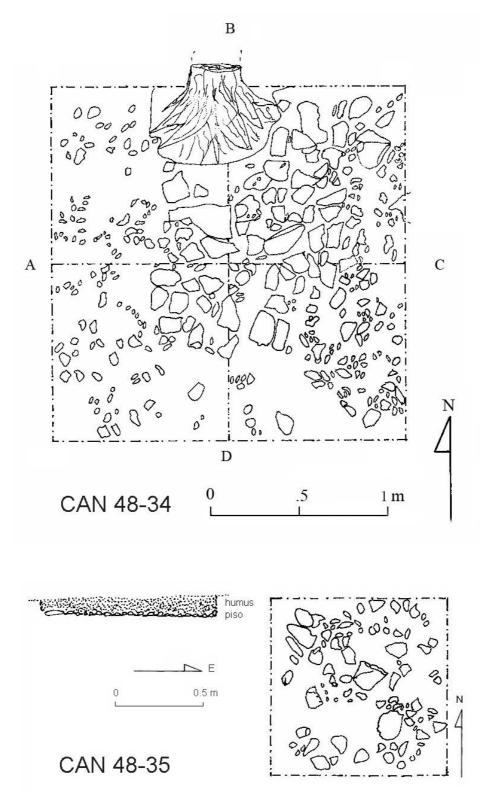


Figure 17. Plan of CAN 48-34 and CAN 48-35 units, showing the floor of the Northeast Plaza (Oswaldo Cuc).

Units CAN 48-29 to CAN 48-37 were located on an east-west axis, directly above the possible location of the Northeast Aguada (Figure 16). Upon removing the humus

layer of around 20 cm we discovered a stone floor of similar characteristics as the floor of the causeway, but with bigger stones, a greater percentage of limestone and sandstone, and very little river cobbles (Figure 17). In the CAN 48-32 unit and its four extensions we went under the floor, finding clay-like soil but no other evidence of construction. CAN 48-34 unit was located in the west end of the plaza, near the L8-5 Structure. Toward the west, in the extension CAN 48-34B, the paving showed limestones of greater size and near the structure we exposed several slabs forming a banquette. Toward the north, in the CAN 48-34A extension, we located a small canal which led to a small hole exposed in the CAN 48-34F and CAN 48-34G showed how the plaza floor descends toward the drain on its east and west sides.

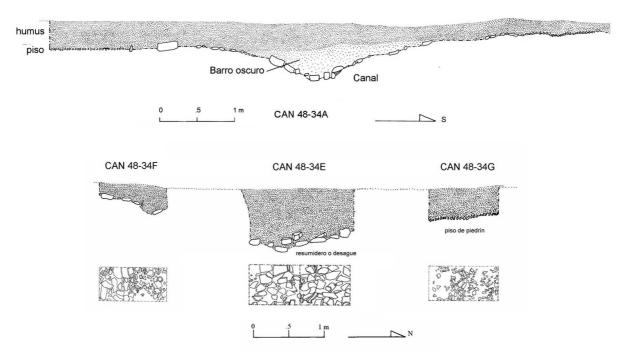


Figure 18. East profile of CAN 48-34A unit and west profile of CAN 48-34E, CAN 48-34F, and CAN 48-34G units, showing the canal and drain of the Northeast Plaza (Oswaldo Cuc).

To the north of the former units another series of 1 x 1 m pits was laid down on an east-west axis, including the following units: CAN 48-38 to CAN 48-42, CAN 48-47 to CAN 48-48. Upon removing the humus layer we found a cobblestone pavement with the same characteristics, although dominated by small sandstones (Figure 19). This floor was also exposed in units CAN 48-45 and CAN 48-46.

