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# Viewing the World through Cosmvision at Late Preclassic Noh K'uh in Chiapas, Mexico

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*This article examines how landscape modification was key to the development of an urbanizing society within a valley in Chiapas, Mexico. The Late Preclassic (400 BC–AD 250) site of Noh K'uh demonstrates how both the altered and unaltered environment signified the importance of cosmological concepts within this society. In an area rich with mountains and caves, the natural landscape offered residents opportunities to create symbolically meaningful living spaces. Evidence from local settlements reveals how the cosmological universe played a guiding role during the site's peak growth period, suggesting that other common contributors (such as economic and militaristic needs) of expansion may have been secondary.*

The Lacandon Maya people are an indigenous community located in the rainforests of Chiapas, Mexico. In Maya studies, the Lacandon have received a lot of attention due to their preservation of cultural practices (Nations & Clark 1983; Nations & Nigh 1980) and the integration of ancient Maya ruins in their ceremonial activities (McGee 2002). Such practices gave the Lacandon an image of traditionalism, where their society appeared less affected by colonization and processes of modernization. Their indigenous subsistence methods, specifically slash-and-burn methods of farming (Nations & Nigh 1980) and the use of stone-tool technology (Nations & Clark 1983), prompted an anachronistic image of Lacandon culture. Palka (2005) illustrates the shortcomings of this portrayal and describes how the Lacandon balanced the preservation of their cultural traditions against exogenous influences. Through my interactions with the Lacandon community of Cerro Bello Metzabok (also spelled Mensäbäk), during conversations about the location of local landforms, I have noticed the ways in which the Lacandon people are connected to and shaped by their surrounding environment. During surveys, for instance, older Lacandon men asked younger participants to point out the location of the mountain of Chak Aktun (described later in this article) when the horizon

was obscured by vegetation. Additionally, the people of Mensäbäk frequently post images of the landscape on social media and hang photos and artworks depicting nearby mountains and lakes in their homes. Most importantly, the Lacandon told me to pay attention to the mountains, stating that 'something has to be there'. As a result of working with the Lacandon community and listening to them, I have come to see archaeological sites more broadly, as including the archaeological remains and the surrounding landscape and its unmodified landforms.

The modern Lacandon community is not equivalent to the ancient civilization that once occupied the same space more than 2000 years ago. In addition to the Spanish conquest, multiple disruptions drove ethnic groups all across the Yucatan as they fled conquest and pandemic diseases (Palka 2005). Yet, the importance of landscapes is a consistent theme within Mesoamerican ideological practice (see Astor-Aguilera 2011). Moreover, recent calls to decolonize archaeology have emphasized the importance of listening to the perspectives of the modern Indigenous people who inhabit the landscapes we study. Archaeologists such as Spector (1993) and Wilcox (2010) have critiqued the field for dismissing indigenous points of view as irrelevant, or too distant from their ancestors to be worthy

of consideration. I do not treat these movements as a condemnation of the field, but as a call towards new approaches that still use established methods and techniques, embracing Kimmerer's (2013) approach of weaving together multiple ways of knowing. My research utilizes traditional archaeological methods, but input from Lacandon informants has guided my understanding of the archaeological data.

In this article, I will discuss the Preclassic (400 BC–AD 250) site of Noh K'uh, in Chiapas, Mexico. I propose that the ancient residents of Noh K'uh used landforms (both unaltered and altered) to construct an *axis mundi* in their site design. I pay special attention to unmodified landforms of the landscape—elements that are often excluded in archaeological analyses—in an effort to value Indigenous worldviews more fully (Wobst 2004). I do not claim to be able to reconstruct completely how ancient residents of Noh K'uh viewed this landscape, because archaeological evidence is inherently fragmentary. Instead, I argue that integrating Indigenous ontologies into our interpretations can allow us to look at archaeological evidence in new ways and reconstruct the daily lives of ancient people better (Ashmore 2009, 66).

Cross-culturally, archaeologists have observed the importance of mountains, caves and other landforms in the layout and design of ancient constructions (Bender 2002; Crumley 1999; Pauketat 2012; Schele & Kappelman 2001; Vogt & Stuart 2005). Such features allowed ancient peoples to interact with non-human forces and sacred realms (Bender *et al.* 2007; Crumley 1999; Palka 2014; Pauketat 2012). Across the Americas, researchers had described how monuments and city avenues aligned with mountains along the horizons, and how these patterns signified a religious connection to the universe. American indigenous populations in particular continue to view landscapes as spaces that integrate memory, identity, non-human beings and different planes of existence (Astor-Aguilera 2011; Basso 1996; Kimmerer 2013). Similarly, many Mesoamerican scholars view ancient city spaces as microcosms of the cosmological universe, or as *axis mundi* (Estrada-Belli 2006; Reilly 1994; Taube 2000). The use of the *axis mundi* as a link between the earth and the cosmos has been applied to civilizations across the world (Eliade 1959), including North America (Pauketat 2012) and China (Wheatley 1971), but it can be misapplied (Smith 2007). Viewing the relationship between architecture and prominent landforms as a version of an *axis mundi* can provide potential explanations for site design and settlement decisions. I do not propose that this is the only factor that drove construction and settlement, but this approach may help explain

why residents were willing to invest time and labour in constructing a large society within a valley with little military or economic value.

This analysis contextualizes the built environment together with the unmodified landforms of the Mensábäk basin because natural features may have influenced site organization and the daily lives of the people. The shape and orientation of large-scale construction projects shows how residents interacted with the landscape. I further argue that the intermontane basin that was home to Noh K'uh served as a sacred landscape that afforded Preclassic residents an opportunity to construct a symbolically meaningful community that bridged features of the natural landscape with human-constructed structures. I also suggest that the residents of Noh K'uh designed their community with an emphasis on centring. Noh K'uh's largest gathering space (known as an E Group formation) reveals stylized modifications that emphasize the cardinal directions but through an intercardinal system that was permanently commemorated at the site's ceremonial centre.

In the following discussion, I review landscape theory and Mesoamerican cosmological symbolism to discuss how a landscape-focused approach can inform the study of altered and unaltered environments. This article builds on previous research on the *axis mundi* in the Maya world by looking beyond the limits of the site core and by integrating natural features from the basin into Noh K'uh's *axis mundi*. I then present settlement survey and LiDAR data to discuss how residents altered their surroundings in congruence with landscape symbolism. By situating mapping data within the context of Preclassic Mesoamerican cosmology, I am able to construct the relationship that existed between the altered and unaltered environment of Noh K'uh. Finally, I consider the different factors that contributed to the growth of Preclassic communities and conclude that the human–landscape relationship played a significant role in the urban development of Noh K'uh. I reveal how the construction of cosmologically focused landscapes played a guiding role in the design and layout of societies (Ashmore 2002; Pauketat 2012; Ringle 1999).

### Viewing the world through cosmivision

Mesoamerican literature has highlighted how cosmological systems utilized landforms to guide the design and layout of planned societies (Ashmore 2002; Ringle 1999). As Ashmore (2009, 66) argues, 'Mesoamerican landscapes are alive, pervasively imbued with cosmological meaning, or cosmivision'.

Mesoamerican researchers have identified sites where people constructed monuments and pathways in alignment with landforms such as caves, mountains and volcanoes (Ashmore & Sabloff 2002; Clark & Hansen 2001; Estrada-Belli 2011; Grove 1999; Inomata *et al.* 2013). These studies demonstrate how landforms, both natural and human-made, provide nexus points between the natural and the supernatural.

Beginning as early as the Middle Preclassic (1000–400 BC), people began to move about and interact with their surroundings through alterations of the environment (Inomata *et al.* 2020; Love 1999). During the Preclassic period (1000 BC–AD 250), the Maya probably practised cosmological rituals that treated landscape features as powerful entities and commemorated the conjunction between the land and people through the construction of ceremonial spaces. The scale of alterations to the natural landscape during the Preclassic period suggests that landscape rituals are likely to have played a central role in everyday life and thus should be treated as having the broader cultural significance already enjoyed by ceramics, iconography and architecture (Šprajc 2018).

Both the natural and the built landscape shape ideology and individual identity (e.g. Ashmore 2009; Basso 1996; Reese-Taylor & Koontz 2001). Just as human activities are responsible for shaping landscapes, so in return do landscapes shape people (Ingold 1993). As such, landscapes are not external features to the human experience: ‘through living in it, the landscape becomes a part of us, and we are a part of it’ (Ingold 1993: 154). Western perspectives on landscapes, which de-emphasize the mutual agency of the human–landscape relationship, can hinder our ability to understand how ancient people lived in their world (Bender 2002; Crumley 1999; Johnson 2007). Wobst (2004) further highlights how archaeological methods often facilitate a focus on objects and spaces that were clearly modified by humans, which can prove limiting in societies that placed great value on the natural world. Astor-Aguilera (2011) is critical of using Western concepts to access Native American ontologies, because it can create a barrier between the researcher and the subject. Whether one takes a phenomenological approach (Hamilton 2006; Tilley 1994) or uses concepts of embodiment (Bender 2002; Bender *et al.* 2007), the goal is to understand how spaces were lived and experienced by the people who inhabited ancient landscapes rather than impose our own views onto the past.

