Ancient Mesoamerica, **23** (2012), 297–311
Copyright © Cambridge University Press, 2012
doi:10.1017/S0956536112000211

"ALL THAT IS SOLID…": *SACBES*, SETTLEMENT, AND SEMIOTICS AT TZACAUIL, YUCATAN

Scott R. Hutson,[a] Aline Magnoni,[b] and Travis W. Stanton[c]

[a]Department of Anthropology, University of Kentucky, 211 Lafferty Hall, Lexington, KY 40506-0024
[b]Department of Anthropology, Tulane University, 6823 St. Charles Avenue, New Orleans, LA 70118
[c]Departamento de Antropología, Universidad de las Américas Puebla, Sta. Catarina Mártir. Cholula, Puebla. C.P. 72810 México

Abstract

This paper applies structuration theory and semiotics to interpret the results of a recently completed total coverage pedestrian survey to the east of Yaxuna, Yucatan. Data from this survey suggest that a social group centered at the site of Tzacauil vied for political clout in the Late Preclassic period through the construction of a triadic acropolis 3 km from Yaxuna. This group also initiated but did not complete a new experimental construction: a long-distance causeway between the two sites. A central facet of structuration is the instability of social practice. Rules can be altered when transposed to new contexts, while durable resources, such as causeways and acropolis groups, do not ensure the solidity of the coalitions they are meant to represent. Despite an outlay of labor never again seen to the east of Yaxuna, Tzacauil had a rather short occupation. Though they never completed the causeway, the people of Tzacauil did succeed in transforming the conventional understanding of causeways. These events support a semiotic approach since they show that materiality is contingent: it has a potential that people may or may not work to realize.

Marx and Engels' (1967[1872]) quote—"all that is solid melts into air"—expresses the tendency of the nineteenth-century European bourgeoisie to constantly change aspects of the mode of production. These frequent disturbances create a feeling of uncertainty that distinguishes capitalism and modernity from previous epochs (Berman 1988; Harvey 1990:10). Theories of practice emphasize that uncertainty characterizes not just capitalism and modernity, but humanity in all epochs. All social systems risk melting if they are not actively produced and reproduced. Material culture is an important aspect of strategies for producing and reproducing social systems. However, insofar as material culture can be interpreted in multiple ways, it is also less stable and concrete than its physicality suggests (Hodder 1989; Tilley 1991).

In this paper, we report the results of an archaeological survey to the east of the site of Yaxuna, located in the center of the Northern Maya Lowlands in the Mexican state of Yucatan (Figure 1). An intriguing feature of the settlement survey reported below is a stone causeway that begins from a massive Late Preclassic (250 B.C.–A.D. 250) acropolis among a small scatter of platforms—Tzacauil—and heads in the direction of a large Maya center—Yaxuna—but does not get there. Tzacauil and Yaxuna are distinct sites with unoccupied land between them. Though this causeway is solid, made of rock, it is merely a gesture toward solidity, a provisional built feature, not complete. The causeway provides a good example of Anthony Giddens' theory of structuration. As most archaeologists know, Giddens defines structure as rules and resources. Structure does not simply constrain action, it is produced in action. Structure is therefore dual, both medium and outcome of action (Giddens 1979, 1984:25). If structure is an outcome, it can be transformed in action and is therefore always in the process of formation. Structuration—the notion that social systems are produced and reproduced in action—is an ongoing process whose outcome is never guaranteed. The Tzacauil causeway provides a nice example of the uncertainty of outcomes: the fact that it stops short of Yaxuna shows that when it was under construction there was no guarantee that it would make it all the way to Yaxuna. Yet the Tzacauil causeway should not be seen merely as a failure. As we discuss below, the causeway is also an innovation. Regardless of where it ended, the causeway stretched a full order of magnitude longer than previous causeways in the region. More than just reproducing an existing category of monument, the people of Tzacauil transformed it, producing a new category.

As an innovation, the Tzacauil causeway did not satisfy any logistical necessities nor solve any technological problems. Nonelevated paths would have served just as well for crossing the same terrain, even in the rainy season. These considerations focus our attention on the meaningful symbolic aspects of the causeway. In this paper, we suggest that the data lend themselves to a semiotic approach to meaning. We interpret the development of Tzacauil and its causeway toward Yaxuna not as an inevitable process in the political evolution of Yaxuna, but as the materialization of a daring political strategy with mixed results. The political landscape to the east of Yaxuna is therefore a relic of shifting and uncertain "relations of authority created within practices that demarcate difference, hegemony, exclusion" (Smith 2003:115). In keeping with the theme of this paper, we caution that our interpretations are also uncertain. We share these tentative arguments with the hope that they will motivate further research in the region and inspire archaeologists working with data sets from other regions to consider the historical processes that structure and are structured by local political landscapes. The Tzacauil case study adds to several recent studies that have shown the potential of this approach (Gillespie 2008; Joyce 2004; Pauketat and Alt 2003).

