CAMBRIDGE
UNIVERSITY PRESS

Research Article

The carved monuments of La Milpa, Belize: Results of photogrammetric and epigraphic documentation

Christophe Helmke[a] , Norman Hammond[b], Fred Valdez Jr.[c] and Thomas Guderjan[d]

[a]Institute of Cross-Cultural and Regional Studies, University of Copenhagen, Karen Blixens Plads 8, DK-2300 Copenhagen S, Denmark; [b]McDonald Institute for Archaeological Research, University of Cambridge, Downing Street, CB2 3ER Cambridge, United Kingdom; [c]Department of Anthropology, University of Texas at Austin, 2201 Speedway - Stop C3200, WCP 4.102, Austin, TX 78712, USA and [d]Department of Social Sciences, University of Texas at Tyler, 3900 University Boulevard, Tyler, TX 75799, USA

Abstract

La Milpa, situated in northern Belize, stands out as one of the region's largest archaeological sites, having served as the capital of an ancient Maya city-state. Its significance is indicated by extensive monumental architecture, with the epicenter covering approximately 8.8 ha. The site's corpus of monuments, comprising 23 stelae and several altars, underscores its prominence in northern Belize, rivaling the corpora of sites such as Nim li Punit and Caracol. Despite its remote location, La Milpa has garnered the attention of researchers, particularly since the first modern survey of the site in 1988. Subsequent studies—in particular, that by Nikolai Grube in the 1990s—has provided detailed analyses of the site's corpus of carved monuments. Recent efforts, including epigraphic documentation in 2019, serve to enhance our understanding of La Milpa's dynastic history through traditional epigraphic and computational photographic methods. Utilizing field observations, raking light photography, and 3D photogrammetric models, we have refined previous analyses and provide new insights into the iconography and textual segments of the monuments. Here, we present the results of these recent efforts as well as our new analyses of a selection of monuments.

Resumen

El sitio arqueológico de La Milpa, situado en el norte de Belice, fue la capital de una antigua ciudad-estado maya. El sitio se destaca como uno de los sitios más grandes de la región y su importancia se evidencia por su extensa arquitectura monumental, con el epicentro que cubre aproximadamente 8.8 hectáreas. El corpus de monumentos del sitio, que comprende 23 estelas y varios altares, subraya su prominencia en el norte de Belice, rivalizando con los corpora de sitios como Nim li Punit y Caracol. A pesar de su ubicación remota, La Milpa ha atraído la atención de los investigadores, especialmente desde el primer levantamiento moderno del sitio en 1988. Estudios posteriores, especialmente el realizado por Nikolai Grube en la década de 1990, han proporcionado análisis detallados del corpus de monumentos tallados del sitio. Los esfuerzos recientes, que incluyen la documentación epigráfica de 2019, sirven para mejorar nuestra comprensión de la historia dinástica de La Milpa a través de métodos epigráficos tradicionales y fotográficos computacionales. Utilizando observaciones de campo, fotografía con luz rasante y modelos fotogramétricos 3D, hemos refinado análisis anteriores y brindamos nuevas interpretaciones de la iconografía y segmentos textuales de los monumentos. Aquí presentamos los resultados de estos esfuerzos recientes, así como nuestros nuevos análisis de una selección de monumentos.

Keywords: Maya; Belize; La Milpa; epigraphy; photogrammetry

The site and its corpus

The archaeological site of La Milpa is among the largest in northern Belize. As the capital of an ancient Maya city-state, its importance is made evident by the substantial architecture of the monumental epicenter as well as in the number of monuments that were raised there in antiquity (see Hammond et al. 1996; Houk 2015). In all, the most densely built and contiguously constructed portion of the monumental epicenter covers an area of about 8.8 ha, and it exhibits a range of pyramidal temples, broad plazas, imposing range structures, large palatial compounds (replete with finely decorated thrones), at least two ballcourts (that

define the entrances to the monumental groups), and a prominent *via* connecting the northern and southern portions of the site (e.g., Hammond 1998; Hammond and Thomas 1998; Hammond et al. 1996; Houk 2015:171-175; Schultz et al. 1994; Zaro and Houk 2012) (Figure 1). Together, these mark the site as the third largest in Belize, after Caracol and Lamanai (Houk 2015:236, Table 10.1; see also Chase and Chase 2017; McLellan 2020; Pendergast 1981). At its peak, the city had a population in the tens of thousands, and its core territorial extent can be approximated by the location of minor centers, established roughly 4 km from the monumental epicenter (Hammond et al. 1996; Rose 2000; Tourtellot et al. 2002; Tourtellot et al. 2003).

La Milpa was built on a prominent limestone ridge some 180 m above sea level; the Rio Bravo escarpment, 9 km to the southeast, drops 140 m to the low coastal plain. (Hammond and Tourtellot 1993:71; Houk 2015:170). The territory under the control of La Milpa and affiliated sites atop the Rio Bravo escarpment formed a discrete region of northern Belize (see Kosakowsky and Sagebiel 1999; Sagebiel 2014), which exploited the marshy lowlands along the escarpment for intensive raised-field agriculture, thereby forming a veritable maize basket for the region (see Beach et al. 2019; Turner and Harrison 1983).

The monumental corpus to date has 23 stelae and perhaps a half dozen altars, the largest such assemblage in northern Belize and second in all of Belize after Caracol
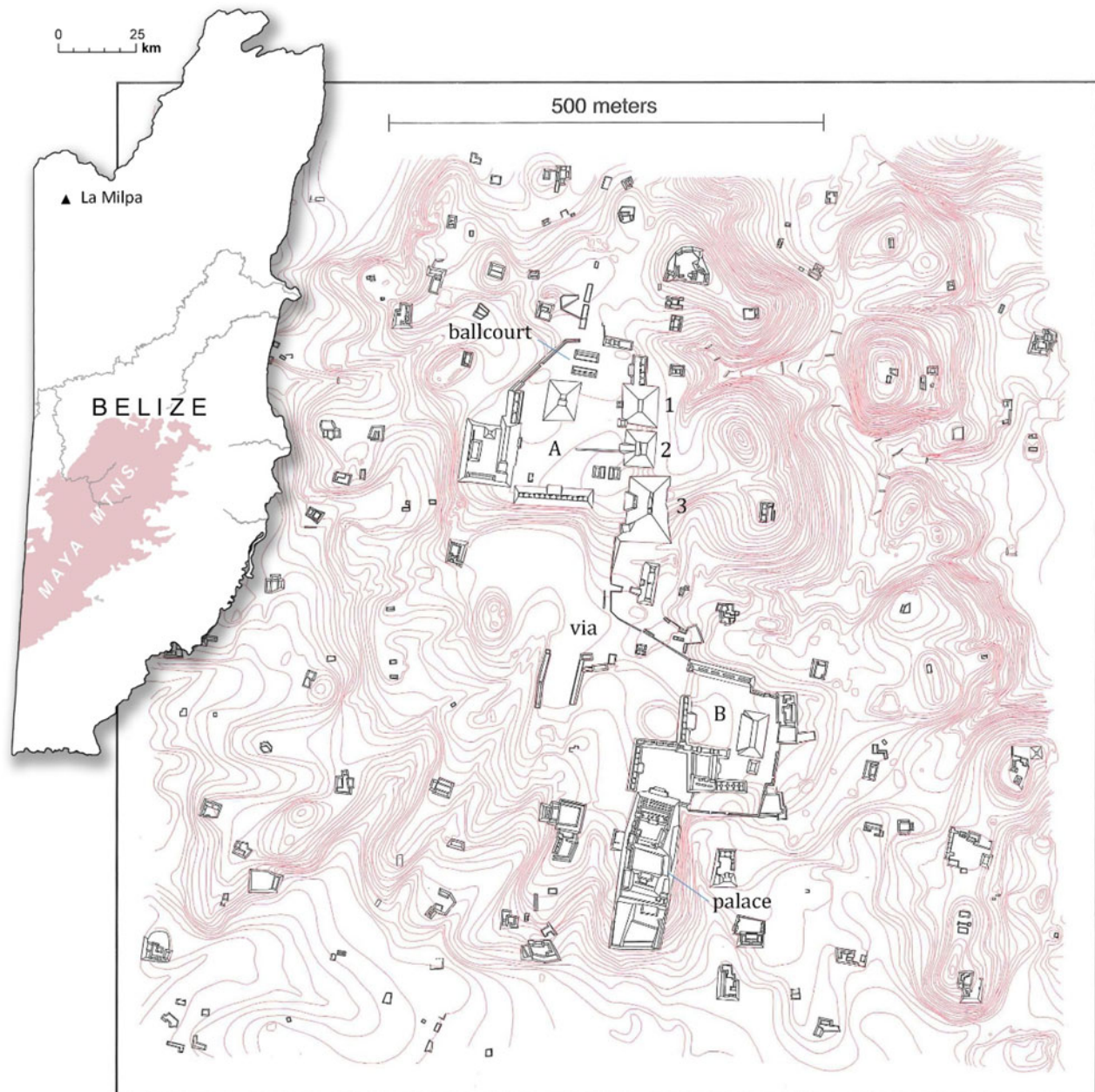

Figure 1. The epicentral square kilometer of La Milpa. Survey by Gair Tourtellot. GIS map by Francisco Estrada-Belli (after Hammond 1998: Figure 1). Inset: Map of Belize showing the location of La Milpa. Map by Christophe Helmke.

(27 stelae)—closely followed by southern Belizean sites such as Nim Li Punit (21 stelae) and Uxbenka (22 stelae) (see Helmke 2018a, 2019:32; Wanyerka 2003). Admittedly, the size, volume, and areal extent of monumental architecture, coupled with the presence and relatively high number of carved monuments, constitute only rudimentary proxies of a site's importance. Yet, these are tangible embodiments of a long architectural history, with powerful and charismatic rulers at the helm who invested surplus production into grand architectural projects (e.g. Andres et al. 2014:48–49, Table 1; Helmke and Awe 2008:67–69, Figure 4; Houk 2015:13–45).

An account of epigraphic documentation

The monumental corpus of La Milpa has attracted the attention of many researchers since the site was first explored by J. Eric. S. Thompson in 1938 (Hammond 1991). Initially, Thompson reported on the site's first dozen monuments (designated Stelae 1–12 from north to south) along the base of the three pyramidal Structures 1–3 that dominate the eastern edge of Group A (Thompson 1938). Due to its remote location the site then lay virtually unexplored for five decades after its discovery, until it was surveyed in 1988 by the Río Bravo Archaeological Project. As part of these efforts, Thomas Guderjan mapped the monuments and structures of the northern plaza (Group A), re-designating the monuments and leading to the identification of Stelae 13 through 16 (Guderjan and Yaeger 1991; we have since reinstated Thompson's numbering of Stelae 1–12). New sketches of the monuments were produced alongside a detailed description of each monument (Guderjan and Yaeger 1991). This work was followed by the La Milpa Archaeological Project (LaMAP) in 1992 (Hammond and Tourtellot 1993). The most current and coherent analysis of the monumental corpus of La Milpa is the initial study conducted by Nikolai Grube with LaMAP in 1993 (Grube 1994) (Figure 2).

Following this study, the monuments of La Milpa have only sporadically attracted attention concerning particular details, although none have superseded the earlier epigraphic work (e.g. Robichaux and Houk 2005:9–10; Sagebiel

Table 1. Synthesis of the stelae of La Milpa.[a]

Designation	Context	Carved/Plain	Number of Sides	Comments
Stela 1	Structure 1	carved	2 (3)[b]	Early Classic
Stela 2	Structure 1	carved	1	Early Classic
Stela 3	Structure 1	carved		
Stela 4	Structure 1	carved	3 (4)	Late Classic
Stela 5	Structure 1	carved		
Stela 6	Structure 1	carved		
Stela 7	Structure 5	carved	4	9.17.10.0.0
Stela 8	Structure 2	carved	1?	Late Classic
Stela 9	Structure 3	plain		reused as altar of Stela 10
Stela 10	Structure 3	plain		Protoclassic
Stela 11	Structure 3	plain		
Stela 12	Structure 3	carved	3	Late Classic
Stela 13	Structures 11–12	plain		
Stela 14	Structure 16	plain		
Stela 15	Structure 54	carved	3	not erected
Stela 16	Structures 11–12	carved	3	Early Classic
Stela 17	Structure 1	plain		fragment laid flat, not erected
Stela 18	Structure 9	plain		lower fragment?
Stela 19	La Milpa East	plain		
Stela 20	Structure 199	carved	2 (3)	9.7.?.?.? ~ 9.8.?.?.?
Stela 21	Structure 21	plain		
Stela 22	La Milpa North	plain		
Stela 23	La Milpa South	plain		