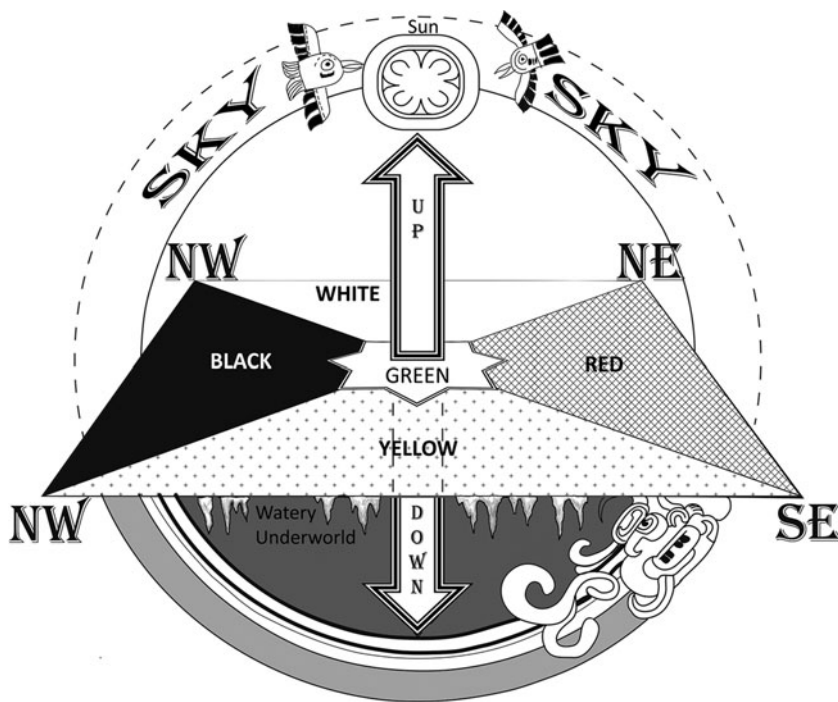
#### *Maya worldviews*

Religious systems in the Maya region varied across time and space, particularly during the expansion

of Late Preclassic polities. Researchers studying Preclassic landscapes (Doyle 2017; Estrada-Belli 2006; Grove 1999; Rice 2018; Stanton & Freidel 2003; Vogt & Stuart 2005) have combined spatial analysis with iconographic observations to understand the role of natural features (such as mountains, caves and solar movements) in religious rituals and site design. For example, in the Olmec region sacred geographies were embedded in the construction of monuments and stone carvings, as evidenced by the cloud and rain symbols discovered near the peaks of local mountains (Grove 1999). Stanton and Freidel (2003) describe how both the Olmec and Maya used ceremonial plaza centres to commemorate the rebirth of the Maize god, yet each society used different symbols to distinguish itself from the other. Both societies viewed the living world as existing on the back of a primordial reptile, with turtle imagery more common in the Maya area and images of crocodiles more common in the Olmec region (Stanton & Freidel 2003). Estrada-Belli (2006) discusses how the Olmec and the Maya used monuments and caches to commemorate the *axis mundi* by constructing quadripartite symbols in the centre of ceremonial plazas. Estrada-Belli (2017) also describes geomancy at the site of Cival, Guatemala, where many constructions are aligned toward hill-tops. Astor-Aguilera (2011, 4) argues that Mesoamerican views relating to life and fertility were ‘marked by geographic markers and celestial bodies’. The importance of the land and its mountains, caves and lakes endured throughout Maya and Mesoamerican history (Brady 1997; 2005; Grove & Gillespie 2009; Lucero 2006; Palka 2014; Vogt & Stuart 2005). However, the emphasis on the *axis mundi*, the importance of cardinal directions and the integration of prominent natural features are hallmarks that were established during the Preclassic.

#### *Axis mundi*

In Mesoamerica, the *axis mundi* is a representation of an interconnected universe where opposites such as up/down, east/west and sky/underground are juxtaposed to create cross patterns with a central point (Ashmore & Sabloff 2002). The Maya situated their ceremonial centres to serve as an *axis mundi* (Ashmore 1991; 2002; 2009; Ashmore & Sabloff 2002) so their communities would be at the centre of their sacred universe. The *axis mundi* re-creates a model of the universe at a variety of scales, ranging from individual homes to the entirety of monumental complexes. Mesoamericans constructed *axis mundi* for different reasons: to consolidate power



**Figure 1.** Artistic depiction of cardinal relationships in Mesoamerican cosmology. (Drawing: author.)

(Fields 2005; Scherer 2015; Smith 2003a), communicate to deities (Lucero 2010; Reilly 2005), establish cosmological order (Estrada-Belli 2006; Freidel *et al.* 1993; Grove 1999; Rice 2007), communicate concepts of strength and vitality (Scherer 2015; Vogt & Stuart 2005), invoke communal identity through practice (Hendon 1999), or ask permission of the gods to modify the living landscape (Plunket & Uruñuela 2002). These objectives were not mutually exclusive and could be invoked simultaneously given the complexity and ubiquity of the *axis mundi* in Mesoamerica.

References to the *axis mundi* are often portrayed through quadripartite motifs (Astor-Aguilera 2011), and in almost all cases the centre is demarcated as the location of the living world where humans reside (Bauer 2005; Freidel *et al.* 1993). In Maya cosmology, the four cardinal directions were associated with specific realms of the universe (Fig. 1). North, for instance, was associated with influential ancestors (Schele & Miller 1986) and occasionally the realm of kingly royalty (Ashmore 1991). Because mountains and pyramids served as gateways to the heavens and the sky, they were sometimes associated with the north. South had an inverse relationship with death and the watery underworld. In Maya iconography, water symbolism was used to make a connection to the underworld (Coe 1999; Stone and Zender 2011; Tedlock 1996). The east–west axis corresponded to the movement of the sun, which was considered the most sacred axis in Classic Maya

ideology (Ashmore 1991; Estrada-Belli 2006; Freidel *et al.* 1993).

Ceremonial centres integrated directional symbolism through the use of linear arrangements that represented the presence of multiple worlds, gateways and the animism of landscape features (Ashmore & Sabloff 2002; Clark & Hansen 2001; Estrada-Belli 2011; Grove 1999; Inomata *et al.* 2013). Of particular importance were those instances where linear arrangements crossed each other at a centre point. These nexus points demonstrated the connection between different worlds, such as the watery underworlds, the earth and the sky (Reilly 2005; Rice 2007; Saturno 2009; Scherer 2015). Centring rituals that placed objects and structures in quincunx patterns were performed at all levels of society in both public (Aoyama *et al.* 2017; Chase *et al.* 2017a; Estrada-Belli 2017; Halperin 2005) and domestic contexts (Robin 2017).

According to Ashmore and Sabloff (2002, 202), evidence from some Maya sites suggests that civic plans embodied cosmological principles through an emphasis on cardinal directionality; they thus called for ‘increased field inquiry into ideational models for ancient urban planning’. In response, Smith (2003b), warning of the pitfalls of presumptive observations, highlighted the difficulty of studying alignments in densely occupied settlements within a karstic environment where one could draw arbitrary alignments between random objects. Smith (2007, 30–33) also

argues that the concept itself is over-used cross-culturally, as a subjective approach can lead one to see an *axis mundi* in any construction. Thus, Smith calls for more textual, artistic and empirical evidence that clearly outlines cosmological principles in urban planning. However, Maya texts do not include discussions of mundane subjects (Montgomery 2002, 3), and it is unlikely that a text describing site plans exists. Presuming that a practice did not exist based on the lack of textual evidence can be problematic for a civilization that limited their writing towards specific political and religious purposes. Archaeological and iconographic evidence of the *axis mundi* are admittedly fragmentary and debatable, but like many archaeological hypotheses, the model of the *axis mundi* works as a provisional explanation for complex social behaviour.

This paper represents a continuation of a theoretical discussion (Ashmore 1991) that leads to towards new information on how ancient people structured their daily life. Furthermore, archaeological research continues to find evidence of alignments and references to cosmology (Landau 2015; Šprajc 2005), especially during the Preclassic (Grove & Gillespie 2009; Love 1999; Rice 2018). Furthermore, materials from Noh K'uh demonstrate that residents shaped their homes in a rectangular pattern, reshaped and remodelled hill façades to accommodate a specific orientation (Juarez 2021), made offerings in the earth and stone foundations of their homes (Juarez 2011) and utilized quincunx symbols in architecture (discussed in this article). Additionally, Inomata and colleagues' (2020) recent discovery of a 1400 m long artificial plateau further demonstrates that the desire to reshape the landscape into ceremonial arenas may predate the construction of permanent homes (Inomata *et al.* 2015).

## Methodology

The site of Noh K'uh is located in the northeastern portion of Chiapas, Mexico, where research has been conducted under the auspices of the Mensäbäk Archaeological Project (MAP). All sites recorded in MAP are located in between parallel systems of small mountains and foothills, creating an intermontane basin (Fig. 2). In total, these surveys revealed the presence of 176 house mounds and monumental structures (Juarez 2021) in an area covering 50 ha (Juarez *et al.* 2019). The majority of excavated materials date to the Late Preclassic between 395 and 1 BC (Juarez *et al.* 2019, 213).

Seventy-three square kilometres have been mapped using a laser theodolite and handheld GPS

