Analysis of Archaeological Artifacts from Cotzumalhuapa, Guatemala

Research Year: 2003
Culture: Maya
Chronology: Late Classic
Location: Southern Guatemala
Site: Cotzumalhuapa

Table of Contents

Annex I. Preliminary Report on the Artifact Analysis of the Obsidian Workshop at El Baúl

Abstract

Recent research at Cotzumalhuapa focused on the extensive system of causeways and bridges that linked together the settlements and major architectural compounds of the ancient city. Further excavations investigated a large obsidian workshop dump and associated structures, including possible workshop platforms and a probable sweat bath. Analysis of ceramics from these excavations provides a basis to date of the construction and use of the causeways, and the use of the obsidian workshop area. Analysis of obsidian debris recovered from the dump revealed details on the production of both prismatic blades and projectile points from raw materials imported from highland sources. The location of the workshop suggests a degree of centralized control of the industry.

Resumen

Las investigaciones recientes en Cotzumalhuapa se enfocaron en el extenso sistema de calzadas y puentes que integraba los asentamientos y conjuntos arquitectónicos principales de la antigua ciudad. También se excavó un gran basurero de desechos de talla de obsidiana, y algunas estructuras asociadas, que incluyen posibles plataformas del taller y lo que parece ser un baño de vapor. El análisis de la cerámica de estas excavaciones provee una base para fechar la construcción y el uso de las calzadas, y el uso del área del taller. El análisis de los desechos de obsidiana recuperados en el basurero revela detalles de la producción de navajas prismáticas y puntas de proyectil, a partir de materias primas importadas de las fuentes en el altiplano. Lo localización del taller sugiere un grado de control centralizado de la industria.

Submitted 06/16/2004 by:

Dr. Oswaldo Chinchilla Mazariegos
ofchinch@ufm.edu.gt

Introduction

Recent excavations at Cotzumalhuapa, Guatemala, have significantly improved our understanding of this ancient city, one of the largest capitals in Southern Mesoamerica during the Late Classic period. Located on the Pacific coastal piedmont (Figure 1), on the lower slope of the active Fuego volcano, Cotzumalhuapa has long been known for its distinctive sculptural style (Habel 1878; Bastian 1876, 1882; Seler 1892; Thompson 1948; Parsons 1967, 1969), which may now be interpreted as the monumental means of expression of a powerful ruling elite that commanded this major center and extended its political and cultural prestige over a large region of southern Guatemala (Chinchilla 1996a; 2002a; Chinchilla *et al*. 2001; cf. Wobst 1977). Their city covered an approximate 10 km^2, which included the major architectural compounds of Bilbao, El Baúl, and El Castillo. These compounds were integrated by an extensive system of causeways and bridges that also linked together other habitational and ceremonial areas. Cotzumalhuapa ranks among the major Late Classic centers of southern Mesoamerica, and therefore, its proper study is germane for current discussion of the complex political and cultural landscape of this period.

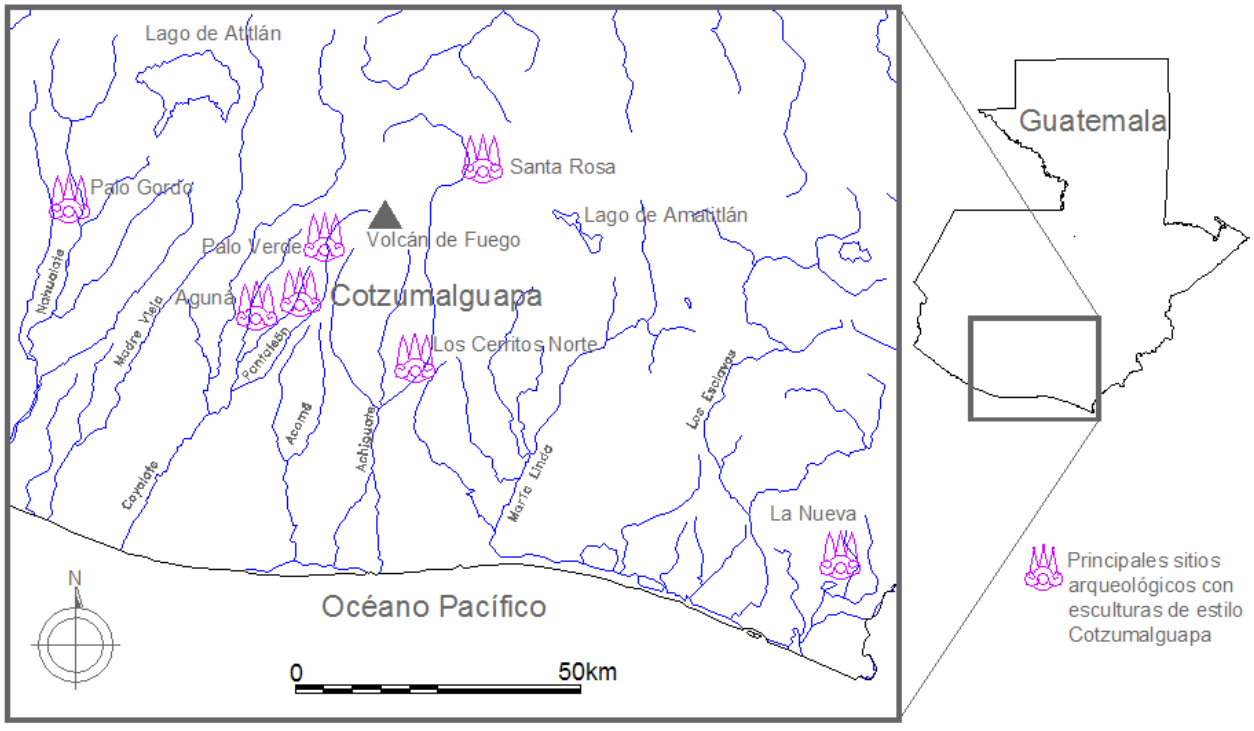

Figure 1. Map of Southern Guatemala, showing the location of Cotzumalhuapa and other sites on the Pacific coast (DWF file available)

This project focused on the analysis of archaeological artifacts from Cotzumalhuapa, Guatemala, recovered during field research carried out by the author between 2000 and

2002. This research was possible thanks to grants and support provided by FAMSI, the National Geographic Society, the Wenner-Gren Foundation for Anthropological Research, and the Popol Vuh Museum, Francisco Marroquín University. It included: (a) Excavations carried out along the causeway system; and (b) Excavations in an extensive obsidian workshop dump in the vicinity of El Baúl. Funding provided for by FAMSI for the analysis of artifacts made it possible to complete the analysis of ceramics from these excavations, and to advance significantly in the analysis of obsidian debris from the El Baúl obsidian workshop dump. Analysis of these materials provided significant insights on the chronology and function of the excavated areas. Analysis of obsidian recovered from the El Baúl workshop dump is especially significant because of its potential to reconstruct aspects of the political economy of ancient Cotzumalhuapa, including the procurement of commodities and the production processes involved in the transformation of raw materials.

Laboratory analysis was conducted by a group of students from the University of San Carlos, Guatemala, supervised by the author, with the assistance of M.A. Edgar Carpio, who directed the analysis of obsidian; and Licenciado José Vicente Genovez, who provided advice on the analysis of ceramics. Regina Moraga organized laboratory activities and conducted the major part of ceramic analysis. Participant students included Margarita Cossich Vielman, Ana Cristina Morales, Elisa Mencos, Paola Duarte, Rafael Castillo, Victor Castillo, Edgar Bendfeldt, and José Luis López.

The Cotzumalhuapa Causeways

Description

The map in Figure 2 summarizes our current knowledge of Cotzumalhuapa. The monumental compounds of El Baúl and Bilbao stood on the northern and southern parts of the city. Both are large acropolis-type platforms sustaining numerous buildings, with large concentrations of monumental sculpture. The enclosed and elevated layout of El Baúl suggests a defensive function, while Bilbao appears to be more open and accessible. El Castillo is a smaller but significant concentration of monumental architecture and sculpture, dominated by a ten-meter high mound that overlooks what appears to be an open plaza. Another important ceremonial compound was probably located at Golón, on the southeastern part of the city. No monumental architecture is visible today, but an important group of monumental sculptures appeared in this sector (Chinchilla 1996a: 269-272).

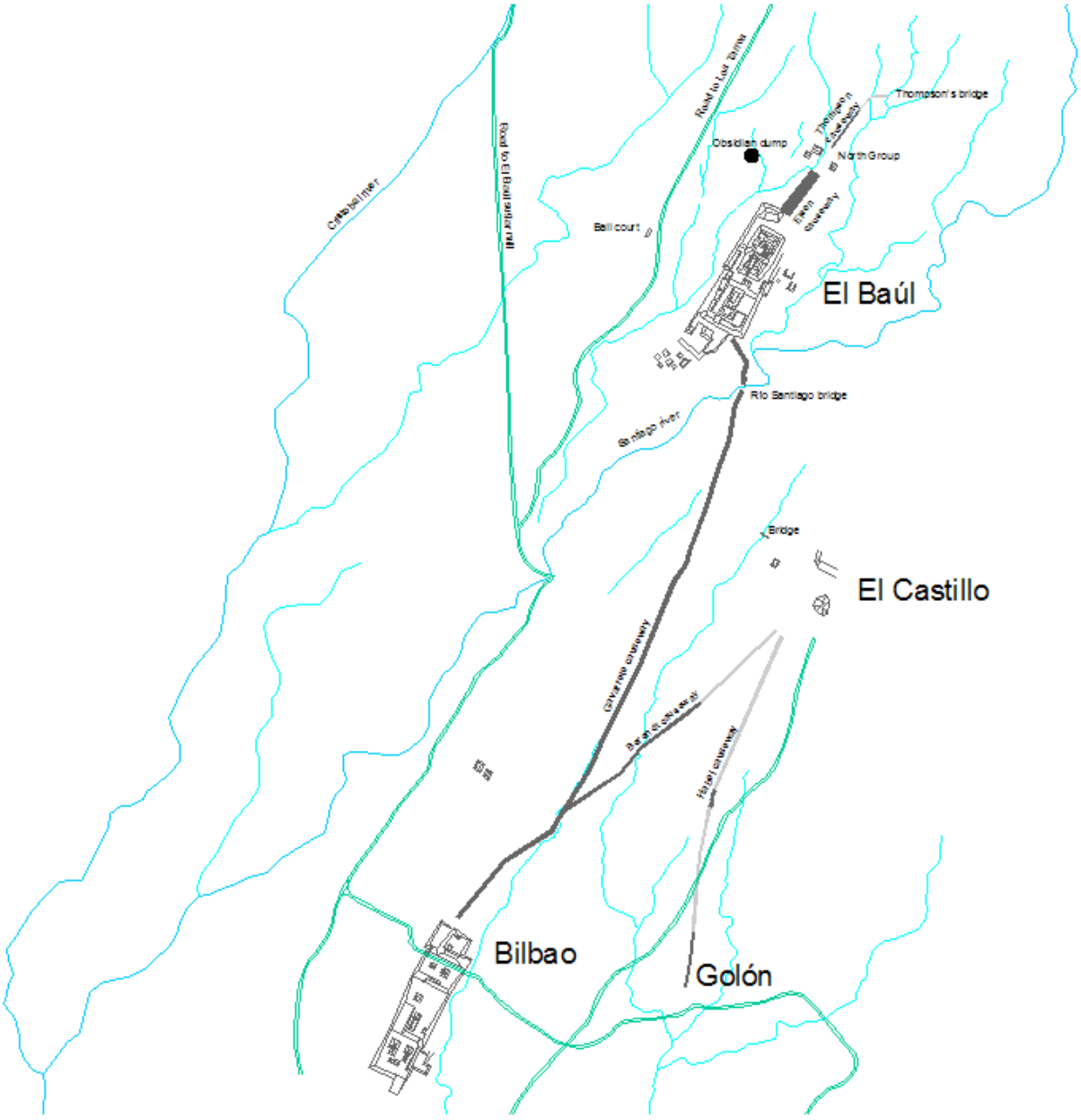

Figure 2. The Cotzumalhuapa Nuclear Zone (DWF file available).