E-mail correspondence to: scotthutson@uky.edu

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press

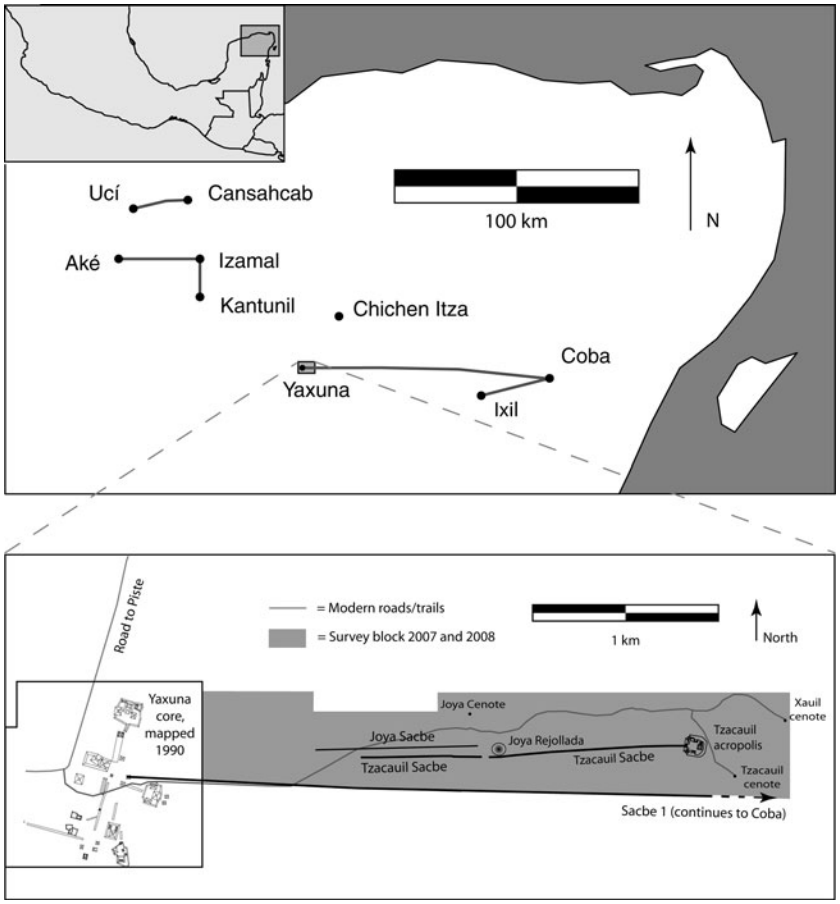


Figure 1. Map of study region and survey area.

CONCEPTUAL FRAMEWORK

When archaeologists engaged seriously with meaning in the early 1980s, structuralism provided a readily available approach (Hodder 1982). However, archaeologists immediately recognized problems with structuralism (see Conkey 1989). One critique of structuralism's application to material culture arose from the fact that it came to archaeology packaged with a very specific, narrow theory of meaning: Ferdinand de Saussure's semiology. In semiology, the relationship between the signifier (the object) and the signified (the object's meaning) is arbitrary. For example, there is nothing in the sound or appearance of the word "buffalo" that refers to a bovine. Social convention alone stabilizes this arbitrary/symbolic relation. Yet with material culture (as well as with language) (Silverstein 1976), the relation between an object and its meaning is not always arbitrary (Hodder 1986, 1989). For example, the image on the back of an old nickel actually looks like a buffalo. Charles S. Peirce (1998) used the term "iconic" to refer to this kind of a relation, in which the sign (the image of the buffalo) actually looks like the object (a bovine) to which the sign refers. In addition to arbitrary/symbolic relations and iconic relations, Peirce emphasized indexical relations, in which there is a relation of spatiotemporal contiguity between object and sign (Parmentier 1994:6). For example, the hoof print of a buffalo can be recognized as a sign of the passing presence of a buffalo because the hoof and the mud were at one point spatio-temporally contiguous. (An iconic relation is also at work here since the shape of the hoof print matches the outline of a hoof.) Anthropologists refer to Peirce's work as a cornerstone in the field of semiotics, defined broadly as the study of signs (Preucel 2006:5). Peircian semiotics has only recently come into broader circulation in archaeology (Hodder and Hutson 2003; Preucel 2006; Preucel and Bauer 2001). Therefore, semiotics may seem a bit "bandwagonesque," the latest in an interminable parade of short-lived trends. Some archaeologists have tired of such trends (Chippindale 1993). This exhaustion would be understandable if the use of Peircian semiotics amounted not to new understandings of the past but to another layer of jargon, such as "dicent indexical legisign," to take an example from Peirce. Semiotics, however, is not merely a passing trend. Since archaeologists cannot talk about the past without implicitly making assumptions about meaning, semiotics always pervades archaeological interpretation. To discuss semiotics in the context of central Yucatan is therefore not to impose exotic theory onto local data, but to focus explicit attention on something that has always been of interest: how people produce and understand a meaningfully constituted world.

Semiotics and practice theory fit each other remarkably well. The value of combining them is that semiotics, which deals deftly with material culture, can address what others have noticed as a shortcoming in practice theory's treatment of the physical world. To clarify the concept of semiotics and show how it articulates with practice theory, we now highlight additional differences between semiotics and semiology (see also Keane 2003, 2005;

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press

Preucel 2006; Singer 1984). First, Saussure's model of the sign is dyadic, consisting only of signifier and signified. On the other hand, Peirce's theory is triadic. We have already identified two elements in Peirce's model: sign and object. The third element is the "interpretant." These elements each appear in Peirce's definition of the sign: "something which stands to somebody for something" (Peirce Edition Project 1984, quoted in Preucel [2006:54]). The sign and the object—the first and the second "somethings," respectively, in Peirce's quote—are easily understood, but the idea of the interpretant is more difficult to grasp. The interpretant is an effect or feeling that the sign produces in an interpreter. The inclusion of an interpreter (the "somebody" in Peirce's definition of the sign) in the sign relation represents a major breakthrough because people enter the picture. The presence of people brings up another fundamental difference between Peirce's semiotics and Saussure's semiology. When people are involved, things get messy, active, and unpredictable. The possibility for change arises, and historical context becomes important. Signs come to life. "Signs have a capacity to generate new signs" because their effect on people (the interpretant, the third part of the sign triad) can get people to create new objects and new signs (Bauer 2002; Preucel 2006:55). By contrast, Saussure's semiology is timeless. When meaning is dyadic (signifier–signified), with no room for a third party to misinterpret or reinterpret, it is difficult to understand how the meaning of a sign could ever change. In semiotics, signs are open to interpretations that can change their meaning.