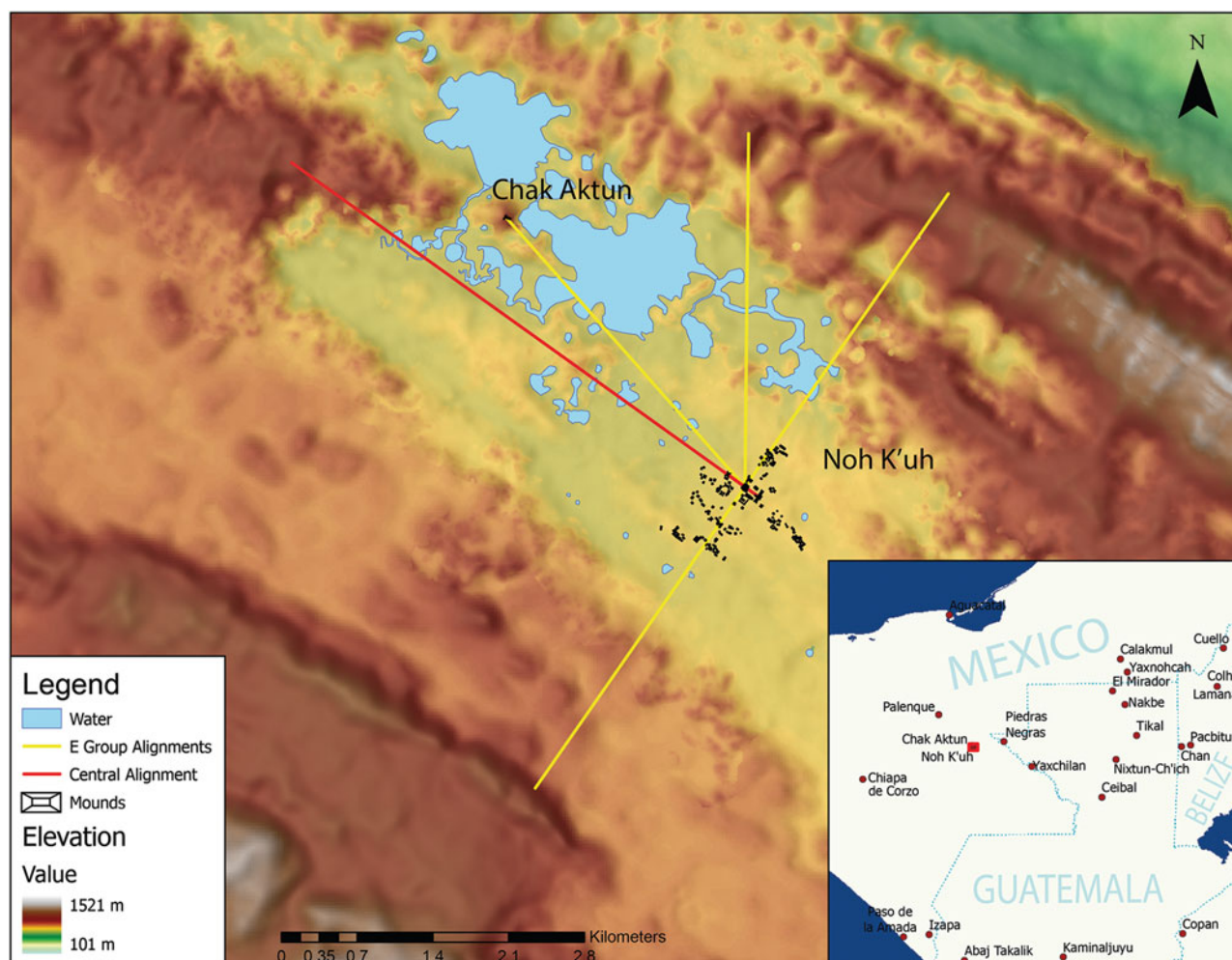
devices to georeference datums. Combined with data from the LiDAR survey in 2019 provided by the National Center for Airborne Laser Mapping (NCALM), updated maps provide a broad-scale image of land modifications. This article focuses on the 300 ha surrounding Noh K'uh's core that were ground-truthed through survey techniques.

A Mavic Pro drone was flown over Noh K'uh to collect panoramic images of the surrounding mountain ranges. Drone footage was processed using Adobe Photoshop CC's Photomerge tool that combines multiple images to create a panoramic image of the mountains (Fig. 3a). To interact better with LiDAR three-dimensional data, the digital elevation model (DEM) was displayed in Colgate University's Ho Tung visualization laboratory. Evans & Sutherland's Digistar technology projects georeferenced LiDAR data on the earth's surface in combination with celestial movements (Fig. 3b). The virtual reconstructions produced by this technology can account accurately for the curvature of the earth, as well as the position of celestial objects in the ancient past. Images are projected on a dome theatre screen to allow the viewer to interact with a virtual model that portrays a first-person perspective in real time. This system provides real-world sense of scale and perspective when compared to the omniscient point of view of virtual camera angles provide by GIS software.

In 2016, my team flew a drone 30 m over the E Group's central plaza to capture a panoramic view of the surrounding valley. The top of the E Group's central pyramid provides an unobstructed view of the community and mountain ranges. Using LiDAR data, Colgate University's Ho Tung Visualization lab projected a virtual environment—from the perspective found on top of the site's tallest pyramid (Fig. 4)—to interact virtually with topographic data. An Arcmap viewshed analysis (Fig. 3c) from the top of mound NK-M-13 further highlights the features from the same viewpoint. These findings demonstrate that the large-scale construction programme in the basin yielded prime viewing platforms.

## Results

LiDAR data at Noh K'uh reveal a large-scale construction programme that flattened the low-lying hills of the basin. Surface survey revealed an orientation pattern that ranges from 135° to 154° southeast, with an average of 145°. Juarez, Salgado-Flores and Hernandez (2019) previously described the orientation of the central plaza as 135° southeast. However, a follow-up investigation in 2017 found



**Figure 2.** Map of Noh K'uh's location with reference to other Preclassic sites.

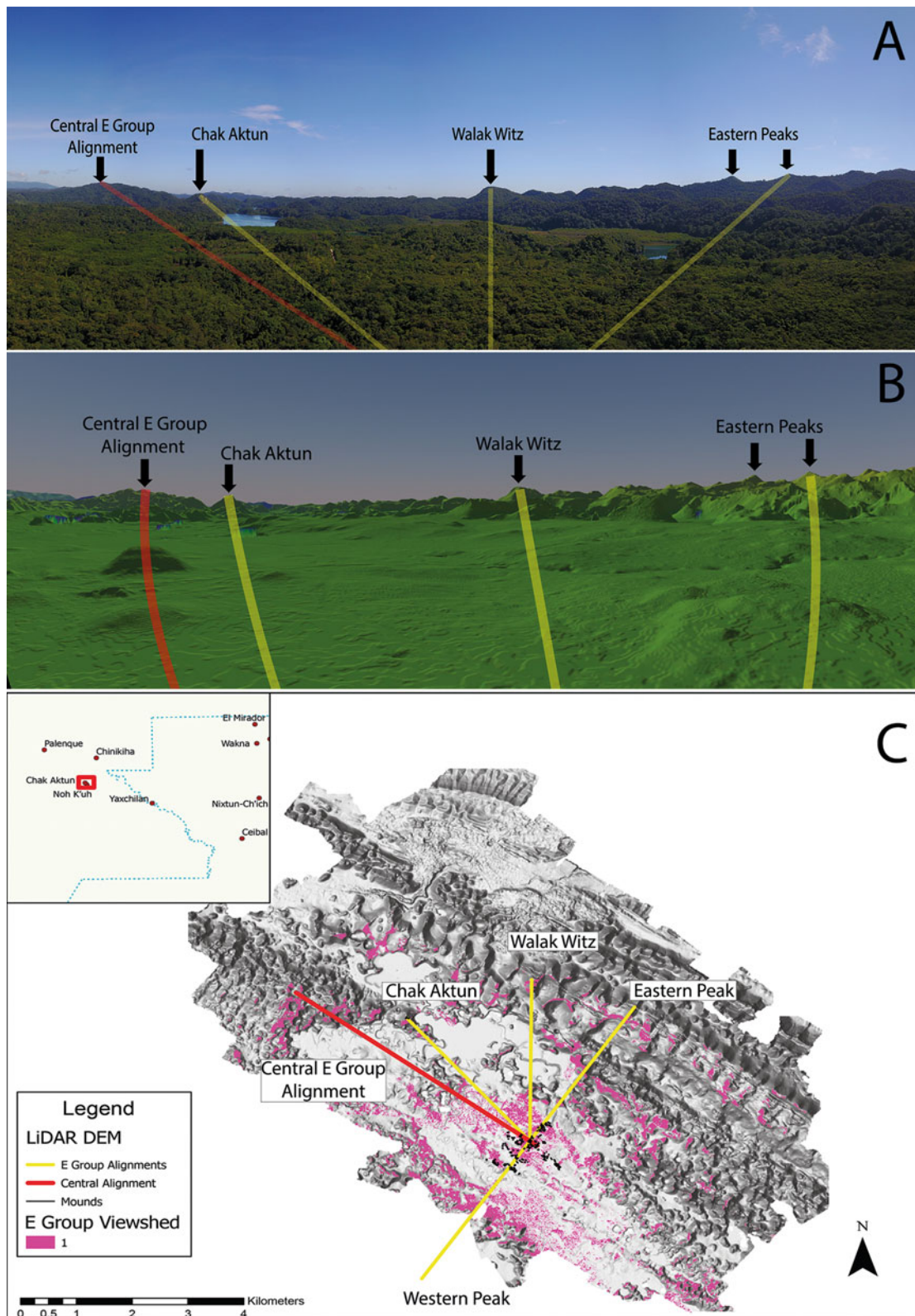
evidence of architectural disturbance that had obscured the shape and orientation of the architecture (Fig. 4). After adjusting for historic period disturbances made to the site's E Group, the plaza's orientation is now closer to 145° southeast.

Several years of survey work and recent LiDAR scans uncovered a construction programme that used unmodified landforms, such as mountaintops, caves, chultuns and rock formations, in multiple ways. For example, in the nearby site of La Punta, a plaza space was constructed at the centre of four boulders that were naturally arranged in a cross pattern (Palka 2013). In fact, many sites along the shores of Lake Mensäbäk (i.e. Chak Aktun, Tz'ib'ana and La Punta) integrated natural features such as boulders in the construction basal platforms and stone temples. Such a construction programme marks the ritual importance of the unaltered environment, but also proved challenging to study. In some cases,

natural features of the landscape were visibly emphasized through constructions that transformed mountaintops and stone formations to create accessible and open-air gathering spaces. In other cases, the relationship between residents and visibly prominent peaks was less clear, as some mountaintops were modified subtly or not at all.

As our survey work continued to expand across the basin, I noted the relationship between many landscape features and the archaeological remains of Noh K'uh. The site, particularly its ceremonial complex that is often referred to as an E Group formation, was positioned at the centre of the basin. E Groups are a set of ceremonial structures defined as a plaza bounded by a long mound and an offsetting pyramid (Ricketson & Ricketson 1937).