These compounds were linked together by a system of stone-paved causeways identified by project excavations between 1997 and 2002. The causeways were named after early pioneers of Cotzumalhuapa archaeology. The following causeways have been identified so far:

Gavarrete Causeway, named after the Guatemalan historian and archivist Juan Gavarrete, who published the first report on Cotzumalhuapa archaeology (1929[1866]). This was the main avenue in the city, averaging 11-14 meters wide, and stretching

along a distance of 2.5 km, to communicate the acropolises of Bilbao and El Baúl. Before entering El Baúl, the causeway ran across a large bridge over the Santiago river gorge. The foundation walls of the bridge, which most probably sustained a wooden structure, are still visible along a 30-meter span of the river course. An excavation carried out on the western side of the river gorge revealed two constructional stages for the causeway at this location, both of which date to the Late Classic period.

Berendt Causeway, named after the German linguist and archaeologist Carl Hermann Berendt, who conducted research at Cotzumalhuapa for the Ethnographic Museum of Berlin, Germany, in 1876 (Bastian 1882; Chinchilla 1996b). This smaller, 8-10 meter wide causeway branched off from the Gavarrete Causeway to communicate Bilbao with El Castillo.

Habel Causeway, named after Simeon Habel, Swedish traveler who made drawings of Cotzumalhuapa sculpture in 1863, and eventually published the first comprehensive report (1878). This is the second largest causeway in the city, extending an estimated 1.3 km between El Castillo and Golón, with an average width of 10 m. The Habel and Berendt causeways apparently converged near El Castillo. However, modern urban developments prevented the detection of their northernmost sections.

Eisen Causeway, named after Gustav Eisen, traveler and ethnologist who published an important report on Cotzumalhuapa sculptures, and first called attention to the style's presence in Antigua Guatemala (1888). The causeway stretches about 180 meters from the El Baúl acropolis to the North Group, a group of prominent mounds that was thus fully integrated within the site's ceremonial precincts. Excavations undertaken on the southern part of the causeway revealed its extraordinary width of about 40 meters. In fact, the causeway may give the appearance of an elongated plaza, except for the fact that it is not leveled, but rises sharply northward.

Thompson Causeway, named after J. Eric S. Thompson, who conducted the first modern archaeological investigation at Cotzumalhuapa (1948), and reported a small bridge that still stands about one kilometer north of El Baúl. The presence of this bridge first provided a clue for the existence of causeways going northward from El Baúl. As it turned out, the Thompson causeway is a very narrow avenue, only 4-5 meters wide. It runs northeast from the El Baúl North Group in the direction of Thompson's bridge. Presumably, the causeway continues past the bridge, reaching an important settlement area on the other side, whose presence was determined by surface reconnaissance.

The Thompson causeway suggests that there may be numerous other small causeways extending to outlying settlements, but their small size makes their detection difficult. Interestingly, there appears to be no direct avenue joining El Castillo with El Baúl, but its existence cannot be absolutely discarded.

Ceramic Analysis

Ceramics recovered from a large portion of the Gavarrete causeway were analyzed. The typological analysis was carried out using the typology of Pacific coastal ceramics developed by Frederick Bove, José Vicente Genovez, and Sonia Medrano (in preparation). This typology is partly based on Lee Parsons' (1967) study of ceramics from his excavations at Bilbao, with significant modifications based on previous excavations at Cotzumalhuapa and elsewhere on the Pacific coast. Based on their analysis, Bove and his collaborators developed a new chronological sequence for Escuintla, supported by a series of radiocarbon dates (Figure 3; Chinchilla, Bove, and Genovez n.d.).

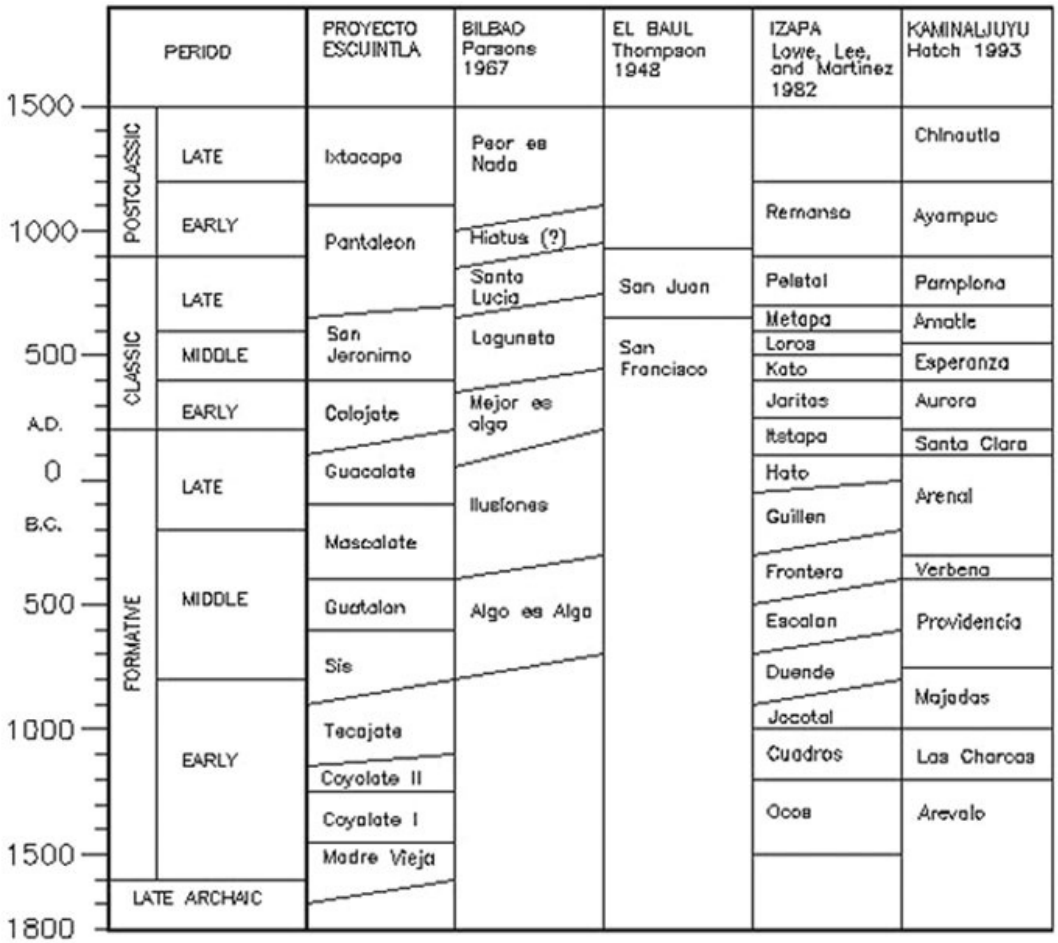

Figure 3. Chronological chart for Escuintla, based on unpublished research by Frederick Bove, Sonia Medrano, and José Vicente Genovez.

Causeway excavations were largely limited to the upper layers or recent soils and sediments above the causeway pavements. Therefore, the materials recovered do not

necessarily provide dates for the construction of the causeways. They may include considerable amounts of materials that were transported by natural erosion and human agents from other locations, and redeposited above the causeway pavements. Yet, the composition of the sherd collections is largely consistent with patterns observed elsewhere at Cotzumalhuapa, and it seems probable that they reflect the composition of ceramic assemblages in the general area traversed by the causeways. Typically, they include small amounts of Postclassic sherds, which are restricted to the most superficial levels. Middle to Late Classic materials are overwhelmingly dominant in every assemblage. Diagnostic sherds from the Formative and Early Classic periods are also found occasionally.

An important problem in Cotzumalhuapa archaeology involves the discrimination of Middle and Late Classic materials. As first observed by Parsons (1967: 142-143), numerous Middle Classic types continue into the Late Classic period. These include numerically important types such as Tiquisate and Perdido. However, they are mostly found mixed with Late Classic diagnostics such as Diamantes, San Andrés, and San Juan Plumbate. Therefore, any particular context that includes Late Classic diagnostics is considered to be Late Classic in date. Only those rare contexts that include no Late Classic diagnostics are considered to be Middle Classic.

Operation VA11D (Figure 4) may serve as representative of the ceramic assemblages recovered from excavations in the Gavarrete causeway. This operation is located 110 meters south of the bridge on the Santiago River, on the side opposite to El Baúl. The operation included two trenches (respectively 2×8 m and 2×6 m), that revealed the eastern and western sides of the causeway. These trenches were divided in 2×2 m excavation units. At this point, the causeway rises from the river gorge to the reach level of the terrain above. The natural terrain was substantially leveled and the excavation trench revealed a retaining wall built on the western side of the causeway, which still rises 60 cm, with three courses of stones preserved on the outer (western) side. On the eastern side, the causeway adjoins a natural elevation that was probably cut to level the causeway, and provided with a rough stone facing.

Two additional 2×2 m pits (units S10 and V10) were excavated 8 m south of the previous trenches. They revealed the causeway pavement and its western edge. At this point, there was no further need for substantial leveling, and therefore, the causeway is delimited by a single line of roughly aligned stones.

