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Textile-Clay Laminates: A special-use material in ancient Mesoamerica



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Site: Aguateca

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Introduction

Many pictorial features in Maya vase painting and stone carving have been shown by excavated examples to be faithful renderings, including aspects of architecture and furnishings, ritual implements and costume. We can infer that the depictions of elaborate headdresses and back-racks are to some degree realistic, but to date the archaeological evidence of their materials has been scanty. While stone, the material of some excavated mortuary masks, and wood, cited as a mask material in ethnohistoric records [e.g., Tozzer 1941:111], must be considered among the possibilities, these seem impractical choices for the ornate headgear that would have been worn by elites during ritual activities. Recent discovery of mask and headdress components made of a previously unknown textile-clay laminate offers an intriguing alternative as a material for such ceremonial regalia. Further investigation of this material, including a search for additional examples, is the focus of the project funded through a grant received from the Foundation for the Advancement of Mesoamerican Studies, Inc., (FAMSI).

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Initial Materials Investigations

The examples that introduced this textile-clay laminate material to us were recovered from two archaeological locations, both in the Petexbatún region of the Petén, Guatemala. The first few fragments were found in 1993 in unstratified Classic period ritual deposits in Cueva de los Quetzales, a cave underlying the ceremonial center of Las Pacayas [Brady and Rodas 1995¹] ([Figure 1](#)). The discovery in 1998 of similar material from a storeroom in the palace complex at the nearby site of Aguateca added significantly to the data set [Inomata *et al.* 1998²] ([Figure 2](#) and [Figure 3](#)). Thanks to the circumstances of the site's attack and rapid abandonment in ca. A.D. 800, and to careful recovery and conservation, the Aguateca fragments could be partially reassembled into recognizable objects, and the material studied more thoroughly from a technological standpoint.

The fundamental work on both of these sample sets was carried out under the aegis of the Smithsonian Center for Materials Research and Education [SCMRE]'s archaeological conservation program. This work included technical studies at SCMRE of the Las Pacayas and Aguateca fragments; on-site lifting and laboratory conservation in Guatemala of the Aguateca objects; and replication studies at SCMRE to formulate hypotheses about the technological processes of crafting objects with this material [Beaubien 2001; Beaubien *et al.* 2002].



Figure 1. Fragments from Cueva de los Quetzales, Las Pacayas [S]. A perforation is preserved in the left fragment.



Figure 2. Face mask found in Str M7-22, Aguateca [A]. A perforation is preserved in the right tip, and the outer surface is colored red.



Figure 3. Selected headdress (?) fragments from Str M7-22, Aguateca [B]. The group on the left includes a large eye and four fangs. Finished edges, a perforation and folds are visible in the group on the right.

Bearing superficial resemblance to ceramic sherds, the fragments were shown from the research to be made of multiple layers of woven textile and clay slip. These were assembled and shaped on a mold or support, allowed to dry, modified and then heat-hardened. This last step produced a rigid ceramic that, with the incineration of the fabric component, was also porous and light-weight.

Many factors might explain the material's archaeological elusiveness thus far, including inherent preservation problems, deceptive appearance, and excavation practices that might not permit its recognition. The few known occurrences, however, also suggest that it might have been highly restricted or specialized in its use, introducing another limitation. That use appears to be for elite ceremony and, based upon the Aguateca evidence, specifically for the fabrication of mask and headdress components. These interpretations have remained largely conjectural because of the extremely small data set from which they have been drawn. Fortunately, several new sample groups have been identified and their preliminary study promises to expand our understanding not only of its use, but also of other key aspects of technology and distribution of this unusual material.