As Keane (2005) makes very clear, the open-endedness of signs, their unpredictability, works well with theories of practice. Iconicity, one of three ways in semiotics that signs can relate to their object, illustrates this compatibility. Though we defined iconic relations above using the example of a buffalo nickel, we now switch to architecture because it is at the center of the case study below. An architectural drawing (the icon) shares a resemblance to an actual building (the object). However, an architect can make a drawing of a building that does not yet exist. Signs, such as the drawing, therefore have what Keane calls futurity: they have the potential to bring new ideas or relations into being. This potential, however, hinges on whether or not people are disposed to recognize it. Realizing potential requires the right interpretant: it depends on whether someone can convince people to actually build the building. Thus, whether or not the building gets built depends on how people interpret signs, on whether or not a leader can get people to recognize the value of the leader's ideas. This is what Keane calls a semiotic ideology. Analyses attuned to the possible presence of semiotic ideologies permit accounts of the past that involve power struggles and tension between different background assumptions, worldviews, and more.

When we as archaeologists look at a completed building, we sometimes overlook the fact that at one point, the building was just a plan and had no guarantee of getting built. Looking at a causeway that never got finished (such as the one at Tzacauil) or a wall that exists only as fragments (such as the one at Tikal) (Webster et al. 2007) helps us emphasize this and gets us to focus on processes and practices as opposed to finished products taken for granted, as if their existence was never in question (see also Bourdieu [1990:12] on confusing the *opus operatum* with the *modus operandi*).

A final difference worth highlighting between semiology and semiotics is that semiology is modeled after language, whereas semiotics incorporates material culture. Bringing physical things into the picture (as opposed to just words [Saussure's signifiers] and concepts [Saussure's signifieds]) also provides a corrective to early theories of structuration. Sewell (1992) has shown that Giddens' stance on material culture is incomplete. Giddens defines structure as rules and resources, but in other passages the solidity of these resources tends to melt away. For example, Giddens (1984:377) makes the arresting claim that "structure exists only as memory traces." As Sewell clarifies, structure cannot be entirely virtual: resources, such as factories, exist in the real world. In other words, all that is solid *does not* melt into air. Buildings have an existence that outlasts the intentions of their creators. As Parmentier (2009) notes, one of the difficulties of semiotic analysis in archaeology is that the analyst is not present at the moment in which ancient features are first interpreted. Yet the perseverance of artifacts is not lost on their creators (Parmentier 2009; Preucel 2006). One of the peculiar features of material culture is that, unlike Saussure's signs, they do not so easily disappear. This underscores the need for what John Barrett (1999) calls an archaeology of inhabitation. Though the Tzacauil causeway did not reach as far as Yaxuna, and eventually fell into disuse, people could not ignore it. Thus, in the discussion, we will be attending not just to the role that the causeway played in the political strategies of its creators, but to the multiple and sometimes unintended ways in which the causeway impacted later processes.

RESEARCH BACKGROUND AND GOALS

The data in this paper come from an intensive survey transect east of the site of Yaxuna. Yaxuna first came to archaeologists' attention during the Carnegie Institution of Washington project at Chichen Itza, when Alfonso Villa Rojas (1934) confirmed that Yaxuna was indeed the site at the western terminus of a *sacbe*—a raised limestone causeway—that extends 100 km eastward to the site of Coba (Figure 1). George Brainerd (1958), the first to excavate and publish a map of the site, noted that Yaxuna had a large Preclassic occupation, now known to extend from 500 B.C. to A.D. 250 (Suhler et al. 1998), as well as a Classic period occupation. From 1986 to 1996, David Freidel directed fieldwork at Yaxuna, focusing on the site's role in regional politics of the Northern Lowlands (Suhler and Freidel 1998). Archaeologists from Mexico's National Institute of Anthropology and History continued work at Yaxuna after Freidel's project, consolidating many structures in the site core.

Research in the vicinity of Yaxuna began again in 2007 when the authors initiated the Proyecto Interacción Política del Centro de Yucatan (PIPCY). The chief goal of PIPCY is to build a microregional understanding of Terminal Classic political transformations. This multi-stage and multi-site project involves documenting the social, ritual, and political impact of the florescence of nearby Chichen Itza (Stanton et al. 2008). The largest constructions we report in this paper, however, predate the Terminal Classic period. In fact, research conducted by Freidel's team confirmed Brainerd's earlier finding that Late Preclassic (250 B.C.–A.D. 250) constructions account for most of the volume of architecture in Yaxuna's site core (Stanton 2000; Stanton and Ardren 2005; Stanton and Freidel 2005; Suhler et al. 1998).

Tzacauil is a large structure to the east of Yaxuna—a tree-covered artificial construction jutting out from the forest floor, visible from the top of Yaxuna's East Acropolis as a bump on the horizon (Figure 2). It became clear on the first day of the 2007 field season that Tzacauil, situated 3.2 km from the center of Yaxuna, was an acropolis similar to other acropolis groups at

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press



Figure 2. Tzacauil acropolis 3 km in the distance. Photo taken from the East Acropolis at Yaxuna.

Yaxuna. It also became clear that a raised limestone causeway departed from the west side of the acropolis, heading in the direction of Yaxuna. At the point where the causeway departs from the acropolis, it lies 276 m north of Sacbe 1, which connects Coba and Yaxuna (a distance of 100 km), and runs approximately parallel to the Tzacauil *sacbe*. At its terminus to the west, the Tzacauil causeway is only 130 m to the north of Sacbe 1. Sacbe 1 has been shown to date to the Late Classic period (Shaw and Johnstone 2001), which, as discussed below, is well after the abandonment of Tzacauil and its *sacbe*.

The primary goal of the survey was to clarify the relation between Tzacauil and Yaxuna. We needed to know whether settlement was continuous between Yaxuna and Tzacauil. We also needed to know where the Tzacauil causeway ended and what form it took. We needed architectural details of the Tzacauil acropolis to compare it with the acropolises of Yaxuna and other sites. Other initial goals were to determine the nature of settlement to the east of Tzacauil, to document natural resources, and to understand patterning between human settlement and such resources.