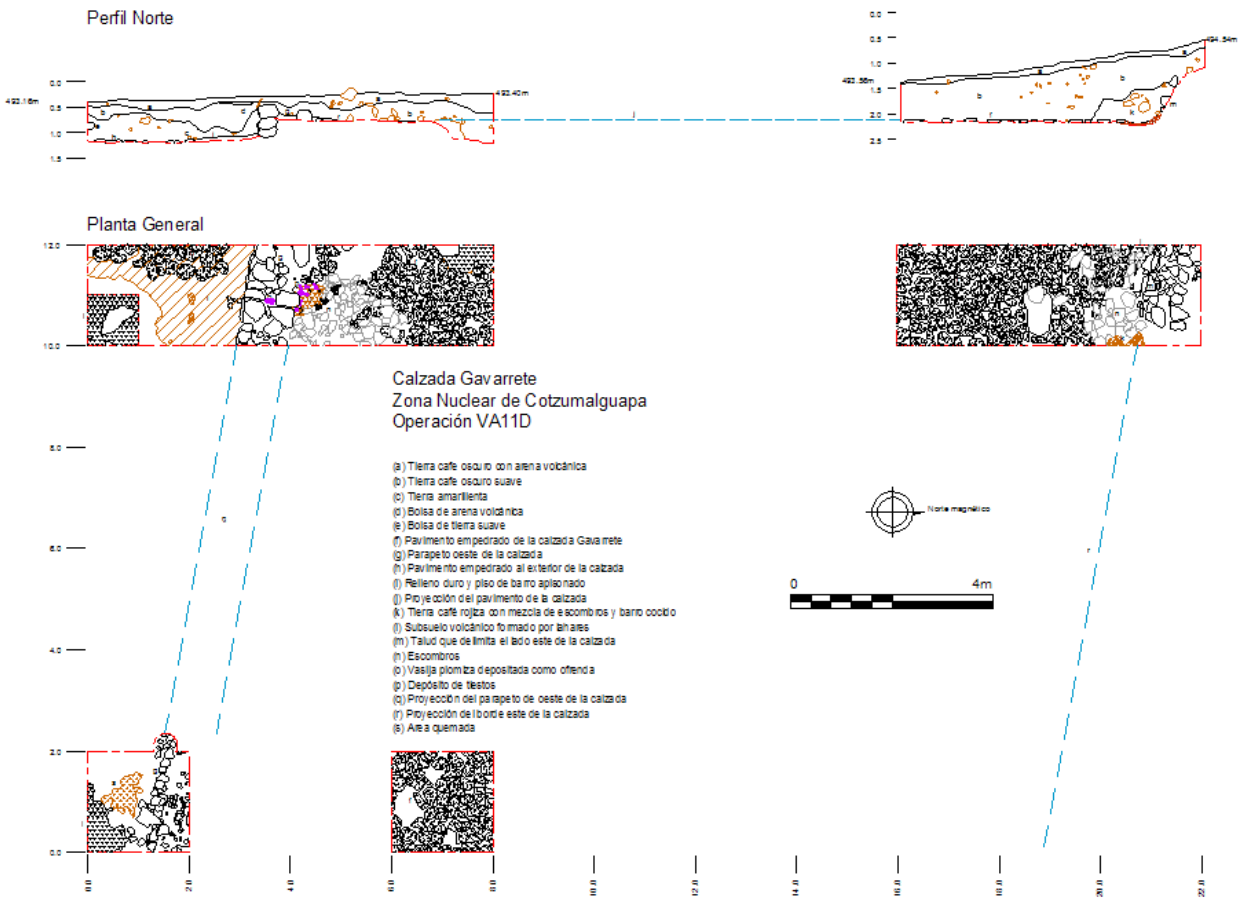

Figure 4. Operation VA11D plan and profile, showing a segment of the Gavarrete causeway (DWF file available).

Tables 1-3, shown below, summarize the ceramic contents of these excavations. As noted, these materials were found within the thick soil layers above the level of the causeway pavements, and therefore, do not necessarily coincide with the date of their construction. Nevertheless, they provide a general dating for the occupation of the area. Formative sherds were entirely absent, while Early Classic materials were minimally present. Diagnostic materials from the Middle Classic period are scarce, while the dominant component of every excavation level consisted of Middle to Late Classic materials. Late Classic diagnostics formed the second largest group, but their abundant presence suggests that these lots are largely of Late Classic origin. A small presence of Postclassic materials in the uppermost excavation levels most likely derives from thin settlements of that period in the surrounding area, whose presence postdates the abandonment of the causeway system and the city as a whole.

Table 1. Operation VA11D, Suboperations A15-C15. Summary of Ceramic Types by Period.																
Unit	**A15**				**B15**				**C15**							**Total**
Excavation levels	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	
Formative	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Early Classic	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Middle Classic	0	4	0	0	0	0	0	1	0	0	0	1	1	1	0	8
Middle/Late Classic	86	51	60	30	35	20	55	60	61	0	18	35	25	14	40	590
Late Classic	38	12	19	3	18	16	24	14	23	0	5	9	5	13	2	201
Postclassic	5	1	0	0	0	0	0	0	1	0	0	0	0	0	0	7

Table 2. Operation VA11D, Suboperations S15-V15. Summary of Ceramic Types by Period.																					
Unit	**S15**					**T15**					**U15**					**V15**					**Total**
Excavation levels	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
Formative	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Early Classic	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
Middle Classic	2	2	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	6
Middle/Late Classic	101	101	0	61	36	0	10	40	41	76	61	21	32	0	16	21	29	29	15	0	690
Late Classic	33	32	0	20	6	0	11	5	13	23	28	9	6	0	0	7	12	12	2	0	219
Postclassic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3. Operation VA11D, Suboperations S10 and V10. Summary of Ceramic Types by Period.								
Unit	**S10**		**V10**					**Total**
Excavation levels	**1**	**2**	**1**	**2**	**3**	**4**	**5**	
Formative	0	0	0	0	0	0	0	0
Early Classic	0	0	0	0	0	0	0	0
Middle Classic	3	0	1	2	1	0	0	7
Middle/Late Classic	82	47	44	91	74	63	15	416
Late Classic	16	20	14	35	19	16	1	121
Postclassic	0	0	0	0	0	0	0	0

Special Objects

A particularly important find was a San Juan Plumbate jar (Figure 5) with globular, striated body, and incurving neck, that was deposited inside the fill of the retaining wall of the Gavarrete causeway. This cache vessel allows a secure dating of this construction to the Late Classic period. San Juan Plumbate is one of the major makers

of the Late Classic period at Cotzumalhuapa and elsewhere on the Pacific coast (Thompson 1948; Parsons 1967).

Figure 5. San Juan Plumbate vessel deposited as a cache deposit inside the fill of the western parapet of the Gavarrete causeway, operation VA11D.

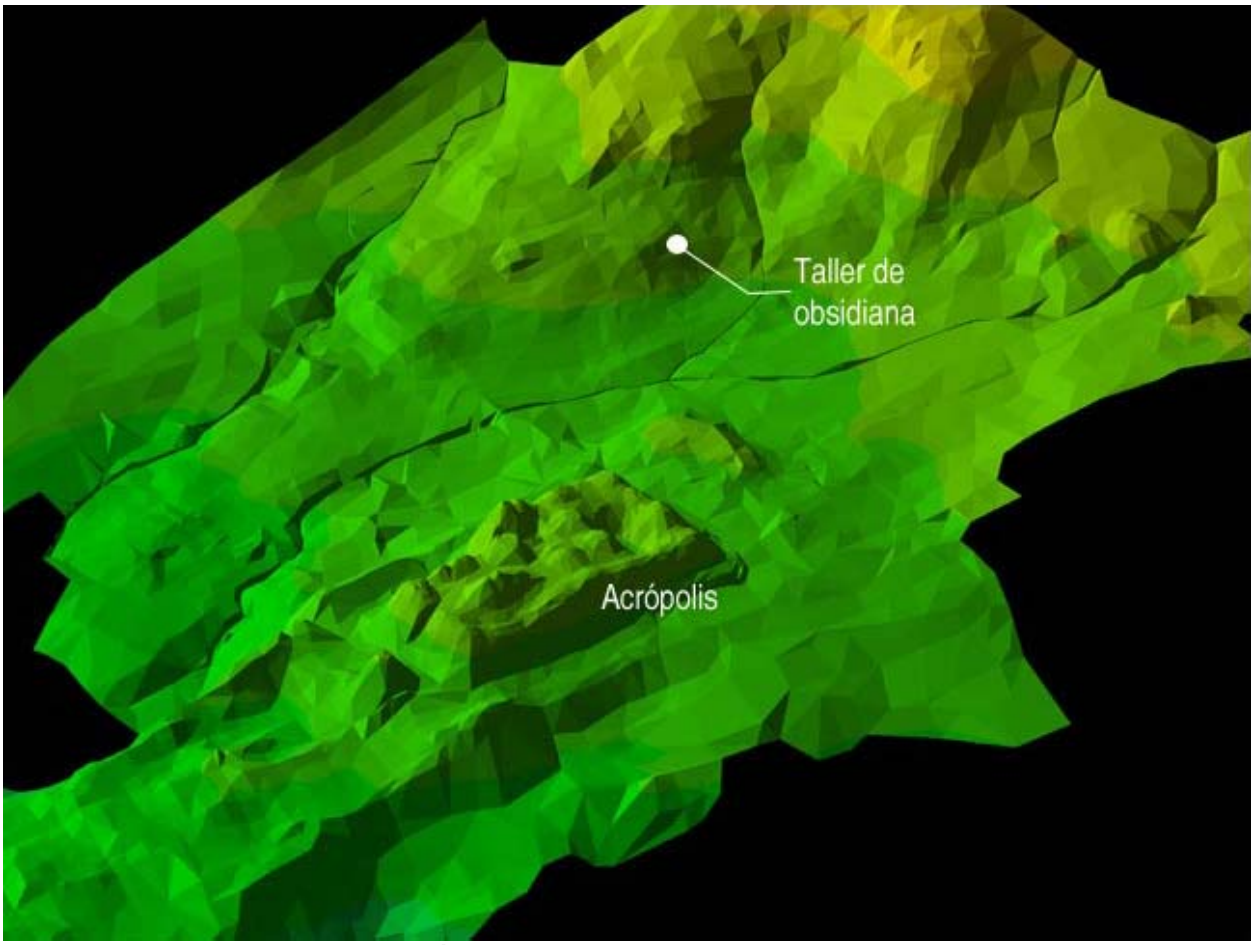

Figure 6. 3D view of the El Baúl acropolis, showing the location of the obsidian workshop.