Research Outline for the Current Study

The research undertaken with FAMSI Grant #01010 seeks ultimately to establish the textile-clay laminate material as a Maya craft technology. The primary objectives were to expand the data set through identification of additional laminate examples, and to conduct preliminary analysis of these, in order to test hypotheses formed on the basis of only two previously known occurrences. Several collections, with the potential to include laminate examples, were defined after interviewing a number of archaeologists working in various parts of the Maya world. The list included Aguateca, which continued to yield more laminate examples subsequent to the 1998 season's discovery of the masks in excavations by several other projects. Other textile-clay laminate prospects (although not identified at the time as such) were from various sites investigated by the earlier Proyecto Arqueológico Regional Petexbatún³, Aguateca among them.

The study of these materials was carried out during several research periods, primarily during the summer of 2002 and in follow-up visits in December 2002 and January 2003. The review was conducted in the following locations in Guatemala:

1. *Aguateca Archaeological Project house*, Guatemala City: private house, serving as a temporary laboratory facility and storing most of the material excavated by the Aguateca Archaeological Project [AAP], pending completion of analysis and transfer to IDAEH.
2. *Aguateca storeroom*, Aguateca (Departamento Petén): on-site storage building belonging to IDAEH, holding all bulk ceramics, ground stone and some small finds excavated in 1999 and 2000 by the Proyecto de Restauración Aguateca [PRA]. Material excavated since 2002 by the Proyecto de Restauración Aguateca Segunda Fase [PRAS] is stored in a separate facility at the site.
3. *Departamento de Monumentos Prehispánicos storeroom*, Guatemala City: storeroom within IDAEH's facilities, containing specially designated collections from many archaeological projects, including Aguateca.
4. *Salon 3*, Guatemala City: IDAEH storeroom containing bulk or other non-museum collections turned over by all archaeological projects at the conclusion of research, including those of the Proyecto Arqueológico Regional Petexbatún [PARP].

These investigations were successful in identifying new examples of textile-clay laminate from two additional sites in the Petexbatún region, Arroyo de Piedra⁴ and Tamarindito⁵, as well as from Aguateca. It is significant, however, that two other possibilities were brought to my attention by researchers, who were alerted by our earlier discussions. One, a small sample of a promising composite material from a burial at Tikal and examined at the University of Pennsylvania Museum in Philadelphia, proved not to be a textile-clay laminate (personal communication H. Moholy-Nagy,

2002). The other, a fragment found during a study of ceramic figurines from Piedras Negras (personal communication Z. Nelson, 2002), was examined at the project's house in Guatemala City⁶. It was indeed made of textile-clay laminate, thereby adding a significant dimension to this study.

Results and Discussion

Textile-Clay Laminate Data Set

The currently known examples of textile-clay laminate (newly located as well as previously reported examples) come from the sites indicated on the map in [Figure 4](#), and are listed in [Table 1](#), shown below. An "occurrence" ranges from a single fragment to a cluster of fragments, and represents a rather spatially confined distribution within a room, trench unit, or comparable stratum of a larger midden area. A letter code is assigned to each occurrence for ease of reference in the text; those in bold are the newly recorded examples. Fragment clusters presumed to represent shattered whole objects are shown in bold face. It should also be noted that, in many cases, the initial fragment count was higher; the number in the table is the count resulting after limited readhesion, but is not definitive as additional joins are also possible within some groups.

Figures 5 through 10, shown below, in addition to Figures 1 through 3, shown previously, illustrate a selection of laminate examples; letter codes are included to indicate provenience.

Laminate Technology

Component materials

All fragments were made of a cohesive material composed of multiple layers of woven textile and clay. The clay appears to have been applied in the form of a thin slurry to coat each textile layer and to serve as the "adhesive" between layers, thus creating a laminated unit.

The textiles (now universally absent) were visible in cross-section as stacked pattern of holes where threads had once been. When the outermost clay surfaces were intact, a textile topography was often suggested. Often, however, the high points were abraded, exposing tiny hollows or channels. In areas where the clay surface loss was more extensive, the weave pattern was clearly visible as impressions in the underlying clay layer.