METHODS

Survey and mapping to the east of Yaxuna took place during the summers of 2007 and 2008. The boundaries of the survey, shown in Figures 1 and 3, include Sacbe 1 to the south, the Xauil *cenote* (sinkhole reaching to open, standing water) to the east, arbitrary east/west lines to the north, and, to the west, the eastern edge of Freidel's map of the Yaxuna site core (Freidel et al. 1990). This edge lies 500 m east of the Yaxuna site center datum (next to structure 6E-14). In total we surveyed 143 ha. Figure 3 shows three areas where we documented structures beyond the bounds of the survey block. In two cases, these structures were visible from the edge of the boundary. In the third case, workmen led us to mounds 160 m north of the survey boundary.

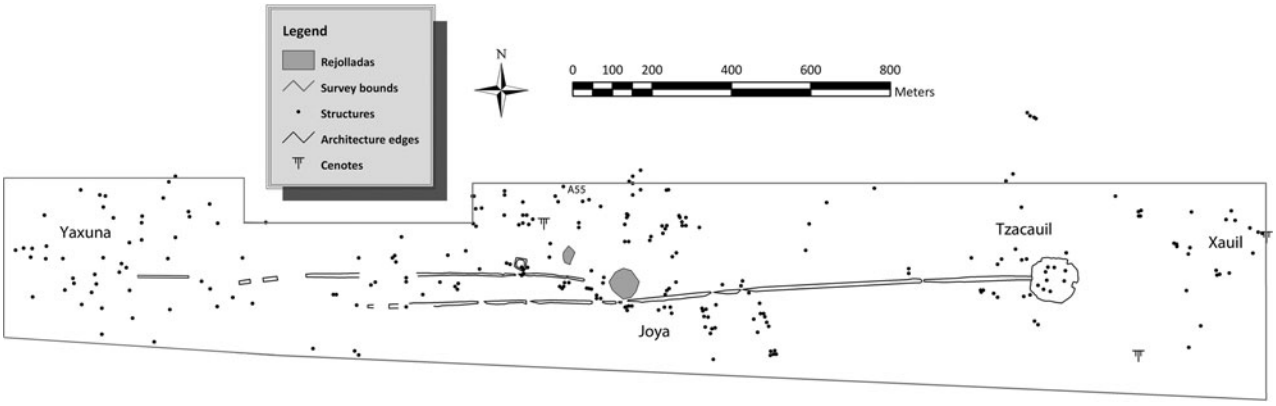


Figure 3. Sites (Yaxuna, Joya, Tzacauil, and Xauil), structures, and other features investigated on the survey.

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press

The survey method involved systematically walking across 100% of the survey block in teams of three to six people, with 10 m spacing between each person. Each walker was thus responsible for viewing five meters of terrain to either side. As is the case with most surveys in the humid lowlands, ceramic sherds were seldom visible. But the visibility of architecture is excellent in northern Yucatan. Natural sedimentation and soil formation processes consist mostly of the weathering of bedrock and wind-blown deposition of volcanic ash and Saharan dust and therefore rarely bury ancient stone foundations and stone platforms (Muhs et al. 2007; Perry et al. 2003). Thus, minimal colluviation and the absence of alluviation, given the generally flat topography, minimize the problem of invisible structures (Ashmore 1981; Chase 1990; Folan 1983; Johnston 2004; Pyburn 1990). Bioturbation would affect stone architecture in the northern lowlands, but the shallow biomantle depth limits the degree to which architecture sinks and soil rises. We recognize that nonmounded structures made entirely of perishable materials would have been missed, but such structures may have been rare and may not have been dwellings (Tourtellot 1988:437). The close spacing between members of survey teams and the degree of visibility give us confidence in the representativeness of our survey, though no surveys are perfect (Healy et al. 2007:26). The quantity of land covered may pale in comparison to the much larger surveys in arid parts of Mesoamerica, but the more intensive nature of our survey ensures higher resolution, which enables close consideration of political processes (O'Brien and Lewarch 1992).

Once structures and other features (sinkholes, wells, natural depressions, quarries, stone fence walls, grinding stones) were located, they were registered utilizing a geographical positioning system (GPS) and mapped with tape and compass. Surface collections were made at a sample of architectural groups. Surface collection methods varied depending on vegetation cover. In cases where the ground surface was not obscured by vegetation and sherds were visible on the surface, all sherds located within three meters of the structures were collected. In cases where the ground surface was obscured, 3×3 m collection units were established, vegetation cover was removed, and all sherds were collected. Only a small fraction of the structures located in the survey were collected in this manner, and several 3×3 m collection units retrieved no diagnostic sherds. Ten off-mound test pits measuring 2×1 m were excavated to bedrock at the center of the Joya site in the summer of 2011, though these excavations yielded few artifacts. These conditions underscore the provisional nature of the analysis that follows and the need for further excavation. We produced digital elevation models of a number of features, including the Tzacauil acropolis, two *sacbes* discovered during the survey, and a natural karst sinkhole classifiable as a *rejollada*.

RESULTS

The survey located 274 pre-Hispanic structures (most visible as dots in Figure 3) and a variety of other features. Most features pertain to three sites: Tzacauil, Xauil, and Joya. As discussed below, the extreme low density of structures between these sites enables us to consider them as distinct settlements. We discuss the Tzacauil *sacbe* separately.

Tzacauil

The Tzacauil acropolis dominates this site. Figures 4a and 5 present digital elevation models of the acropolis. The base of the acropolis consists of a platform that measures 80×70 m at the top and 110×105 m at the base. The orientation of the long axis is approximately 98°. The height of the platform varies from 8 to 8.5 m. A 2 m high bedrock outcrop on the northeast corner of the acropolis indicates that builders took advantage of natural rises in the topography. The stairway, approximately 20 m wide, ascends the west side, connecting with the Tzacauil *sacbe* at its base.