[a]Table by Christophe Helmke and Norman Hammond.
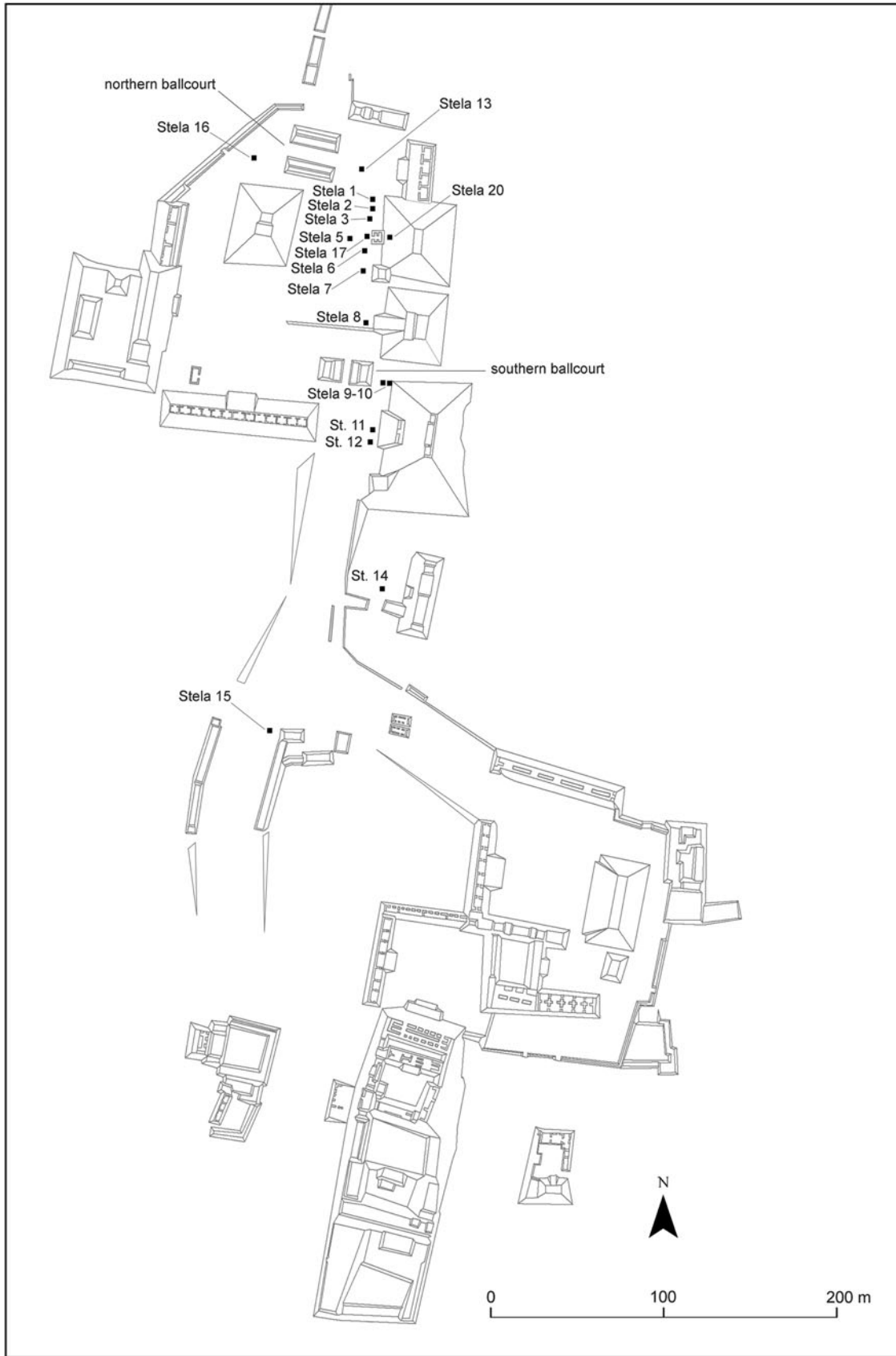[b]Numbers in parentheses are reconstructed values.

Figure 2. Map of the monumental epicenter, showing the distribution of stelae mentioned in the text. Map by Francisco Estrada-Belli and Christophe Helmke.

2006:335). Additional work at the base of Structure 1 led to the rediscovery of Stela 4, as well as the discovery of Stela 17, both buried under looters' rubble along the structure's primary axis (Grube and Hammond 1998; Hammond and Bobo 1994:22, 24). Likewise, additional clearing in the looters' trench bisecting Structure 1 revealed the buried Structure 199, which appears to have housed the fragments of Stela 20 (Hammond 2001).

Much like the other monuments, these are indicative of shuffling and repositioning of monuments in antiquity. The butt of Stela 18 was found reset as a riser in the monumental stair of Structure 9 on the western side of the great plaza (Hammond et al. 2014:88). More intensive settlement surveys in the periphery and investigations of minor centers in the vicinity of the monumental epicenter have led to the discovery of additional plain monuments (Stelae 19, 21, 22, 23) at these centers, bringing the greater La Milpa total to 23 stelae (Hammond et al. 2014; see also Tourtellot et al. 2002). A synthesis of basic data pertaining to some of these monuments is presented here (Table 1): the plain stelae are not discussed in this article, nor are the carved Stelae 1, 3, 4, 5, 6, and 8. Stela 4 is detailed in Grube and Hammond (1998), and the others are outlined in Hammond and Bobo (1994). Most are fragments, and none have legible epigraphic records.

In 2016, Bruce Love visited the site and secured raking-light photographs of a number of monuments, with a view to integrating these into a larger photographic register of Belizean monuments. As part of a larger synthesis of the glyphic texts of Northern Belize, Christophe Helmke joined the Lamanai Archaeological Project as epigrapher and was invited to La Milpa as project epigrapher to examine the monuments and assess the potential for further epigraphic work (Helmke 2017a, 2018b, 2020; Helmke and Pawlowicz 2021). As part of these efforts, Helmke visited La Milpa in 2019 to initiate a collaborative program of epigraphic documentation—integrating traditional photography and complemented by 3D modeling—that was generated by computational photography.

Some of the most important observations made during the 2019 season of epigraphic documentation are reported below, according to individual monument designations in ascending numerical order. A selection of photographs, drawings, and stills of 3D models are provided where necessary to best illustrate the features described, especially as these pertain to the epigraphy of the monuments. The observations are deemed to complement and/or supersede those made by earlier researchers and are intended to build upon the earlier study by Grube (1994). All of the monuments presented below were examined in the field, both during the day as well as at night, and inspected using artificial raking light, from portable LED lights (with variable Lumen ranging from 200 to 1,000). The monuments were photographed both by daylight and at night with raking light to obtain templates to serve as a basis for the drawings of the iconography and accompanying textual segments. Raking-light examinations were undertaken to highlight sculptural details and determine areas of erosion. In so doing, details could be emphasized that served as the basis for field sketches,

which were compared to earlier drawings. These either confirmed sculptural details or prompted minor corrections, which were then applied to the drawings at the close of the field season.

In addition to these more traditional epigraphic field methods, we have been fortunate to be able to draw on the 3D photogrammetric models of the monuments generated by Chance Coughenour and Bryan Allen. Using these models, templates of the monuments were produced, and their carved surfaces were inspected under radiance scaling view, shifting the light and emphasizing contours to serve as a means of either verifying the traits and features identified in the field or further fine-tuning details. This process has greatly enhanced the present epigraphic study and thereby warrants a new set of drawings as well as commentary on several of the monuments.

In addition to the redrawing and full photogrammetric documentation of the carved monuments, some of the most salient results of this recent documentation effort include the identification of the name and title of an early dynastic figure on Stelae 2 and 16; clarification of the caption and cruciform text of Stela 7 as well as the later part of the lateral text; the identification of the regnal name of a *Kanu'l* monarch on Stela 12; and clarification of the iconography of Stelae 15 and 20, along with a reassessment of their stylistic features, allowing us to offer provisional dates. On this basis, we provide a more extensive historical synthesis of the region, at the end of the article, to better situate the epigraphic and archaeological evidence from La Milpa.

Stela 2, Structure 1

Context and iconography

This stela is located just to the south of Stela 1, in the row of monuments at the foot of Structure 1. The other monuments erected at the base of this structure include Stelae 1, 3, 4, 5, 6, 7, and 17 (with the latter repositioned on the primary axis of Structure 1; see Grube 1994:218; Hammond and Bobo 1994:21–24). At the time of discovery, Stela 2 was found lying face down and with the upper portion missing; it appears to have been repositioned during the Late Classic period, possibly in the eighth century. There is no evidence to suggest that any attempt was made to reerect this stela, and Hammond and Bobo (1994) suggest that the repositioning may have taken place as late as the sixteenth century. Only the lower half of the stela remains, and attempts were made in antiquity to separate the butt from the carved surface (Hammond and Bobo 1994:21), leaving a large scar along the base (see Grube 1994: Figure 8). What remains of the iconography represents only the lowest portion of the carved scene (Figure 3), which preserves the outlines of a standing figure, facing to the left, with parts of the belt assemblage visible above the sinuous outlines of the legs.

Glyphic caption

Close to the base of the carved scene, near the groundline, is a little column of three glyphs that undoubtedly serves as a caption, naming the individual depicted. The glyphs are quite
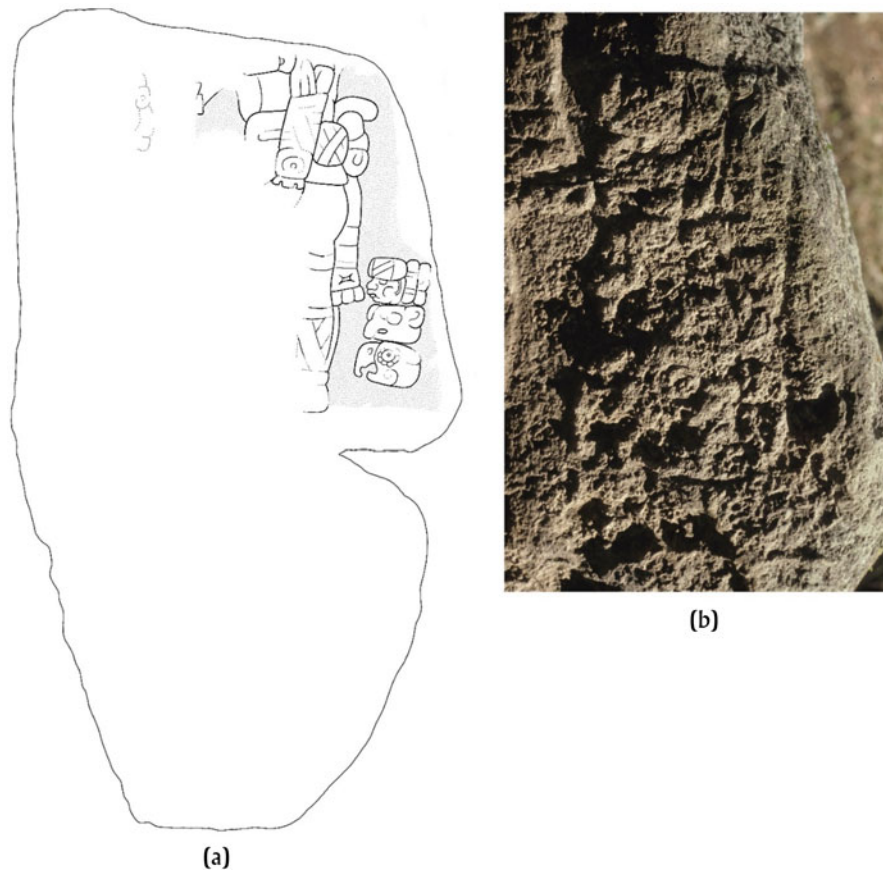
Figure 3. The basal portion of Stela 2, with its small glyphic caption: (a) drawing; (b) close-up photograph of the glyphic caption. Drawing by Christophe Helmke. Photograph by Norman Hammond.

eroded, but given their style and that of the accompanying iconography, it is clear that these date to the Early Classic period. Inspection of the monument in 2019 confirmed the drawing made by Grube. The first glyph (pA1) is composed of a head-variant glyph, apparently depicting the solar deity, which is followed by the more geometric form of the logogram **K'INICH**. When this logogram appears in the final portion of nominal contexts, it usually functions as part of a theonym, providing the name of a particular manifestation of the solar deity *K'inich*, and it is typically used as a regnal name, taken upon one's accession (see Colas 2014). Alternatively, when nominal sections are initiated by *k'inich*, it serves as an honorific form of address that precedes a name, qualifying the named individual as being "radiant" or "resplendent" (Colas 2003). In the second glyph block (pA2), we see the head of another animal possibly a tapir, and in the final glyph block (pA3), the head is that of the macaw, read **MO'**. Together, the name on Stela 2 therefore appears to have recorded *K'inich … Mo'*, with an unclear middle segment.

Given the similarity of this name to that of the dynastic founder of Copan, *K'inich Yax K'uk' Mo'* (r. A.D. 427–c. 437) (Schele 1992:135–138), Norman Hammond initially suggested that this may refer to one and the same figure—a plausible suggestion given the rough contemporaneity of the monument with this figure (see Hammond and Tourtellot 2002:4; Helmke 2020a:266)—and we can recall that the name *K'uk'*

Mo' also appears on the Hombre de Tikal statue, in a phrase relating an event in A.D. 403 (8.18.7.3.5; see Fahsen 1988:6). Were this a contemporaneous reference to one and the same figure, this would suggest a dating of the monument to the first half of the fifth century. Nevertheless, it seems more likely that this is a local ruler.

Likewise, more recent work on the murals and inscriptions of Uaxactun has revealed the existence of an even earlier figure named *K'inich Mo'* in a late-fourth-century context (Kováč et al. 2019). At present, it is difficult to clearly resolve which individual is named on Stela 2 or how one would account for these putative foreign mentions, but we can confirm that this name is well within the onomastic practices of the Early Classic period, given the continuities identified in the texts of the central lowlands, most notably at Tikal, Uaxactun, and Caracol (remembering that the Copan dynastic founder originally hailed from the latter site; see Helmke et al. 2019:101-102; Stuart 2007a; Stuart and Houston 1994:23, 52). As we will see below, there may be added evidence to conclude that this names a local ruler of La Milpa in the Early Classic period.

Stela 7, Structure 5

Context

Stela 7 was raised in a prominent place, in front of its own smaller shrine, designated as Structure 5, built at the

southwestern corner of the larger, more imposing, and ancient Structure 1. Given this context, we can see the resurgence of La Milpa's Late Classic strength with the construction of this shrine, echoing the grandeur of Structure 1 and serving to conduct ritual commemorations that were celebrated here since the onset of the dynasty (Hammond and Tourtellot 2002:5). The excavations of Structure 5 confirmed that the terminal architecture is contemporaneous with the dating of Stela 7 (Hammond et al. 1996:88, Figure 3). The pairing and contemporaneity of Stela 7 with Structure 5 indicate that these are part and parcel of the same construction effort and were raised in tandem to mark a new beginning of a revived dynasty in the Late Classic period. This is further confirmed by the replastered plaza surface that lips up to the stela and the lowest step of Structure 5.