The textiles typically were varieties of plain weave, most commonly with single elements in each direction. Occasionally, paired or tripled elements were utilized consistently in one of the directions (e.g., [Figure 8](#)). Thread thickness and weave density varied, but all

weaves provided sufficient openness to allow the clay to penetrate through the weave to create a cohesive lattice-like network.

Laminate assembly, shaping and finishing

The thickness of the fragments was formed using five or more textile layers, with the resulting laminate mostly 2-5 mm thick (the Aguateca mask fragments are notably thin), with some in the 10 mm range. The weakness of the laminate components during the assembly process would necessitate the use of a support or mold, but because many of the fragments were small, relatively plain, and only slightly curved, it was difficult to ascertain whether the molds had been convex or concave. However, some fragments showed features such as ridges or folds, finished edges, perforations and red slip coloration. Previous replication experiments had shown that some of the minor modifications (e.g. edge features) could be carried out on the laminate, once it was dried, removed from the mold, and then locally wetted [Beaubien 2001].

Heat hardening

The samples were somewhat brittle and friable, but all had been exposed to heat, producing a ceramic product with no extant textiles. Color and hardness varied, suggesting differences in heating environment and exposure. While depositional exposure to heat can not be ruled out unambiguously, I think it is reasonable to assume that heat-hardening was the final production step in making the laminate objects rigid, resistant to water exposure and practical for use.

Laminate Products

Object type and possible usage

Generally, many of the documented occurrences are of a limited number of fragments, preventing identification of the type of object made using the laminate material. At the other extreme, however, are four substantial concentrations that were once whole objects. Three are most confidently identifiable as ceremonial gear, and all were found in the Palace Group at Aguateca.

Two of these were the first recognizable objects made of textile-clay laminate [A, B]. The face mask [A], roughly life-size and depicting an old man, has holes in the eyes suggesting positioning over the face ([Figure 2](#)). The other [B] has more exaggerated animal/grotesque facial elements with no apparent eye openings and is probably a headdress component ([Figure 3](#)). Both objects were found in a small storeroom in a royal residence, along with other personal costume elements and musical paraphernalia, probably utilized for ritual performance [Inomata *et al.* in press]. The third

concentration [C, currently missing] was also reported to be a mask on the basis of large eye and ear fragments. It was found next to an administrative structure within the Palace Group, a place where public ritual performance activities were also likely to occur [Urquizú, in Valdés *et al.* 1999].

The fourth substantial concentration, again from Aguateca [D], includes a reassembled segment with a smoothly curving expanse and finished edge ([Figure 5](#)); a number of otherwise flat fragments from the deposit have features such as small perforations. The fragment cluster was found in a high status residence notable for strong evidence of craft activities. Its find spot—near a bench in the roofed entry area just outside the central room—could be related to use in connection with more public activities carried out in this room of the household. Alternatively, since many work activities today occur in roofed areas outside the rooms, it is possible that the object was being produced there. From the range of ornaments found in various stages of production in various parts of the household, it has been suggested that the resident may have been responsible for preparing or refurbishing royal attire [Inomata *et al.* 2002]; this may have included the laminate object.

Less substantial occurrences still provide glimpses of object type or possible use. Several of these include fragments that are more sculptural, reminiscent of the masks. The one from Piedras Negras [U], originating from an elite midden, has wrinkle-like ridges ([Figure 10](#)). Two of the fragments from Cueva de los Quetzales (the first reported occurrence of laminate [S]) are particularly easy to imagine as facial elements, such as a chin ([Figure 1](#)). The midden in which they were deposited had formed under the cave's roof opening, which was situated in the plaza area at the ceremonial center of Las Pacayas. Its contents suggest controlled disposal of high status items [Brady and Rodas 1995].

Other types of objects are also possible. A group of fragments [J], small in number but notable for their overall form, make up a thick-walled segment with a rim-like edge, perforation and red slip coloring ([Figure 6](#)). These were found near a residential structure in the elite zone. A cluster of plain fragments [L], found in wall collapse of an administrative building in Aguateca's elite zone, may be remnants of an object connected to some aspect of public activities ([Figure 7](#)).