The structures on top of the acropolis clearly conform to a common Late Preclassic plan: the triadic group (Hansen 1998). Of the three structures that form the triad, Structure 1 is the central structure, reaching an elevation of 6.5 m above the acropolis. Structures 3 and 6, which flank Structure 1 and face each other, rise between 4 and 3.5 m above the acropolis, respectively. Structures 3 and 6 each have low extensions stretching to the west. Three smaller structures stand atop the acropolis, two of which flank the stairway on the west side while the third, Structure 2, a split-level structure, lies to the north of Structure 1, at the northeast corner of the acropolis. The volume of the acropolis and the structures on top of it barely exceeds 80,000 m^3. Surface collections from the top of the acropolis produced Late Preclassic ceramics.

Seventeen structures huddle within 150 m of the acropolis, bringing Tzacauil's total structure count to 28 (Figure 5). Most of the 17 nonacropolis structures are on the west side of the acropolis, the direction in which the acropolis faces and the direction toward which the *sacbe* runs. Though no surface sherds were seen around these structures, their close association with the Late Preclassic acropolis suggests they were contemporary with the acropolis. The people who lived here were most likely the support population for the acropolis. Thirteen of these 17 structures form six groups. Four of the groups consist of a basal platform supporting a single stone superstructure, most likely a house. The average surface area of the basal platforms is 234 m^2, while the volumes are 86 m^3, 176 m^3, 206 m^3, and 600 m^3. The average surface area of the other 13 structures, mostly house foundations, is 26 m^2.

The structures around the acropolis form a relatively discrete grouping. The closest cluster of structures to the west—a collection of 147 buildings named Joya (see below)—is nearly 600 m away. Between Tzacauil and Joya lie six scattered structures in a 30 ha area. Settlement density in between these two clusters is therefore 20 structures per km^2, which is well below what has been considered typical of intersite settlement densities in Yucatan and elsewhere (Hutson et al. 2008; Rice and Rice 1990). The most substantial of these structures is 15a, a basal platform measuring $14.7 \times 13 \times 1.3$ m and supporting one superstructure. The superstructure and the other four structures are substantially smaller: none of these buildings measures more than 8 m on a side nor exceeds 30 m^3 in volume.

Xauil

To the east of Tzacauil lies a stretch of unoccupied land ranging from 200 m to 320 m wide (see Figure 3). At the eastern edge of this empty zone begins a cluster of structures that collects around a *cenote* (Figure 6), not unlike the water-hole groups documented ethnographically in highland Chiapas by Vogt (1968). The *cenote* is part columnar and part covered, following Houck's classification (2006:63). The *cenote* lends its name, Xauil, to this site. We mapped 25 structures at Xauil, though additional mounds to the east of the survey boundary and possibly to the north remain undocumented. Large quantities of slatewares in surface collections at the