Iconography

The iconography shows the monarch in splendor on the front of the stela (Figure 4), richly attired with a large

Figure 4. The front surface of Stela 7, showing the iconography and the glyphic registers. Photograph by Bruce Love.

necklace and a broad belt that is embellished with a row of olive shell tinklers, with small maskettes on either hip, each above a triad of jadeite celts. The broad loincloth is decorated with the frontal depiction of a supernatural entity, and the sides are framed by two serpentine entities with squared snouts, symbolizing solar rays. Although only partly preserved, the high-backed sandals were further decorated with sprays of feathers at the front. The king brandishes a manikin scepter in his right hand, in the form of a diminutive deity, *K'awiil* (God K), the personification of lightning. The iconography undoubtedly continued in the basal register below the standing ruler, but this portion is so eroded that one cannot comment further, except to suggest that a captive may have been represented, cowering and prostrated below, as is typical for monuments of this period (see Proskouriakoff 1950—for this stela, pp. 141, 192, Figure 64c; Dillon 1982). This is in fact supported by the presence of two small glyphs along the left margin of the stela, revealed by the 3D model produced by Coughenour and Allen (see Figure 5a). These two glyphs probably served as a caption, hovering close to the head of the captive, which these once served to name.

Glyphic registers: Front

In addition to the caption to the probable captive below, the iconography is also accompanied by two larger glyphic registers: One primary one to the left, arranged in double columns (C–D) and another secondary register to the right split between a short single column (E) above an even shorter row (F–G) (note that the designations of the columns in the secondary register have been updated here, and they differ from those originally suggested by Grube [1994:233]). The secondary register to the right probably served as a caption to the king, describing his portraiture as rendered on the stela. Most of this is now completely eroded, but it was probably once initiated with the heading (at G1) *u-baah*—literally, 'it is his head' or, more figuratively, "it is his portrait, portrayal," or even "it is his self/himself" (see Houston and Stuart 1998). The ensuing names are completely eroded (G2–G4), but the nominal section ends in the row below with **NAH-5-CHAN-na** (F1) and **{a-AJAW-wa}** (G1) (Figure 5b). The first portion provides the name of a supernatural locality, a celestial one to be precise (Stuart and Houston 1994:71), that is typically connected with the so-called Paddler Deities, a pair of aged entities who ferry the deceased on a canoe between the realms (Schele and Miller 1986:52, 183; Stone and Zender 2011:51, 69). As a title, the whole can be read as *Nah Ho' Chan Ajaw* and understood as 'lord of the First Five Skies.' Outside of mythological scenes, the same title is used at times to style historical individuals, where earthly lords aspired to supernatural epithets. At present, we have clear examples of this for the rulers of Nakum (Stela 1), Tikal (Stela 5), Tipan Chen Uitz (Monument 4), and Nim li Punit (Stela 1), who all bore this title, in addition to an individual connected to Altun Ha, named in the glyphic texts of Naj Tunich (Drawing 65) (see Helmke et al. 2015:18, Figure 16; see also Helmke et al. 2018:131, Figure 15b; Wanyerka 2003:27–29, Figure 14).
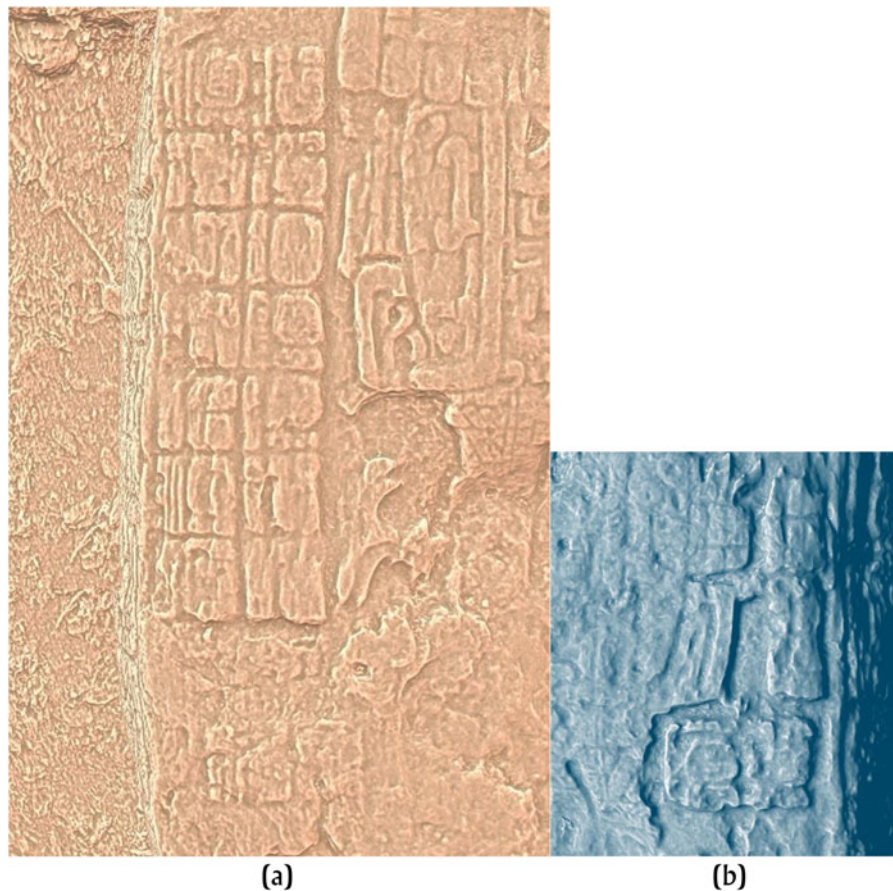
Figure 5. Excerpts of the 3D model produced of the front of Stela 7, in radiance scaling view, showing (a) the primary glyphic register and with the two-glyph caption in the eroded basal register below; (b) the secondary glyphic register. Model by Chance Coughenour and Bryan Allen.

The primary glyphic register on the front of the stela has greatly benefited from additional photographic documentation, and computational photography has allowed enhancement of the carved features. This, coupled with examination in the field, has enabled us to produce a new drawing of this glyphic register (Figure 6). The glyphic panel reiterates the date that is recorded on the sides of the stela (see below), and is only rendered as a Calendar Round, written as 12 Ajaw (C1) and 8 Pax (D1), corresponding to A.D. 780. The event that took place on this date is recorded in the following glyph block (C2) as **a-AK'-ta-ja** for *ahk'taj* 'was danced,' indicating that a dance was also celebrated to commemorate this particular Period Ending. The type of dance performed is qualified by the implement used as part of the dance—in this case, the Manikin scepter depicted in the iconography. This is recorded as **ti-?-NAL** (D2), in which the main sign is an undeciphered logogram for the Manikin scepter, rendered as a set of two little plump legs. The whole is preceded by the general preposition *ti* 'with,' serving to bind the object to the dance in which it was used (see Grube 1992:209–211, Figure 11).

What appears to be another subclause follows by listing two partly eroded logograms (C3–D3) that record a proper name. That these constitute a name is indicated by the following glyph block (C4), which records **u-K'ABA'**, *u-k'aba'* 'is its name.' The object that is named is mentioned next (D4) as **u-bi-hi**, for *u-bih*, 'it is his road' (see Stuart 2006, 2007b), which may well name the main causeway or the *via* that connects the northern Group A with the palatial complexes to the south. Archaeological evidence pertaining to the construction of this architectural feature indicate that it was built in two phases: the first major phase dates to the Early Classic period, and the subsequent refurbishment one dates to the Late Classic period (based on the dating of associated structures), which may well date to the eighth century.

The owner of this road, or *via*, or the name that is tied to this object through the possessive pronoun is expressed in the following two glyphs (C5–D5). Only portions of the name can be made out as **YAX-#-# / YOP-AT-ti**, for *Yax ... Yopaaht*, involving the theonym of a particular storm god, with the initial segment qualifying the manifestation of this deity and here serving as a regnal name for the monarch of La Milpa, undoubtedly the individual portrayed on the stela. Onomastically, the name resembles that of the *Kanu'l* monarch *Yax Chan? Yopaaht*, who reigned at the end of the sixth century (Martin and Grube 2000:102, 104), as well as the last well-established ruler of Copan, *Yax Pasaj Chan*
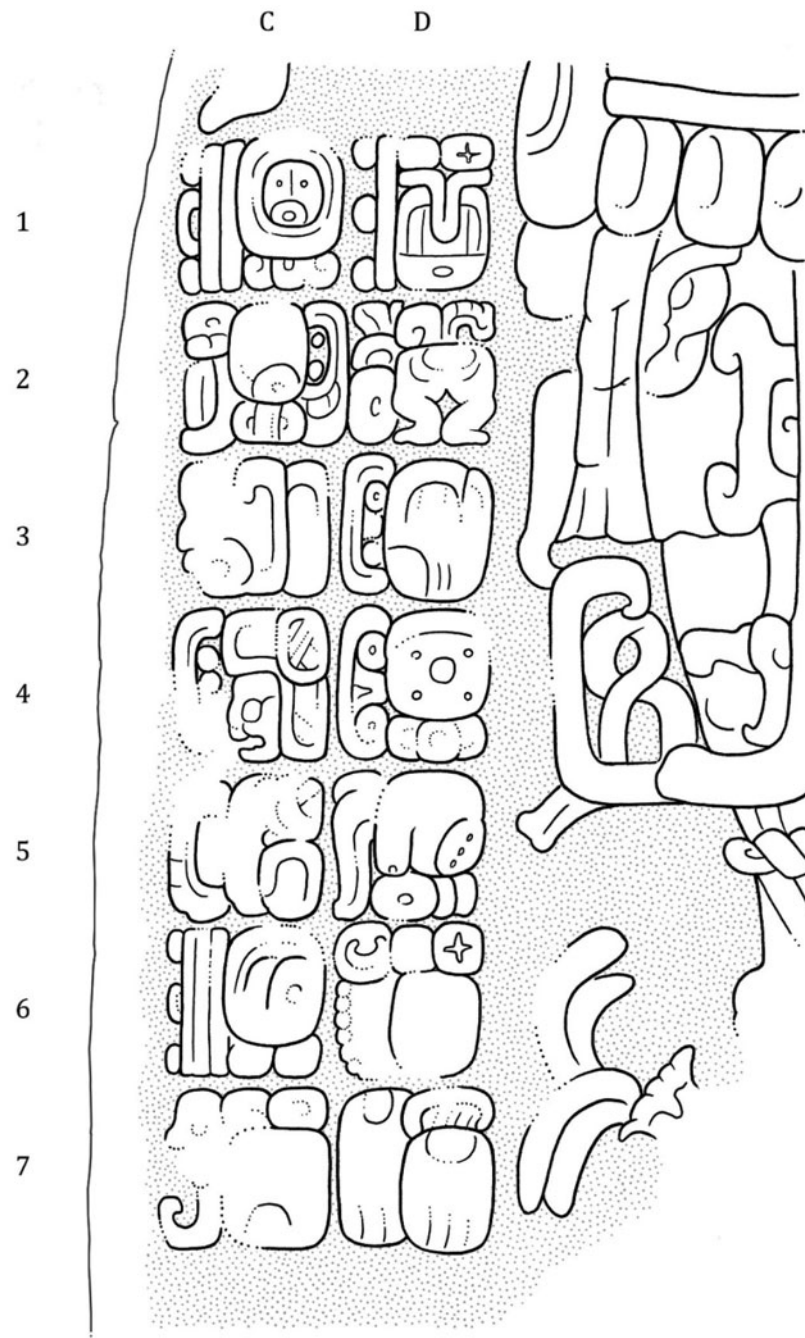
Figure 6. The primary glyphic register on the front of Stela 7. Drawing by Christophe Helmke.

Yopaaht (r. A.D. 763–c. 810) (Martin and Grube 2000:209–212)—although these are merely comparisons to similar names.

The titular string of *Yax … Yopaaht* follows, and this is initiated by the numeral **17** (not 18, as in previous analyses as the central element is a filler, not a disk) followed by the eroded, though discernable **TAL-la** (C6) (see Robichaux and Houk 2005 for an earlier analysis). Together, this reads as *huklajuun-tal* and serves as an ordinal expression, indicating that the individual named here is the seventeenth in a sequence to hold the title specified in the following glyph block. That title is none other than an Emblem Glyph (D6),

written **K'UH-#-AJAW**, in which the main sign is unfortunately eroded, but it demonstrates the use of the title 'godly … king' by the monarchs of La Milpa, a mark of autonomy for a powerful royal dynasty (e.g., Martin 2020:395–398; Mathews 1991). As he was the seventeenth monarch in the dynasty to hold this title, we can postulate a dynastic founding sometime at the end of the fourth century, given the average documented lengths of reigns (i.e., 25.44 years; Grube 2006:156).

The following title (C7) remains unclear, although it may involve a logogram in the form of a square-nosed solar

entity at the onset, and the glyph block does not record another EG, as has heretofore been assumed (see Grube 1994:223). The final glyph block (D7) is the customary **ba-ka-ba**, which typically ends titular clauses (see Kelley 1962:306–307), and which ascribes the bearer with the title *baahkab*—literally 'head-earth' but intended as "foremost of the land," roughly analogous to the Latin *princeps*, 'the first, foremost' (see Helmke et al. 2018:35). With this, the primary glyphic register on the front of the stela comes to a close.

Lateral texts

In large measure, the glyphic texts that embellish the narrow sides of the stela form the primary text of the monument, as suggested also by the sheer size of the glyphs. These lateral texts start on the left (northern side) of the stela and continue on the right (southern side) (Figure 7). The text of column A was initiated by a now missing Initial Series Introductory Glyph (A1) that opened a complete Initial Series, headed by a Long Count (A2–A5a) that can be transcribed rather unproblematically as 9.17.10.0.0, recording the lahuntun or half-katun Period Ending of December 2, A.D. 780 (Grube 1994:222, Figure 5a; Thompson 1938). This remains the only secure Long Count date recorded at La Milpa. The Tzolkin date 12 Ajaw follows (A5b) as does the reference to the Lord of the Night (Glyph G9 at A6a), and they are accompanied by their customary title (Glyph F at A6b), read *ti'huun*, to be understood as "spoke(person) of the crown" (see Zender 2004:215–221).