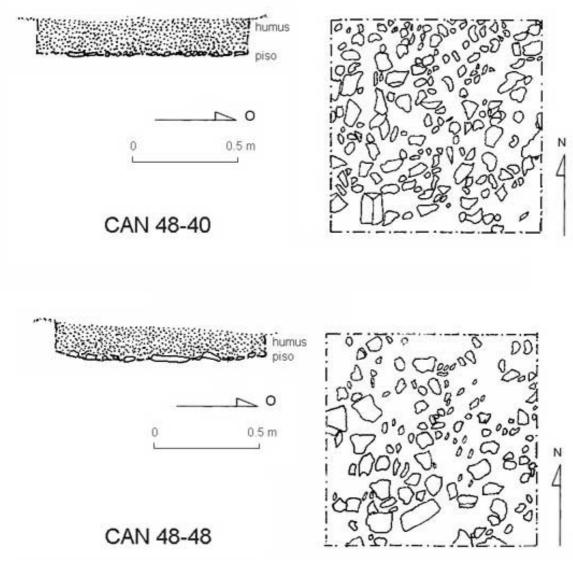


Figure 19. Plan and south profile of CAN 48-40 and CAN 48-48 units, showing the floor of the Northeast Plaza (Oswaldo Cuc).

In the southwest end of the Northeast Plaza we located units CAN 48-45 to CAN 48-55, each one measuring 2 x 2 m. Humus was removed from them, exposing the start of a canal that functioned as drain for the plaza, in the spot where the canal system of the site's North Drain started. The canal was bordered by L8-6 Structure, which is a low platform, and its surface showed a cobblestone pavement similar to the causeway, although with the presence of some slabs (see below, under Excavations in the North Drain).

Except for the areas with perturbations caused by roots or trees, each one of the laid-down pits showed the presence of a pavement, which corresponds to the floor of the causeway and the Northeast Plaza. We could also see that the plaza has a slight depression toward the west, showing that the water used to run in that direction to a small canal marking the start of the canal system called North Drain.

This system prevented the plaza from being flooded, so it was also shown that the so-called Northeast Aguada did not exist. Therefore, the current flooding of the

Northeast Plaza is due to the fact that the humus layer prevents it from having a proper drainage (Figure 20).



Figure 20. Photo of the flooded Northeast Plaza, which initially was considered as the "Northeast Aguada" (Tomás Barrientos).

Excavations in the North Drain

The North Drain consists of a series of canals located in the site's North Plaza, which served to drain the whole area to the north and west of the Palace, as well as the Northeast Plaza. Likewise, they served to channel the water spring under L7-33 Structure of the Palace's Ball Court. Excavations consisted of 13 units, and were carried out by Tomás Barrientos and Silvia Alvarado. Most of the units were trenches located perpendicular to the canals, with the objective of exposing their surface and obtaining transects (Figure 21). We have to point out that these canals are still functioning, so the water has completely uncovered their surface in some parts (Figure 22). Because of this it was not necessary to perform many excavations to define their shape and construction features.

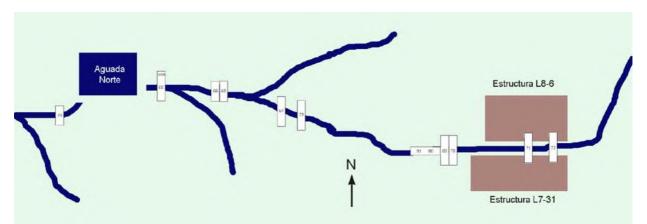


Figure 21. Drawing (not to scale) of the excavation units located in the canals forming the North Drain (Tomás Barrientos).



Figure 22. Photo of the main canal of the North Drain, before its excavation (Tomás Barrientos).

The west end of the main canal was excavated with the unit CAN 48-65, located in the meeting point with the North Aguada. A series of big slabs were exposed with north-south orientation, just like in units CAN 48-66 and CAN 48-67 (Figure 23). The canal's sides also showed small slabs laid down as a possible contention wall.

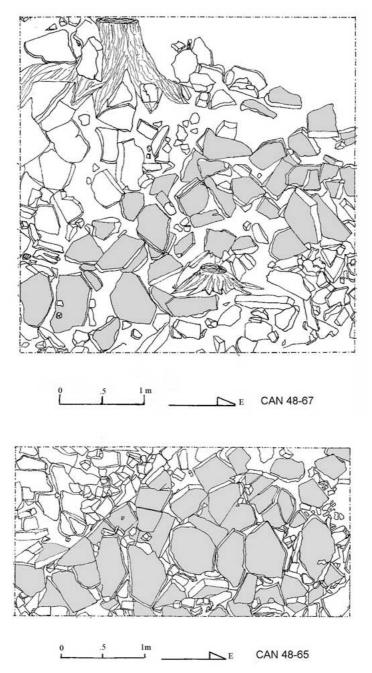


Figure 23. Plan of CAN 48-65 and CAN 48-67 units, showing the slabs that form the main canal of the North Drain (Oswaldo Cuc and Tomás Barrientos).