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press

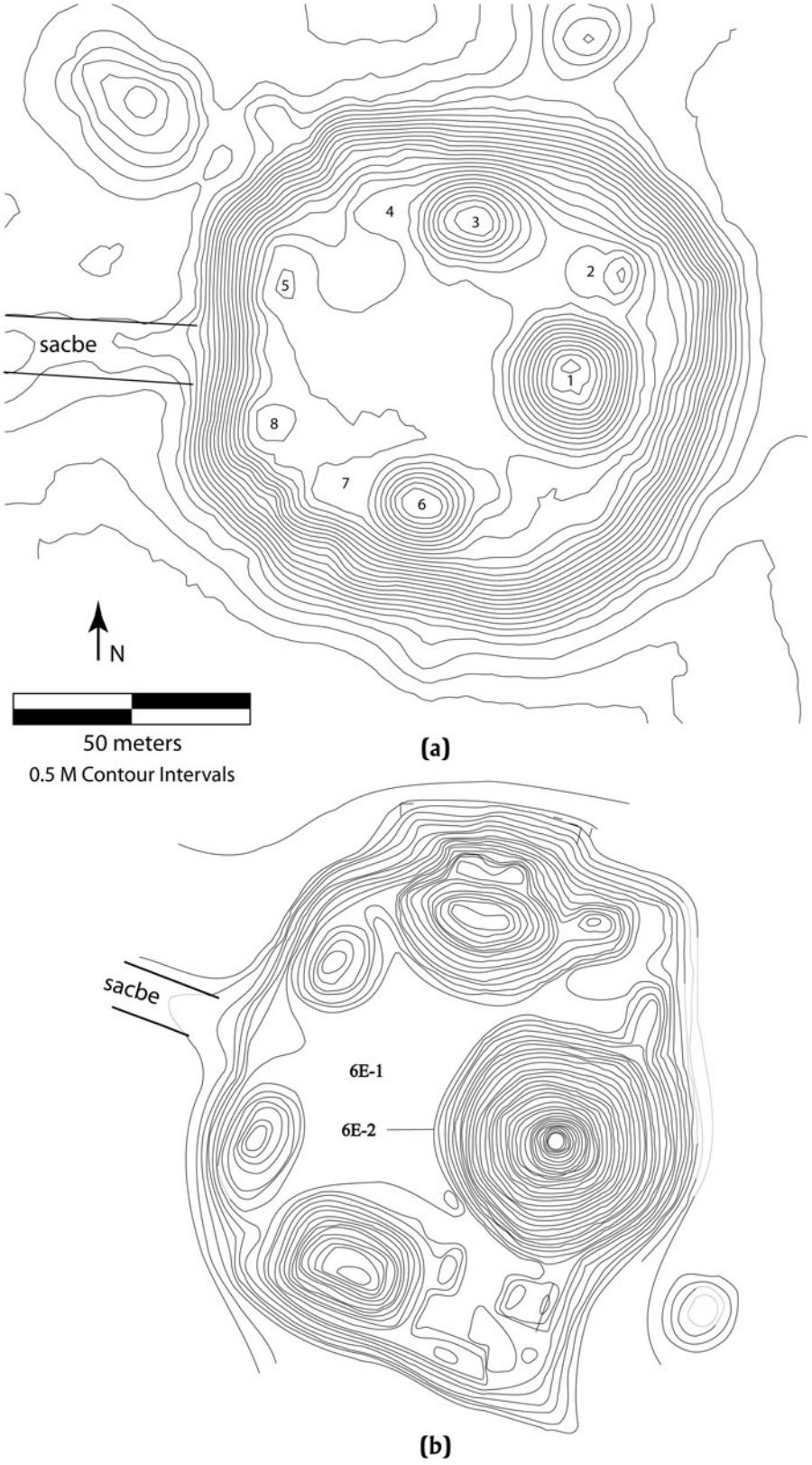


Figure 4. Topographic maps of the Tzacauil Acropolis and Yaxuna's East Acropolis.

C22–C23 group and Puuc-style veneer stones found in one structure (C27) suggest that Xauil dates to the late part of the Classic period, not contemporaneous with the Tzacauil acropolis, which faces to the west, away from Xauil. Nevertheless, most of Xauil's architecture is not chronologically diagnostic. Excavations at groups with no surface ceramics are needed to refine the chronology.

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press

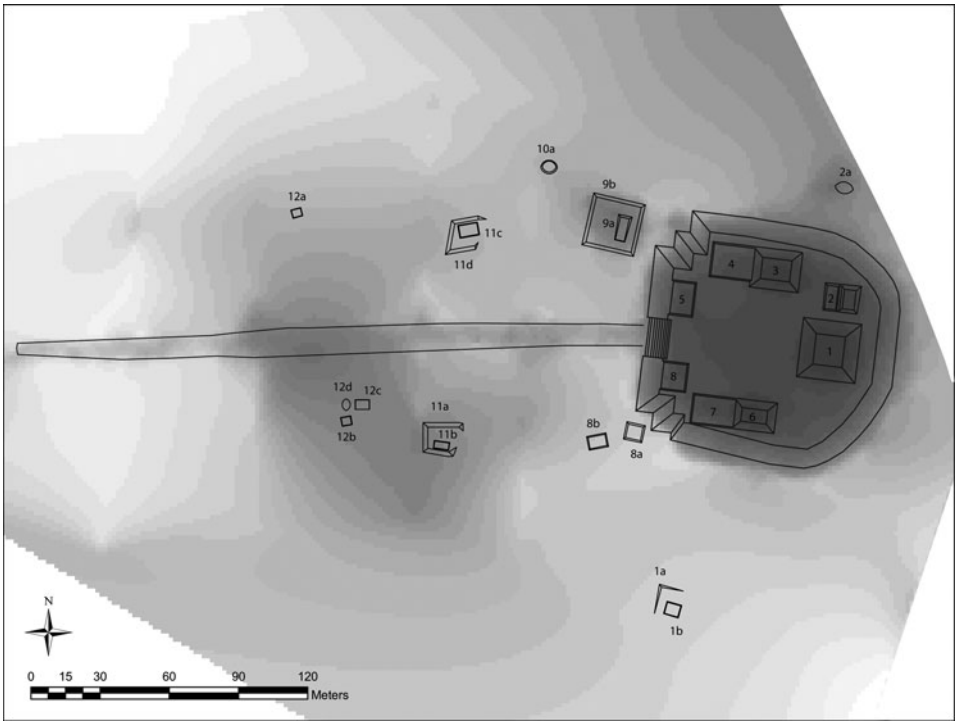


Figure 5. Tzacauil Acropolis and surrounding structures, with structure labels. Darker shades indicate higher elevation.

Although the people living at Xauil form a spatially bound aggregate and share access to water from the *cenote*, none of the structures we mapped appear to have hosted administrative or ritual activities that would have helped integrate these people into an interactional community (Yaeger and Canuto 2000:3). The largest structure, C14, measuring $16 \times 14 \times 1$ m, is also the closest to the *cenote*. Although Structure C14 supports a superstructure, it does not combine with other mounds to delineate a plaza. Larger structures or compounds may be present to the east, beyond the survey bounds. The average surface area of the 25 structures is 61 m^2. Removing the two basal platforms (C14, C27) and the C9 terraced hilltop gives an average of 37.4 m^2. We found a small limestone quarry at the southern edge of the site (labeled C5 in Figure 6), though it likely did not serve many households. Another *cenote*, the Tzacauil *cenote*, classifiable according to folk taxonomies as *cubierto*, or covered (has only a small opening at the ground surface; Houck 2006:62–63), sits 220 m southeast of the Tzacauil acropolis and 430 m southwest of the Xauil *cenote*. Figures 3 and 6 show no settlement clusters near this *cenote*, though people have drawn water from it in recent decades.

Joya

The crescent-shaped settlement cluster to the west of Tzacauil accounts for most of the features found during the survey (Figure 3). Locals use the name Joya to refer to the large *rejollada* (a dry karst sinkhole) (Houck 2006) located near the center of the cluster (see Figure 7). A covered *cenote* and a second *rejollada* also lie near the center of the Joya settlement cluster (see Figure 3). Joya contains 147 pre-Hispanic structures within 0.38 km^2, yielding a settlement density of 376 structures per km^2. Assuming that the shape of this cluster is truly a crescent, another 7 ha of the crescent, containing perhaps another 25 structures, lie to the north of the survey boundary. To the south, west, and east, areas without settlement delimit the edge of the site. The stretch of unsettled land to the west between Joya and Yaxuna's east boundary measures about 300 m.