The Lunar series follows by specifying that 25 days have elapsed since the new moon 'arrived' (Glyphs E and D at A7a), before going to record additional information concerning the lunar trimester (Glyph C at A7b). This particular expression is here written with a cranium (as revealed by inspection of the 3D model), with the proper name of the lunation, or the tutelary deity of the lunar semester, written in the following glyph block (Glyph X at A8a). The glyph in question represents what may be a small celt, before a cranium, that is above a pair of crossed legs, which together identify this as Glyph X4, at present still of unknown reading. The last glyph on this side of the stela (A8b) specifies that the preceding glyph provided the proper name, here stated to be the *u-ch'ok k'aba'*, or 'its youth name' (Glyph B).

The Initial Series continues on the opposite side, at the top of the southern side in column B, which is greatly enhanced by the 3D model (Figure 8). The very first glyph (B1a) specifies the length of a given lunation, here written as 10+20, for "thirty" (Glyph A10). Even though the following glyph block (B1b) has completely spalled away, we can nonetheless reconstruct it as a type of "fire sequence" recording a pyrolatrous ritual. Such rituals typically record how a particular type of fire was brought about and then specify to which supernatural entity this fire is consecrated (Grube 2000). In this particular case, we can make out that the fire was cited as **u-K'AK'-LEM-AJAN** (B2), to read as *u-k'ahk' lem ajan*, or 'it is the fire of *Lem Ajan*,' naming one particular manifestation of the young maize god *Ajan* (Stone and Zender 2011:21–22) that is here qualified by a
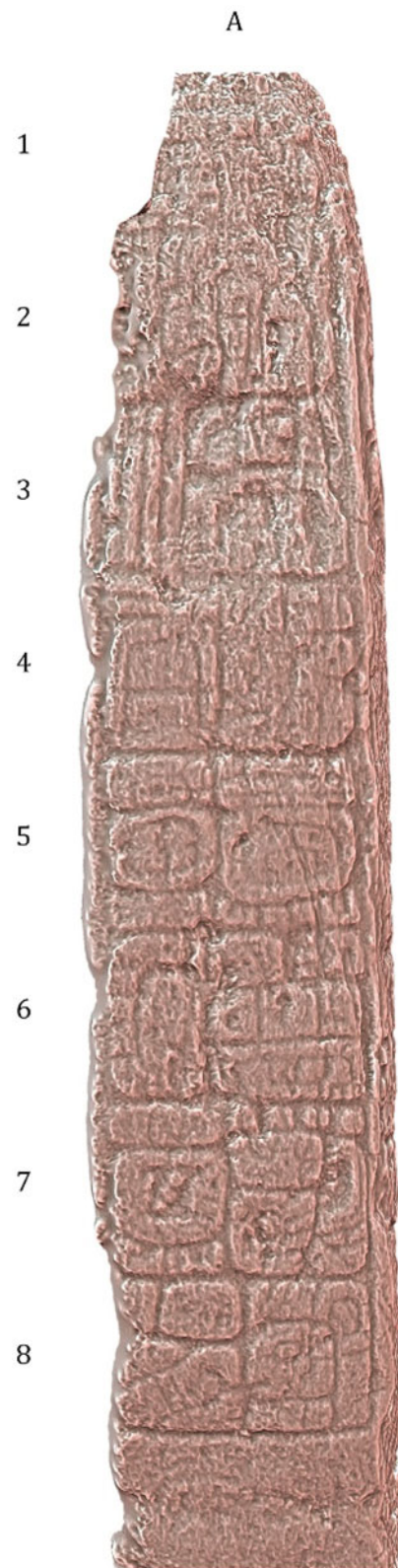

Figure 7. The lateral text on the north side of Stela 7. Excerpt of 3D model by Chance Coughenour and Bryan Allen.

polished celt, possibly read *lem* (Stuart 2010:291, Figure 125a–b). In other contexts, we see fuller references to this name as *Lem Hut Ajan*, which is to say, '*Ajan* with
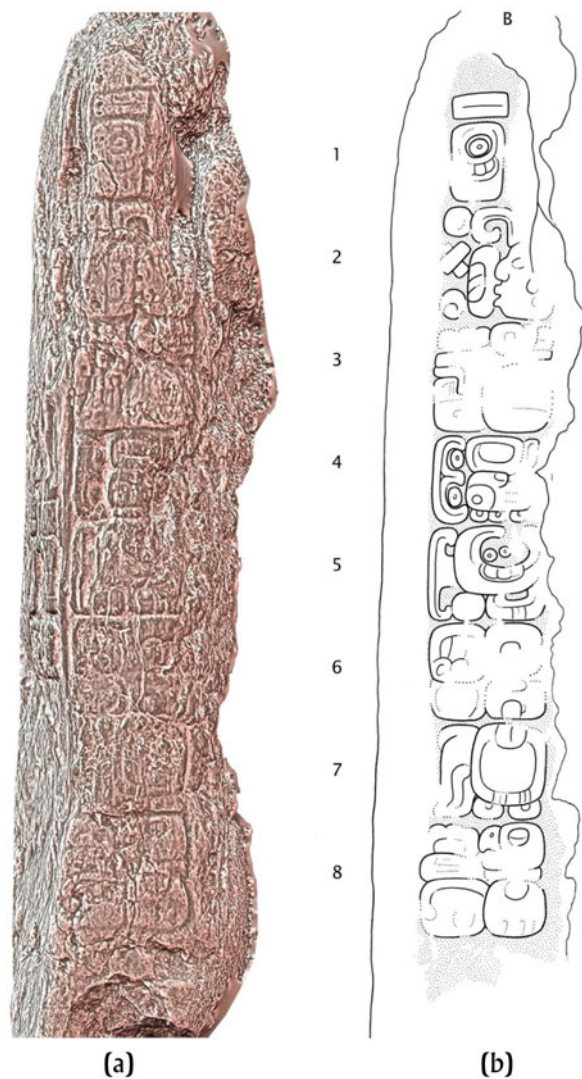
Figure 8. The lateral text on the south side of Stela 7: (a) excerpt of 3D model; (b) drawing. Model by Chance Coughenour and Bryan Allen. Drawing by Christophe Helmke.

the shining face' (understood as being as shiny as a polished celt) (Stela 1 of Yaxchilan) or even *Lem Hut Winik Ajan*, 'Ajan who is the man with the shining face' (incised bone in the Dallas Museum of Art). The same type of fire rituals, connected to precisely this deity, are recorded in the texts of Stela 1 of Yaxchilan, Stela 21 of Caracol, and Stela 2 of Xnaheb Ahse Enil (Grube 2000:96, 97, Figures 9 and 10). In these contexts, the verb that is connected to this ritual fire represents a hand holding either a torch or glowing embers, which may be read as **PUK**, for *puk* 'to disperse, scatter' (Grube 2000:95). This also may once have been recorded on Stela 7 at La Milpa (B1b).

Closing the fire sequence are the remains of a very effaced Haab calendrical date that, as we have seen, should be 8 Pax (B3a). The faint outlines of this date can still be made out, but the following glyph block (B3b) is all but effaced. We suspect that this qualified the type of calendrical station or made reference to a ritual action that was

deemed appropriate for such a date. On Stela 19 at Naranjo, which records the same date, we can see the calendrical station fittingly labeled as **ti-10-HAB** or "at 10 *haab*" (specifying the coefficient of the middle digit in the Long Count), and probably the same was recorded on Stela 7 at La Milpa (B3b). Directly below, in the next glyph block, is the verb proper (B4), and it is written **u-K'AL-TUN?-ni-#-ji**, likely for *u-k'al-tuun-...*, referring to a type of 'stone-binding' or even a 'stone-raising'—a typical ritual for this type of calendrical station (see Stuart 1996). This action is then qualified as **NAH-ja-wa** (B5), or *nah jaw*, 'it is the first *jaw*,' although the segment remains unclear at present, given the ambiguity of the final lexeme. Nonetheless, it may be a regional expression qualifying such a lahuntun Period Ending.

The subject, and presumably the agent of these events, is then named in the following three glyph blocks as **ta-#-mi?** (B6) **yo-OL-la** (B7) **#-#-#-a-ba?** (B8). Whereas much of the name resists a clear reading, given extensive erosion of this section, we can see that this is a type of theonym in three parts—but here it is used as a regnal name—in which some object (1) is said to be the body part (2) of a particular deity (3). As we can see that *yohl* 'heart' is the middle segment, whereas the object named in the preceding glyph block and the final block must record the name of a particular deity.

Cruciform text: Reverse side

As the texts on the narrow sides of the stela jump from Glyph B (at the end of the northern side) to Glyph A (at the top of the southern side), we can see that these are meant to be read in continuation as a single textual segment. This then leaves the cruciform text that adorns the back of the stela (which may well have been secondarily applied at a later date) to be read as an independent textual segment. Unfortunately, we have been unable to inspect the cruciform text more recently because the stela has collapsed onto its back due to tree fall. The last clear photographs of the reverse side were secured by Bruce Templeton in 2008, four years before the stela's fall (Figure 9a).

Regardless, based on this photographic record and the drawing of the text (Figure 9b–c), we can make a few observations, including the segment **#-ta-ji** (I3), which has been read as part of a conjunctive expression *yitaaj* for 'companion' (Grube 1994:223), usually used to connect two subjects in the same clause (Stuart 1997:5). The ensuing glyph block (I4) is the best preserved of this segment and has been transliterated as **u-KAY-ya**, for *Ukay*, which has been interpreted as a name (Grube 1994:223–224; Robichaux and Houk 2005:9–10; Zaro and Houk 2012:146, 147, 155). Another feature of interest is the expression *uhtiiy* (J2/3) 'it happened,' given that this is used not only in calendrical expressions to refer to the occurrence of a particular temporal interval or date but also as an introductory expression for toponymic subclauses, specifying at the end of phrase, where an event took place (Stuart and Houston 1994:7–18). Because of this, we wonder whether it is not in its toponymic capacity that this glyph is provided here, given that it occurs toward the end of the clause (see also Grube 1994:224).
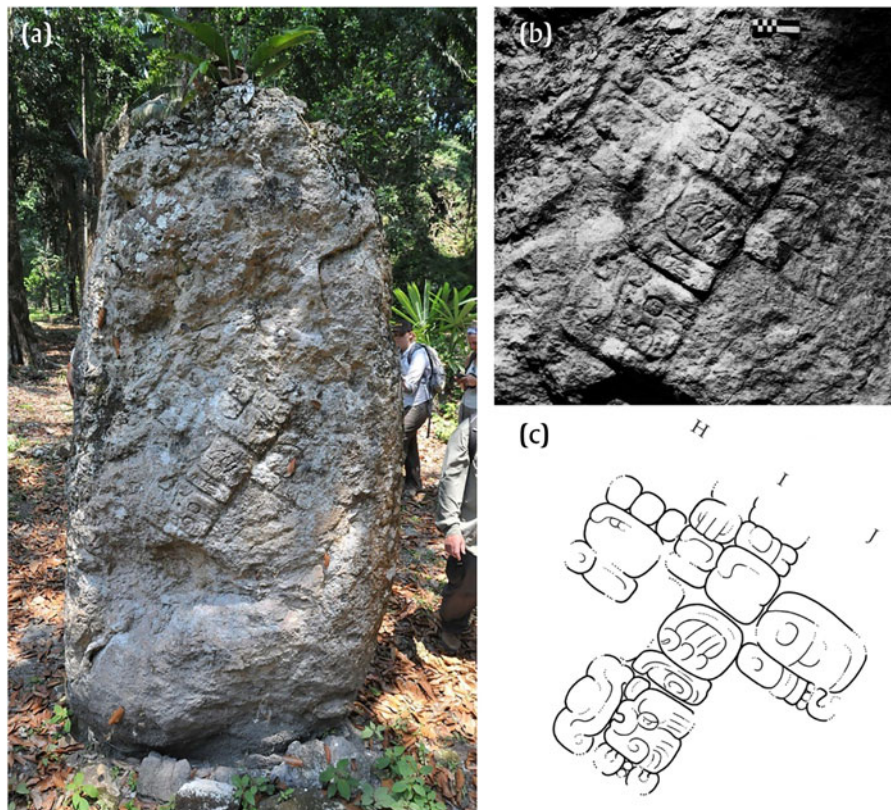
Figure 9. The cruciform text on the reverse of Stela 7: (a) as standing (photograph by Bruce Templeton); (b) detail of the cruciform text (photograph by Norman Hammond); and (c) the glyphic text (drawing by Christophe Helmke).

This then leaves us to identify the place name that would have followed, and assuming that the central column is read first, the glyph to the left (H2/3) appears most probably. Although only the outlines remain, it can be transliterated as **#-3-TUN-TE'**, suggesting that this may record *Uxte'tuun*, one of the toponyms that is closely identified with Calakmul in the Late Classic period, from the early seventh century onward (Helmke and Awe 2016b:8, 13, 16–17; Helmke and Kupprat 2016). Consequently, whatever the thrust of the clause in the cruciform text, we can conclude that it may have transpired at Calakmul and involved two individuals.

Stela 12, Structure 3

Context and iconography

Stela 12 is one of two monuments raised at the foot of Structure 3 (along with Stela 11). When the site was first described by Thompson, Stela 12 had already fallen onto its back (Thompson 1938). The front of the monument depicts a standing ruler brandishing a circular shield in his left hand and, in an innovative rendition, the inside of the shield is represented, complete with the strap across the hand (Figure 10). In his right hand, he holds a staff upright; it is a type of spear that is interwoven with bands tied together in bunches of three cloth knots. A small figure—quite possibly a dwarf (see Grube and Hammond 1998)—is represented at his feet on the right side of the stela, but this portion is so eroded as to preclude secure identification.