The El Baúl Obsidian Workshop

Summary Description of Excavations

The El Baúl obsidian workshop was first identified and test excavated in 1996 by Sonia Medrano, who observed an extensive area with dense surface concentrations of obsidian debris, located about 200 meters north of the El Baúl Acropolis (Figure 2, and Figure 6). Debitage concentrations extended over the slope of a low, rock-strewn promontory that was probably ill-suited for habitational purposes, a condition that may have influenced its selection as a dump. Field research in 2002 focused on this area, beginning with a series of 81 shovel tests placed along a ten-meter grid that covered the entire area. Significant samples of obsidian were recovered from these shovel tests, allowing to quantify the density of obsidian throughout the debitage area and to define its approximate limits (Figure 7). The major concentration covers an area of 3120 m^2, covering the top and the eastern slope of a natural promontory. The highest concentrations are found at the rock-strewn top of the promontory, where a shovel test

revealed a maximum density of 40,526 obsidian fragments per cubic meter, recovered by sifting materials through a 1/4 inch mesh. Very high densities were also found at selected places along the promontory slope. Excavations were carried out at two locations:

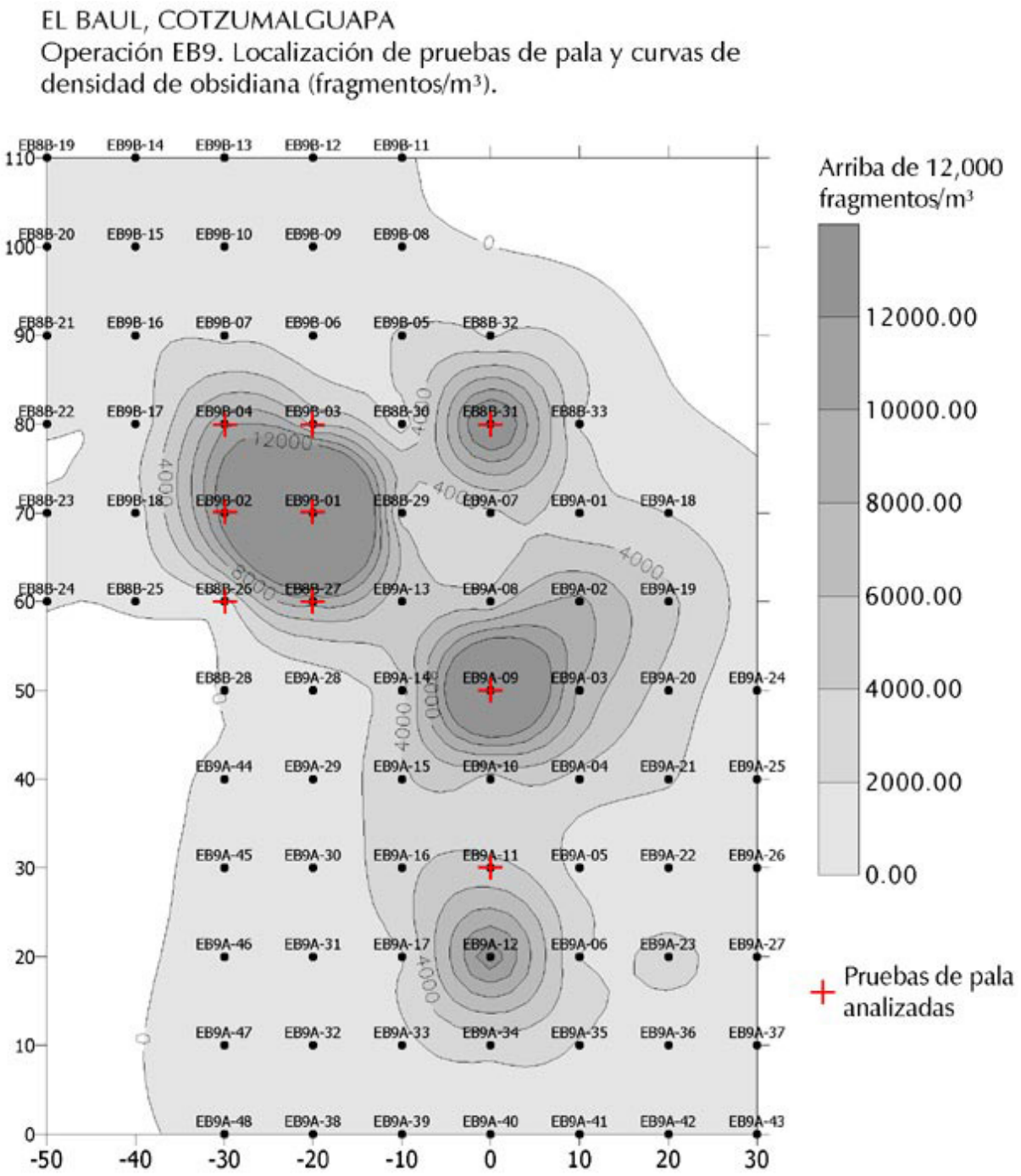

Figure 7. El Baúl obsidian workshop, showing the location of shovel tests and densities of obsidian debris.

Figure 8. Earthen platforms delimited by rough stone alignments, excavated in the area of highest obsidian density, operation EB9.

(a) Possible Workshop Platforms

Excavations on the promontory slope revealed simple platforms with earthen floors lined with rough stones (Figure 8, and Figure 9). The location of these platforms amidst the major concentrations of obsidian debitage suggests that they were not habitational in function, and there is a possibility that they may have served as work places for the artisans involved in the industry. A stratigraphic pit (Suboperation P31) excavated by the edge of one of these platforms revealed a series of primary deposits of obsidian refuse (Figure 10, and Figure 11). Unlike the indistinctly mixed materials recovered in upper excavation strata, these deposits appeared to be the result of specific depositional events, which were sealed relatively fast by the construction of the platforms above, and thus remained undisturbed. Analysis of these deposits is particularly important for the study of the ancient obsidian industry. The P31 stratigraphic pit continued below these deposits to a depth of 3.78 meters, revealing volcanic ash layers derived from the adjacent Fuego volcano. Obsidian debitage continued below these ash layers, suggesting that the area was used as a refuse deposit for a prolonged period.

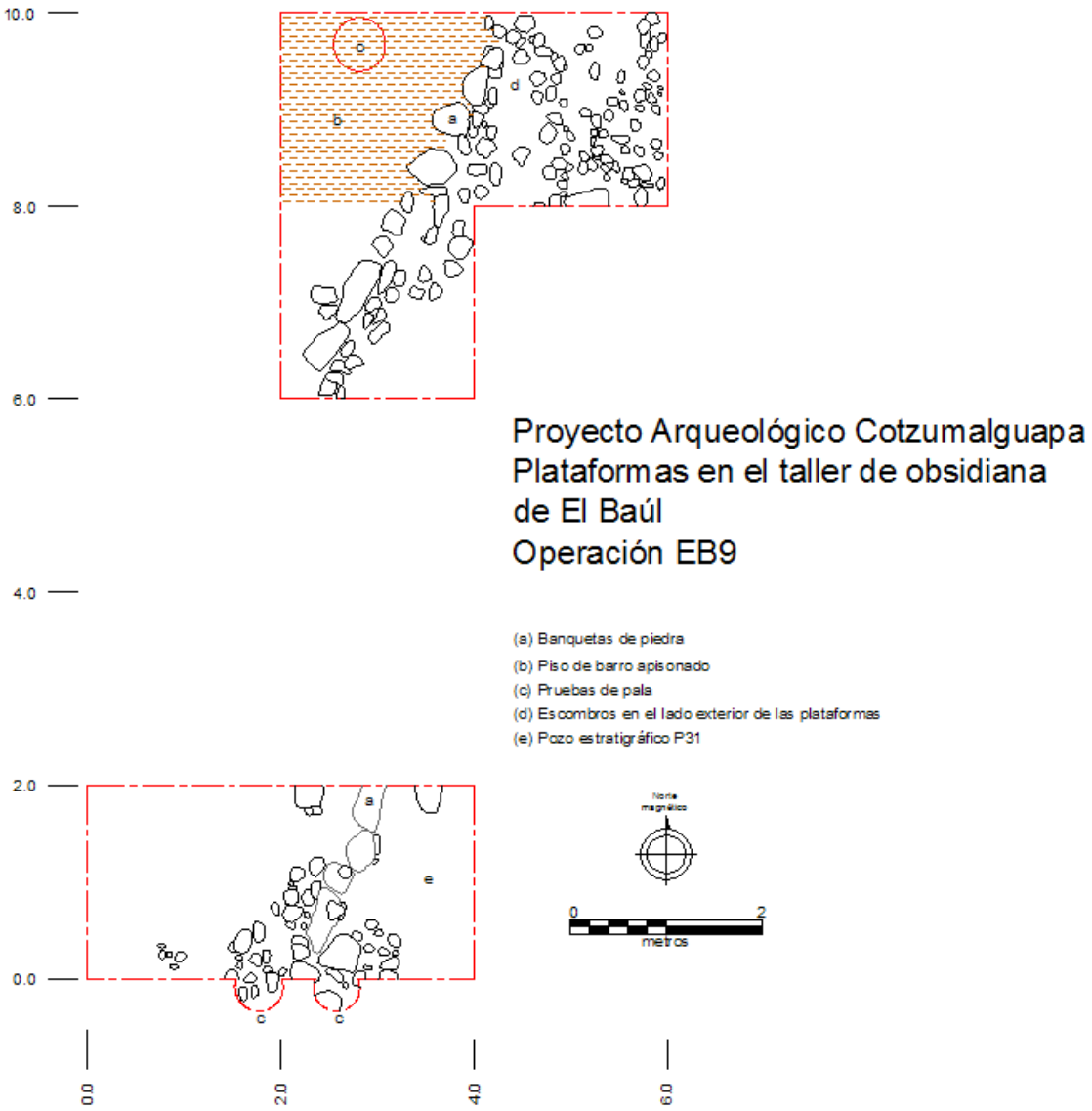

Figure 9. Plan of earthen platforms with rough stone alignments, in the area of highest obsidian density, operation EB9 (DWF file available).

Figure 10. Profile of P31 stratigraphic pit, showing packed obsidian deposits.