Unlike Xauil, Joya has an easily definable center consisting of a plaza measuring 58×32 m (Hutson et al. 2012) (Figure 7). Joya has a *sacbe* that runs westward from the midpoint of the west side of the plaza. The *sacbe*'s terminus at the midpoint suggests it was a formal part of the plaza design. The Joya *sacbe* joins the Tzacauil *sacbe* and Sacbe 1 as the third of three parallel *sacbes* to the east of Yaxuna. Like Sacbe 1 and in contrast to the Tzacauil *sacbe*, Joya's *sacbe* extends into Yaxuna (see Hutson et al. 2012). Eight 3×3 m surface collections and ten 2×1 m test pits were placed among the buildings surrounding the Joya plaza (Figure 7). These operations yielded very few ceramics. A small portion of the ceramics date to the Late Preclassic and the Early Classic periods, while most date to the Late Classic period and pertain to the Maxcanu, Arena, and Muna ceramic groups. A few stones on the ground in front of Structure 27e were carved in the Late/Terminal Classic Puuc veneer style. These data suggest that the Joya plaza and the Joya *sacbe* were built after Tzacauil and its *sacbe*. Several buildings beyond the Joya plaza are well preserved. For example, one of Structure A55's platform retaining walls has six courses of stone preserved up to 1.2 m high for a length of 8 m (Figures 3 and 8).

None of Joya's structures are monumental. The largest structure by volume—A6, a basal platform supporting other superstructures—measures $30 \times 20 \times 2$ m and is located 150 m west of Joya's central plaza. The average surface area and volume of Joya's 16 basal platforms are 361 m^2 and 408 m^3, respectively. These figures are larger than those for Tzacauil. The average surface area and volume of the other 131 structures is 53 m^2 and 31 m^3, respectively.

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press

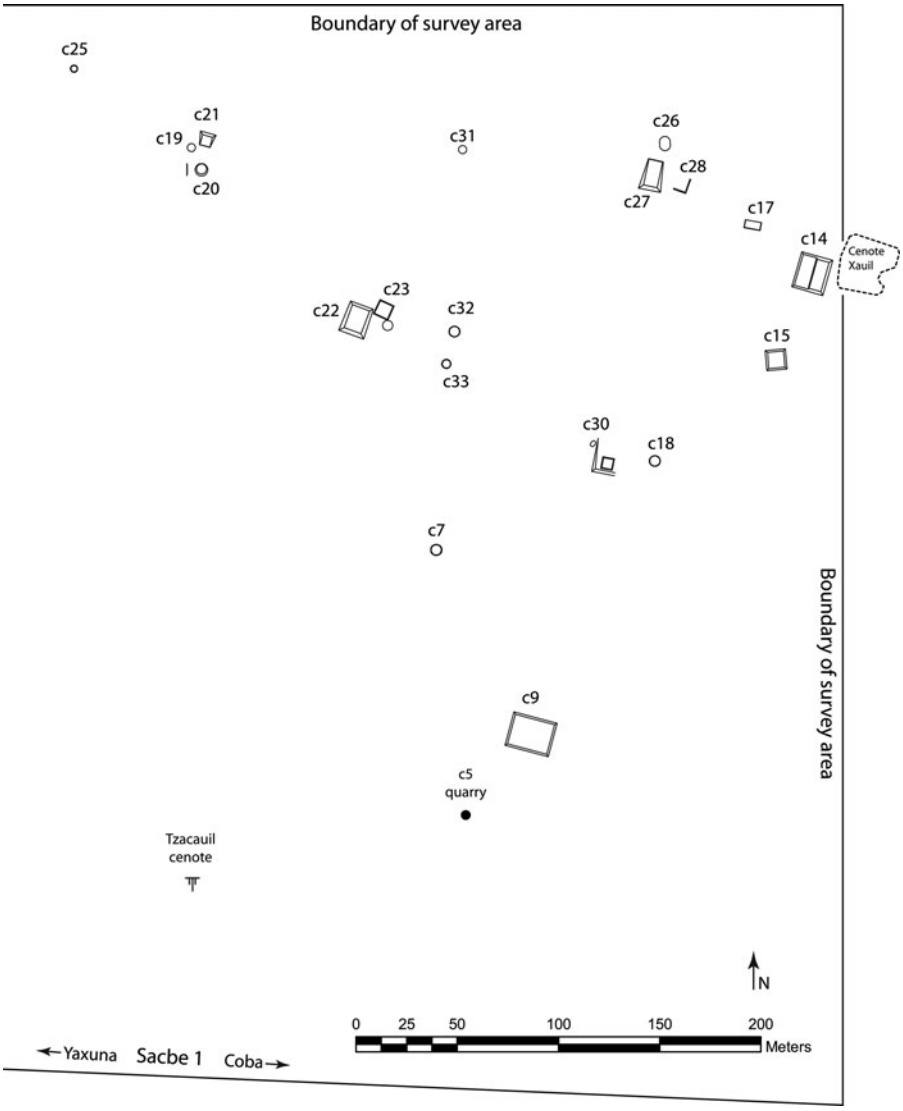


Figure 6. Map of Xauil site.