Glyphic text: Lateral sides

The glyphic text associated with the monument was applied to the narrow lateral portions of the monument. The right side of the stela (southern side) is completely eroded, and only the rough outlines of the glyph blocks are discernible. The left side of the stela (northern side) is better preserved, and we can see that as many as a dozen or so glyphs were once recorded on a side, although only the bottom three glyph blocks can be made out (Figure 11a). From the first epigraphic analyses of this lateral text, it was already clear that the final glyph block recorded an Emblem Glyph, although its identity remained unclear and was therefore the topic of conjecture (Grube 1994:220–221). Based on raking light photographs by Bruce Love and close inspection of the monument in situ, it was possible to enhance and redraw the details of these last few glyph blocks (Figure 11b). In so doing, it is clear that the final glyph is that of the *Kanu'l* kings, with the snake-head and initial phonetic complement clearly visible at the start, as **ka-KAN** (Helmke 2020a:275). Together, they form the royal title of an exalted king, read as *k'uhul kanu'l ajaw* 'divine *Kanu'l* king' (see Helmke and Kupprat 2016; Martin 1997). In keeping with expected syntax, the preceding glyph records the regnal name of the king who is styled with the title. And here, we can make out an initial **u** sign, before a scroll, that emanates from the maw of a serpentine entity.

Together, these are the characteristic elements that form part of the name of the king known as "Scroll Serpent,"

Figure 10. The iconography on the front of Stela 12. Photograph by Norman Hammond.

(a)   **(b)**

Figure 11. The lateral glyphic text on the north side of Stela 12: (a) photograph; (b) drawing. Photograph by Bruce Love. Drawing by Christophe Helmke.

although his name was probably more along the lines of *Uk'ay Chan* 'the song of the serpent' (see Martin 1997:861–862; Martin and Grube 2000:105–106). From records at Calakmul (Stela 33), we know that Scroll Serpent acceded to power in A.D. 579 and reigned sometime until around 611 (Martin and Grube 2000:105–106). Intriguingly, on Stela 12, we can see that the glyph that precedes the name of the king is a hand grasping a small *K'awiil* figure, which serves as the object-incorporating verb *ch'am-k'awiil*, 'to take power,' the metaphorical accession expression favored by the *Kanu'l* kings (see Helmke and Awe 2016b:13–15; Martin 1997:855–856). Consequently, we can conclude that the reference made to Scroll Serpent on Stela 12 refers to his accession on the CR 11 Kaban 10 Ch'en in the year 579 (Helmke 2020a:275). In turn, this suggests that Stela 12 may be more or less contemporary with that historical event and may have been raised to commemorate the Period Ending of 9.8.0.0.0 in 593, recording the
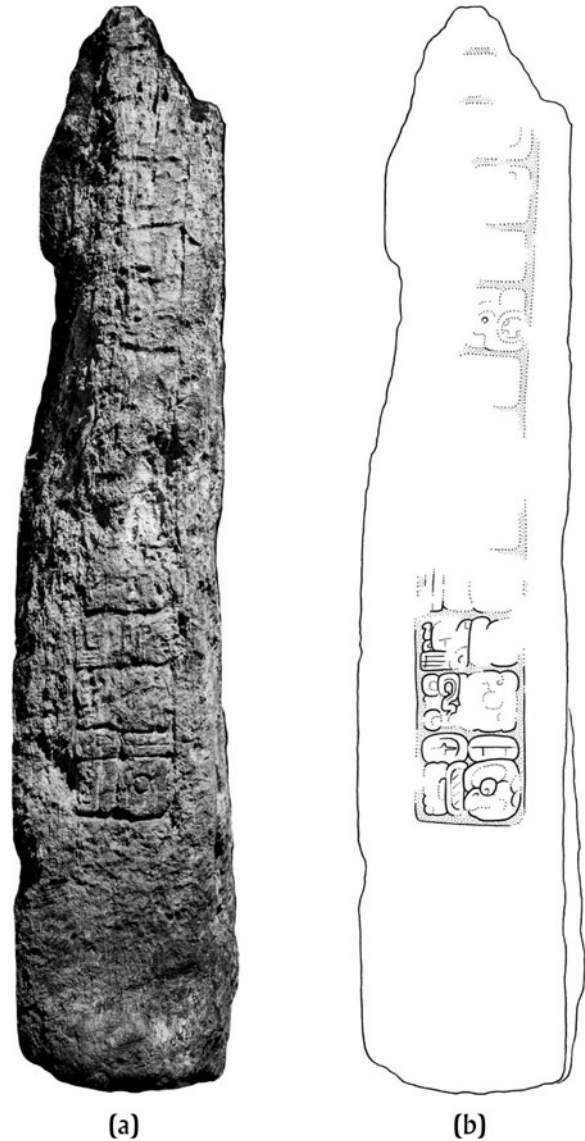
highlights of the main historical events in the years leading up to this important calendrical station. Foreign records to the accessions of *Kanu'l* kings usually mark that site as one drawn into a hegemonic network of allegiance and, at times, vassalage, as may be the case here also, clarifying the place of La Milpa in the geopolitics of the central lowlands at the end of the sixth century.

Stela 15, Structure 54

Context

When this monument was found, it was lying at the base of Structure 54, on the eastern side of the *via* that connects Group A with the Structures 69–75 patio group. The small Structure 54 has been looted, and a large spoil heap is

scattered across its front. No evidence was found that this stela had ever been erected there, so it seems likely that the monument was left there during transport either to or from the main plaza. Given the concentration of monuments, and particularly the number of reset monuments, it seems probable that Stela 15 was being transferred northward to the plaza when this process was halted. In 1992, the La Milpa Archaeological Project decided to raise it at this location to prevent it from further erosion (Hammond 1993:9). Stela 15 was carved on three sides: the front (western side) and the two narrow sides (northern and southern sides). The back (eastern side) of the monument does not appear to have ever been modified or dressed, and it exhibits the original undulating surface of the limestone.

Iconography

The iconography can still be made out with raking light, but it is none too clear in the daylight. It represents a standing figure, looking to the right, who clasps a relatively small circular shield in his right hand as well as a spear that is held transversally in the same hand (Figure 12). The proportions and facial features are somewhat incongruous, thereby complicating its stylistic appraisal and style dating (Grube 1994:224–225). The posture of the figure, in profile with rounded features, is reminiscent of some of the earliest stelae in the region, particularly Stela 12 of Xultun (dated stylistically to about the fourth century). What really speaks in favor of an early date, however, is the beaded frame to the headdress and the large chain that runs downward from the belt, usually attaching to the head of a deity. These are Early Classic features that are found on monuments predating A.D. 475 (Proskouriakoff 1950:65–70, Figure 23, IX-D1-D3), the belt chain being something that is also seen on Stelae 2 and 16 at La Milpa.

The outline of the helmet-like headdress can be made out, as can a prominent set of celts attached to the small personification head at the back of the belt assemblage. In addition to the circular shield that denotes the figure's capacity as a warrior, the individual also holds a ceremonial staff upright with his left hand. This is an object characteristic of central lowland pageantry, and it shows a series of woven bands that are tied to the staff with a set of three knots at regular intervals. From some of their earliest depictions at Tikal (Stelae 3, 6, 7, 15, and 27) and Naranjo (Stelae 26, 38, and 41) we can see that these are essentially oversized fire drills, interwoven with bands of paper that are tied together with small strips of cloth.

It is in their capacity as officiants of nocturnal fire-drilling rituals that kings wielded these objects as part of a set of pyrolytic rituals that began to assume greater prominence after the central Mexican incursions of the late fourth century (see Nielsen and Helmke 2018). An examination of the iconography of well-dated Classic-period monuments reveals that these staffs are represented on monuments dating anywhere between A.D. 593 and 830 (Helmke and Nielsen 2014:21). Accounting for the belt chain, which speaks of an early date, and the woven spears that appear later, we are probably looking at a style date for

the monument around the fifth century or possibly slightly later.

Grube (1994:225) reported on a small set of incised glyphs at the base of the panel, which were not readily detected in 2019. Additional photography by Bruce Templeton in 2022 has allowed us to verify the presence of these glyphs, although these are very faint. Using the 3D models and the original photographs of this part of the monument from the 1990s, we have been able to render these glyphs, and we have found that these actually label the chest of a captive who is seated cross-legged with head bowed at the feet of the standing monarch. This incised text undoubtedly named the captive and may have even recorded his place of origin.

Glyphic text: Lateral texts

The texts on the lateral side of the monument were carved as a single vertical column on each of the narrow sides of the stela. On the southern side, only the outlines of eight large glyph blocks can be made out (some faint traces are preserved in the uppermost glyph block). On the northern side, the uppermost three glyphs are eroded but retain traces of carving, whereas the lower glyphs survive only as rough outlines. Interestingly, the very top of the northern column of glyphs can be made out with raking light as a calendrical notation (Figure 13). The uppermost glyph (pA1) records a Tzolkin date combining the day sign *Ajaw* with a now mostly effaced coefficient (although anywhere between 7 and 10 would seem likely based on remaining outlines). Alternatively, it is possible that the coefficient was merely a larger decorated bar. The second glyph block (pA2) provides the notation of the date in the Haab calendar, written boldly with three dots above a clear turtle carapace—together read *ux[te'] mahk*, for '3 Mak'—recording the fourth day of the thirteenth month. Together, these two glyph blocks provide a Calendar Round date, which increases the likelihood of establishing an anchor to the Long Count.

Given the style of the glyphs and the iconography, it is clear that this is an Early Classic monument and, assuming that this date records a Period Ending, we can begin our search of possible Long Count placements. We can disregard the possibility that this records a katun Period Ending because there is no "round" date for 8.X.0.0.0 or 9.X.0.0.0 involving the Haab date 3 Mak for the entirety of the Classic period. Expanding the search to minor Period Endings in which the final two coefficients are "round" (to include Period Endings such as lahuntun and quarter-katun celebrations), only six possible dates emerge, in keeping with the stylistic range (Table 2).

Of these, most of the dates provide irregular Haab coefficients, and are therefore unlikely, yet two dates stand out among these: 9.3.11.0.0 and of 9.14.10.0.0. The second may be too late, considering the style of monument, which leaves us with the first, which is well within the stylistic parameters (between A.D. 475 and 593), and the 10 Ajaw date also agrees with the remaining outlines visible on the stela. If this is the correct calendrical placement of
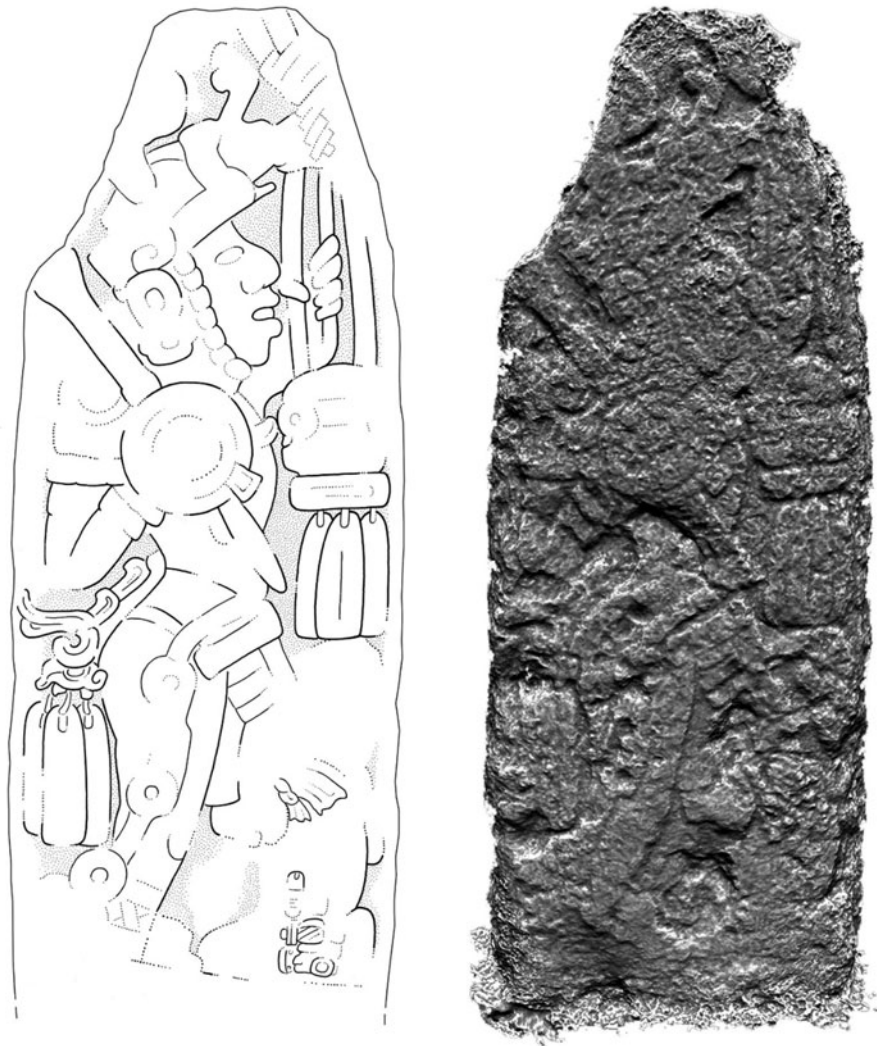
Figure 12. The front face of Stela 15, showing the iconography. Drawing by Christophe Helmke. Model by Chance Coughenour.

the date recorded on Stela 15, this would allow us to date this monument to the early sixth century, and it would indicate that the Early Classic monarchs of La Milpa continued expressing their powers until at least this date. The alternative scenario is that the monument is indeed from the Early Classic period, but that the texts on the lateral side were added in the Late Classic period for the period-ending of 721.