The monumental E Group at Noh K'uh is centred in two ways (see Figure 4). First, it is centred within the population, with subsidiary occupations



**Figure 3.** (a) Panoramic view of northern and northeastern section of the valley collected by Mavic Pro drone from about 15 m above Mound NK-M-13 and processed in Adobe Photoshop; (b) Evans & Sutherland's Digistar model based on NCALM LiDAR data. Image portrays a first-person perspective from the top of mound NK-M-13. Note that the image is distorted by the camera's fisheye lens; (c) LiDAR scan and viewshed analysis from the top of Mound NK-M-13.

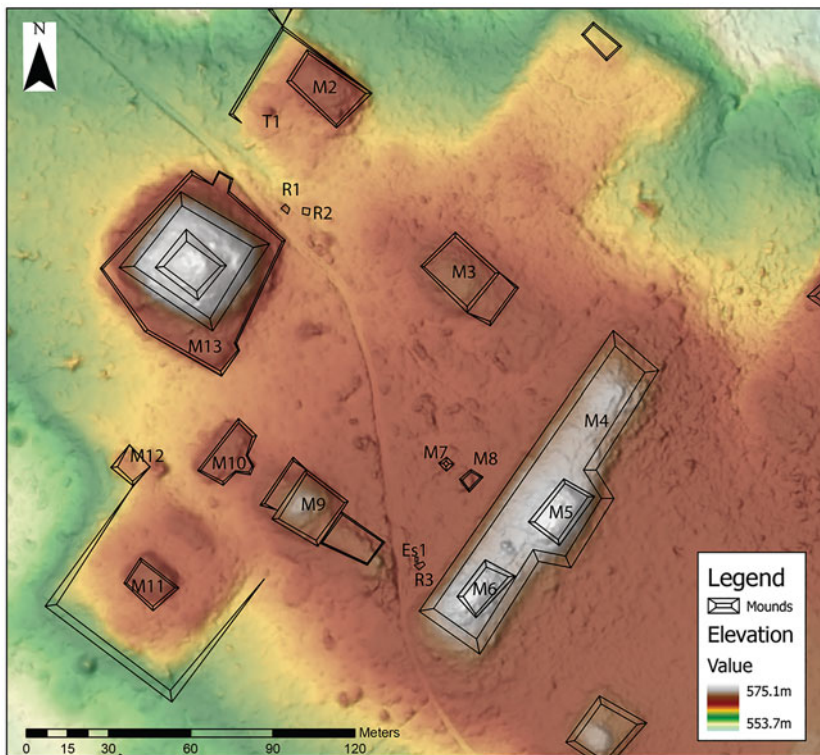


Figure 4. *Noh K'uh*: E Group.

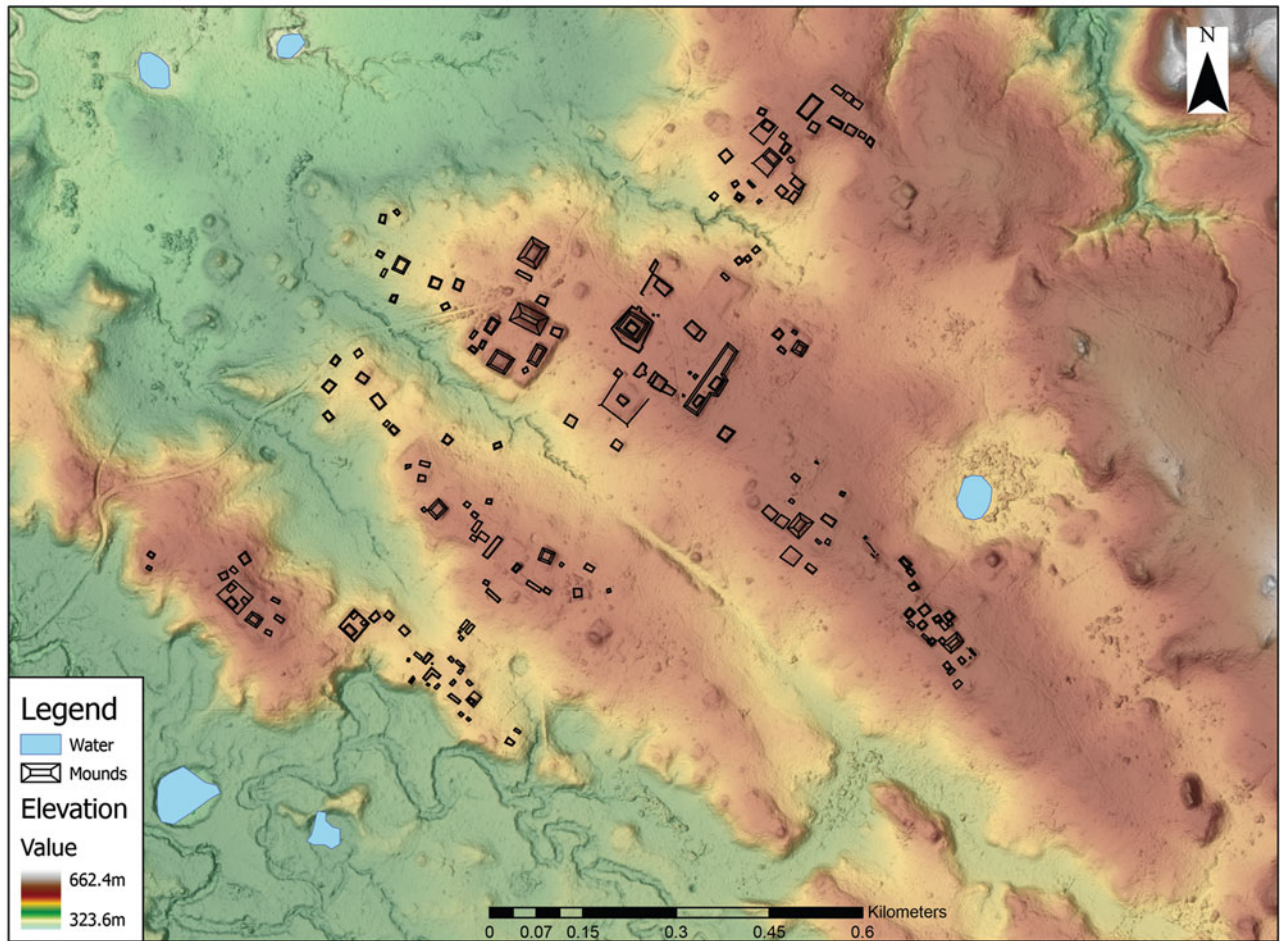
equally positioned on all sides. Second, it is centrally located in reference to mountain ridges at the north-eastern and southwestern edges of the site, and they run along a northwest–southeast axis. Mapped in 2010 (Salgado-Flores 2011), mounds NK-M-13 (a pyramid) and NK-M-4 (a 125 m long platform) represent both the E Group and the site's largest monumental formation. Test-pit excavations near the centre of the plazas (Salgado-Flores 2011) established that the open-air gathering space was artificially constructed through the use of dense clay fill. Mound NK-M-5 represents a short pyramid structure located on top of NK-M-4's platform at its centre, whereas NK-M-6 is backfill from a historical intrusion. Mound NK-M-3 is located along the north-eastern edge of the plaza and NK-M-9 and NK-M-10 are located along the southwestern edges.

The recently updated map of Noh K'uh's settlement based on LiDAR data shows that the population radiated outward from the central complex, thus placing the E Group at the centre of this community. According to the most recent estimates, Noh K'uh settlements aggregated within 800 m of the central plaza, with a few satellite sites located beyond this limit. Thus far, the excavations and LiDAR data from the E Group illustrate that the foundation of the monumental structures was an artificial plateau where residents extended a pre-existing hill

further northwest to serve as the foundation to the E Group (see Figure 5). LiDAR data also indicate that this E Group is associated with large open-air platforms to both its southwest and northeast, giving the plaza a quincunx pattern. An L-shaped platform extends the central plaza toward the northeast, increasing the open-air space, and a smaller, square-shaped, subsidiary platform (identified in 2013) extends the plaza to the southwest. When these extensions are factored in, the flattened space that supports the E Group measures about 38,000 sq. m.

The parallel mountain ranges along the north-eastern and southwestern edges of Noh K'uh are located about 3.3 km distant from the ceremonial complex; thus, the E Group is situated at the centre of both mountain ranges. The mountains' roughly northwest–southeast axis appears to have played a significant role in the site's orientation, because almost all of the Noh K'uh constructions follow the same angle. LiDAR data reveal that the peak ridge on the northeast range aligns with the E Group's L-shaped platform, suggesting this plaza extension was designed to face the peak. The LiDAR survey also indicate the presence of a chultun-like feature in front of the peak and in line with the L-shaped platform and the northeast peak. Less is known about the mountain ridges to the southwest because this area was not included in the LiDAR survey.





**Figure 5.** *Noh K'uh: settlement. All ground-truthed features are depicted in a prismatic convention.*

ASTER data provided by NASA, however, reveal that a similar alignment existed with the plaza's southwest extension, because this platform also points toward and faces these mountains.

The central axis of an E Group is measured from the top of the complex's pyramid toward the central axis of the elongated platform, about  $145^\circ$  due southeast. Thus far, no clear alignment with a landscape feature is visible in this direction, which could suggest that the E Group was aligned toward a celestial event, as has been seen in some Maya E Groups that aligned toward the summer solstice (Šprajc 2018). However, in the opposite direction there exists a set of monuments that align the E Group toward a mountain 5.3 km  $325^\circ$  due northwest. This is the farthest peak visible along the horizon: LiDAR survey reveals that the peak is inside a bowl-shaped depression and is also associated with a chultun-like feature.