The east side of the canal was exposed initially with units CAN 48-69, CAN 48-69A and CAN 48-70, where we found at a small depth a series of finely worked faced stones, laid down as a slab floor which surely was the surface of the bottom of the canal where the water used to run (Figure 24). This feature was also exposed in the following units: CAN 48-79, CAN 48-80 and CAN 48-81 (Figure 25).

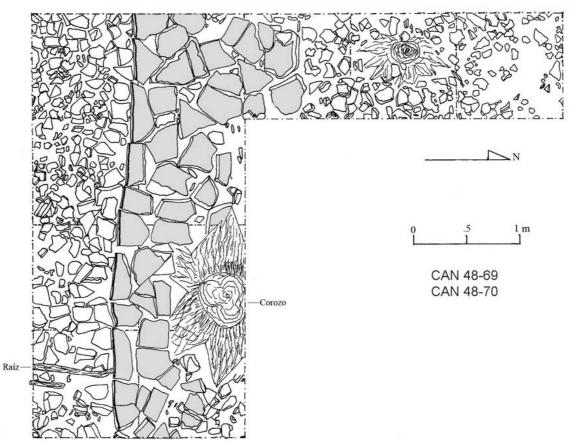


Figure 24. Plan of CAN 48-69 and CAN 48-70 units, showing the slabs that form the main canal of the North Drain (Oswaldo Cuc and Tomás Barrientos).



Figure 25. Photo of CAN 48-69, CAN 48-70, CAN 48-80, and CAN 48-81 units, showing the slabs that form the main canal of the North Drain (Tomás Barrientos).

The canal's east end is found between structures L8-6 and L7-31, and was excavated through units CAN 48-71 and CAN 48-72. The bottom of the canal was exposed, which is made up of slabs and of part of the stepped bodies of both structures (Figure 26).

Excavations in the main canal of the North Drain disclosed a construction based on stone slabs, in parts showing a very fine finish, especially in the canal's central part. This canal seems to have small dikes which could have kept the water free of trash. Toward the west it is joined by another small stream until it reaches the North Aguada. The quality of the work in laying down the canal's slabs suggests that considerable labor was invested in its construction, supporting the idea of a function that went beyond the drainage of the plazas, possibly with a ritual association.

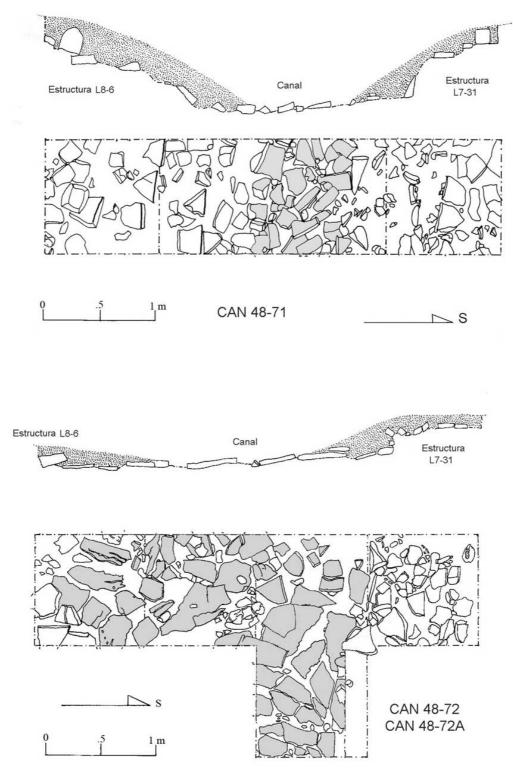


Figure 26. Plan and east profile of the CAN 48-71 and CAN 48-72 units, showing the main canal of the North Drain (Oswaldo Cuc and Tomás Barrientos).

Excavations in the North Aguada

Within the system known as North Drain there is a small reservoir that fills up with clean water during the rainy season (Figure 27). This aguada is fed from its east side

by two canals (one of which functioned as drain for the Northeast Plaza). Starting from a dike another canal of bigger proportions is originated, which meets up with other three canals to form a stream that follows in that direction until reaching the La Pasión River. Excavations in this aguada were carried out using a grid of $2 \times 2 \text{ m}$ pits, 15 of which were excavated under the direction of Tomás Barrientos and Silvia Alvarado (Figure 28).