Stela 16, Northern ballcourt

Context

The stela was found at the western end of the unfinished northern ballcourt (formed by Structures 11 and 12), which together with Stela 13 may have served as end zone markers of the playing field (Guderjan 1991). Similar configurations of monuments are found at other lowlands sites, which, aside from sites in the Pasión and Copan, include Calakmul and Xultun (see Barrios 2006:73–74, 140–144; Schultz et al. 1994), and it is to the latter sites that we probably owe the presence of this regional

feature at La Milpa. Stela 16 has been secondarily paired with a much larger circular altar, possibly of Late Classic date, now broken into four pieces (Grube 1994:219; Hammond and Bobo 1994:24; Hammond et al. 2014:88). Together, these form a stela and altar complex, and from the mismatched size, the placement in association with the ballcourt is indicative of a secondary context. Presumably, Stelae 13 and 16 were moved to the ballcourt during its construction, which for one reason or another was never completed, and there is no evidence that either stela was erected.

Stela 16 has the distinction of being a miniature monument, measuring no more than 48 cm wide at its base, 26 cm thick, and 91 cm high, including a shallow butt that is only 8 cm in height. These metrics reveal that Stela 16 is not only the smallest stela at the site but also undoubtedly the smallest carved stela raised in Belize (Helmke 2020b:45, Figure 4). It is, however, comparable to other Early Classic stelae found in the central lowlands—including Stelae 8 and 15 at Tikal and Stela 45 at El Palmar—which all date stylistically to around the fifth century (Grube 1994:220).
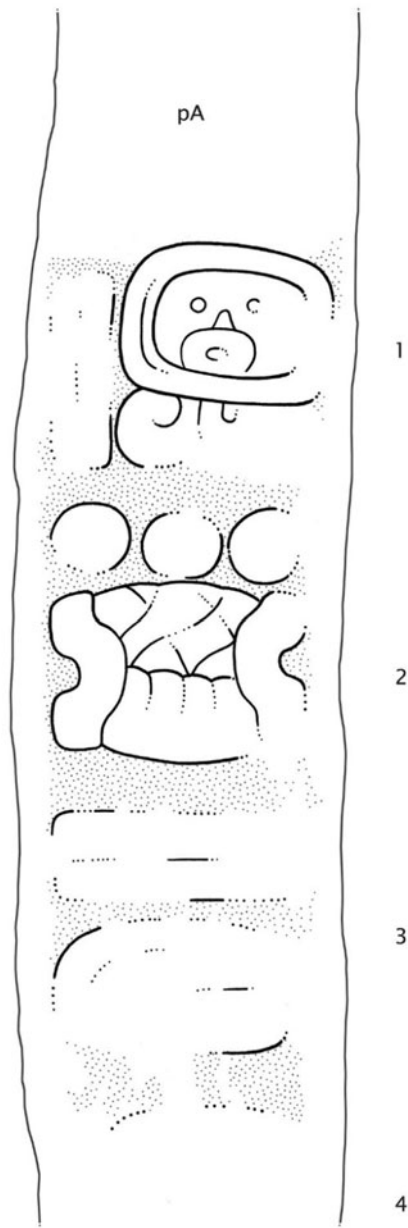
Figure 13. The uppermost preserved portion of the lateral text on the northern side of Stela 15. Drawing by Christophe Helmke.

Table 2. Possible dates for a combination of ? Ajaw 3 Mak in Baktun 8 and 9.

Long Count	Tzolkin	Haab	Date	Year
8.16.5.0.0	9 Ajaw	3 Mak	8 Jan.	362
8.19.18.0.0	3 Ajaw	3 Mak	21 Dec.	433
9.3.11.0.0	10 Ajaw	3 Mak	4 Dec.	505
9.7.4.0.0	4 Ajaw	3 Mak	16 Nov.	577
9.10.17.0.0	11 Ajaw	3 Mak	30 Oct.	649
9.14.10.0.0	5 Ajaw	3 Mak	13 Oct.	721

Iconography

The stone is dense crystalline limestone (comparable to Stela 9 at Lamanai). Small crystalline concretions have since grown across selected parts of the carving, indicating that these are mineralogical processes that postdate the Classic period. The carving is relatively shallow, with differentiation between foreground and background amounting to 2 mm and finer details at around 1 mm in depth. The iconography is well preserved on the lowest third of the carved scene, whereas the upper portions have completely eroded away from continued exposure to the elements. The imagery presents a figure that looks to the left, much like the other Early Classic monuments of the site, including Stelae 1 and 2. The distinctive high-backed sandals, indicative of high status, are bound at the front in large well-preserved knots, as is the lowest portion of the figure's loincloth (Figure 14a). Along the back is the head of a storm deity—likely *Chaahk* or *Yopaaht*, personifications of violent weather phenomena—which is suspended from the belt of the main figure by a chain made of earspools that are knotted together. As we have seen, this is a particularly diagnostic feature of Early Classic regal attire, and it is seen on a range of iconography predating the fifth century (Leventhal 1992:145–150; Proskouriakoff 1950:65–70, Figure 23, IX-D1-D3). This thereby shows that Stela 16, along with Stela 1, are among the earliest monuments documented to date at La Milpa.

Glyphic text: Lateral texts

Whereas the back of the stela is plain, the sides were each embellished with a single column of glyphs (see Grube 1994:219). Those on the left side of the stela are completely eroded. The right side, however, was more promising, and the lowest two glyphs did preserve some details. The penultimate glyph (pB4), although only partially legible, appears to record a title that can be transcribed as ... *naahbal*, involving the logogram **NAB** for 'pool, aguada' (Figure 14b). The eroded first element at the front is likely **K'INICH**, yielding a complete title as *k'inich naahbal*. This title is specifically tied to the royal house of Tikal (see Martin 2003), but isolated examples found in the murals of Río Azul show the use of the title within junior lines (Figure 15).

In much the same way, Lady Six Sky of Dos Pilas still bore the *Naahbal K'inich* title, which she inherited from her father, the ruler of Dos Pilas, *Bajlaj Chan K'awiil*, despite the fact that this line of the *Mutu'l* royal line had been ousted from Tikal proper years before (see Helmke 2017b:94, n4; Martin and Grube 2000:56–58, 74–76). The presence of this title, here on Stela 16, suggests that the individual named in the text, presumably one and the same as that portrayed on the front of the monument, had consanguineal ties to the Tikal dynasty. This is certainly plausible given the prevailing models that have viewed Río Azul and neighboring sites as part of an enclave of Tikal influence at the end of the Early Classic period (Adams 1999). Based on this textual element on Stela 16, we can conjecture that the Early Classic kings of La Milpa were likewise drawn from the Tikal royal house. The final glyph of the
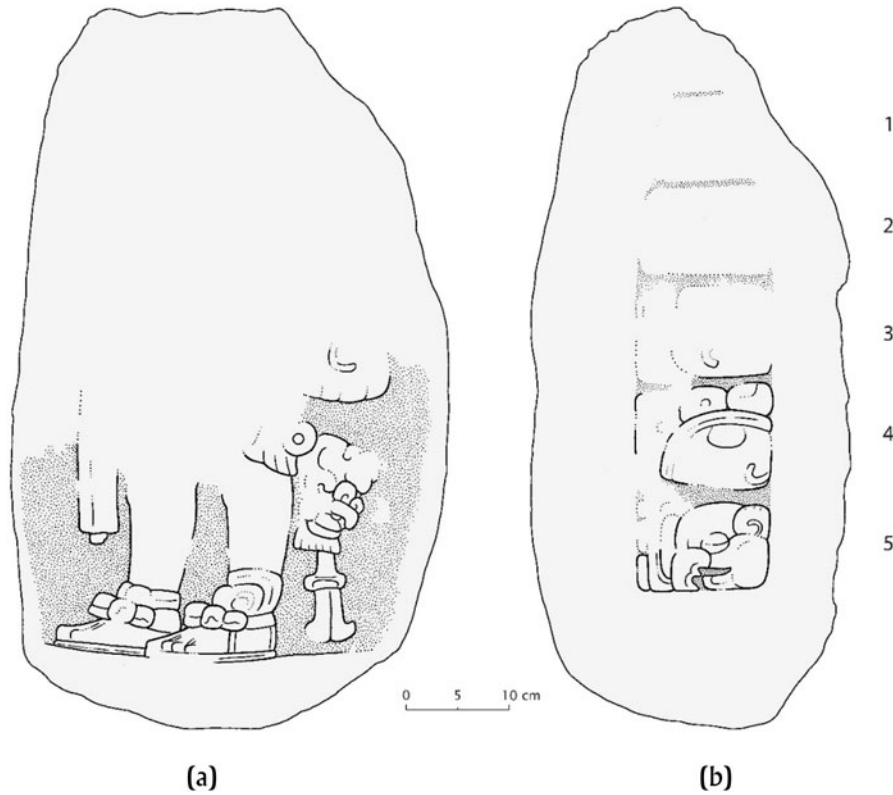
Figure 14. Stela 16: (a) iconography on the front of the stela; (b) glyphic text on the right side of the stela. Drawings by Christophe Helmke.

same column (pB5) appears to record the name of the figure styled by the *K'inich Naahbal* title. The name is written with the beak of a macaw, conflated with another animal (to judge from the ear and form of the temporal), and prefixed by the logogram **K'INICH**. This suggests that the individual was also named *K'inich ... Mo'*, closely duplicating the nominal sequence seen on Stela 2 and may also be rendered in a headdress on Stela 20 (see below). Admittedly, the information pertaining to this individual is sparse, yet it seems likely that this names one of the earliest rulers of La Milpa, given the examples of his name on monuments of the same period at the site.

Stela 20, Structure 199

Context

The four fragments that together constitute Stela 20 were found eroding out of a cut from a looter's trench that bisected Structure 1 (Hammond 2001). This section revealed that an earlier double-vaulted building, designated Structure 199, was built abutting the base of Structure 1 and was also penetrated by the looters. The context of these fragments and the relatively good state of preservation of the carving suggest that these fragments had been enshrined in Structure 199 during the Classic period
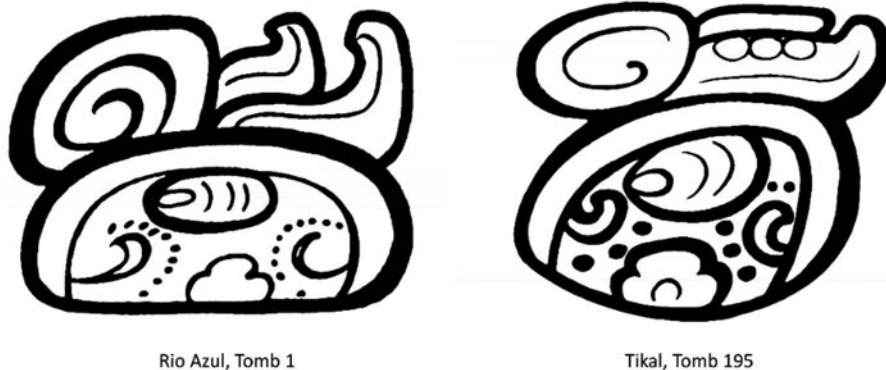

Rio Azul, Tomb 1   Tikal, Tomb 195

Figure 15. Examples of the *naahb(al)* glyph as rendered in the murals of Río Azul and on a ceramic vessel at Tikal. Drawings by Christophe Helmke.

(Hammond 2001:267–268). The destruction and fragmentation of the stela, including the defacing of the regal figure portrayed on the monument, are all indicative of an earlier episode of possible social unrest or even warfare. The same type of defacement is also seen on Stelae 7 and 12 at La Milpa, although the timing of these acts of vandalism undoubtedly differs; that affecting Stela 20 possibly occurred in the seventh century, whereas that of the latter two monuments dated to the site's Terminal Classic abandonment.

Iconography

The iconography of the stela shows an ornately attired ruler facing right holding a large bicephalic ceremonial bar in his right hand and an upright staff in his left (Figure 16). In addition to the large necklace that conceals the entirety of his neck, he also wears large circular earspools and bracelets with small personification heads. His headdress represents the head of the great celestial bird, recalling the deeds of mythic heroes who in the deep past vanquished this supernatural entity and fashioned the first headdress from its head (see Helmke and Nielsen 2015:36–37, Figure 7; Nielsen and Helmke 2015:3, 6, 8–9). The staff seen on Stela 20 is of the same type as that represented on Stelae 12 and 15 at La Milpa, but here, there are rope-like elements bound to the staff by small cloth knots. The staff terminates in the head of a supernatural centipede, and in lieu of its tongue, a large lanceolate-shaped eccentric flint (although here it is only partially preserved) emerges from the maw. The bicephalic ceremonial bar terminates in the head of a serpentine entity from whose maw emerges the profile of an anthropomorphic figure. From other

examples, we can see that these figures tend to be supernatural entities, especially local tutelary deities connected to particular capitals, and this is probably also the case here. The combination of the centipede spear, the mark of a warrior with solar traits, and the bicephalic bar, connected to rulership and the conjuring of protective deities, illustrate the two complementary and idealized facets of kingship. Behind the ruler, at the small of the back, we can see a partial anthropomorphic profile with a headdress in the form of a macaw. These small maskettes typically represent deified ancestors, whose headdresses provided clues about their names and identity. In light of this, it bears recalling the name of the ruler seen on Stelae 2 and 16, which makes us wonder if this is not the same individual or a close namesake.