Study of this northeast–southwest axis reveals that other landforms were also visible from Noh

K'uh's E Group. The mountain of Chak Aktun (Palka 2011) falls on a line  $44^\circ$  west of north and just 3.3 km northwest of Noh K'uh's largest pyramid (the Lacandon also refer to Chak Aktun as El Mirador, and it is labelled as such in some literature; Fig. 3). Located at the centre of a jade-coloured lake system, the mountain is the only one with a sheer edge. Near the peak of Chak Aktun, a vertical plunging cave is encircled by several small altars and stone platforms, evidence that this cave may have been a point of connection between transformed environments and ritual practices. Another prominent mountain is located 3.5 km from the E Group, due  $0^\circ$  north. This mountain is cleft at its peak and is known today as Walak Witz or 'round mountain' in Lacandon. The area near the cleft is flat and provides a clear view of the basin and Noh K'uh, but it is not yet known whether this area was altered by ancient residents.

Figure 2 demonstrates that the site's ceremonial centre is equidistant from four mountaintops in the

northeastern and southwestern mountain ridges. The mountain and cave entrance at Chak Aktun are both located 3.3 km from the centre of Noh K'uh. Walak Witz is similarly located 3.3 km directly north of NK-M-13. This resulted in intersecting axes that all position the E Group equidistant from multiple landmarks and the entire community at the visual centre of the basin. The top of pyramid NK-M-13 provides one of the very few spaces that allow a person to view all these peaks simultaneously. In fact, it is the viewshed that may have played a guiding role in this centring work, which may have carried ritual significance.

## Discussion

When constructing spaces within this living world, ancient residents used a combination of multiple features of the landscape to construct their *axis mundi* (Estrada-Belli 2006; Scherer 2015). Here, I analyse the relationship among the site's most prominent landforms to discuss visuo-spatial relationships, some marked by human-made alterations to spaces and others supported by ambiguous signs of alteration and lines of sight. I argue that the site organization of Noh K'uh was constructed in relation to the mountains of the surrounding valley to create an *axis mundi* with Noh K'uh at the centre. Key mountains provide focal points in multiple cardinal directions. The final result is a community plaza (E Group) that is centred according to intersecting axes.

Noh K'uh's E Group does not appear to align to a significant solar event like the solstice, according to preliminary findings from the Ho Tung visualization laboratory, but such alignments are no longer seen as an inherent characteristic of E Groups (Aimers & Rice 2006). Others have posited E Groups as manifestations of elite power (Chase & Chase 1995; Chase *et al.* 2017b), observatories (Aveni *et al.* 2003), calendar devices, markers of agricultural seasons (Estrada-Belli 2017), or symbolic manifestations of cosmological forces (Aylesworth 2004; Dowd 2017; Inomata 2017; Reese-Taylor 2017; Stanton & Freidel 2003). The fact that many E Groups did not align to significant solar events like the solstices (Clark & Hansen 2001; Šprajc 2018) has led researchers like Stanton and Freidel (2003) to move away from the interpretations that these spaces served as observatories and toward a perspective that treats them as arenas for ceremonial activities. However, applying Aveni's (2003) concept of E Groups as planetariums as opposed to observatories that served as devices for astronomical measurement endows these architectural groups with a much more fluid relationship

with the cosmos. Furthermore, Aveni's (2003) planetarium model poses E Groups as both a ceremonial space and a place to study and track movements in the sky. Noh K'uh's central placement in the basin, particularly structure NK-M-13, provides an observer with an ideal location to view all the valley's prominent peaks at once. Combined, these peaks serve as permanent points of reference in the enclosed environment that was home to Noh K'uh.

Further, each mountain peak discussed earlier has specific features that might also have held symbolic significance to the inhabitants of Noh K'uh. According to Andrade and colleagues (2012), the plunging cave at the top of Chak Aktun probably served as the entry or mouth of the mountain, providing ritual practitioners with access to multiple cosmological worlds. Andrade and colleagues (2012) describe clusters of ceramic deposits that range in date from the Late Preclassic to the Postclassic. Combined with the discovery of human remains, their findings are evidence of a long history of offerings that span the Preclassic to modern times. Palka (2014) reports that the mountain of Chak Aktun was heavily modified through the construction of 13 stone terraces that converted one face of the mountain into a giant staircase. Similar labour-intensive activities have been identified in the Preclassic site of Nixtun-Ch'ich, where the city was designed in the shape of a crocodile (Rice 2018) as a reference to the creation of the earth (Reilly 1994). Other peaks, like those at the northeast ridge and at the northwest of the basin (the E Group's northwestern focal point), also have chultuns nearby, as indicated by recent LiDAR data. The presence of these caves and chultuns may have given the mountain the image of being hollow, which in some Maya societies represented the homes of deities (Vogt & Stuart 2005). Similar imagery is described in the Late Preclassic murals of San Bartolo, where deities were depicted emerging out of the mouth of the so-called flower mountain (Saturno *et al.* 2005).

There is a cleft mountain to the north of Noh K'uh (Walak Witz) that is also equidistant from the site centre, but no constructions yet discovered are oriented toward this peak. A cleft mountain was a significant symbol in ancient Mesoamerica, particularly within contemporary civilizations of the Olmec region. In those civilizations, cleft objects and figures were a direct reference to the Maize deity, which is portrayed as a cleft-headed being in association with cardinal direction symbolism (Freidel 1993; Saturno *et al.* 2005; Taube 1996). The Late Preclassic murals of San Bartolo, for example, depict the Maize deity through Olmec-style

iconography (Saturno *et al.* 2005, 28) and in direct association with a mountain cave. The mountain ranges to the northeast and southwest of Noh K'uh and the peak directly to the northwest probably played a more significant role in Noh K'uh's design, given that the construction programme follows the same orientation as these mountains. However, Walak Witz is the same distance from the ceremonial centre as these other landmarks, and given its peak viewing platform (whether altered or not), it may have played some role in landscape-related rituals.

The intercardinal orientation of Noh K'uh may be a result of multiple influences from various Preclassic cultures present within the broader Chiapas region, including traditions outside the Maya region. Noh K'uh's E Group formation exhibits characteristics from Maya, Olmec and other isthmian civilizations that constructed their ceremonial centres according to different cosmological focal points. Orientation patterns of ceremonial centres vary (Estrada-Belli 2017), but an emphasis on an east-west alignment is the most common one in the Maya region (Freidel *et al.* 1993). In Noh K'uh, the site does not appear to correspond to the movement of the sun in a precise manner, but the sun rises from the eastern mountain ridge and settles over the western ridge, giving the mountains a general relationship to the movement of the sun.

I suggest that Noh K'uh's residents gave the landscape and celestial movements equal importance as they sought to recreate a cosmological universe. This is an important distinction, because cosmological centring on the landscape is more characteristic of non-Maya civilizations, whereas solar alignments (east-west) were more common in the Maya region (Aimers & Rice 2006; Ashmore & Sabloff 2002; Inomata 2017). The E Groups found within the Olmec and isthmian region are part of a much larger ceremonial complex that runs along a north-south axis. Noh K'uh's site organization demonstrates characteristics seen in the southern Maya Lowlands, but its layout also resembles the architectural patterns seen in contemporary Preclassic traditions in central Chiapas (Clark & Pye 2011; Lowe & Agrinier 1960) and the Pacific Coast (Kappelman 2004; Lesure 1997; Love 1999; 2011; Rosenswig & Lopez-Torrijos 2018; Rosenswig & Mendelsohn 2016). E Groups in these areas were part of larger processional spaces where monuments were often arranged along a north-south axis. Additionally, E Groups in the isthmian sphere, often described as a Middle Formative Chiapas (MFC) pattern (Clark & Hansen 2001), were also oriented toward landforms. Noh K'uh's E Group

combines multiple influences that are oriented according to local geography, but it lacks that north-south processional space as identified in the MFC-style complexes. Despite the cleft mountain located directly north of the E Group plaza, residents chose an intercardinal axis when a nearly perfect north-south alignment was available to them.

The study of spatial relationships also demands a sceptical eye, as buildings and random landforms are going to align within a karstic environment that provides numerous cave systems, cenotes and mountain ranges. This issue is also compounded by variability of Maya site designs that demonstrate many shared characters, but at the same time no two complexes are ever identical (Doyle 2017; Estrada-Belli 2017). Other factors probably played an important role in the shape and design of Noh K'uh, but they are not clearly represented in the site's physical remains. The consistent intercardinal orientation of Noh K'uh's buildings, for instance, does not support the explanation that the site is a result of random patterning. Furthermore, this level of organization signifies the presence communal coordination, where a site plan was measured and sustained beyond the ceremonial centre. Additionally, the central location of the ceremonial centre could only be achieved through large labour investments that created a new artificial plateau where one did not previously exist. Given the degree of landscape modification, the residents of Noh K'uh could have selected any space and orientation to construct their ceremonial centre. The decision to place the core of their community here stands out due to a central position within the valley, and the fact that higher ground and freshwater lake resources were also available within the basin but were not given primacy in this site design.

Economic and militaristic needs appear to have been secondary concerns with regard to site design at Noh K'uh. Local lake resources make this basin appealing to a small population, but the confined region is not capable of supporting an urban community through its own resources alone. Noh K'uh's location within a valley, rather than along a water route, places it away from important trade routes such as those that contributed to rise of Classic period Yaxchilan and Piedras Negras (Golden *et al.* 2012). Additionally, at the bottom of the basin Noh K'uh is surrounded by higher ground on all sides, making this the least appealing space with regard to tactical needs. Mounds at Noh K'uh congregate, but with a mean distance of 25.139 m between structures within the site's densest settlement; thus, they are too spread apart to be a defensive strategy.

It is likely that most Maya site plans resulted from a compromise between numerous factors, including the availability of space and the pre-existing landforms. Economic and defensive needs may have not been placed at the forefront of site design here, but residents would need to consider these issues as the community continued to grow in size and influence. For example, current evidence indicates that Noh K'uh was integrated in broader regional trade networks, particular with regard to foreign resources. Excavations recovered 1316 pieces of obsidian, including debitage, from 23 test pits in domestic contexts. An XRF analysis completed at the University of Illinois at Chicago revealed that 76 per cent of obsidian samples tested originated from San Martin Jilotepeque, a significant source of obsidian during the Late and Middle Preclassic (Rice 1984). Small amounts of jade and marine shell indicate that the populace enjoyed access to foreign goods, and the identification of Sierra Red ceramics further reveals a cultural connection with the surrounding Maya region, where this type of pottery was common. Defensive structures in other communities near the Usumacinta region (Houston *et al.* 2003) also indicate some evidence of regional warfare. Noh K'uh's involvement in such militaristic activity remains unclear.

