


Incised Lines: Planning and Design in the Late Formative E Group at Yaxuná, Yucatán, Mexico

Ryan H. Collins 

Although direct evidence of civic planning is rare among Mesoamerican sites, such features offer great insight into past practices, intentions, and urban transformation. Using data from the transition to the Late Formative period (ca. 400–300 BC), I argue that direct evidence of urban planning is present in the monumental constructions of Yaxuná in Yucatán, Mexico. There, investigators detected a series of carefully rendered incised lines directly on Floor 6 of the E Group plaza. Along with the buildings' exposed surfaces, incised lines served as visual markers for placing rubble and dry-core fill into two categories: large dry-core stones and small compact fill. These visual distinctions informed the location of features built on top of this fill, including Floor 5 and a causeway spanning the plaza's central axis, distinguished from the white floor surface sascab (a durable product of pulverized limestone) by a red-orange color. The incised lines at Yaxuná grant insight into how ancient builders envisioned public works and then implemented and completed features in a step-by-step design process, which required precision and foresight.

Keywords: Northern Maya Lowlands, Late Formative, specialization, architecture, design

Si bien la evidencia directa de planificación cívica es rara entre los sitios mesoamericanos, estas características reveladoras ofrecen una gran perspectiva de las prácticas pasadas, la intención y la transformación urbana. Usando datos de la transición al período Formativo Tardío (ca. 400 a 300 aC), argumento que la evidencia directa de la planificación urbana está presente en las construcciones monumentales de Yaxuná, Yucatán, México. Allí, los investigadores detectaron una serie de líneas incisas cuidadosamente directamente en el Piso 6 del Grupo E. Junto con las superficies expuestas de los edificios, las líneas incisas sirvieron como marcadores visuales para colocar escombros y relleno de núcleo seco en dos categorías: grandes piedras de núcleo seco y relleno compacto pequeño. Estas distinciones visuales informaron la ubicación de las características construidas sobre este relleno, incluido el Piso 5 y una calzada que se extiende sobre el eje central de la plaza, que se distinguen de la superficie blanca del piso sascab por un color rojo anaranjado. Las líneas incisas en Yaxuná dan una idea de cómo los antiguos constructores imaginaban las obras públicas, luego implementaban y completaban las características en un proceso de diseño paso a paso, que requería precisión y previsión.

Palabras claves: Tierras Bajas del Norte Maya, Formativo Tardío, especialización, arquitectura, diseño

Incised lines remain a rare feature class among Mesoamerican sites. Although usually associated with art, calendrics, and games as final products, their presence at Yaxuná instead represents the beginning of a design process that blends Mesoamerican cosmology with local memory. Using data from the transition into the Late Formative period (ca. 400–300 BC), I argue that incised lines in the E Group plaza are evidence of early urban planning and

architectural specialization at Yaxuná in Yucatán, Mexico. Ancient specialists carefully etched incised line features, four of which were detected by archaeologists, directly onto Floor 6 along the central axis of the E Group plaza. The organizational principles conforming to cardinal directionality established in the E Group subsequently became the template guiding Yaxuná's urban layout until the Classic period (Stanton 2017:464).

Ryan H. Collins (Ryan.H.Collins@dartmouth.edu; corresponding author) ■ Neukom Institute for Computational Science, Department of Anthropology, Dartmouth College, Hanover, NH, USA

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Along with the exposed surfaces of buildings, the Yaxuná line features served as visual markers for where builders placed large dry-core stones and small compact fill. Furthermore, these visual distinctions informed the placement of architectural features built on this fill, including a plaza-spanning causeway and a floor surface, visually distinguished from one another by orangish-red (or rose) and white *sascab* (a durable product of pulverized limestone). Thus, the incised lines at Yaxuná show how builders of public works first envisioned, then implemented, and finally brought projects to completion in a step-by-step design process—one that required forethought and precision.