Glyphic text: Lateral texts

Of the glyphs inscribed on the monument, only those of the narrow right side are preserved. Contrary to earlier reports (Hammond 2001:267), the identification of these glyphs can be made when inspected under raking light. From what is preserved, it would appear that the glyphs were inscribed in a single vertical column that was read from top to bottom (Figure 17). The uppermost glyph (pA1) is in fact the very start of the glyphic inscription given that it records the Initial Series Introductory Glyph that heads a complete Long Count record. The following glyph (pA2) records, as is to be expected, the baktun, which is here written here with the logogram **PIK** and preceded by a numerical coefficient written with a single bar and partially preserved dots. Given the style of the iconography and the paleography of the glyphs, it is most likely that the numeral was
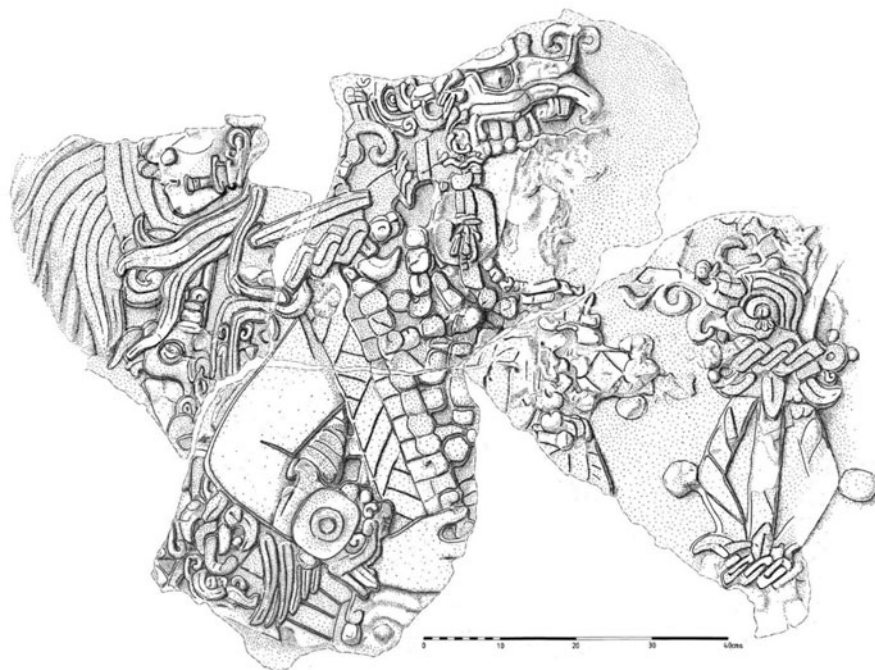

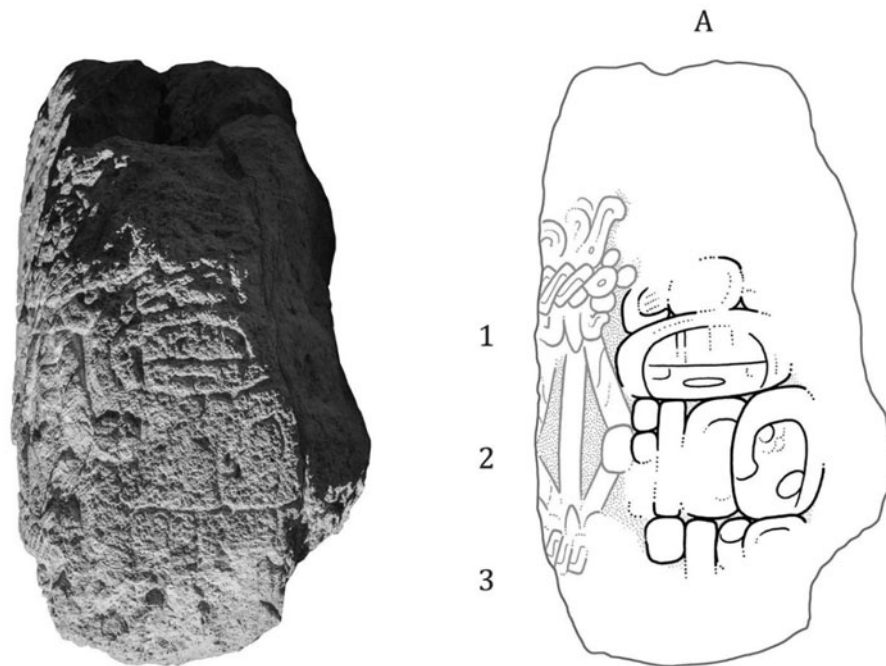**Figure 16.** The front face of Stela 20. Drawing by Candida Lonsdale.

Figure 17. The remaining lateral text on the right side of Stela 20. Photograph and drawing by Christophe Helmke.

once **9**. The following glyph block (pA3) went on to record part of the katun record. Although damage induced from breakage and spalling mar a clear reading of the numerical coefficient, the numeral could be **7** or **8**, accounting for the surviving features. Although the date cannot be made out with certainty, based on the combination of traits, it seems likely that this was a Long Count date in the first half of Baktun 9, with 9.7 or 9.8 appearing most likely (c. A.D. 573–613).

Synthesis and prospects for the future

This study presents some salient observations concerning the important corpus of carved monuments found at La Milpa. Through renewed photographic documentation, physical inspection of the monuments, examination with raking light, and the capturing and analyses of 3D models, additional details have come to light, and corrections have been made that supersede earlier studies. This demonstrates the importance of continued work on the carved monuments and how technological innovations as well as the collaborative and interdisciplinary efforts of many are both rewarding and fruitful. What remains to be done is a complete documentation of all of the site's altars as well as the initiation of a comprehensive program of preservation of these monuments, given that these remain exposed to the elements and continue inexorably on the path of erosion. Such a program should identify the most promising monuments and, following curation, should be shielded from the elements so that they can endure as the witnesses of dynastic history—and be available for further studies and instrumental analyses in the future. Ideally, the monuments would be protected from the elements and removed to a

nearby location (such as a purpose-built structure at the research station), with high-quality replicas placed on site.

For now, we have been able to confirm that La Milpa was the locus of an important and vibrant Early Classic royal house, as attested by Stelae 1, 2 and 16, and that one of the important regal figures at the time was named *K'inich … Mo'* (possibly *K'inich Tihl Mo'*), who reigned sometime before the end of the fifth century. These rulers may have had ties to the royal houses of Río Azul and Tikal—based on the partial title seen on Stela 16—and one of these may even be the dynastic founder (see Schele 1992). Our careful reexamination of the iconography of Stela 15 also reveals that this is in fact an Early Classic monument, which, as a possible sixth century stela, provides evidence for the continued power of the monarchs of La Milpa during this period.

The text of Stela 7 allows us to confirm that the ruler depicted on the front of the monument was styled with an Emblem Glyph in A.D. 780, indicating that at this time, the rulers of La Milpa claimed the exalted titles of *k'uhul ajaw* 'divine king' and *baahkab* 'foremost of the land.' Use of these titles is a mark of resurgence and even political autonomy, and it suggests that, at this juncture, La Milpa was (at least nominally) independent and free of foreign interferences.

The numbered glyph that precedes the Emblem Glyph now appears to provide an ordinal count specifying the ruler's place in a dynastic king list. Given the reference to the seventeenth successor, we can most likely trace the founding of this dynasty to the late fourth century, which indicates that the monumental construction from the Late Preclassic period to the initial half of the Early Classic period inclusively were the works of monarchs who identified as part of another royal house. This also implies that

there was a dynastic rift at La Milpa sometime in the fourth century, undoubtedly in the wake of a more general socio-political restructuring of the central lowlands, which echoes the patterns seen at Río Azul (Adams 1999).

It is probably as part of this restructuring that the more recent dynasty of La Milpa sought allegiances with neighboring city-states, including the powers established at Dzibanche, the capital of the *Kanu'l* prior to A.D. 642. It is in this atmosphere that we also see references to Scroll Serpent, probably to his accession in A.D. 579, on Stela 12. This duplicates analogous references made on the monuments of Naranjo and Caracol—which, as allied polities, also recorded the accessions of *Kanu'l* kings (Martin and Grube 2000). This suggests that La Milpa—having been on the ceramic evidence, within the ambit of Tikal in the Preclassic and Early Classic periods—became an ally of the *Kanu'l* during the Middle Classic period and may have been drawn into vassalage and tributary networks during the initial part of the Late Classic period, prior to the eighth century.

With the defeat of Calakmul's *Yukno'm Yich'aak K'ahk'* in 695 at the hands of Tikal (Martin and Grube 2000:44–45, 110–111), the hegemonic network of the *Kanu'l* took a serious blow and freed many of the erstwhile vassal states to reassert themselves, break away from tributary networks, and claim political autonomy. This still leaves unanswered the question of how La Milpa was affected by the dynastic strife that we know upset the *Kanu'l* in the first half of the seventh century. These conflicts appear to have pitted the enthroned monarch of Dzibanche, *Waxaklajuun Ubaah Chan* (who came to power around 630), against his obstinate contender *Yuhkno'm* Head. This period of contention may have culminated in an outright civil war (Helmke and Awe 2016a:11), during which *Yuhkno'm* Head sought allegiance with the forces of Calakmul and used that capital as a safe haven (Helmke and Vepretskii 2024) until *Waxaklajuun Ubaah Chan* met his untimely death "at the edge of the knife" in 640 (Helmke and Awe 2016a:9–10). From then on, the main ruling *Kanu'l* monarch was *Yuhkno'm Ch'een* II, also dubbed "the great," who acceded to the throne in 636—on the heels of the "Star War" that defeated the army of *Waxaklajuun Ubaah Chan* (Helmke and Awe 2016b:18). We surmise that *Yuhkno'm* Head and *Yuhkno'm Ch'een* are one and the same individual: the former his earlier moniker, and the latter the regnal name taken upon his accession at Calakmul (Helmke and Awe 2016b:17–18; see also Martin 2005:7–8). With this historical précis of the *Kanu'l* conflicts of 630–640, we can introduce the archaeological evidence, which quite clearly reveals that La Milpa likewise underwent a period of turmoil in the seventh century, resulting even in a type of "quasi-abandonment" (Hammond 2001:267). Noting the latest possible date of Stela 20 and the possible date of Stela 15, we obtain a window from 613 to 649, which coincides precisely with the times of trouble of the *Kanu'l*. To this, we can also add the observation that all monuments predating 630 appear in a fragmentary state and were secondarily displaced, whereas all monuments postdating 640 appear whole, although these too were ultimately defaced at the close of the Classic period. This correlation suggests that the fate of La

Milpa was closely tied to that of the *Kanu'l*, who exerted considerable influence in the region.

Given this panorama, and remembering the mention made of Scroll Serpent of Dzibanche, we might conclude that the rulers of La Milpa backed the traditional line of *Waxaklajuun Ubaah Chan* during the civil war. With his defeat and execution, and with the establishment of the *Kanu'l* dynasty at Calakmul, the kings of La Milpa may have suffered political reprisals as well as economic marginalization that resulted in the collapse of centralized rulership, manifesting itself archaeologically in the cessation of construction activities and the absence of monuments until the start of the eighth century (see Hammond et al. 1998; Zaro and Houk 2012).

Although much about the history of La Milpa remains unknown, the results of the most recent epigraphic analyses show that we can begin to identify several nodal points in the dynastic history, which, when interwoven with the findings of continued archaeological investigations, will continue to flesh out a more holistic picture of this significant millennial site and its rulers.

References cited

Adams, Richard E. W.
    1999 *Río Azul: An Ancient Maya City.* University of Oklahoma Press, Norman.

Andres, Christopher R., Christophe Helmke, Shawn G. Morton, and Gabriel Wrobel
    2014 Contextualizing the Glyphic Texts of Tipan Chen Uitz, Cayo District, Belize. *Latin American Antiquity* 25(1):46–64.

Barrios, Ramzy
    2006 *Les Sculptures Associées aux Jeux de Balle dans l'Aire Méso-Americaine.* Doctoral thesis, Faculté des lettres, Université Paris 1 Panthéon-Sorbonne, Paris.

Beach, Timothy, Sheryl Luzzadder-Beach, Samantha Krause, Tom Guderjan, Fred Valdez, Jr., Juan Carlos Fernandez-Diaz, Sara Eshleman, and Colin Doyle
    2019 Ancient Maya Wetland Fields Revealed under Tropical Forest Canopy from Laser Scanning and Multiproxy Evidence. *Proceedings of the National Academy of Sciences* 116 (43):21469–21477.

Chase, Diane Z., and Arlen F. Chase
    2017 Caracol, Belize, and Changing Perceptions of Ancient Maya Society. *Journal of Archaeological Research* 25:185–249.

Colas, Pierre Robert
2003   K'inich and King: Naming Self and Person among Classic Maya Rulers. *Ancient Mesoamerica* 14(2):269–283.
2014   Personal Names: The Creation of Social Status among the Classic Maya. *A Celebration of the Life and Work of Pierre Robert Colas*, edited by Christophe Helmke and Frauke Sachse, pp. 19–59. Acta Mesoamericana, Vol. 27. Anton Saurwein, Munich.

Dillon, Brian D.
1982   Bound Prisoners in Maya Art. *Journal of New World Archaeology* 5(1):24–45.

Fahsen, Federico
1988   A New Early Classic Text from Tikal. *Research Reports on Ancient Maya Writing* 17:1–8.

Grube, Nikolai
1992   Classic Maya Dance: Evidence from Hieroglyphs and Iconography. *Ancient Mesoamerica* 3(2):201–218.
1994   A Preliminary Report on the Monuments and Inscriptions of La Milpa, Orange Walk, Belize. *Bæssler-Archiv: Beiträge zur Völkerkunde* 12:217–238.
2000   Fire Rituals in the Context of Classic Maya Initial Series. In *The Sacred and the Profane: Architecture and Identity in the Maya Lowlands*, edited by Pierre Robert Colas, Kai Delvendahl, Marcus Kuhnert, and Annette Schubart, pp. 93–109. Acta Mesoamericana, Vol. 10. Anton Saurwein, Markt Schwaben.

Grube, Nikolai
2006   Ancient Maya Royal Biographies in a Comparative Perspective. *Janaab' Pakal of Palenque: Reconstructing the Life and Death of a Maya Ruler*, edited by Vera Tiesler and Andrea Cucina, pp. 146–210. University of Arizona Press, Tucson.

Grube, Nikolai, and Norman Hammond
1998   Rediscovery of La Milpa Stela 4. *Mexicon* 20(6):129–132.

Guderjan, Thomas H.
1991   *Maya Settlement in Northwestern Belize: The 1988 and 1990 Seasons of the Rio Bravo Archaeological Project*. Labyrinthos, Culvert City.

Guderjan, Thomas H., and Jason Yaeger
1991   Investigations at La Milpa. In *Maya Settlement in Northwestern Belize: The 1988 and 1990 Seasons of the Río Bravo Archaeological Project*, edited by Thomas H. Guderjan, pp. 7–34. Maya Research Program, San Antonio.