## Conclusions

Current efforts to decolonize anthropological archaeology (Silliman 2001; Sonya 2006) challenge us to think beyond the empirical framing of scientific research and to include Indigenous perspectives and alternative ways of knowing (Wobst 2004). In this spirit, this article incorporates archaeological evidence, but goes beyond it to consider the way the landscape had an impact on the lives of people (Basso 1996; Tilley 2010). I propose that landscape theory and Mesoamerican studies of landscape symbolism provide a means of approaching spaces that aligns with the perspective of the ancient peoples who constructed the earliest civilizations in the Americas. In Prehispanic societies, the living world, cosmology and the surrounding environment served as key focal points for daily and religious practices.

In this analysis of Noh K'uh's surrounding environment, I make three key observations that explain the settlement pattern of Noh K'uh. First, the central positionality of Noh K'uh's E Group created a focal point for both the basin and the community. The E Group location and open-air plaza space would have provided an ideal gathering space. Second, the central location of the E Group's pyramid

also provided this complex with a viewing platform. Significant locations, like the pilgrimage mountain of Chak Aktun, provided the basin with a wealth of landscape symbols that were established by the Late Preclassic. Additionally, the permanency of peaks may have also played a role in tracking celestial movements, further accentuating the cosmological relationship between site design and the broader universe. Third, the altered and unaltered parts of the basin played a central and active role in the settlement and expansion of Noh K'uh. Endowed with specific topographical features that could be transformed into powerful symbols—connecting people to non-human entities—the environment surrounding Noh K'uh inspired local residents to invest in costly landscape transformations that commemorated cosmological relationships.

I also argue that this settlement programme represented an attempt to construct an *axis mundi* within Noh K'uh's site design. The stylized plaza shape and the central location of this formation are physical remnants of an *axis mundi* that was oriented according to the mountains (see also Ashmore 2002; Ashmore & Sabloff 2002; 2003; Taube 1998). According to Astor-Aguilera (2011), Preclassic Mesoamericans solidified cosmological systems that emphasized geographic markers and celestial bodies, which endured until the conquest. The construction of sacred landscapes that re-created the cosmological universe and the moment of creation (Ashmore 1991; 2002) was as important to the organization of the Late Preclassic community of Noh K'uh as access to trade or natural resources. Furthermore, Noh K'uh's design represents a ceremonial innovation that arose from well-established practices that existed outside the Maya region. Landscape-focused orientation systems that originated from the Olmec and Izapan areas are present in the *axis mundi* at Noh K'uh. The shape and position of Noh K'uh's E Group stand out as a stylized centre point that is oriented and aligned to landforms around the basin.

When we consider the spatial configuration of landforms in relation to Noh K'uh's central plaza, we can see that this community exists in the centre of this potential *axis mundi* and the realm of human beings (Ashmore & Sabloff 2002; Freidel *et al.* 1993). The result is a community plaza (E Group) that residents centred according to landforms that aligned to create intersecting axes. The combination of all these axes gave the entire system a greater sense of power and focus.

The model of the *axis mundi* helps answer many questions about the site's orientation and location, but it only works as a provisional explanation with

currently available data. The integration of unmodified landforms, by definition, will be difficult to link conclusively to the modified environment. Further research of this basin may add new evidence to support the *axis mundi*, but it will probably not be the conclusive textual or illustrated plans that Smith (2007) described in parts of Asia and Rome. Setting such a standard may not work well for a population that depicted their history and environment through metaphorical standards that differed from those of the Old World. The evidence in support of the *axis mundi* is tentative for the time being, but this model allows me to view the landscape through the type of 'cosmovision' proposed by Ashmore (2009), which contributed towards the identification of new patterns. Additionally, the Lacandon request to look towards the mountain also helped me embrace the outward view that is almost universally shared by indigenous populations across the Americas. Until recently, the Lacandon Maya of this region referenced the multi-layered universe in their religious practices, as well many landscape and celestial objects in their worship of Lacandon deities (McGee 1990).

On a regional level, the Basin of Mensábák is seemingly unexceptional: it is not located along prominent waterways and has few natural resources. However, by using a landscape-focused approach, we can see that the combination of multiple landscape features—caves, mountains, chultuns, rivers and lakes—would have provided this small basin with ritual symbols that created a connection between multiple worlds. By viewing this space through 'cosmovision', Noh K'uh's construction programme and settlement pattern can be understood as the site's largest artifact. The importance of this society's landscape will undoubtedly have an impact on understanding Noh K'uh's social, economic and political systems as well and may provide a framework for these analyses. Noh K'uh, like many contemporary sites, reflects a society that was tied to the environment and invested in the commemoration of the cosmological universe. Despite centuries of conquest events (Palka 2005) and ongoing religious shifts, the landscape and the broader universe continue to affect how the Lacandon interact with this space. Older Lacandon men have told me that my research takes place within the homes of gods they once worshipped, thus demanding that I treat these materials and lands with great respect. Such comments have guided my research towards new approaches, where I now view the landscape as an active and potent entity that should not be taken for granted. It is unlikely that we will ever be able

to reconstruct fully how the Late Preclassic Maya of Noh K'uh viewed this landscape, but I can follow the clues found within site design that lead us beyond the boundaries of archaeological sites and beyond.

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### References

- Aimers, J.J. & P.M. Rice, 2006. Astronomy, ritual, and the interpretation of Maya 'E-group' architectural assemblages. *Ancient Mesoamerica* 17, 79–96.
- Andrade, G.M., C. Thompson, J.C.F. Guillen & K.Z. Galvez, 2012. Las exploraciones en cuevas Mayas-Lacandonas de Metzabok, Ocosingo, Chiapas, Mexico [Explorations in Lacandon Maya caves of Metzabok, Ocosingo, Chiapas, Mexico], in *Mundos Subterráneos* [Subterranean worlds], ed, J.G.P. Vargas. Mexico: Unión Mexicana de Agrupaciones Espeleológicas, A. C. 22, 40–53.
- Aoyama, K., T. Inomata, D. Triadan, F. Pinzon, J.M. Palomo, J. Maclellan & A. Sharpe, 2017. Early

- Maya ritual practices and craft production: Late Middle Preclassic ritual deposits containing obsidian artifacts at Ceibal, Guatemala. *Journal of Field Archaeology* 42(5), 408–22.
- Ashmore, W., 1991. Site-planning principles and concepts of directionality among the ancient Maya. *Latin American Antiquity* 2, 199–226.
- Ashmore, W., 2002. 'Decisions and dispositions': socializing spatial archaeology. *American Anthropologist*, 104, 1172–83.
- Ashmore, W., 2009. Mesoamerican landscape archaeologies. *Ancient Mesoamerica* 20, 183–7.
- Ashmore, W. & J.A. Sabloff, 2002. Spatial orders in Maya civic plans. *Latin American Antiquity* 13, 201–15.
- Ashmore, W. & J.A. Sabloff, 2003. Interpreting ancient Maya civic plans: reply to Smith. *Latin American Antiquity* 14, 229–36.
- Astor-Aguilera, M., 2011. What are Mesoamerican religions?, in *The Maya World of Communicating Objects: Quadripartite Crosses, Trees, and Stones* by M. Astor-Aguilera. Albuquerque (NM): University of New Mexico Press, 1–24.
- Aveni, A.F., 2003. Archaeoastronomy in the ancient Americas. *Journal of Archaeological Research* 11, 149–91.
- Aveni, A.F., A.S. Dowd & B. Vining, 2003. Maya calendar reform? Evidence from orientations of specialized architectural assemblages. *Latin American Antiquity* 14, 159–78.
- Aylesworth, G.R., 2004. Astronomical interpretations of ancient Maya E-group architectural complexes. *Archaeoastronomy* 18, 34–66.
- Basso, K.H., 1996. *Wisdom Sits in Places: Landscape and language among the Western Apache*. Albuquerque (NM): University of New Mexico Press.
- Bauer, J.R., 2005. Between heaven and earth: the Cival cache and the creation of the Mesoamerican cosmos, in *Lords of Creation: The origins of sacred Maya kingship*, eds V.M. Fields & D. Reents-Budet. Los Angeles (CA): Los Angeles County Museum of Art, 28–9.
- Bender, B., 2002. Time and landscape. *Current Anthropology* 43, S103–S112.
- Bender, B., S. Hamilton & C. Tilley, 2007. *Stone Worlds: Narrative and reflexivity in landscape archaeology*, Walnut Creek (CA): Left Coast Press.
- Brady, J.E., 1997. Settlement configuration and cosmology: the role of caves at Dos Pilas. *American Anthropologist* 99, 602–18.
- Brady, J.E., 2005. Introduction: religion and role of caves in Lowland Maya archaeology, in *Stone Houses and Earth Lords: Maya religion in the cave context*, eds K.M. Prufer & J.E. Brady. Boulder (CO): University Press of Colorado, 1–24.
- Chase, A.F. & D.Z. Chase, 1995. External impetus, internal synthesis, and standardization: E Group assemblages and the crystallization of Classic Maya society in the southern Lowlands, in *The Emergence of Lowland Maya Civilization: The transition from the Preclassic to the Early Classic. A conference at Hildesheim, November 1992*, ed. N. Grube. Möckmühl: Saurwein, 87–101.
- Chase, A.F., A.S. Dowd & D.A. Freidel, 2017a. The distribution and significance of E Groups: a historical background and introduction, in *Maya E Groups: Calendars, astronomy, and urbanism in the Early Lowlands*, eds D.A. Freidel, A.F. Chase, A.S. Dowd & J. Murdock. Gainesville (FL): University Press of Florida, 3–30.
- Chase, D.Z., P.A. McAnany & J.A. Sabloff, 2017b. Epilogue: E Groups and their significance to the ancient Maya, in *Maya E Groups: Calendars, astronomy, and urbanism in the Early Lowlands*, eds D.A. Freidel, A.F. Chase, A.S. Dowd & J. Murdock. Gainesville (FL): University Press of Florida, 578–82.
- Clark, J.E. & R.D. Hansen, 2001. The architecture of early kingship: comparative perspectives on the origins of the Maya royal court, in T. Inomata & S. Houston (eds), *Royal Courts of the Ancient Maya, Volume Two: Data and case studies*. Boulder (CO): Westview Press, 1–45.
- Clark, J.E. & M.E. Pye, 2011. Revisiting the Mix-Zoque: a brief history of the Preclassic peoples of Chiapas, in *The Southern Maya in the Late Preclassic: The rise and fall of an early Mesoamerican civilization*, eds M. Love & J. Kaplan. Boulder (CO): University Press of Colorado, 25–46.
- Coe, M.D., 1999. *The Maya*. New York (NY): Thames & Hudson.
- Crumley, C.L., 1999. Sacred landscapes: constructed and conceptualized, in *Archaeologies of Landscape: Contemporary perspectives*, eds W. Ashmore & A.B. Knapp. Malden (MA): Blackwell, 269–76.
- Dowd, A.S., 2017. More than smoke and mirrors: Maya temple precincts and the emergence of religious institutions in Mesoamerica, in *Maya E Groups: Calendars, astronomy, and urbanism in the Early Lowlands*, eds D.A. Freidel, A.F. Chase, A.S. Dowd & J. Murdock. Gainesville (FL): University Press of Florida, 517–77.
- Doyle, J.A., 2017. A tale of two E Groups: El Palmar and Tikal, Peten, Guatemala, in *Maya E Groups: Calendars, astronomy, and urbanism in the Early Lowlands*, eds D.A. Freidel, A.F. Chase, A.S. Dowd & J. Murdock. Gainesville (FL): University Press of Florida, 253–292.
- Eliade, M., 1959. *Cosmos and History: The myth of the eternal return* (trans. W.R. Trask). New York (NY): Harper & Row.
- Estrada-Belli, F., 2006. Lightning, sky, rain, and the Maize God. The ideology of Preclassic Maya rulers at Cival, Peten, Guatemala. *Ancient Mesoamerica* 17, 57–78.
- Estrada-Belli, F., 2011. *The First Maya Civilization: Ritual and power before the Classic period*. London/New York: Routledge.
- Estrada-Belli, F., 2017. The history, function and meaning of Preclassic E Groups in the Cival region, in *Maya E Groups: Calendars, astronomy, and urbanism in the*