Incised Lines and Intention

Incised lines are challenging to detect on architectural features like walls and floors composed of plaster or *sascab*. In part, preservation processes often obscure such markings' full extent, challenging the meaning that researchers could otherwise garner from full compositions. Likewise, cultural and natural processes can create unintentional markings on plaster surfaces. Wear and tear from tree growth, for example, will force a researcher to consider whether fragmentary findings are worth pursuing through existing resources and time-consuming investigation. Additionally, there is always the concern that incised lines could result from uncareful excavations with sharp implements. With good context, scholars categorize incised features as calendars (Aveni et al. 1978; Worthy and Dickens 1983), games (Voorhies 2017), and graffiti (Triik and Kampen 1983). Rarely do incised lines signal specialized building practices as they do at Yaxuná.

Incised Lines in the Yaxuná E Group

The Northern Maya Lowland site of Yaxuná is located in the tropical dry broadleaf forest ecoregion of Yucatán, Mexico (Figure 1). At its height (Figure 2), Yaxuná occupied a dense, roughly 1 km² area approaching urban proportions (Stanton and Collins 2022:115). Between 2013 and 2016, investigations in the Yaxuná E Group by Proyecto de Interacción Política del

Centro de Yucatán (PIPCY) excavated 117 2 × 2 m units (Figure 3), revealing significant features and 11 phases of floor construction. E Groups, a category of pyramid plaza complexes, are important because researchers connect their presence to early mound-building traditions throughout eastern Mesoamerica (e.g., Freidel et al. 2017). Morphologically, most E Groups share an east–west orientation: a pyramid typically bounds a plaza on the west, and a long raised platform bounds the east.

The Middle Formative (1000–300 BC) occupation of Yaxuná originated around 900 BC, although construction of the site's most significant buildings began after 400 BC (Stanton and Collins 2022:115). Some incised features on Floor 6 could date earlier, but most features coincide with Floor 5's construction. Therefore, radiocarbon dates from samples under Floor 5 suggest a range for incised line production between about 400 and 200 BC (Collins 2021:9), coinciding with Yaxuná's Late Formative expansion and the transition between the Hok'ol phase (650–300 BC) and Ka'nal phase (300–50 BC) ceramics.

As with features and caches in many E groups (Estrada-Belli 2006:59; Inomata and Triadan 2015:72), the incised lines at Yaxuná are most prominent along the central axis (Figure 4). Floor 6 was the best-preserved surface for the Formative period, probably because of its 20 cm thickness and subsequent retreatments. As a result, investigators were able to uncover evidence of four discrete incised line features on the floor's surface. It is worth noting that the most significant changes to the Yaxuná E Group coincided with Floor 5, which raised the plaza 60 cm above the previous floor level. No other modifications to the E Group were as extensive for ancient builders.

Ancient builders rendered most incised lines through unbroken incisions and constructed one feature through pecking. Collectively, the incised features included a 2 m diameter circle, a 2 m cross, a pecked square with an undetermined length, and a series of squares with lengths consistently measuring 164–168 cm. Although ancient builders produced the Floor 6 features during the same general period, they have different purposes.