These last examples are more typical of the newly recorded occurrences, characterized by small fragment numbers and undistinguished forms. Such deposits were somewhat surprising for Aguateca, where rapid abandonment and absence of later occupation produced deposits with largely reconstructible objects in use-contexts. Nevertheless, low-density occurrences were recorded from inside or beside three household structures in the elite core [E, F; G, H, I; and J, K], and one administrative building [L]. Three others came from residential buildings [M, N, Q], which were outside the Main Plaza and elite core areas; two were within the close-in defensive wall system, and one was further away. Most of the examples were found in above-floor wall collapse, and it is not clear why more fragments weren't found.

Disarticulated fragments in low numbers are less surprising in middens or trash-filled contexts. At Aguateca, a few samples were under a patio [O] and associated with construction debris [P], from a cluster of structures located immediately behind the site's largest temple, on the west side of the Main Plaza; a service relationship is assumed. The fragments from Arroyo de Piedra [R] came from the midden area immediately behind the North Plaza's small palace ([Figure 8](#)). The two from Tamarindito [T] were found in wall collapse of part of the palace complex ([Figure 9](#)). The fragment from Piedras Negras [U] came from trash-filled layers leveling the plaza of a group probably occupied by elites or by those serving them ([Figure 10](#)).



Figure 5. Selected fragments from an object found in Str M8-4, Aguateca [D], showing a curved edge.



Figure 4. Partial map of the Yucatán Peninsula, showing sites indicated in red that yielded textile-clay laminate samples. Near Aguateca are Arroyo de Piedra and Tamarindito, above, and Las Pacayas/Cueva de los Quetzales, below. [Map modified from Sharer 1994:21]



Figure 6. Fragments from Str M8-11, Aguateca [J], with a rim-like edge and red slip coloration.



Figure 7. Fragments associated with Str M8-37, Aguateca [L].



Figure 8. Selected fragments associated with Str 13, Arroyo de Piedra [R]. The fragment on the right has textile impressions of a plain weave variant.



Figure 9. Fragments from Str 5, Group A, Tamarindito [T].