Hammond, Norman
1991   The Discovery of La Milpa. *Mexicon* 13(3):46–51.
1993   Cities in the Jungle: Field Study at Cuello and La Milpa, Belize, 1992. *Context* 10(3/4):1, 5–9.
1998   "A Pillar of State... Majestic, Though in Ruin": The Royal Acropolis of La Milpa. *Context* 14(1):11–15.
2001   A New Maya Stela from La Milpa, Belize. *Antiquity* 75:267–268.

Hammond, Norman, and Matthew R. Bobo
1994   Pilgrimage's Last Mile: Late Maya Monument Veneration at La Milpa, Belize. *World Archaeology* 26(1):19–34.

Hammond, Norman, Eric Heller, Brett A. Houk, and Gair Tourtellot, III
2014   Three New Stelae at La Milpa? *Mexicon* 36(3):88–93.

Hammond, Norman, and Ben Thomas
1998   Another Maya Throne Room at La Milpa. *Context* 14(1):15–16.

Hammond, Norman, and Gair Tourtellot, III
1993   Survey and Excavation at La Milpa, Belize, 1992. *Mexicon* 15(4):71–75.
2002   The Persistence of Memory: Two Millennia at the Great Plaza of La Milpa. *Context* 17(1):1–7.

Hammond, Norman, Gair Tourtellot, Sara Donaghey, and Amanda Clarke
1996   Survey and Excavation at La Milpa, Belize, 1996. *Mexicon* 18(5):86–91.
1998   No Slow Dusk: Maya Urban Development and Decline at La Milpa, Belize. *Antiquity* 72:831–837.

Helmke, Christophe
2017a   Report on the Photographic Documentation of Carved Monuments at Lamanai. *Report on the 2016 Investigations at Lamanai*, edited by Elizabeth Graham, pp. 108–115. Institute of Archaeology, University College London, London.

Helmke, Christophe
2017b   "The Heart and Stomach of a King": A Study of the Regency of Lady Six Sky at Naranjo, Guatemala. *Contributions in New World Archaeology* 11:83–130.

2018a   Appendix: Epigraphic Report on Recently Discovered Stelae at Caracol, Belize. In *Markets and the Socio-Economic Integration of Caracol, Belize: Investigating Residential Groups and Public Architecture in the Vicinities of the Monterey Residential Group and the Puchituk Terminus: Caracol Archaeological Project Investigations for 2018*, edited by Arlen F. Chase and Diane Z. Chase, pp. 27–39. University of Nevada, Las Vegas.
2018b   Continued Documentation of Carved Monuments at Lamanai. In *Report on the 2017 Investigations at Lamanai*, edited by Elizabeth Graham, pp. 3–10. Institute of Archaeology, University College London, London.
2019   Reading between the Lines: The Epigraphy of Central Belize. *Research Reports in Belizean Archaeology* 16:31–46.
2020a   Under the Lordly Monarchs of the North: The Epigraphy of Northern Belize. *Ancient Mesoamerica* 31(2):261–286.
2020b   Los monumentos de Belice. *Arqueología Mexicana* 28(165):44–48.

Helmke, Christophe, Christopher R. Andres, Shawn G. Morton, and Gabriel D. Wrobel
2015   For Love of the Game: The Ballplayer Panels of Tipan Chen Uitz in Light of Late Classic Athletic Hegemony. *The PARI Journal* 16(2):1–30.

Helmke, Christophe, and Jaime J. Awe
2008   Organización territorial de los antiguos mayas de Belice Central: Confluencia de datos arqueológicos y epigráficos. *Mayab* 20:65–91.
2016a   Death Becomes Her: An Analysis of Panel 3, Xunantunich, Belize. *The PARI Journal* 16(4):1–14.
2016b   Sharper Than a Serpent's Tooth: A Tale of the Snake-Head Dynasty as Recounted on Xunantunich Panel 4. *The PARI Journal* 17(2):1–22.

Helmke, Christophe, Arlen F. Chase, and Diane Z. Chase
2019   Another Look at Stela 2 of Caracol, Belize. *Mexicon* 41(4):97–104.

Helmke, Christophe, Stanley P. Guenter, and Phillip J. Wanyerka
2018   Kings of the East: Altun Ha and the Water Scroll Emblem Glyph. *Ancient Mesoamerica* 29(1):113–135.

Helmke, Christophe, Julie A. Hoggarth, and Jaime Awe
2018   *A Reading of the Komkom Vase Discovered at Baking Pot, Belize*. Monograph 3. Precolumbia Mesoweb Press, San Francisco.

Helmke, Christophe, and Felix A. Kupprat
2016   Where Snakes Abound: Supernatural Places of Origin and Founding Myths in the Titles of Classic Maya Kings. In *Places of Power and Memory in Mesoamerica's Past and Present: How Sites, Toponyms and Landscapes Shape History and Remembrance*, edited by Daniel Graña-Behrens, pp. 33–83. Estudios Indiana, Vol. 9. Gebrüder Mann Verlag, Berlin.

Helmke, Christophe, and Jesper Nielsen
2014   Identifying the Provenance and Dating of Maya Influences at the Cacaxtla Court. In *Palaces and Courtly Culture in Ancient Mesoamerica*, edited by Julie Nehammer Knub, Christophe Helmke, and Jesper Nielsen, pp. 17–35. Pre-Columbian Archaeology Vol. 4. Archaeopress, Oxford.

Helmke, Christophe, and Jesper Nielsen
2015   The Defeat of the Great Bird in Myth and Royal Pageantry: A Mesoamerican Myth in a Comparative Perspective. *Comparative Mythology* 1(1):23–60.

Helmke, Christophe, and Leszek Pawlowicz
2021   *Continued Documentation of Monuments at Lamanai and Initial Computational Photography*. Lamanai Archaeological Project; Report submitted to the Belize Institute of Archaeology, Belmopan.

Helmke, Christophe, and Sergei Vepretskii
2024   An Account of the Kings of Kanu'l as Recorded on the Hieroglyphic Stair of K'an II of Caracol. *Ancient Mesoamerica*. doi: 10.1017/S0956536122000219

Houk, Brett A.
2015   *Ancient Maya Cities of the Eastern Lowlands*. University Press of Florida, Gainesville.

Houston, Stephen, and David Stuart
1998   The Ancient Maya Self: Personhood and Portraiture in the Classic Period. *RES: Anthropology and Aesthetics* 33:73–101.

Kelley, David H.
1962   Fonetismo en la escritura maya. *Estudios de Cultura Maya* 2:277–317.

Kosakowsky, Laura J., and Kerry Sagebiel
1999 The Ceramic Sequence of La Milpa. *Mexicon* 21(6):131–136.

Kováč, Milan, Dmitri Beliaev, Alexander Safronov, Jakub Špoták, and Michaela Šimonová
2019 Uaxactun after the Conquest by Teotihuacanos – as Told by the Mural from Building B-XIII. Paper presented at the 24th European Maya Conference, Jagiellonian University, Cracow.

Leventhal, Richard
1992 The Development of a Regional Tradition in Southern Belize. In *New Theories on the Ancient Maya*, edited by Elin C. Danien and Robert J. Sharer, pp. 145–154. University Museum, University of Pennsylvania, Philadelphia.

Martin, Simon
1997 The Painted King List: A Commentary on Codex-Style Dynastic Vases. In *The Maya Vase Book, Volume 5*, edited by Justin Kerr and Barbara Kerr, pp. 847–867. Kerr Associates, New York.
2003 In Line of the Founder: A View of Dynastic Politics at Tikal. In *Tikal: Dynasties, Foreigners, and Affairs of State*, edited by Jeremy A. Sabloff, pp. 3–45. School of American Research Advanced Seminar Series, School of American Research Press, Santa Fe.
2005 Of Snakes and Bats: Shifting Identities at Calakmul. *The PARI Journal* 6(2):5–13.
2020 *Ancient Maya Politics: A Political Anthropology of the Classic Period 150-900 CE*. Cambridge University Press, Cambridge.

Martin, Simon, and Nikolai Grube
2000 *Chronicle of the Maya Kings and Queens: Deciphering the Dynasties of the Ancient Maya*. Thames & Hudson, London.

Mathews, Peter
1991 Classic Maya Emblem Glyphs. In *Classic Maya Political History: Hieroglyphic and Archaeological Evidence*, edited by T. Patrick Culbert, pp. 19–29. Cambridge University Press, Cambridge.

McLellan, Alec
2020 *Settlement Change, Urbanism, and Human and Environmental Interaction at Lamanai and Ka'kabish*. BAR, Oxford.

Nielsen, Jesper, and Christophe Helmke
2015 The Fall of the Great Celestial Bird: A Master Myth in Early Classic Central Mexico. *Ancient America* 13:1–46.
2018 "Where the Sun Came into Being": Rites of Pyrolatry, Transition and Transformation in Early Classic Teotihuacan. In *Smoke, Flames, and the Human Body*, edited by Vera Tiesler and Andrew Scherer, pp. 77–107. Dumbarton Oaks Research Library and Collection, Washington, DC.

Pendergast, David M.
1981 Lamanai, Belize: Summary of Excavation Results, 1974–1980. *Journal of Field Archaeology* 8:29–53.

Proskouriakoff, Tatiana
1950 *A Study of Classic Maya Sculpture*. Carnegie Institution of Washington, Washington, DC.

Robichaux, Hubert R., and Brett A. Houk
2005 A Hieroglyphic Plate Fragment from Dos Hombres, Belize: Epigraphic and Archaeological Evidence Relating to Political Organization in the Three Rivers Region of Northwestern Belize and Northeastern Guatemala. *Mono y Conejo* 3:4–12.

Rose, John J.
2000 A Study of Late Classic Maya Population Growth at La Milpa, Belize. PhD dissertation, Department of Anthropology, University of Pittsburgh, Pittsburgh.

Sagebiel, Kerry Lynn
2006 La Milpa: Shifting Alliances, Shifting Fortunes. *Research Reports in Belizean Archaeology* 3:329–339.
2014 The Late and Terminal Classic Ceramic Sequence at La Milpa, Belize: Implications for Its Occupation History. *Ancient Mesoamerica* 25(1):115–137.

Schele, Linda
1992 The Founders of Lineages at Copan and Other Maya Sites. *Ancient Mesoamerica* 3(1):135–144.

Schele, Linda, and Mary Miller
1986 *The Blood of Kings: Dynasty and Ritual in Maya Art*. George Braziller, New York.

Schultz, Kevan C., Jason J. Gonzalez, and Norman Hammond
1994 Classic Maya Ballcourts at La Milpa, Belize. *Ancient Mesoamerica* 5(1):45–53.

Stone, Andrea, and Marc Zender
2011 *Reading Maya Art*. Thames and Hudson, London.

Stuart, David
1996 Kings of Stone, a Consideration of Stelae in Ancient Maya Ritual and Representation. *RES: Anthropology and Aesthetics* 29/30:148–171.
1997 Kinship Terms in Maya Inscriptions. In *The Language of Maya Hieroglyphs*, edited by Martha Macri and Anabel Ford, pp. 1–11. Pre-Columbian Art Research Institute, San Francisco.
2006 The Inscribed Markers of the Coba-Yaxuna Causeway and the Glyph for *Sakbih*. Electronic document, www.mesoweb.com/stuart/notes/Sacbe.pdf, accessed June 29, 2019.
2007a The Origin of Copan's Founder. *Maya Decipherment*. Electronic document, https://decipherment.wordpress.com/2007/06/25/the-origin-of-copans-founder/, accessed September 9, 2022.
2007b "Hit the Road." *Maya Decipherment*. Electronic document, https://mayadecipherment.com/2007/12/07/hit-the-road/, accessed April 6, 2023.
2010 Shining Stones: Observations on the Ritual Meaning of Early Maya Stelae. In *The Place of Stone Monuments: Context, Use, and Meaning in Mesoamerica's Preclassic Transition*, edited by Julia Guernsey, John E. Clark, and Bárbara Arroyo, pp. 283–298. Dumbarton Oaks Research Library and Collection, Washington, DC.

Stuart, David, and Stephen Houston
1994 *Classic Maya Place Names*. Studies in Pre-Columbian Art & Archaeology 33. Dumbarton Oaks Research Library and Collection, Washington, DC.

Thompson, J. Eric S.
1938 Reconnaissance and Excavation in British Honduras. In *Annual Report of the Division of Historical Research*, pp. 16–17. Carnegie Institution of Washington, Washington, DC.

Tourtellot, Gair, Francisco Estrada-Belli, John J. Rose, and Norman Hammond
2003 Late Classic Maya Heterarchy, Hierarchy, and Landscape at La Milpa, Belize. In *Heterarchy, Political Economy, and the Ancient Maya: The Three Rivers Region of the East-Central Yucatán*, edited by Vernon L. Scarborough, Fred Valdez, Jr., and Nicholas Dunning, pp. 37–51. University of Arizona Press, Tucson.

Tourtellot, Gair, Marc Wolf, Scott Smith, Kristen Gardella, and Norman Hammond
2002 Exploring Heaven on Earth: Testing the Cosmological Model at La Milpa, Belize. *Antiquity* 76(293):633–634.

Turner, B.L., and Peter D. Harrison
1983 *Pulltrouser Swamp: Ancient Maya Habitat, Agriculture, and Settlement in Northern Belize*. University of Texas Press, Austin.

Wanyerka, Phillip J.
2003 *The Southern Belize Epigraphic Project: The Hieroglyphic Inscriptions of Southern Belize*. Report submitted to the Foundation for the Advancement of Mesoamerican Studies, Inc., Crystal River.

Zaro, Gregory, and Brett A. Houk
2012 The Growth and Decline of the Ancient Maya City of La Milpa, Belize: New Data and New Perspectives from the Southern Plazas. *Ancient Mesoamerica* 23(1):143–159.

Zender, Marc U.
2004 A Study of Classic Maya Priesthood. PhD dissertation, Department of Archaeology, University of Calgary, Calgary.