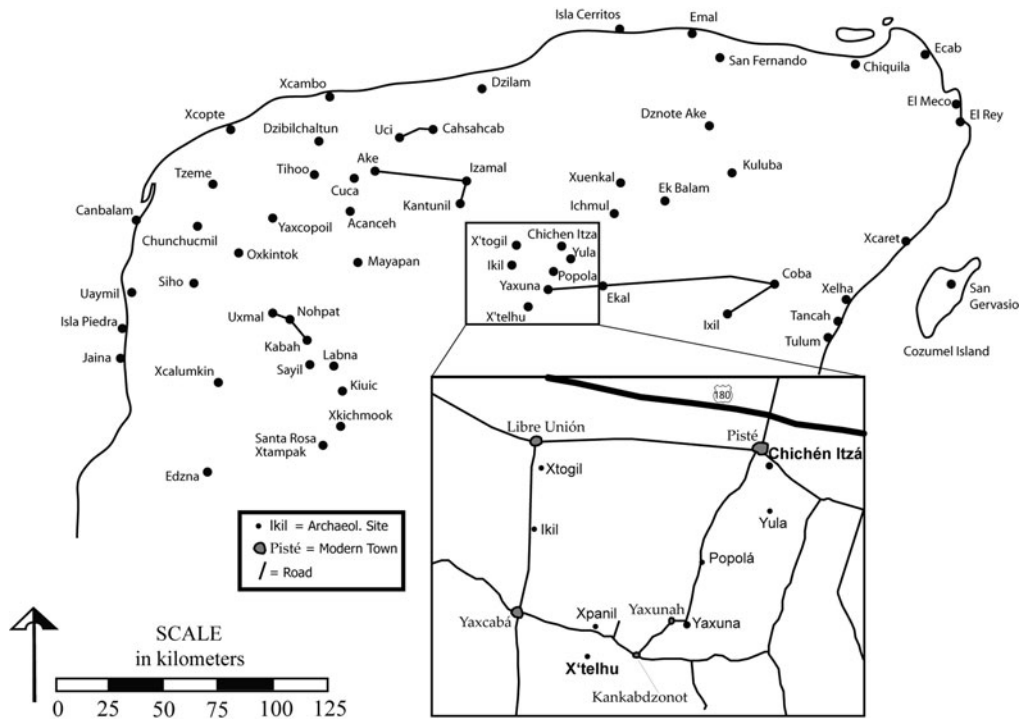


Figure 1. Map of the Northern Lowlands, showing Yaxuná (map courtesy of Travis W. Stanton, Traci Ardren, and Aline Magnoni).

Incised Circle

On Floor 6, investigators documented a 2 m diameter incised circle along the plaza's central axis (Figure 5). Collins (2021:7) argues that its purpose relates to the memory of features present in earlier phases of floor construction. For example, directly under the incised circle on Floor 7, investigators noted concentrated burning with a cache containing polished iron pyrite. Furthermore, investigators detected a circular stone foundation with a 2 m diameter on Floor 8 (Collins 2021:10). Although the 2 m incised circle on Floor 6 does not rest directly over the 2 m circular stone foundation on Floor 8, the two features certainly overlap. Therefore, it is plausible that the incised circle was a direct reference to the shape of the earlier stone foundation.

Incised Cross

Distinct from the circle, the incised cross (Figure 6) marked a shift in the plaza's center resulting from the planned expansion of the

E Group that coincided with Floor 5's construction (Stanton and Collins 2022:117). Significantly, ancient builders placed the 2 m incised cross where investigators detected no significant earlier features. Visually marking the new center was likely necessary for the ancient builders while raising and expanding the E Group plaza. Directly above the incised cross on Floor 5, investigators detected a series of five postholes arranged in a quadripartite axis; perhaps this was an altar, recalling the symbolism underneath it.

In addition to its practical and planning purposes, the incised cross on Floor 6, interpreted as a quatrefoil, carries religious significance (Figure 7). In Mesoamerican art and architecture, quadripartition represents the centering of the cosmos with associations to portals recalling caves as animate entrances to the underworld (Guemsey 2010:76). In some E Group plazas, such as Ceibal (Inomata and Triadan 2015:73) and Cival (Estrada-Belli 2006:59), cruciform chambers are cut directly into bedrock as