Figure 27. Photo of the North Aguada before its excavation (Tomás Barrientos).

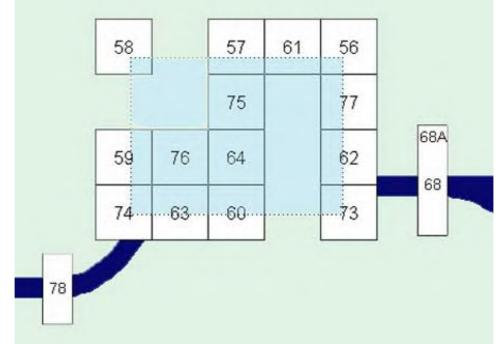


Figure 28. Drawing of excavation units in the North Aguada (Tomás Barrientos).

The CAN 48-56, 48-57, 48-58, and 48-61 units were located in the north end of the aguada, and units CAN 48-62, 48-73 and 48-77 in the east end. The western end was investigated in units CAN 48-58, 48-59 and 48-74, with units CAN 48-60 and 48-63 in its southern end. In the center of the aguada three units were laid down: CAN 48-64, 48-75 and 48-76. These excavations went through a fill of dark brown clay-like earth, almost black and of a soft texture. The sides of the aguada showed evidence of alignments or walls of coarsely worked limestone and sandstone, with east-west and north-south orientation. These walls do not seem to have been vertical, but descended toward the center (Figure 29). As we excavated toward the center, water started to flow at a depth of 0.80 m, which prevented us from finding the bottom of the aguada (Figure 30). However, this indicated the presence of a water spring, which is important because it constitutes a source of fresh water that could have been used by the inhabitants of the North Plaza for domestic or ritual use. This also explains why the residences located in this zone are among the oldest in the site (Arriaza and Barrientos 2006).

In the aguada's southwest corner a stone wall was partially defined which functioned as a dike or small dam, since to the west a canal starts on a level lower than the aguada. We tried to investigate the water flow toward the canal (CAN 48-74 unit), but the water level prevented us from discovering the relationship between the canal and the bottom of the aguada. The CAN 48-78 unit was located on the canal to the west, where a great amount of stones were exposed, suggesting that the water may have flowed underground.



Figure 29. Photo of the southwest corner of the North Aguada during its excavation (Tomás Barrientos).



Figure 30. Photo of the excavation of the south wall of the North Aguada (Tomás Barrientos).

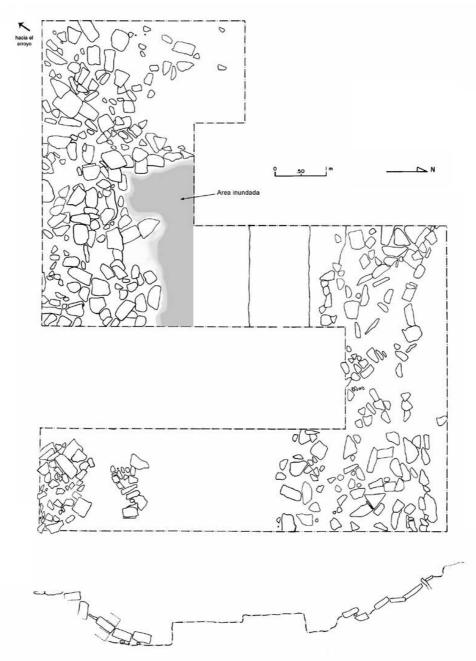


Figure 31. Plan and profile of the exposed portion of the North Aguada (Luis F. Luin).

Although the North Aguada superficially resembles a natural bajo or depression, we found plenty of evidence of modification, and it is likely that all its surface was covered with stone. The architecture of this aguada shows a rough construction with little-worked sandstone, something very different from the South Aguada or Royal Pool (see below).

Although the North Aguada was not excavated in its entirety, we could define a rectangular shape of 7 x 10 m, with its longest part on an east-west axis (Figure 31). Its sides show an inclination towards the center, creating a truncated conical shape, where the bottom appeared to measure 3 x 5 m. Although this may be due to the collapse of vertical walls, this is not likely the case.