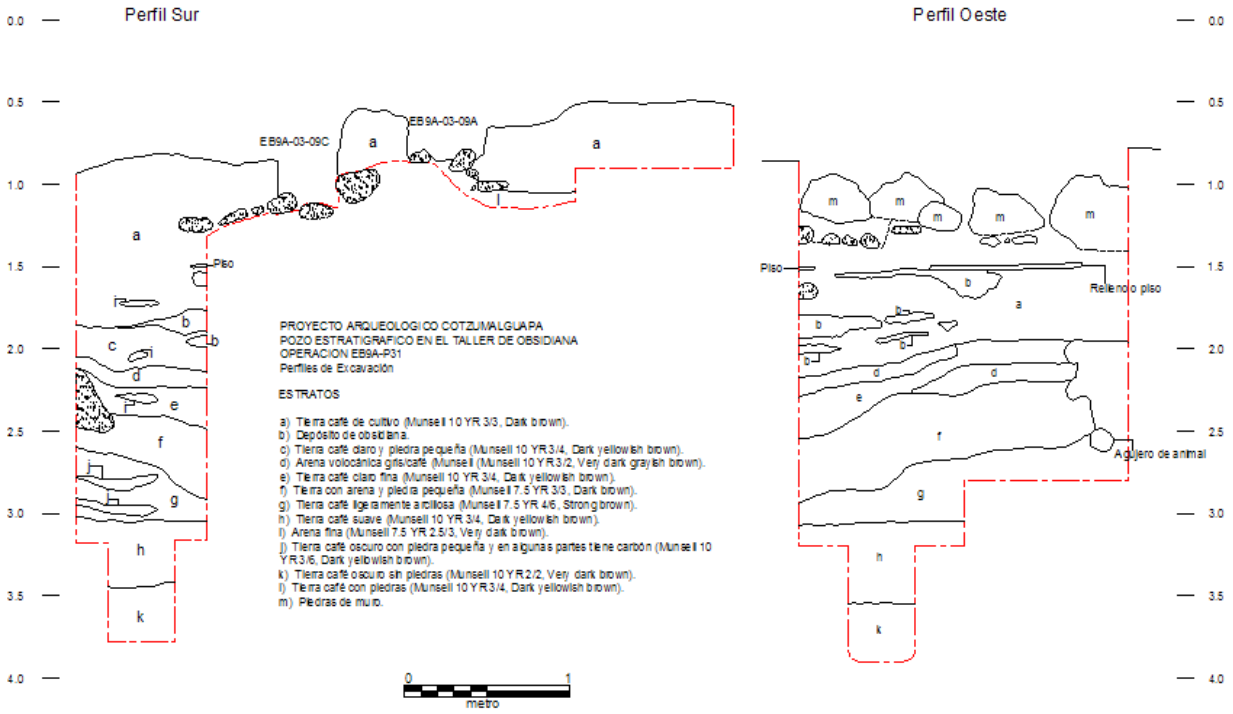

Figure 11. Excavation profiles of P31 stratigraphic pit, operation EB9 (DWF file available).

(b) Possible Sweathouse

Further excavations located 30 meters south from the former, revealed architectural features that merited extensive inquiry to determine their conformation and association with the obsidian debitage deposits. Excavations revealed a one-meter high, stone-faced leveling terrace built against the natural slope, providing a foundation for a small but elaborate stone-walled room provided with a finely laid stone pavement in the interior (Figure 12, Figure 13 and Figure 14). This is no ordinary trait, since stone pavements found in previous excavations commonly cover exterior surfaces. Moreover, this pavement was built with a concave depression that reached its bottom at the southeastern corner of the room.

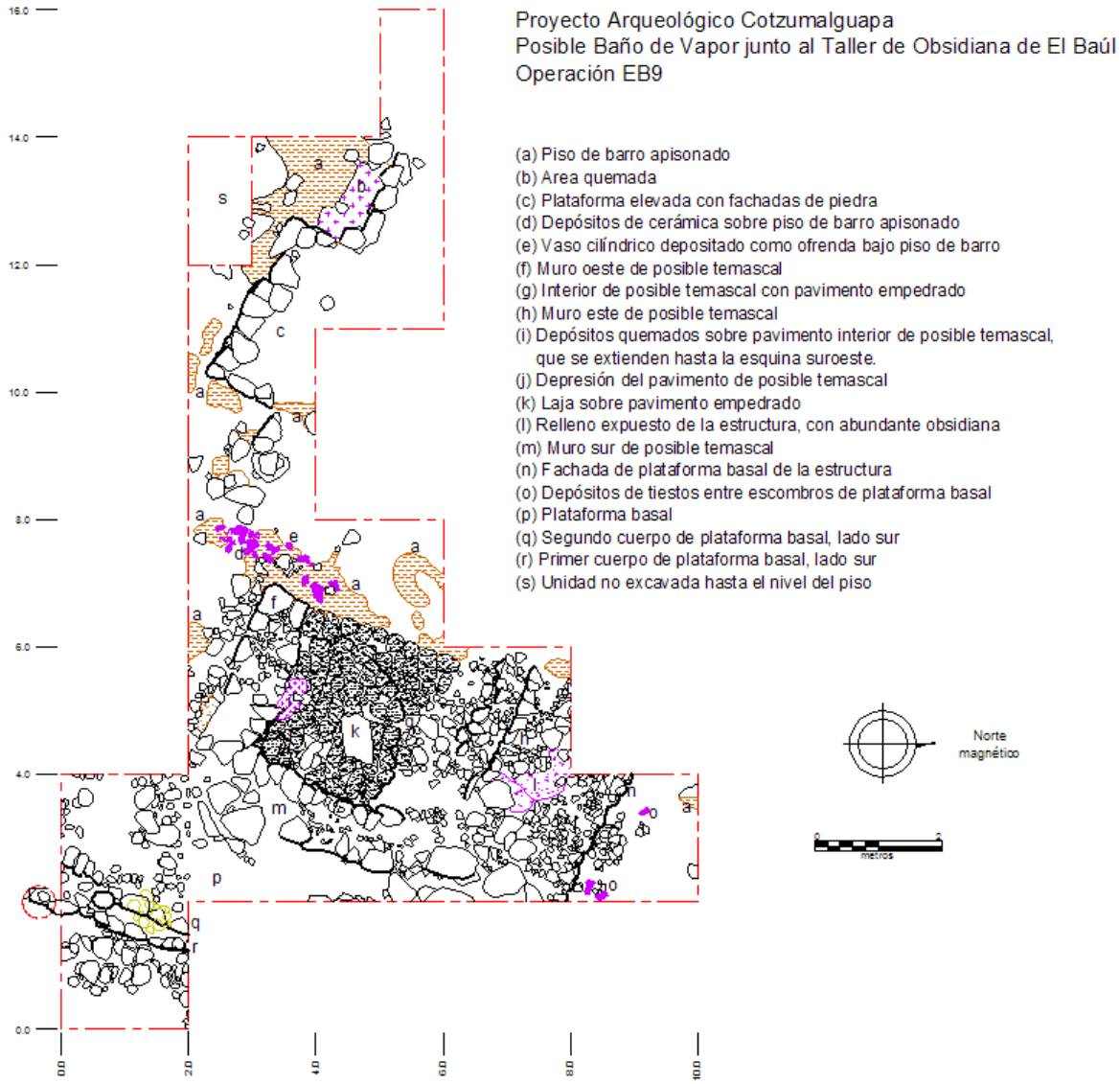

Figure 12. Plan of probable sweat house excavated in the vicinity of the obsidian workshop dump, operation EB9 (DWF file available).

Figure 13. Excavations at the probable sweat house, looking northwest, showing the retention walls of the basal platform, operation EB9. The large rocks on the background stand on a promontory that was part of the obsidian workshop dump.

Figure 14. General view of probable sweat house, showing inner stone pavement with circular depression on the southeastern corner of the room, operation EB9.

The precise function of this room remains in doubt, but there its size and conformation suggest that it may have functioned as a sweathouse, with the concave depression serving as an inner drainage system. Moderate concentrations of burned sherds and ashes, associated with a concentration of rough stones suggested that this corner of the room was also used as a fireplace. The western side of the room is devoid of a stone wall, but the excavations revealed the southern façade of an elevated platform that must have closed this side of the possible sweathouse. There are indications that this was part of a larger architectural compound, but it was not possible to extend excavations to other adjacent buildings. Therefore, the question remains whether this was part of a domestic compound or otherwise. Yet, the presence of such elaborate architecture next to the obsidian dump is intriguing, because of the possibility that it may be related with the industry. High concentrations of obsidian debris were recovered from the structural fill, indicating that its construction involved reuse of earth from the dump area.

Ceramic Analysis

(a) Possible Workshop Platforms

The P31 stratigraphic pit provided significant information for dating the utilization of the workshop dump. The pit went down 2.40 m below the surface, plus an additional 70 cm deep shovel test (level 17) that explored the lowermost levels. Table 4 summarizes the ceramic contents of this pit.

Table 4. Operation EB9, Unit P31.
Summary of Ceramic Types by Period.

Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
Formative	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Early Classic	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Middle Classic	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Middle/Late Classic	23	44	28	30	15	44	26	12	29	11	67	13	38	6	2	2	0	390
Late Classic	13	19	7	12	5	9	5	4	1	0	5	3	5	1	0	1	0	90
Postclassic	1	1	1	0	0	0	0	0	0	0	0	1	2	1	0	0	0	7

The major stratigraphic units identified were the following:

1. The uppermost levels (1-4), down to 0.60 m below the surface, consisted of recent soils and sediments deposited above the level of the earthen platforms that are considered as possible work places. Traces of an earthen floor were visible below the base of the rough stone alignments that delimit these platforms, providing a fairly clear delimitation for these upper strata. As normal the uppermost excavation levels yielded a small number of Postclassic sherds, while the bulk of materials belonged to Middle Late Classic types.

2. Between 0.60 and 1.20 m below the surface (levels 5-7); the major features were primary deposits of obsidian refuse. Unlike debris found in other deposits, which may include materials that were moved by erosion from their primary depositional locations, these were well-delimited and densely packed pockets of refuse, giving the impression that they originated from discrete depositional events. Each of them may represent a bagful of refuse deposited by a single artisan, or a closely related group of artisans. However, ceramic artifacts were also found near these deposits, suggesting that they do not derive exclusively from the obsidian industry. Ceramics associated with these deposits included a representative sample of Middle to Late Classic types, firmly dating the deposits to the Late Classic period.

3. A well-defined layer of volcanic ash, 10 cm thick, was found at depths between 1.20 and 1.30 m below the surface. This layer most probably derives from an eruptive event of the Fuego volcano. Obsidian density decreased sharply below this layer (levels 8-13), but still remained relatively high, and may still derive from workshop activities. Importantly, the ceramic assemblages from levels below this volcanic ash layer shifted significantly to a near absence of Late Classic diagnostics. The presence of a small number of San Juan Plumbate and Diamantes sherds may still indicate a Late Classic date, but there is a possibility that deposits below the ash layer are predominantly of Middle Classic date. This suggests that the deposition of obsidian debris in the vicinity may extend back into the Middle Classic San Jerónimo phase. The density of artifacts decreased sharply in levels 14-17. While the last excavation level yielded no ceramics, a small amount of obsidian was still recovered at this depth.

(b) Possible Sweat House

Collections recovered from the possible sweat house are predominantly Middle to Late Classic, but they also contain a significant amount of Postclassic sherds, including Santa Rita Micaceous and Sumatán (Parsons 1967: 157-158). Importantly, there is also a small amount of early types such as Nahualate, Colojate, and Achiguate, that may date to the Terminal Formative or Early Classic periods (Medrano 1993).

Excavations on the western side of the possible sweat house revealed a tamped earth floor that may have been a corridor between the sweat room and the adjoining elevated platform. A concentration of large sherds deposited on this floor proved to include mainly large censer fragments, suggesting that ceremonial activities were carried out in this structure. A cache found underneath this floor contained a cylindrical vase covered with a small black bowl (see below).