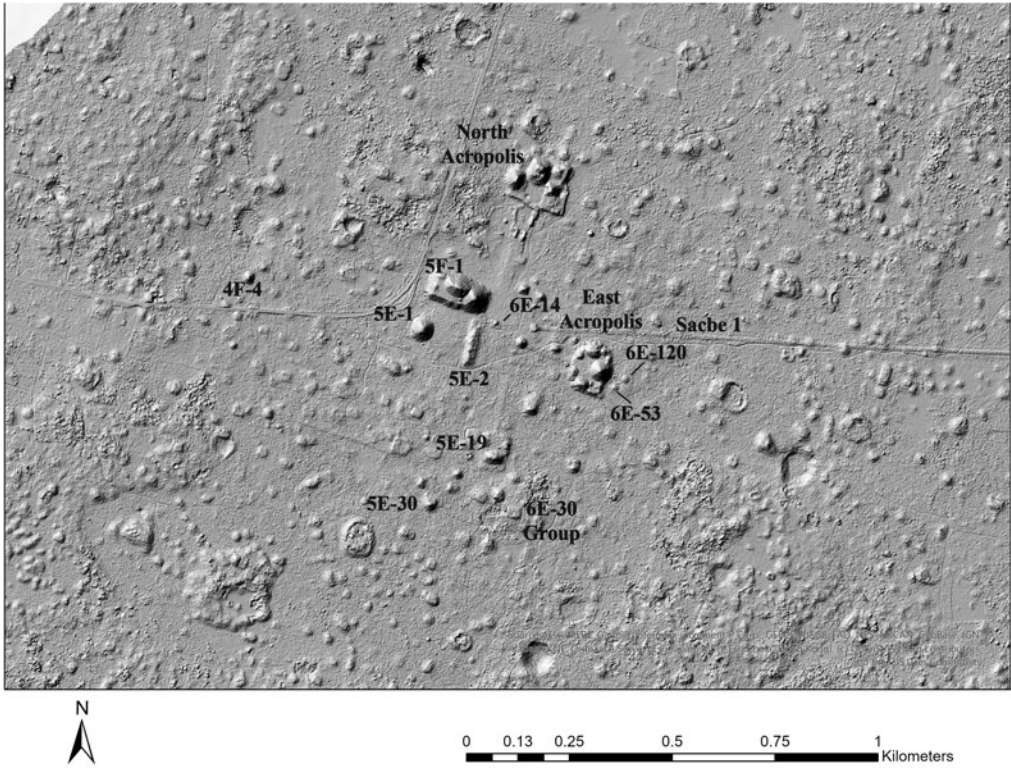


Figure 2. Lidar map of the Yaxuná settlement (map by author; lidar data courtesy of Travis W. Stanton).

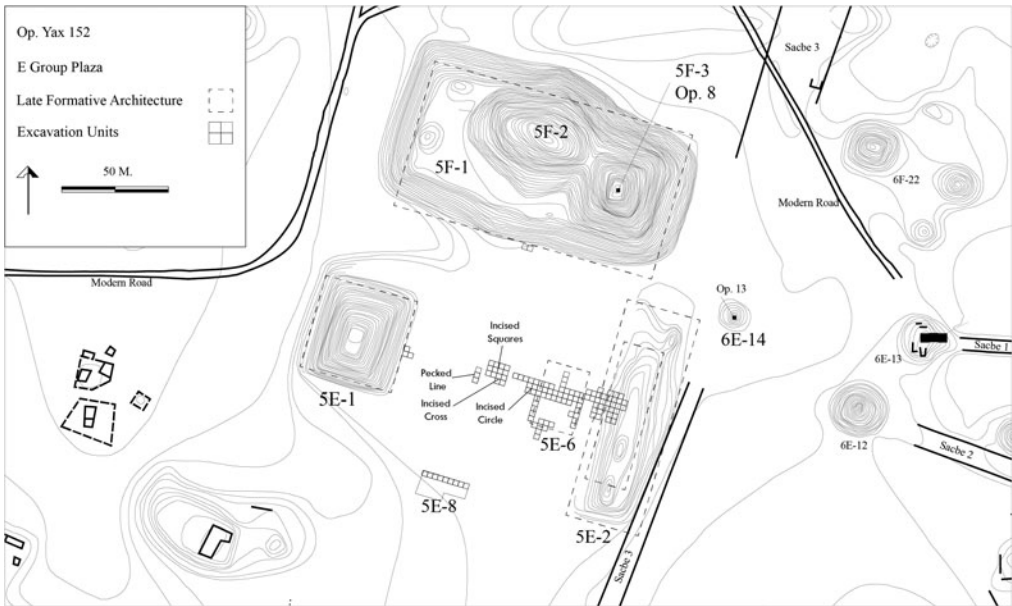


Figure 3. Map of Op. Yax 152 excavations in the Yaxuná E Group.