- Early Lowlands*, eds D.A. Freidel, A.F. Chase, A.S. Dowd & J. Murdock. Gainesville (FL): University Press of Florida, 293–327.
- Fields, V.M., 2005. Introduction: the first sacred kings of Mesoamerica, in *Lords of Creation: The origins of sacred Maya kingship*, eds V.M. Fields & D. Reents-Budet. Los Angeles (CA): Los Angeles County Museum of Art, 21–6.
- Freidel, D., 1993. Centering the world, in *Maya Cosmos: Three thousand years on the shaman's path*, eds D. Freidel, L. Schele & J. Parker. New York (NY): W. Morrow, 123–72.
- Freidel, D., L. Schele & J. Parker, 1993. *Maya Cosmos: Three thousand years on the shaman's path*. New York (NY): W. Morrow.
- Golden, C., A. Scherer, A.R. Muñoz & Z. Hraby, 2012. Politics, boundaries, and trade in the Classic Period Usumacinta river basin. *Mexicon* 34, 11–19.
- Grove, D.C., 1999. Public monuments and sacred mountains: observations on three Formative period sacred landscapes, in *Social Patterns in Pre-Classic Mesoamerica*, eds D.C. Grove & R.A. Joyce. Washington (DC): Dumbarton Oaks, 255–95.
- Grove, D.C. & S.D. Gillespie, 2009. People of the Cerro: landscape, settlement, and art at Middle Formative Period Chalcatzingo, in *The Art of Urbanism: How Mesoamerican kingdoms represented themselves in architecture and imagery*, eds W.L. Fash & L.L. Lujan. Washington (DC): Dumbarton Oaks Research Library and Collection, 53–76.
- Halperin, C.T., 2005. Social power and sacred space at Actun Nak Beh, Belize, in *Stone Houses and Earth Lords: Maya religion in the cave context*, eds K.M. Prufer & J.E. Brady. Boulder (CO): University Press of Colorado, 71–90.
- Hamilton, S., 2006. Phenomenology in practice: towards a methodology for a 'subjective' approach. *European Journal of Archaeology* 9, 31–71.
- Hendon, J.A., 1999. The Pre-Classic Maya compound as the focus of social identity, in *Social Patterns in Pre-Classic Mesoamerica*, eds D.C. Grove & R.A. Joyce. Washington (DC): Dumbarton Oaks Research Library and Collection, 97–125.
- Houston, S., H. Escobedo, M. Child, D. Golden & R. Muñoz, 2003. The moral community: Maya settlement transformation at Piedras Negras, Guatemala, in *The Social Construction of Ancient Cities*, ed. M.L. Smith. Washington (DC): Smithsonian Institution Press, 212–53.
- Ingold, T., 1993. The temporality of the landscape. *World Archaeology* 25, 152–74.
- Inomata, T., 2017. The isthmian origins of the E Group and its adoption in the Maya Lowlands, in *Maya E Groups: Calendars, astronomy, and urbanism in the Early Lowlands*, eds D.A. Freidel, A.F. Chase, A.S. Dowd & J. Murdock. Gainesville (FL): University Press of Florida, 215–52.
- Inomata, T., D. Triadan, K. Aoyama, V. Castillo & H. Yonenobu, 2013. Early ceremonial constructions at Ceibal, Guatemala, and the origins of Lowland Maya civilization. *Science* 340, 467–71.
- Inomata, T., J. MacLellan & M. Burham, 2015. The construction of public and domestic spheres in the Preclassic Maya Lowlands. *American Anthropologist* 117(3), 519–34.
- Inomata, T., D. Triadan, V.A. Vázquez López, et al. 2020. Monumental architecture at Aguada Fénix and the rise of Maya civilization. *Nature* 582(7813): 530–33.
- Johnson, M. 2007. *Ideas of Landscape*. Malden (MA): Blackwell.
- Juarez, S., 2011. Operación NK-2: Investigaciones arqueológicas en el sitio Noh Kuh, Lago Mensabak, Chiapas, Operación 2 (NK-2) [Archaeological investigations at the site of Noh K'uh, Lake Mensabak, Chiapas Operation 2 (NK-2)], in *Informe Temporada 2011, Proyecto Arqueológico Mensabak, Chiapas, Mexico* [2011 Season Report, Mensabak Archaeological Project, Chiapas, Mexico], eds R. Deeb, C. Kestle & J. Palka. Mexico City: University of Illinois at Chicago, 90–123.
- Juarez, S. 2021. Connecting households: ceremonial and domestic settlement patterns at the Preclassic site of Noh K'uh in Chiapas, Mexico. *Journal of Anthropological Archaeology* 63, 101331.
- Juarez, S., S. Salgado-Flores & C. Hernandez, 2019. The site of Noh K'uh, Chiapas, Mexico: a Late Preclassic settlement in the Mensabak Basin. *Latin American Antiquity* 30, 211–17.
- Kappelman, J.G., 2004. Demystifying the Late Preclassic Izapan-style stela-altar 'cult'. *RES: Anthropology and Aesthetics* 45, 99–122.
- Kimmerer, R.W., 2013. *Braiding Sweetgrass; Indigenous wisdom, scientific knowledge and the teaching of plants*. Minneapolis (MN): Milkweed Editions
- Landau, K., 2015. Spatial logic and Maya city planning: the case for cosmology. *Cambridge Archaeological Journal* 25(1), 275–92.
- Lesure, R.G., 1997. Early Formative platforms at Paso de la Amada, Chiapas, Mexico. *Latin American Antiquity* 8, 217–35.
- Love, M., 1999. Ideology, material culture, and daily practice in Pre-Classic Mesoamerica: a Pacific Coast perspective, in *Social Patterns in Pre-Classic Mesoamerica*, eds D.C. Grove & R.A. Joyce. Washington (DC): Dumbarton Oaks, 127–53.
- Love, M., 2011. Cities, states, and city-state culture in the Late Preclassic southern Maya region, in *The Southern Maya in the Late Preclassic: The rise and fall of an early Mesoamerican civilization*, eds M. Love & J. Kaplan. Boulder (CO): University Press of Colorado, 47–75.
- Lowe, G.W. & P. Agrinier, 1960. *Mound 1, Chiapa de Corzo, Chiapas, Mexico*. Provo (UT): New World Archaeological Foundation, Brigham Young University.
- Lucero, L., 2010. Materialized cosmology among ancient Maya commoners. *Journal of Social Archaeology* 10, 138–67.