Excavations included a stratigraphic pit (Suboperation M13), excavated through a tamped earth floor located on the western side of the structure. The pit penetrated to a depth of 2.20 m below the surface. Table 5, below, summarizes the ceramic contents of this pit. As expected, Postclassic diagnostics were limited to the uppermost excavation levels. Terminal Formative–Early Classic sherds were also recovered in small numbers, mixed with the overwhelmingly dominant Middle to Late Classic materials. Importantly, this pit revealed no evidence of earlier constructions below the tamped earth floor associated with the sweat house. Late Classic diagnostics, including San Juan Plumbate, were present down to the lowest excavation levels. Therefore, it may be concluded that the structure had a single construction episode, which included substantial leveling and modification of the natural terrain.

Table 5. Operation EB9, Unit M13. Summary of Ceramic Types by Period.															
Unit	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**Total**
Formative	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Early Classic	0	0	0	0	1	4	1	8	0	0	0	0	0	0	14
Middle Classic	0	0	0	0	0	1	3	1	0	0	0	0	0	0	5
Middle/Late Classic	45	43	33	0	93	81	76	97	30	20	30	7	4	0	559
Late Classic	24	35	8	0	45	47	34	37	0	8	0	9	1	0	248
Postclassic	18	15	4	0	3	0	0	0	0	0	0	0	0	0	40

Figure 15. Cueros vase deposited as a cache offering below the earthen floor at the entrance of probable sweat house, operation EB9.

Special Objects

(a) Cache associated with possible sweat house

A probably dedicatory offering found under the tamped earth floor on the west side of the sweat house room, consisted of a cylindrical vase of the Cueros type, characterized by its smooth brown slip, with a thick red band around the middle section of the vase (Figure 15). Fragments of a small black-slipped bowl with incised decoration were found inside the vase, suggesting that it was placed as a cover for the vase, in inverted position (Figure 16). Such pattern has been previously documented in cache deposits at Cotzumalhuapa.

Figure 16. Black bowl used as a cover for the vase on Figure 15.

A complete and unused obsidian blade was found inside the vase (Figure 17), another feature that has been documented in several cache vessels at Cotzumalhuapa. The presence of these blades inside cache vessels suggests that they were used during the dedicatory ceremonies that led to the deposition of these vessels. One possible explanation is that they were used in bloodletting rituals performed during such ceremonies. Blood was presumably spilled inside the vessels, and the instrument used to let blood was finally deposited inside the same vessels. The consistent appearance

of unused obsidian blades in cache vessels allows an interesting hint into the ritual activities performed at Cotzumalhuapa.

Figure 17. Obsidian blade found inside the vase on Figure 15.

(b) Tiquisate vase with molded scene

One shovel test located 15 meters west of the possible sweat house revealed a Tiquisate cylindrical vase, with mold-made scenes on opposite sides, both with soft red painting (Figure 18). The vase may have been part of a cache offering, perhaps associated with another structure, but the location was not further excavated, and therefore, the vase's context was not completely documented. Nevertheless, the vase has proved to be a very important find, on account of two issues: (a) This is one of only a handful of Tiquisate vases with molded scenes that have a known archaeological

provenance. A number of unprovenanced vessels are also known from private and public collections, but overall, this important type of vessel remains poorly documented. (b) The iconography of this vase relates with a number of unprovenanced vases, and also with a vase that was deposited as a funerary offering in a tomb at the site of Guaytán, on the Motagua river valley (Figure 19; Smith and Kidder 1943, figure 27b). With its distinctive Tiquisate slip, the El Baúl vase suggests that the entire group of vases originated on the Pacific coast.

Figure 18. Tiquisate vase with molded scene found in a shovel test near probable sweat house.

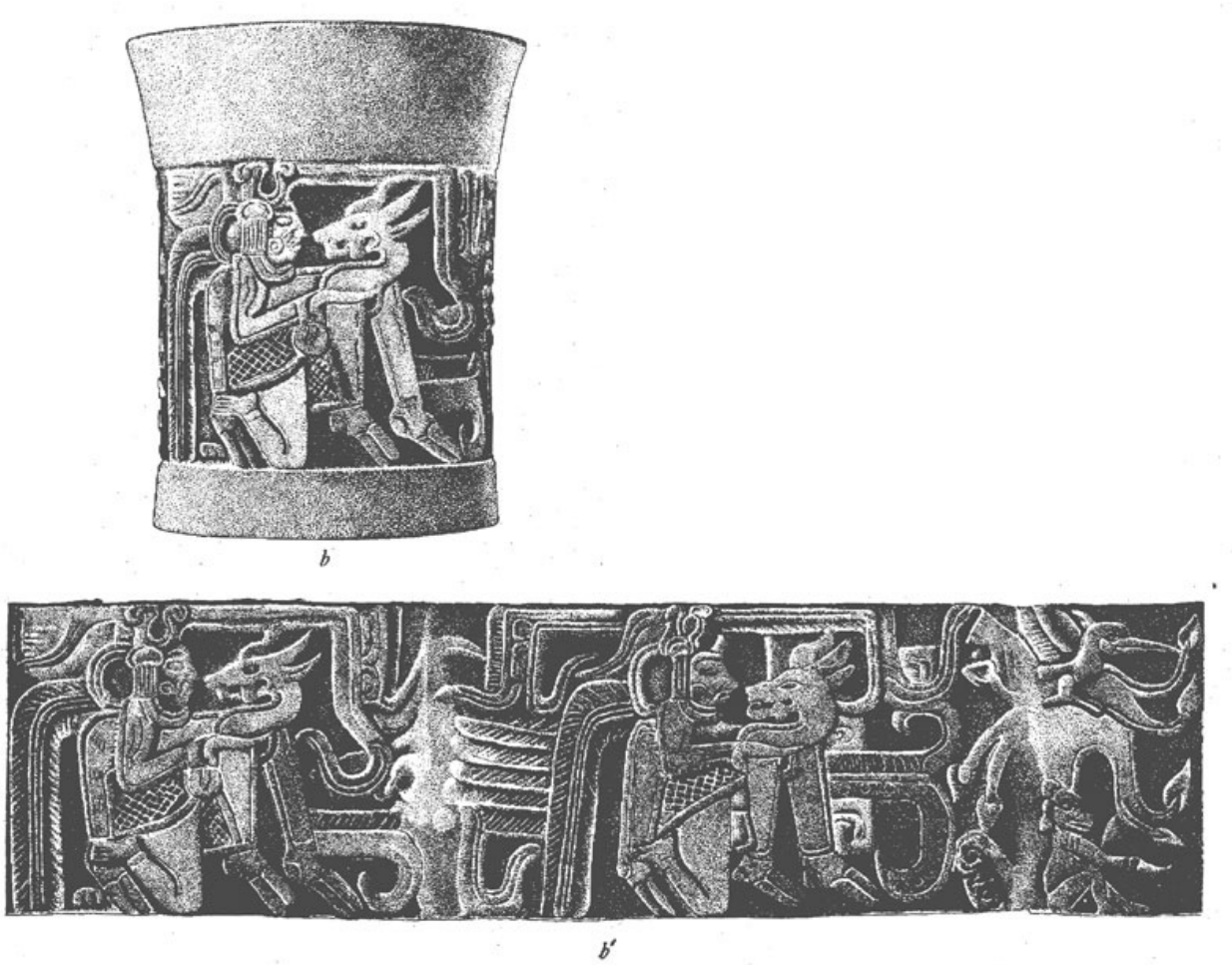

Figure 19. Vase from Tomb III, Structure 24 at Guaytán (San Agustín Acasaguastlán) on the Motagua river valley. After Smith and Kidder 1943, figure 27b.

The iconography of this group of vases concentrates on the capture of a deer, performed by one or two individuals. Both panels on the El Baúl vase show a standing man embracing a long-tailed deer, recognizable as such by their short antlers and the shape of their hoofs. A black vase from the collection of the Popol Vuh Museum shows an identical scene, oriented in opposite direction (Figure 20).

Other vases in this stylistic group show more complex versions of the story. On the Guaytán vase, the scene appears as a continuous band that includes two kneeling individuals, each holding a deer, plus a tree with a bird perched on top and a small animal, possibly a monkey, seated at its base. Other vases that are related stylistically and iconographically include K1378, K1605, K3235, K4599, and K6397. Some of them include additional elements, such as a large reptilian monster that appears on vases K1378 and K6397. A thorough iconographic analysis of these vases escapes the constraints of this report. However, it should be noted that the subject of men capturing deer finds parallel in Lowland Maya iconography, sometimes involving the Hero Twins (Coe 1989; Braakhuis 2001; Chinchilla 2003).

Figure 20. Unprovenanced vase from the Museo Popol Vuh collection. Digital Rollout photograph by Nicholas Hellmuth, courtesy Museo Popol Vuh.

Obsidian Analysis

Annex I includes a summary of the preliminary results of the analysis of obsidian from the El Baúl, by Edgar Carpio Rezzio (in Spanish).

Final Comments

The analysis of ceramics and obsidian from Cotzumalhuapa was crucial for the interpretation of previously excavated contexts, and a necessary step for preparing full reports and publications. Analysis of ceramics recovered from excavations along the Cotzumalhuapa causeway system confirmed previous observations on the chronological placement of the system's construction and use, and it also provided general information for dating the associated settlements. The construction and utilization of the causeway system are firmly dated to the Late Classic period, which is also the major period of growth and constructional activity throughout Cotzumalhuapa, as determined by previously excavated materials from residential compounds and major architecture, and associated radiocarbon dates (Chinchilla, Bove and Genovez n.d.).

Analysis of the obsidian debris recovered from the El Baúl workshop area confirmed the existence of a large-scale obsidian industry, which included the manufacture of both prismatic blades and projectile points. Raw materials were imported mainly from the El Chayal and San Martín Jilotepeque sources in highland Guatemala, and there are indications that a small amount came from the San Bartolomé Milpas Altas source. The database that resulted from the analysis of obsidian debris from this workshop will serve to prepare further reports and interpretations of the Late Classic obsidian industry of Cotzumalhuapa.

Importantly, there are indications that the obsidian dump was located immediately next to the simple platforms that may have served as production loci, which were revealed by excavations. The P31 stratigraphic pit indicated that the area was used for this purpose for a long time, but its ceramic contents tend to indicate that the workshop was mainly active during the Late Classic period. The proximity of the workshop area to an elaborate compound that possibly included a sweat house may be significant in terms of ceremonialism associated with the obsidian production process. Further investigation of this architectural compound is crucial to study the control of obsidian production at Cotzumalhuapa.