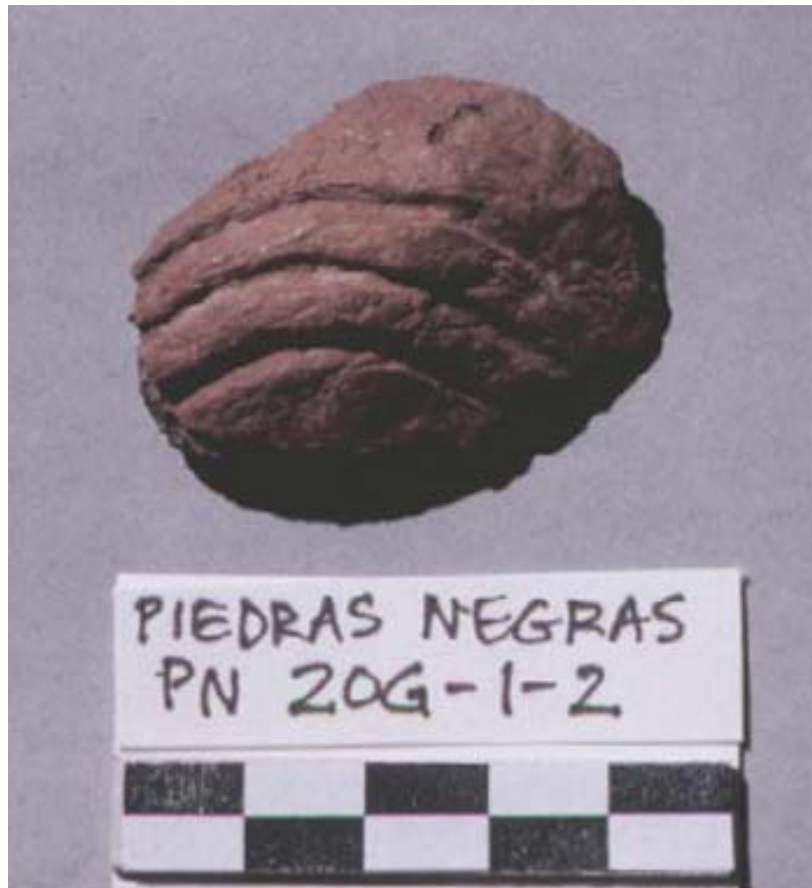


Figure 10. Fragment from Group U-13, Piedras Negras [U].

Table 1. Textile-clay laminate data set				
Site/Structure	Context Type	Occurrence Code/Count	Location Specifics	
Aguateca				
Str M7-22	residence in Palace Group	A	100+	storage rm - floor+collapse above
		B	100+	storage rm - floor+collapse above
Str M7-26	civic bldg in Palace Group	C	100+ [not located]	just outside end wall
Str M8-4	residence in elite core	D	100+	outside center rm - floor, collapse
		E	11	outside north rm - floor, collapse
		F	2	north rm addition - collapse
Str M8-10	residence in elite core	G	1	north rm - collapse above bench
		H	3	outside center rm - floor

		<u>I</u>	1	nr small wall in front - collapse
Str M8-11	residence in elite core	<u>J</u>	5	platform nr center rm - collapse
		<u>K</u>	3	btn Str M8-11 & -10 (back side)
Str M8-37	civic bldg in elite core	<u>L</u>	14	north rm area - wall collapse
Wall L7-5 nr Str L7-5	residence in area surrounding elite core	<u>M</u>	1	defense wall adj to str - collapse
Str L7-42	residence in area surrounding elite core	<u>N</u>	1? [not located]	center room - collapse
Group L8-9	residential group, near Main Plaza	<u>O</u>	1	central patio - fill
		<u>P</u>	2 [photo only]	nr Str L8-70 - construction debris
Group K5-2	residential group, north of epicenter	<u>Q</u>	1	outside Str 22
Arroyo de Piedra				
Str 13	residence in Palace Group	<u>R</u>	6	midden behind structure
Las Pacayas				
Cueva de los Quetzales	cave below central plaza	<u>S</u>	3	midden under cave opening
Tamarindito				
Str 5 (Group A)	residence in Palace Group	<u>T</u>	2	front of structure (plaza) - collapse
Piedras Negras				
Group U-13	residential group, elite	<u>U</u>	1	central patio - fill

Geographic distribution

The occurrence of textile-clay laminate samples at Aguateca, augmented by those from Arroyo de Piedra, Tamarindito and Las Pacayas, place the craft securely in the Petexbatún region, at the heart of the Río Pasión drainage in the southern lowlands (see [Figure 4](#)). Aguateca's notable prominence in the data set might suggest that it was also a production center of this specialized craft. Through networks supported by its political prominence during this period, the laminate products or practices might have made their way easily from there to other sites within the Petexbatún polity. The

presence of a sample from Piedras Negras, given its strategic location on the Río Usumacinta, a trade route between the Maya highlands and lowlands, opens up intriguing lines of inquiry about the craft practice's wider distribution.

Temporal distribution

The textile-clay laminate samples known to date are from Late Classic contexts; although found in a poorly stratified midden in Cueva de los Quetzales, the fragments deposited by activities at Las Pacayas are likely also to be from this time period. The strong showing at Aguateca might suggest a late 8th century flowering of the craft production, but further investigation of the earlier occupation of all of these sites and additional examples would be necessary to clarify this aspect.