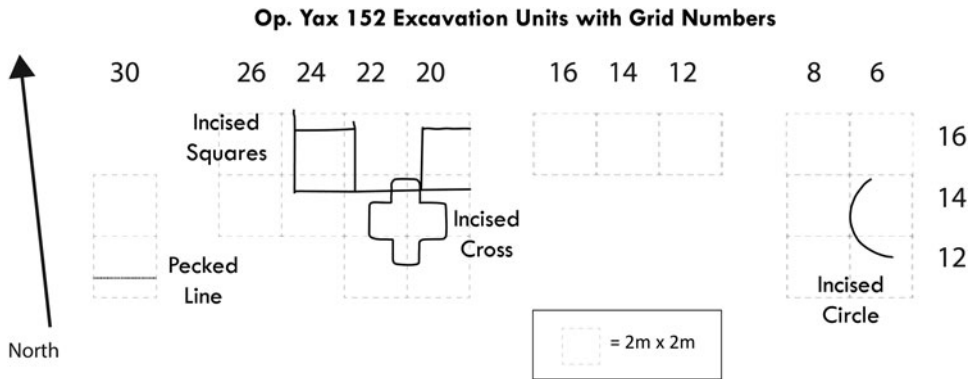


Figure 4. Close-up of Op. Yax 152, showing incised lines on the E Group's central east-west axis.

metaphorical caves. Although the incised cross at Yaxuná is not a carved quadripartite chamber, it does recall the earlier symbolism found in distant E Groups and plaza features, like La Blanca Monument 3 (Love and Guernsey 2007:920). Furthermore, the incised cross at Yaxuná serves to center the E Group. Extending to Yaxuná's settlement, Stanton and Freidel (2005:226) make the case that ancient planners organized the principal Late Formative civic architecture in a cruciform arrangement, creating a sacred

space linking myth, politics, and spatial order with the E Group at its center. In this way, the incised cross guided local civic planning while also linking to broader trends in Mesoamerican civic patterns and religious practices.

Pecked Line

In addition to incised lines, the plaza also hosts a feature made by pecking (Figure 8). Like modern maps, which use different types of unbroken or dotted lines to differentiate distinct feature



Figure 5. Image of the incised circle on Floor 6 (photograph by Ryan H. Collins). (Color online)



Figure 6. Image of the incised cross on Floor 6 in the plaza center (photograph by Ryan H. Collins). (Color online)

classes, the pecked lines seem to represent a form of deliberate differentiation from the unbroken lines. Researchers located the pecked lines 6 m west of the cross. As with the incised circle, the pecked lines marked continuity with caching episodes directly underneath, on Floors 7, 8, 10, and 11. The pecked line feature also served as a border for a small earthen platform with a hollow interior constructed on Floor 6. Surrounded by soil, the hollow interior was composed of three tiers of circularly arranged masonry stones, resembling a short well. The earthen platform bounding this hollow might have functioned as a temporary stage early in the construction of Floor 5. According to Soledad O. Ruiz (personal communication 2021), the open platform visually appears to be a Maya lime kiln used to produce *sascab* floors (Seligson et al. 2019). However, chemical analysis is needed to confirm that the well-like structure is a kiln, a feature that would support the overall civic planning functions of the incised line features.

Incised Squares

The final incised line features mark the E Group plaza's post-expansion (Floor 5) east–west axis.

Spaced at interval lengths between 164 and 168 cm, the connected series of incised squares have a clear planning purpose: they mark the foundation of a plaza-traversing causeway constructed directly above on Floor 5 (Figure 9), spanning the 60 m between Str. 5E-1 (the western boundary of the E Group) and Str. 5E-6 (the former eastern border, reduced to a low-lying platform).

Our investigation revealed compacted fill carefully placed between the northern and southern lines of the extended feature. The highly compacted small fill, stacked to a height of 60 cm, created a visual distinction with the large loose stones bounding the feature. As a result, ancient builders appear to have carefully prepared the stone fill to meet presumable size standards before placing it. The patterned fill then served as a visual marker for constructing a *sascab*, or pulverized limestone, causeway. This observation contrasts with practically all known fill contexts across Yaxuná.