Acknowledgements

Museo Popol Vuh, Universidad Francisco Marroquín, granted the necessary time, office and laboratory space for this research. The maps and plans in this report were prepared with AutoCAD Land Development Desktop Software, generously donated by AutoCAD Guatemala/Geométrica S.A. I wish to acknowledge the collaboration of students Regina Moraga, Margarita Cossich Vielman, Paola Duarte, Ana Cristina Morales, Eliza Mencos, Edgar Bendfeldt, Rafael Castillo, José Luis López, and Victor Castillo.

List of Figures

NOTE: The maps and plans that accompany this report are in an AutoCAD DWF format, which requires the Autodesk® DWF Viewer. With the software installed, you will be able to pan across and zoom into selected areas of the maps by right clicking your mouse and using the features in the menu. Click here for the latest version of Autodesk® DWF Viewer from Autodesk.com.

Figure 14. General view of probable sweat house, showing inner stone pavement with circular depression on the southeastern corner of the room, operation EB9.

Figure 15. Cueros vase deposited as a cache offering below the earthen floor at the entrance of probable sweat house, operation EB9.

Figure 16. Black bowl used as a cover for the vase on Figure 15.

Figure 17. Obsidian blade found inside the vase on Figure 15.

Figure 18. Tiquisate vase with molded scene found in a shovel test near probable sweat house.

Figure 19. Vase from Tomb III, Structure 24 at Guaytán (San Agustín Acasaguastlán) on the Motagua river valley. After Smith and Kidder 1943, figure 27b.

Figure 20. Unprovenanced vase from the Museo Popol Vuh collection. Digital Rollout photograph by Nicholas Hellmuth, courtesy Museo Popol Vuh.

Sources Cited

Bastian, Adolf

1876 "Die Monumente in Santa Lucia Cotzumalguapa." *Zeitschrift für Ethnologie* 8:322-326.

1878 Ein Jahr auf Reisen. Kreuzfahrten zum Sammelbehuf auf Transatlantischen Feldern der Ethnologie. Die Culturländer des Alten America, vol. 1. Berlin: Weidmannsche Buchhandlung.

1882 *Steinskulpturen aus Guatemala.* Berlin: Königliche Museen zu Berlin.

Braakuis, H.E.M.

2001 "The Way of All Flesh: Sexual Implications of the Mayan Hunt." In *Anthropos* 96:391-409.

Chinchilla Mazariegos, Oswaldo

1996a Settlement Patterns and Monumental Art at a Major pre-Columbian Polity: Cotzumalhuapa, Guatemala. Ph.D. Dissertation, Vanderbilt University. Ann Arbor: University Microfilms International.

1996b "Peor es Nada: El Origen de las Esculturas de Cotzumalguapa en el Museum für Völkerkunde, Berlin." *Baessler-Archiv: Beiträge zur Völkerkunde* 44:295-357.

1996c "Las Esculturas de Pantaleón, Escuintla." In *U-Tz'ib* vol. 1, no. 10, pp. 1-23. Guatemala: Asociación Tikal.

1998a "El Baúl: Un Sitio Defensivo en la Zona Nuclear de Cotzumalguapa." In *XI Simposio de Investigaciones Arqueológicas en Guatemala,* edited by J.P. Laporte and H. Escobedo. Guatemala: Instituto de Antropología e Historia/Asociación Tikal.

1998b "Pipiles y Cakchiqueles en Cotzumalguapa: la Evidencia Etnohistórica y Arqueológica." In *Anales de la Academia de Geografía e Historia de Guatemala*73:143-184.

2002 "Palo Gordo, Guatemala, y el Estilo Artístico Cotzumalguapa." To be published in*Incidents of archaeology in Central America and Yucatán: Essays in Memory of Edwin M. Shook,* edited by M. Love, M. Hatch, and H. Escobedo. Forthcoming from University Press of the Americas.

2003 *Gods of the Popol Vuh in Classic Maya Art.* Guatemala: Museo Popol Vuh, Universidad Francisco Marroquín.

Chinchilla Mazariegos, Oswaldo and Julio Antillón

1998 "Investigaciones en áreas habitacionales de la Zona Nuclear de Cotzumalguapa." In*XI Simposio de Investigaciones Arqueológicas en Guatemala.* Guatemala: Instituto de Antropología e Historia/Asociación Tikal.

Chinchilla Mazariegos, Oswaldo, Frederick J. Bove and José Vicente Genovez

n.d. "La Cronología del Período Clásico en la Costa Sur de Guatemala y el Fechamiento del Estilo Escultórico Cotzumalguapa." To be published in *V Coloquio Pedro Bosch Gimpera,* edited by A. Daneels. México: UNAM.

Chinchilla Mazariegos, Oswaldo, Sébastien Perrot-Minnot and José Vicente Genovez

2001 "Palo Verde, un centro secundario en la zona de Cotzumalguapa, Guatemala." In *Journal de la Societé des Américanistes* 87:303-324.

Coe, Michael D.
1989 "The Hero Twins: Myth and Image." In *The Maya Vase Book: A Corpus of Rollout Photographs of Maya Vases,* by J. Kerr, Vol. 1, pp. 161-184. New York: Kerr Associates.

Eisen, Gustav
1888 "On Some Ancient Sculptures from the Pacific Slope of Guatemala." In *Memoirs of the California Academy of Sciences 2,* no. 2, pp. 9-20.

Gavarrete, Juan
1929 "Antigüedades de Cotzumalguapa." In Anales de la Sociedad de Geografía e Historia de Guatemala 5:308-311.

Habel, Simeon
1878 "The Sculptures of Santa Lucía Cosumalwhuapa in Guatemala." In *Smithsonian Contributions to Knowledge,* vol. 23, no. 3, pp. 1-90. Contribution 269. Washington, D.C.: Smithsonian Institution.

Medrano, Sonia
1993 "Preliminary Ceramic Analysis." In *The Balberta Project: The Terminal Formative-Early Classic Transition on the Pacific Coast of Guatemala,* edited by Frederick J. Bove *et al.,*pp. 69-82. Pittsburgh: University of Pittsburgh/Asociación Tikal.

Parsons, Lee A.
1967 Bilbao, Guatemala: An Archaeological Study of the Pacific Coast Cotzumalhuapa Region, vol. 1. Publications in Anthropology, 11. Milwaukee: Milwaukee Public Museum.

1969 Bilbao, Guatemala: An Archaeological Study of the Pacific Coast Cotzumalhuapa Region, vol. 2. Publications in Anthropology, 12. Milwaukee: Milwaukee Public Museum.

Seler, Eduard
1892 "Los Relieves de Santa Lucía Cotzumalguapa." *El Centenario.* Revista Ilustrada. Organo oficial de la junta directiva, encargada de disponer las solemnidades que han de conmemorar el descubrimiento de América. Madrid: El Progreso Editorial.

Smith, A. Ledyard, and Alfred V. Kidder
1943 "Explorations in the Motagua Valley, Guatemala." In *Contributions to American Anthropology and History,* No. 41. Washington, D.C.: Carnegie Institution.

Stoll, Otto
1958 *Etnografía de la República de Guatemala.* Guatemala: Seminario de Integración Social Guatemalteca.

Thompson, J. Eric S.
1948 "An Archaeological Reconnaissance in the Cotzumalhuapa Region, Escuintla." In*Contributions to American Anthropology and History,* 44. Washington, D.C.: Carnegie Institution of Washington.

Wobst, H. Martin
1977 "Stylistic Behavior and Information Exchange." In *For the Director: Research Essays in Honor of James B. Griffin,* edited by Charles E. Cleland, pp. 317-342. Anthropological Papers 61. Ann Arbor: Museum of Anthropology, University of Michigan.

Annex I. Preliminary Report on the Artifact Analysis of the Obsidian Workshop at El Baúl

by Edgar Carpio Rezzio

Presentation

This report presents the most relevant aspects of the analysis of obsidian artifacts recovered from the excavations conducted in 2002 at the site of El Baúl, specifically in operation EB9 where the remains of a probable large workshop involved in the production of obsidian tools were explored. Works were initiated in March 2003 and concluded in March 2004. During the year, the classification of artifacts was carried out according to the established criteria and with the participation of students from the Universidad de San Carlos de Guatemala working under my supervision. The attributes of each artifact were written down in a classification sheet. Simultaneously, a database using the Microsoft Access program was created, so that students could enter the information contained in the classification sheets. With this database a number of tables were elaborated to show the attributes of the sample and the more significant trends of the material.

Methodology

The first step consisted in designing the methodology for the classification and analysis of the several thousand artifacts recovered from the obsidian dump at El Baúl. To this purpose, a preliminary revision of the sample was accomplished to establish the variety of artifacts, the possible provenience of raw materials, and other aspects related to their form and function. Based on this preliminary analysis, a manual including the major variables to be analyzed and their respective codification was elaborated. The established variables were as follows:

Case number
Operation
Lot
Source
Type
Segment
Use
Retouching
Length (cm)
Width (cm)
Weight (grams)

This classification was based on the one used previously for other samples of the south coast, modified according to the characteristics of the material. We tried to outline the technological aspects inherent to the artifacts, which may help to reconstruct the production sequence. The complement was the creation of the classification sheet that included the annotation, case by case, of each one of the artifacts tested. In addition, a notebook was also used to write down and integrate any additional information concerning the artifacts that exhibited special traits and to elaborate the relevant drawing.

The analysis began with the classification of the sample recovered through shovel tests, each of which contained a large amount of artifacts. We soon noted that the dominant types were those associated with carving remains, represented mainly by refuse chips with a maximum size of 0.5 cm. Another type also very frequently observed was the refuse of bifacial flakes, which differently than common refuse, exhibit a special, rounded aspect with a curved distal, a pronounced bulb and a transversal back. This refuse is associated with the carving of projectile points and other bifacial objects. We were surprised to observe the large amount of such artifacts and the presence of complete points recovered from excavations and surface collections, and they were given special attention to define the possible production level of projectile points at the site.

The objects were weighed, by using a digital Acculab scale of 0-200 g. A magnifying glass with 10 magnifiers and a white light lamp were also used, to help appreciate features such as texture, color, erosion, modifications, and other interesting traits that some of the artifacts exhibited.

For the analysis of obsidian sources we used visual techniques, complemented with the analysis at the lab of 20 relevant selected samples. The samples were tested by Dr. Fred Nelson at Brigham Young University, using the method of X-ray fluorescence. These tests revealed a moderate presence of materials originating in the source of San Bartolomé Milpas Altas, which was not initially considered in our work, and was not taken into account in the analysis.

To reinforce our efforts, we visited the obsidian sources of El Chayal, the area of La Joya, the Ixtepeque volcano and the site of Papalhuapa, wherefrom a large amount of samples was collected. Finally, a sampler was created with materials from the most representative sources, namely: El Chayal (several outcrops), San Martín Jilotepeque and Ixtepeque. The results of the artifact analysis indicate that the source of El Chayal was the most represented one, followed by San Martín Jilotepeque.