Data Set Limitations

Material recognition and classification

As a material type unknown to those excavating it, laminate samples carry the obvious risk of going unrecognized, and only certain fragments might capture attention and be classified in ways that would enable them to be located later. As an example, J. Brady noted that the limited number of fragments from Cueva de los Quetzales was likely a function of sorting and not representative of the total occurrence, the three standing out by their oddly sculptural qualities (personal communication, 2001). Other fragments from this context may well have been misclassified. If identified as ceramic and put in populous categories such as "figurines" or "incensarios," their later retrieval would be problematic. The one confirmed sample classified as a figurine fragment was found by serendipity, from Piedras Negras, an unexpected site.

Starting with inventories of box contents and container labels to narrow my search of selected collections, I ultimately located fragments in a range of categories. Several unassuming laminate fragments were found in a random review of "burned daub." Most of the new samples were located in boxes designated "other" or "miscellaneous." In Aguateca's case, a rapidly abandoned site with complex deposits and of necessity a painstaking record-keeping system, the material had been classified as "other material." It was described in notes as "máscara" (after 1998), once the material's similarity was recognized. While that description carries the risk of prematurely pigeonholing the object type, it did enable fragments of interest to be easily sorted from the inventories.

Field recovery

The fragments ranged from brittle and fragile (cracker-like) to solid and robust, directly affecting their response to archaeological recovery, packaging, handling and initial finds

processing choices. Any unfired or poorly fired materials might not survive archaeological burial, which provides degradative factors, such as water and biological agents, for both textile and clay components. In the case of Aguateca, its disproportionate representation in the data set is likely due to favorable depositional circumstances and to archaeological processing well tailored for comprehensive recovery. This included provisions for a conservator to be present, enabling fragile materials to be lifted more effectively. Under any circumstances, recognition of the material's inherent fragility would be expected to favorably influence its handling in the field.

Post-excavation processing

Finds processing protocols are generally established on the basis of material category and perceived fragility. To compound issues of inherent vulnerability and retrieval state, misclassified laminate fragments might not survive being packed in bags with potentially dissimilar material. Those sorted as ceramic might likely have been washed, a potentially disastrous choice for poorly fired materials or those particularly weakened during burial. Those that were located in this study had been packed with some care, and those that appear to have been washed were clearly robust examples of the technology.

Conclusions

This research has expanded the number of known examples of a previously unrecognized material that may now take its place more securely among the craft technologies of the ancient Maya, with a name of its own. While the documented examples are still painfully small in number and notable for their fragmentary state, the following points about textile-clay laminate technology may now be made with greater confidence. The process of layering textiles and clay (probably in slip form) is consistent among all samples. Simple weaves are favored, with some variation in warp/weft count and density, but without any apparent preferential positioning within the laminate structure. The proposed use of a mold or support during fabrication and minor manipulation of the dried laminate in finishing stages continue to be plausible. All samples were heat hardened, and the ceramic product was notably lightweight.

While not helpful in determining object type or use, the occurrences with extremely low fragment count may still be regarded as a useful indication that the laminate was not an everyday material. In general, the majority of fragments were found in high status contexts, including royal buildings, elite buildings or other areas (including middens) closely associated with royal or elite activities, both private and public. Those originating from undisturbed contexts, notably the rapidly abandoned areas investigated at Aguateca, deserve special note, as preservation was more extensive and use much

easier to infer. While there are not enough samples yet to determine restrictions, indications are strong for the material's use for ritual performance items.

The addition of Piedras Negras to the roster—by serendipitous recognition of a fragment as a result of recent personal communications—serves to illustrate the beneficial ripple effect of this study. Even as a singular example, it places for the first the material's distribution outside of the Petexbatún region. This experience is likely to be repeated as awareness of the craft technology increases, and the material is properly identified and curated.