Furthermore, the near-exact repetition of incised lines measuring between 164 and 168 cm may suggest a form of standardized measurement, further signaling that the



Figure 7. Above, photo of incised lines showing the plan of the causeway on Floor 6. Below, Floor 5 features, including the completed causeway and postholes above the cross (photograph by Ryan H. Collins). (Color online)

specialists at Yaxuná were participating in broader forms of Mesoamerican knowledge production. Sugiyama (1993) argues that a standard interval is present in the building practices of the

Early Classic city of Teotihuacan in the Basin of Mexico. The Teotihuacan Measurement Unit (TMU) roughly measures 83 cm (more precisely 82.26) and arguably affected organizational



Figure 8. Image of the pecked line, bounding an earthen platform constructed on Floor 6; only the base tier of stacked masonry is represented here (photograph by Ryan H. Collins). (Color online)

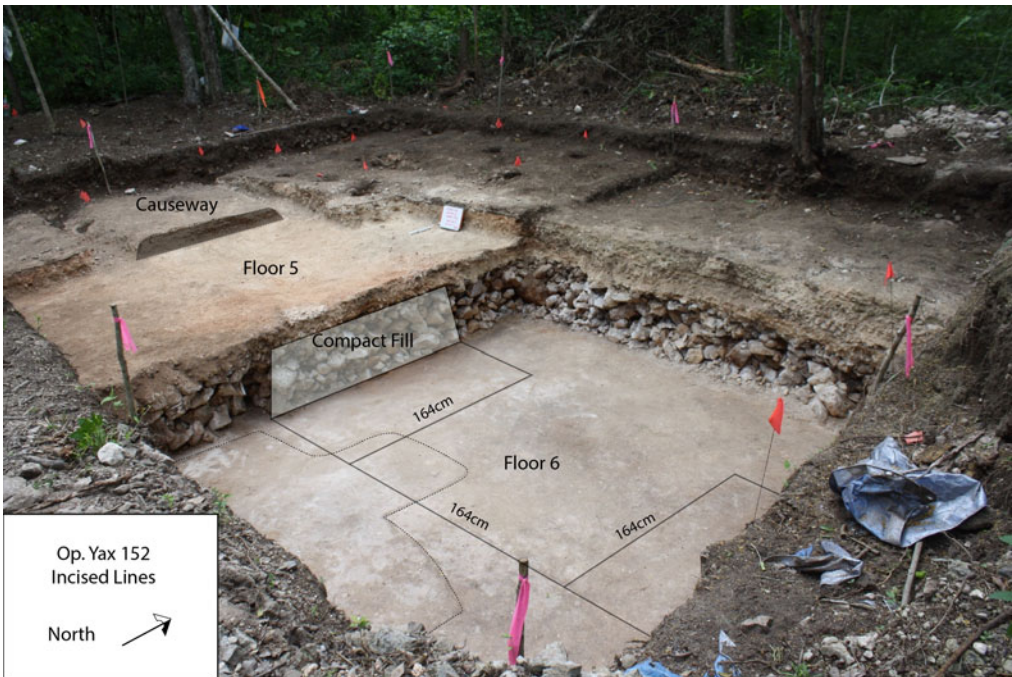


Figure 9. Image highlights distinct fill compositions corresponding to the incised lines (photograph by Ryan H. Collins). (Color online)

practices throughout the urban center (Sugiyama 1993:108). At Yaxuná, the incised squares span almost exactly two TMUs. Although the alignment of the measures could be coincidental or relate to the approximate length of an adult's arm span, consistency and participation in broader Mesoamerican specialization and architectural design remain important considerations for Yaxuná.

Conclusion

The incised features, particularly the central cross, etched into Floor 6 of the Yaxuná E Group may have served multiple purposes, simultaneously symbolic and practical. By the Middle Formative, the cross was a pan-Mesoamerican symbol linked to emerging patterns of specialized knowledge with religious and directional significance (Guernsey 2020:130). At Yaxuná, the presence of the cross signifies that local specialists were participating in broader forms of Mesoamerican knowledge production. Nevertheless, the incised features had the practical impact of establishing a new center in the Yaxuná E Group, guiding subsequent architectural design within the plaza, and directing urban planning along the site's quadripartite axis (Stanton and Freidel 2005:226). As such, the evidence indicates the skilled hand of an architect who guided construction and invested the "blueprints" with a symbol that carried cosmological weight, linking Yaxuná to other sites across Mesoamerica.