- Lucero, L.J., 2006. *Water and Ritual: The rise and fall of Classic Maya rulers*. Austin (TX): University of Texas Press.
- McGee, R.J., 1990. *Life, Ritual, and Religion Among the Lacandon Maya*. Belmont (CA): Wadsworth.
- McGee, R.J., 2002. *Watching Lacandon Maya Lives*. Boston (MA): Allyn & Bacon.
- Montgomery, J., 2002. *How to Read Maya Hieroglyphs*. New York (NY): Hippocrene Books.
- Nations, J.D. & J.E. Clark, 1983. The bows and arrows of the Lacandon Maya. *Archaeology* 36(1), 36–43.
- Nations, J.B. & R.B. Nigh, 1980. The evolutionary potential of Lacandon Maya sustained-yield tropical forest agriculture. *Journal of Anthropological Research* 36(1), 1–30.
- Palka, J., 2005. *Unconquered Lacandon Maya*. Gainesville (FL): University Press of Florida.
- Palka, J., 2011. Operación EM-1: Investigaciones Arqueológicas en el Sitio Mirador, Lago Mensabak, Chiapas [Operation EM-1: Archaeological investigations at the site of Mirador, Lake Mensabak, Chiapas], in *Informe Temporada 2011, Proyecto Arqueológico Mensabak, Chiapas, Mexico* [2011 Season Report, Mensabak Archaeological Project, Chiapas, Mexico], eds R. Deeb, C. Kestle & J. Palka. Mexico City: University of Illinois at Chicago, 31–52.
- Palka, J., 2013. Resumen del Mapeo del Sitio La Punta [Summary of La Punta site mapping], in *Informe Temporada 2013: Proyecto Arqueológico Mensabak, Chiapas Mexico* [2013 Season Report, Mensabak Archaeological Project, Chiapas, Mexico], eds S. Juarez, J. Palka & C. Hernandez. Mexico City: University of Illinois at Chicago, 57–64.
- Palka, J., 2014. *Maya Pilgrimage to Ritual Landscapes: Insights from archaeology, history, and ethnography*, Albuquerque (NM): University of New Mexico Press.
- Pauketat, T.R., 2012. *Archaeology of the Cosmos: Rethinking agency and religion in ancient America*. Florence (KY): Routledge.
- Plunket, P. & G. Uruñuela, 2002. Shrines, ancestors, and the volcanic landscape at Tetimpa, Puebla, in *Domestic Ritual in Ancient Mesoamerica*, ed. P. Plunket. Los Angeles (CA): Cotsen Institute of Archaeology, University of California, 31–42.
- Reese-Taylor, K., 2017. Founding landscapes in the central karstic uplands, in *Maya E Groups: Calendars, astronomy, and urbanism in the Early Lowlands*, eds D.A. Freidel, A.F. Chase, A.S. Dowd & J. Murdock. Gainesville (FL): University Press of Florida, 480–516.
- Reese-Taylor, K. & R. Koontz, 2001. The cultural poetics of power and space in ancient Mesoamerica, in *Landscape and Power in Ancient Mesoamerica*, eds R. Koontz, K. Reese-Taylor & A. Headrick. Boulder (CO): Westview Press, 1–27.
- Reilly, F.K.I., 1994. Enclosed ritual spaces and the watery underworld in Formative period architecture: new observations on the function of La Venta Complex A, in *Seventh Palenque Round Table, 1989*, ed. V.M. Fields. San Francisco (CA): Pre-Columbian Art Research Institute, 1–14.
- Reilly, F.K.I., 2005. Olmec ideological, ritual, and symbolic contributions to the institution of Classic Maya kingship, in *Lords of Creation: The origins of sacred Maya kingship*, eds V.M. Fields & D. Reents-Budet. Los Angeles (CA): Los Angeles County Museum of Art, 30–43.
- Rice, P.M., 2007. *Maya Calendar Origins: Monuments, mythology, and the materialization of time*. Austin (TX): University of Texas Press.
- Rice, P.M., 1984. Obsidian procurement in the Central Peten Lakes Region, Guatemala. *Journal of Field Archaeology* 11(2), 181–94.
- Rice, P.M., 2018. Maya crocodilians: intersections of myth and the natural world at early Nixtun-Ch'ich', Petén, Guatemala. *Journal of Archaeological Method and Theory* 25, 705–38.
- Ricketson, O.G. & E.H.B. Ricketson, 1937. *Uaxactun, Guatemala: Group E, 1926–1931*. Washington (DC): Carnegie Institution of Washington.
- Ringle, W., 1999. Pre-Classic cityscapes: ritual politics among the Early Lowland Maya, in *Social Patterns in Pre-Classic Mesoamerica*, eds D.C. Grove & R.A. Joyce. Washington (DC): Dumbarton Oaks, 183–215.
- Robin, C., 2017. Ordinary people and east-west symbolism, in *Maya E Groups: Calendars, astronomy, and urbanism in the Early Lowlands*, eds D.A. Freidel, A.F. Chase, A.S. Dowd & J. Murdock. Gainesville (FL): University Press of Florida, 361–85.
- Rosenswig, R.M. & R. Lopez-Torrijos, 2018. Lidar reveals the entire kingdom of Izapa during the first millennium BC. *Antiquity* 92, 1292–1309.
- Rosenswig, R.M. & R.R. Mendelsohn, 2016. Izapa and the Soconusco region, Mexico, in the first millennium A.D. *Latin American Antiquity* 27, 357–77.
- Salgado-Flores, S. 2011. Operación NK-1: Excavaciones en el Sitio Noh Kuh, Operación 1 (NK-1) [Operation NK-1: Excavations at the site of Noh K'uh, Operation 1 (NK-1)], in *Informe Temporada 2011, Proyecto Arqueológico Mensabak, Chiapas, Mexico* [2011 Season Report, Mensabak Archaeological Project, Chiapas, Mexico], eds R. Deeb, C. Kestle & J. Palka. Mexico City: University of Illinois at Chicago, 81–9.
- Saturno, W.A., 2009. Centering the kingdom, centering the king: Maya creation and legitimization as San Bartolo, in *The Art of Urbanism: How Mesoamerican kingdoms represented themselves in architecture and imagery*, eds W.L. Fash & L.L. Lujan. Washington (DC): Dumbarton Oaks Research Library and Collection, 111–34.
- Saturno, W.A., K. Taube & D. Stuart, 2005. *The Murals of San Bartolo, El Peten, Guatemala. Part 1: The north wall*. (Ancient America 7.) Barnardsville (NC): Center for Ancient American Studies.
- Schele, L. & J.G. Kopperman, 2001. What the heck's Coatepec? The Formative roots of an enduring



- mythology, in *Landscape and Power in Ancient Mesoamerica*, eds R. Koontz, K. Reese-Taylor & A. Headrick. Boulder (CO): Westview Press, 29–53.
- Schele, L. & M.E. Miller, 1986. *The Blood of Kings: Dynasty and ritual in Maya art*. Fort Worth (TX): Kimbell Art Museum.
- Scherer, A.K., 2015. Ritual, liminality, and the mortuary space, in *Mortuary Landscapes of the Classic Maya*, by A.K. Scherer. Austin (TX): University of Texas Press, 105–70.
- Silliman, S., 2001. Agency, practical politics and the archaeology of culture contact. *Journal of Social Archaeology* 1, 190–209.
- Smith, A.T., 2003a. *The Political Landscape: Constellations of authority in early complex polities*. Berkeley (CA): University of California Press.
- Smith, M.E., 2003b. Can we read cosmology in ancient Maya city plans? Comment on Ashmore and Sabloff. *Latin American Antiquity* 14, 221–8.
- Smith, M.E., 2007. Form and meaning in the earliest cities: a new approach to ancient urban planning. *Journal of Planning History* 6(1), 3–47.
- Sonya, A., 2006. Indigenous archaeology as decolonizing practice. *American Indian Quarterly* 30, 280–310.
- Spector, J.D., 1993. *What This Aowl Means: Feminist archaeology at a Wahpeton Dakota village*. St. Paul (MN): Historical Society Press.
- Šprajc, I., 2005. More on Mesoamerican cosmology and city plans. *Latin American Antiquity* 16(2), 209–16.
- Šprajc, I., 2018. Astronomy, architecture, and landscape in Prehispanic Mesoamerica. *Journal of Archaeological Research* 26, 197–251.
- Stanton, T.W. & D.A. Freidel, 2003. Ideological lock-in and the dynamics of Formative religions in Mesoamerica. *Mayab* 16, 5–14.
- Stone, A.J. & M. Zender, 2011. *Reading Maya Art: A hieroglyphic guide to ancient Maya painting and sculpture*. London: Thames & Hudson.
- Taube, K., 1996. The Olmec Maize God: the face of corn in Formative Mesoamerica. *RES: Anthropology and Aesthetics* 29–30, 39–81.
- Taube, K., 1998. The Jade Hearth: centrality, rulership, and the Classic Maya temple, in *Function and Meaning in Classic Maya Architecture*, ed. S. Houston. Washington (DC): Dumbarton Oaks, 427–78.
- Taube, K., 2000. Lightning celts and corn fetishes: the Formative Olmec and the development of maize symbolism in Mesoamerica and the American Southwest, in *Olmec Art and Archaeology in Mesoamerica*, eds J.E. Clark & M.E. Pye. Washington (DC): National Gallery of Art, 297–337.
- Tedlock, D., 1996. *Popol Vuh: The definitive edition of the Mayan Book of the Dawn of Life and the Glories of Gods and Kings*. New York (NY): Touchstone.
- Tilley, C., 2010. *Interpreting Landscapes: Geologies, topographies, identities*. Abingdon: Routledge.
- Tilley, C., 1994. *A Phenomenology of Landscape: Places, paths, and monuments*. Providence (RI): Berg.
- Vogt, E.Z. & D. Stuart, 2005. Some notes on ritual caves among the ancient and modern Maya, in *In the Maw of the Earth Monster: Mesoamerican ritual cave use*, eds J.E. Brady & K.M. Prufer. Austin (TX): University of Texas Press, 155–85.
- Wheatley, P., 1971. *The Pivot of the Four Quarters: A preliminary enquiry into the origins and character of the ancient Chinese city*. Chicago (IL): Aldine.
- Wilcox, M., 2010. Marketing conquest and the vanishing Indian: an Indigenous response to Jared Diamond's archaeology of the American Southwest, in *Questioning Collapse*, eds P. McAnany & N. Yoffee. Cambridge: Cambridge University Press, 113–41.
- Wobst, H.M., 2004. Power to the (Indigenous) past and present! Or: the theory and method behind archaeological theory and method, in *Indigenous Archaeologies: Decolonizing Theory and Practice*, eds C. Smith & H.M. Wobst. London: Routledge, 17–32.

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