With respect to finds processing, several issues were brought to the fore in the course of this study. The diagnostic features of textile-clay laminates are sometimes subtle. Noticeably light in weight, the fragments might be confused with certain ceramic pastes, where dissolution of calcitic inclusions produce an exceptionally lightweight material (such as those of figurines from Dos Pilas). The hollows might be mistaken for those left by now-disintegrated textile components. Fine striations produced by a toothbrush cleaning a soft surface might similarly be confused with the linear traces of the textile component.

Close inspection and especially the use of a magnifying lens are critically important in recognizing laminate samples. If there is any doubt—with or without this level of scrutiny—classification as "other" or "miscellaneous" is highly recommended, as it will generally take them out of the normal finds processing stream. The latter typically includes cleaning (often with water), which can be very damaging to the more friable, less well fired examples. Unusual materials are more likely to receive protective packaging, which would promote their survival for later review. Such classification also enables fragments of interest to be retrieved more easily from bulk collections, as was clearly the case for this research. Expanding the data set remains a priority, and no fragment is unimportant. Each occurrence offers an opportunity to expand what we know about this craft technology, including details of production and its history of use by the inhabitants of ancient Mesoamerica.

Endnotes

The sites listed below were excavated by projects operating under the oversight of the Departamento de Monumentos Prehispánicos [DEMOPRE], of the Instituto de Arqueología e Historia de Guatemala [IDAEH], Dirección Patrimonio Cultural y Natural. Brief descriptions of the sites are provided, but only the projects whose excavations yielded laminate samples are specifically cited, along with bibliographic references for these proveniences. An individual project name can vary somewhat as it appears on forms, on labels and in publications, as well as in Spanish and English versions; the commonly encountered alternatives are included. For abbreviation purposes in this text, I have chosen the version that appears mostly consistently on sample labels or in publications. General reference: Sharer 1994.

1. The cave known as **Cueva de los Quetzales** [CQ] was investigated in 1993 by the Petexbatún Regional Cave Survey [PRCS], a sub-project of the Proyecto Arqueológico Regional Petexbatún [PARP]³, under the direction of James E. Brady and Irma Rodas. *References*: Brady and Rodas 1995; Brady *et al.* 1997.

The cave underlies the site of Las Pacayas [LP], which was investigated by Héctor Escobedo as part of the Proyecto Atlas Arqueológico de Guatemala [PAAG]. Its occupation began in the Early Classic period (contemporaneous with Arroyo de Piedra and Tamarindito); by the Late Classic, it was absorbed by the Dos Pilas polity, centered about 11 km away to the north. Situated on a modified natural hill, the city appears to have been laid out to place the underlying cave at its civic-religious heart. The chimney-like opening in the cave vault is between the two major plazas (A and B). Most of the excavated materials from the Las Pacayas site date to the Late Classic. *Reference*: Escobedo *et al.* 1994.

2. Strategically positioned along a limestone escarpment, the city of **Aguateca** [AG] was founded in the late 7th-early 8th century A.D. as the second capital of the polity centered on Dos Pilas, located less than 10 km away (to the northwest). Its royal family, linked to that of Dos Pilas, took up residency in the narrow zone framed by the escarpment and by a parallel deep chasm. In a period of increasing military unrest in the region, the natural barriers of the elite zone were augmented with defensive walls. Following the fall of Dos Pilas after 761, Aguateca emerged as the principal capital of the polity. Around A.D. 800, it too was attacked by enemies and subsequently abandoned.

Excavations carried out since 1990 by various projects have included testing operations in the site core (Main Plaza and Causeway area) and periphery, as well as more extensive investigations of individual structures. The excavated materials date primarily to the Late Classic period. The initial work was carried out under the aegis of the Proyecto Arqueológico Regional Petexbatún [PARP]³, in excavations directed by Takeshi Inomata (1990-1993). Explorations in peripheral areas continued for several more seasons under the direction of Arthur A. Demarest. *References*: Inomata 1995 [Strs M8-10, M8-11, L7-5, L7-42]; Inomata and Stiver 1998 [Str M8-10]; O'Mansky *et al.* [Group G-2], in Valdés *et al.* 1994.