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Data Availability Statement. All of the physical data for this project have been turned in to the Instituto Nacional de

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Competing Interests. The author declares none.

References Cited

- Aveni, Anthony F., Horst Hartung, and Beth Buckingham
1978 The Pecked Cross Symbol in Ancient Mesoamerica. *Science*, n.s. 202:267–279.
- Collins, Ryan H.
2021 Selective Memory: Monumental Politics of the Yaxuná E Group in the First Millennium B.C. *Ancient Mesoamerica*, in press. DOI:10.1017/S0956536121000304.
- Estrada-Belli, Francisco
2006 Lightning, Sky, Rain, and the Maize God: The Ideology of Preclassic Maya Rulers at Cival, Peten, Guatemala. *Ancient Mesoamerica* 17:57–78.
- Freidel, David A., Arlen F. Chase, Anne Dowd, and Jerry Murdock (editors)
2017 *Maya E Groups: Calendars, Astronomy, and Urbanism in the Early Lowlands*. University Press of Florida, Gainesville.
- Guernsey, Julia
2010 A Consideration of the Quatrefoil Motif in Preclassic Mesoamerica. *RES* 57/58:75–96.
2020 *Human Figuration and Fragmentation in Preclassic Mesoamerica: From Figurines to Sculpture*. Cambridge University Press, Cambridge.
- Inomata, Takeshi, and Daniella Triadan
2015 Middle Preclassic Caches from Ceibal, Guatemala. In *Maya Archaeology 3*, edited by Charles Golden, Stephen Houston, and Joel Skidmore, pp. 56–91. Pre-columbia Mesoweb Press, San Francisco.
- Love, Michael W., and Julia Guernsey
2007 Monument 3 from La Blanca, Guatemala: A Middle Preclassic Earthen Sculpture and Its Ritual Associations. *Antiquity* 81:920–932.
- Seligson, Ken E., Soledad O. Ruiz, and Luis Barba Pingarrón
2019 Prehispanic Maya Burnt Lime Industries: Previous Studies and Future Directions. *Ancient Mesoamerica* 30:199–219.
- Stanton, Travis W.
2017 The Founding of Yaxuná: Place and Trade in Pre-classic Yucatán. In *Maya E Groups: Calendars, Astronomy, and Urbanism in the Early Lowlands*, edited by David A. Freidel, Arlen F. Chase, Anne S. Dowd, and Jerry Murdock, pp. 450–479. University Press of Florida, Gainesville.
- Stanton, Travis W., and Ryan H. Collins
2022 The Role of Middle Preclassic Placemaking in the Creation of Late Preclassic Yucatecan Cities: The Foundations of Yaxuná. In *Early Mesoamerican Cities: Urbanism and Urbanization in the Formative Period*, edited by Michael Love and Julia Guernsey, pp. 99–120. Cambridge University Press, Cambridge.
- Stanton, Travis W., and David Freidel
2005 Placing the Center, Centering the Place: The Influence of Formative Sacbeob in Classic Site Design at Yaxuná, Yucatán. *Cambridge Archaeological Journal* 15:225–249.
- Sugiyama, Saburo
1993 Worldview Materialized in Teotihuacan, Mexico. *Latin American Antiquity* 4:103–129.

Trik, Helen, and Michael Kampen

1983 *The Graffiti of Tikal*. Tikal Report No. 31. University Museum, University of Pennsylvania, Philadelphia.

Voorhies, Barbara

2017 *Prehistoric Games of North American Indians: Subarctic to Mesoamerica*. University of Utah Press, Salt Lake City.

Worthy, Morgan, and Roy S. Dickens Jr.

1983 The Mesoamerican Pecked Cross as a Calendrical Device. *American Antiquity* 48:573–576.

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