Complementary Activities

With the purpose of familiarizing the analysts with the prehispanic technology, several replicative experiments were carried out using the carving technique of direct percussion. In this way, several flake cores were carved and their refuse recovered and

compared with the carving refuse of the sampler prepared for the obsidian workshop; as a result, similarities were found with certain types of flakes. Work was accomplished as well with bifacial carving through direct percussion, which generated bifacial flakes that when compared with the flakes from the analyzed sample, helped to fully establish this technological type. With the material produced through the experimental carving, a sampler was also created to help establish comparisons, and to be didactically used in the future.

A graphic record of several lots and artifacts was elaborated with digital photographs using a Sony 2.0 mega pixels camera, with slides, and finally with drawings made on sheets of millimeter paper, transparent paper and the sketches drawn up in the notebooks used by all analysts.

With the help of Dr. Chinchilla, a database using the Microsoft Access program was elaborated, with separate tables for samples recovered from shovel tests and objects recovered from excavations, specifically operation P31. Special artifacts were included in an additional database, composed of a collection of 181 mostly complete objects from the excavation of P31, representing the technological types that were being produced and carved at the workshop. These included projectile points of varied styles, prismatic blades of the final series, exhausted cores, some of which were reused, retouched macro blades, etc.

The classification work was concluded in March 2003, with the simultaneous completion of the data entry in the databases referred to earlier in this work. Presently, the statistical analysis is underway with the creation of tables, charts and graphics whose interpretation will be crucial in the reconstruction of production activities connected with obsidian. It should be said that this work could finally be accomplished thanks to the remarkable input of the students, whose hard work allowed for the classification of over 35,000 artifacts, one of the largest collections ever studied in the archaeology of Guatemala and in the overall Maya area.

Finally, a revision was made of another obsidian sample recovered at that same workshop during the excavations that Sonia Medrano conducted in 1996, in a sector adjacent to the area excavated by the Cotzumalguapa Project. This was done with the purpose of establishing comparisons and of complementing the information on the collection of the workshop located at El Baúl. The types are consistent with those of the tested sample, and the trend was confirmed towards the production of prismatic blades and bifacial projectile points. The first, because of the presence of many of those artifacts corresponding to the final series, and the second, because of the large amount of flakes of bifacial refuses.

Preliminary Results

The tested sample was only a fraction of the total obsidian recovered at the excavations. This sample includes two components:

1. Shovel Tests (23,927 analyzed artifacts). This sample derives from the analysis of ten shovel tests, which include some of the richest in obsidian refuse.

2. Excavations (23,670 analyzed objects). This sample derives from one of the special obsidian deposits recovered in operation EB9A-P31.

Tables 1 and 2 summarize the results of the analysis of both components. Then, there are some preliminary comments derived from these results for each analyzed variables.

Table 1. Summary of Results Obtained from Shovel Tests.

Source	**%**	**Frequency**
El Chayal	69.19%	16555
Ixtepeque	0.54%	130
Unidentified	4.50%	1076
Possible SMJ	4.09%	978
San Martín Jilotepeque	21.68%	5188
Total	**100.00%**	**23927**
Type	**%**	**Frequency**
Frequency	0.35%	83
Smash	40.37%	9659
Bipolar flake	0.08%	20
Flake with cortex	0.57%	136
Refuse flake	37.41%	8951
Platform flake	0.24%	57
Flake from bifacial carving	1.50%	360
Large flake	0.35%	83
Small flake	3.26%	781
Macroflake	0.00%	1
Macroblade	0.00%	1
Blade with error or distal of core	0.05%	13
Irregular blade	7.71%	1844
Prismatic blade	7.50%	1794
Exhausted core	0.05%	12
Others	0.42%	101
Projectile point	0.01%	3
Piece of cutting	0.12%	28
Total	**100.00%**	**23927**

Segment	%	Frequency
Complete	84.85%	20134
Distal	2.35%	562
Not defined	0.36%	85
Medial	4.73%	1131
Proximal	8.42%	2015
Total	**100.00%**	**23927**
Use	**%**	**Frequency**
Absent	95.75%	22911
Present	4.25%	1016
Total	**100.00%**	**23927**
Retouched	**%**	**Frequency**
Absent	99.47%	23800
Present	0.53%	127
Total	**100.00%**	**23927**

Table 2. Summary of Excavations Results.		
Source	**%**	**Frequency**
El Chayal	35.21%	8335
Ixtepeque	0.02%	5
Not evaluated	61.21%	14489
Unidentified	0.05%	12
Possible SMJ	1.83%	434
San Martín Jilotepeque	1.67%	395
Total	**100.00%**	**23670**
Type	**%**	**Frequency**
Columnar chip	0.15%	35
Smash	63.69%	15076
Bipolar flake	0.01%	3
Flake with cortex	0.13%	30
Refuse flake	29.93%	7084
Platform flake	0.01%	3
Flake from bifacial carving	3.56%	842
Large flake	0.04%	9
Small flake	1.50%	354
Macroflake	0.00%	1
Blade with error or distal of core	0.00%	1
Irregular blade	0.63%	150
Prismatic blade	0.19%	45
Others	0.05%	11
Projectile point	0.00%	1

Scraper	0.00%	1
Piece of cutting	0.10%	24
Total	**100.00%**	**23670**
Segment	**%**	**Frequency**
Complete	97.03%	22966
Distal	0.81%	192
Undefined	0.05%	13
Medial	0.50%	118
Proximal	1.60%	379
Total	**100.00%**	**23668**
Use	**%**	**Frequency**
Absent	99.99%	23667
Present	0.01%	3
Total	**100.00%**	**23670**
Retouchings	**%**	**Frequency**
Absent	99.98%	23665
Present	0.02%	5
Total	**100.00%**	**23670**

Source

According to data obtained from shovel tests, the most represented source was El Chayal with 69.19%, followed by San Martín Jilotepeque (SMJ) with 21.68%. The materials tentatively identified as from San Martín Jilotepeque amounted to 4.09%, which together with SMJ would add up to 25.75% of the total. The materials originating in Ixtepeque hardly amounted to 0.54%, and they probably derive from the source of San Bartolomé Milpas Altas, a suggestion that considers the results of the X-ray fluorescence analysis. On the contrary, in the excavations, El Chayal represented 35.32% while SMJ only amounted to 1.67%. This remarkable variation in percentages takes place because 61.21% (14,489) of the sample artifacts from the excavations were not evaluated in the aspect of the obsidian sources, as they were very small refuses that made it very difficult to conduct visual analysis.

In the table of excavations, we have included the "Not evaluated" source, which encompasses 61.21% of the artifacts in this sample. This category corresponds to micro-refuses recovered when materials were sifted through a 2 mm mesh. The minimum size of these materials made it impossible to accurately establish the sources through visual methods.

Because of the above, it is inferred that most materials come from the source of El Chayal, which, surprisingly, is located at a greater distance from El Baúl than San Martín Jilotepeque. The variety presented by the materials from El Chayal suggests that there was a supply from different deposits belonging to this source, mainly from La Joya.

The materials that could not be assigned to a source, which amounted to 4.5% in shovel tests and 0.05% in excavations, might be related to the source of San Bartolomé Milpas Altas, whose presence was confirmed through the X-ray fluorescence analysis conducted by Dr. Fred Nelson.

Results of the source analysis indicate that the production workshops at El Baúl were mainly supplied with materials originating at El Chayal, although it is not known whether the artisans traveled directly to the source to obtain preforms, or whether the entity that exploited the deposits in this source sent traders to distribute the necessary materials for the production of the most frequent types. The presence of materials from El Chayal in the southern coast of Guatemala has been documented as of the Preclassic period, and has experienced a strong increase along the Terminal Preclassic and the Early Classic periods.

Type

In this variable, the types most represented in the shovel test sample were the following: smash (40.37%), flake residues (37.41%), irregular blade (7.71%), prismatic blade (7.50%) and small flake (3.26%). As to the excavated sample, the results obtained were: smash (63.69%), flake residues (29.93%), flakes from bifacial (3.56%), irregular blades (0.63%).

As seen, the types associated with the carving of artifacts represent the majority in both samples, with flakes and residues occupying a position of privilege. These results point to an intense activity related to the production of obsidian objects at sector EB9 of the site. The residues are related to the production of prismatic blades and bifacial artifacts such as projectile points. We may say that the huge amount of such artifacts shows that the elaboration of obsidian objects was a major activity in the economy of El Baúl, one that probably involved a large number of artisans and was, possibly, a family activity.

Another type directly related to the production of prismatic blades, as is the exhausted core, is not significant in the sample, with a mere 0.5% for the shovel test sample. On the contrary, this type is represented in the collection originated in the excavations, but it was included in a different database denominated "special artifacts". In this type we observed reutilization and retouching for new purposes, indicating the reuse of available resources.

Reconnaissance activities at other areas in El Baúl have revealed the presence of other zones with a high density of obsidian objects which might indicate the presence of other artifact production workshops, suggesting there was a remarkable demand of such

products that probably exceeded the boundaries of the urban sector, with objects that reached other localities in the surroundings or even farther away.

Segment, Use and Retouching

In both samples, these variables showed the behavior we anticipated for carving refuses. Over 90% presented no use and retouching. Regarding the segment, there is a small variation between the shovel tests and the excavations, as in the first case the complete artifacts represent 83.73%, while the excavated ones amounted to 97.03%. This is because in shovel tests, the amount of prismatic blades and associated objects is larger, with a stronger presence of medial and proximal segments. In the second case, we have more carving refuse of smaller dimensions, and consequently, most of the objects are complete. Furthermore, the already elaborated artifacts such as blades and projectile points are but a few and were analyzed separately.

Comments

This is the first time that a systematic and formal research is conducted with the huge amount of refuses originating in one or several production workshops of obsidian objects in Guatemala. The fact that the site of El Baúl is located in a south coastal area far away from the obsidian sources, makes the presence of production workshops even more interesting, as this may indicate, on one side, that there was a strong demand of obsidian products at the south coast in the Late Classic period, and on the other, that the final production was being carried out right there at the site, in places destined to such effect, duly supplied with previously processed materials, the result of exchange with the entities that controlled the major obsidian sources.

With the data at hand, it may be suggested that at El Baúl there was at least one large scale production workshop of two major types of artifacts, namely, the prismatic blades, of moderate dimensions, and the projectile points. Considering the amount of refuse, it is probable that the production met the local demand as well as the demand of the surrounding areas under the control of this large regional center.

The results of our investigation will be highly valuable to conduct comparative studies with other lithic workshops existing in Mesoamérica. In turn, they will be of help to gain knowledge on the economic behavior of ancient societies regarding the exploitation of natural resources in the pursuit to serve the needs of urban cores and their surrounding areas.