The site was subsequently excavated by the Aguateca Archaeological Project [AAP] (also called Proyecto Arqueológico Aguateca), directed by Takeshi Inomata, Daniela Triadan and Erick Ponciano (1996-2001 seasons). The 2002 season was designated Proyecto Arqueológico de Laboratorio Aguateca, and was directed by Daniela Triadan and Anaité Galeotti. *References*: Inomata 1995; Inomata *et al.* 1998 and Inomata *et al.* in press [Str M7-22]; Inomata *et al.* 2002 [Str M8-4]; Inomata and Murphy [Group L8-9], in Ponciano *et al.* 2000.

The Proyecto de Restauración Aguateca [PR] carried out architectural restoration work at the site (1999-2000), directed by Juan Antonio Valdés, and funded by the Interamerican Development Bank [Banco Interamericano de Desarrollo, BID] as

part of the Programa de Desarrollo Sostenible de Petén. *References:* Urquizú [Str M7-26], in Valdés *et al.* 1999; Díaz-Samayoa y Valdés [Str M8-37] and Díaz-Samayoa y Martínez [Str M8-11], in Valdés *et al.* 2000.

The project was succeeded by the Proyecto de Restauración Aguateca Segunda Fase [PRAS], funded by BID through a contract (beginning in 2002) with the Corporación Antigua, an architectural firm headed by Oscar Santos Corea, with project direction by Takeshi Inomata (beginning 2002). The project also includes some new archaeological investigations, designated the Proyecto Arqueológico Aguateca-BID Programa Complementario, also directed by Takeshi Inomata.

3. The **Proyecto Arqueológico Regional Petexbatún** [PARP], also known as the Petexbatún Regional Archaeological Project and Proyecto Arqueológico Petexbatún, was carried out under the overall direction of Arthur A. Demarest and Juan Antonio Valdés (1989-1994). The project encompassed survey and site investigations in the region lying at heart of the Río Pasión drainage. Numerous archaeologists were involved in individual site excavation, including Antonia E. Foias, Joel W. Palka (Dos Pilas), Takeshi Inomata (Aguateca), Héctor Escobedo (Arroyo de Piedra) and Juan Antonio Valdés (Tamarindito). *Reference:* Demarest 1997.
4. **Arroyo de Piedra** [AP]'s history predated the Late Classic period, but with the emergence of Dos Pilas it became an important secondary center in the Petexbatún polity. Located mid way between Dos Pilas (2-3 km to the west-southwest) and Tamarindito (~3 km to the east), it may have functioned as an outpost to maintain control over Tamarindito. It too was abandoned in the late 8th century, following the collapse of Dos Pilas and its vassal cities.

Test operations and selected investigations of structures were carried out in various portions of the site, under the direction of Héctor Escobedo as part of the PARP, including the Main Plaza and the adjoining North Plaza. *References:* Stuart [Str 13], in Demarest and Houston 1990; Escobedo 1997.

5. Located along the escarpment, **Tamarindito** [TA] is thought to have been the capital of a ruling lineage in the Early Classic Petexbatún, absorbed in the Late Classic by the new power that established itself at Dos Pilas. It must have posed a threat, given the oversight function established at the nearby center of Arroyo de Piedra. Its subsequent military revitalization—notably the capture of Ruler 4 in A.D. 761 by Tamarindito subordinates—ultimately led to Dos Pilas' collapse. Investigations of the site were carried out under the direction of Juan Antonio Valdés as part of the PARP. *Reference:* Valdés 1997.
6. Located on Río Usumacinta some 100 km downriver (north and west) from the juncture of the tributary Río Pasión, the powerful center of **Piedras Negras** [PN] had a long history of independent rule over its surrounding polity; its dynastic history is best documented during the Late Classic period (early 7th to late 8th centuries). Excavations at PN in recent years were conducted under the direction

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