Tzacauil *Sacbe*

Though we assume that the Tzacauil sacbe was built at the same time as the acropolis to which it connects, this has yet to be supported with radiocarbon dating (Van Dyke [2004:424] notes that in Chaco Canyon, New Mexico, roads were occasionally built to abandoned settlements). Beginning at the Tzacauil acropolis, this *sacbe* measures 9 m wide with a height of 0.8 m, but elsewhere the width varies from 6 m to 10 m, and the height varies between 0.3 m and 0.5 m. Crudely cut facing stones line portions of the edges of the *sacbe*; near its beginning the *sacbe* has a lower step visible for a few meters. This lower step is diagnostic of Preclassic period *sacbes* at Yaxuna (Lourdes Toscano, personal communication 2006). The initial orientation (270°) puts the *sacbe* on a collision course with the Joya *rejollada*, yet the builders engineered a slight curve to the south after 100 m, putting it on an azimuth of 264°. The *sacbe* then changes back to its original orientation 900 m west of the acropolis. Though builders of causeways at many sites made every effort to avoid changes in orientation, several sites have examples of causeways that bend in order to avoid natural features (Shaw 2008:68). For the final few hundred meters, the *sacbe* follows an orientation of 268°. The *sacbe* terminates approximately 1,700 m to the west of the acropolis. Folan and others have used both archaeological and ethnohistoric/linguistic data to enumerate various kinds of paths, *sacbes*, and other routes (Folan et al 2001; Bolles and Folan 2001). The details of the Tzacauil *sacbe* do not easily place it into the four general categories of *sacbe* (regional, state, urban, and neighborhood) discussed by Folan. A *sacbe* of this length falls into Shaw's (2001, 2008) category of core-outlier *sacbes*, from 1 to 5 km, but the *sacbe* could be considered part of Shaw's intersite category since Tzacauil and Yaxuna are very distinct settlements.

The *sacbe* does not have a formal endpoint. Rather, it makes an initial stop 1,570 m from the acropolis, but a few meters beyond this stopping point lies an elliptical stone foundation brace measuring 3×1.5 m, and approximately 15 m further to the west (at 1,600 m west of the acropolis), the *sacbe* starts again as a crude, 25 m long alignment of stone rubble. A second crude alignment of rubble extends beyond the first, stopping 1,670 m to the west of the

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press

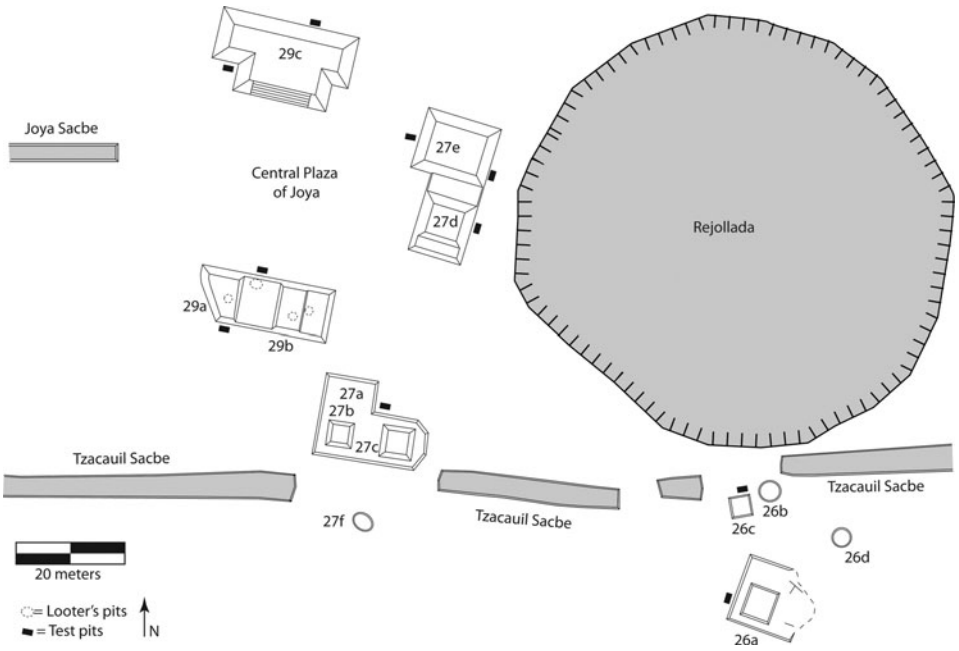


Figure 7. Map of the Joya site center, showing segments of the Tzacauil and Joya *sacbes*, the Joya *rejollada*, the structures around the site's central plaza, and the location of 2 × 1 m test pits.

acropolis. Finally, a 10 m long scatter of medium-size stones was found at 1,700 m west of the acropolis. This is the last *sacbe* fragment we were able to document, and it is located 1,460 m east of the Yaxuna site center datum and 130 m north of Sacbe 1. These small *sacbe* fragments may indicate that different work groups were responsible for constructing different sections (Bolles and Folan 2001:307; Shaw 2008:67). There are no structures in the immediate vicinity of this uncertain endpoint. The nearest structure is an 18 × 14 × 0.4 m platform with a superstructure located 55 m to the northwest. The next closest settlement is a pair of structures 60 m to the northeast. These structures represent the western edge of Joya.

The Tzacauil causeway is not the only one in Yucatan that ends abruptly without connecting to structures, but other examples are rare. Sacbe 26 at Coba is unfinished (Bolles and Folan 2001:307), and several *sacbe* fragments not connected to sites have been



Figure 8. Well-preserved wall of Structure A55, Joya site.

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press

documented in the vicinity of Calakmul (Folan et al. 1995, Figures 3 and 4). At Chunchucmil, two *sacbes* begin from multifamily residential compounds and extend 60 and 100 m *away* from the site center before stopping (see Hutson et al. 2008, Figure 4c). Along the north coast of Yucatan, raised stone walkways begin from coastal sites and cross marshy areas to the south but end far short of nearby sites (Miguel Covarrubias Reyna, personal communication 2008). At Uci (see Figure 1), a *sacbe* from the center of the site runs 1.2 km to the west and stops at a bedrock outcrop with no apparent cultural modification (Hutson 2009).

We now consider the possibility that the Tzacauil *sacbe* continued further to the west than is visible today, perhaps even to the Yaxuna site core, like Sacbe 1. This assertion presumes that the *sacbe* did not preserve in the vicinity of Yaxuna due to later prehistoric scavenging for construction material. We contend that scavenging leaves a clear material signature and that the Tzacauil *sacbe* lacks this signature at the locale where it ends. The material signature for scavenging shows clearly on other portions of the Tzacauil *sacbe*. For example, the center of the Joya site was built around a portion of the Tzacauil *sacbe*. Chronological data discussed above suggest that the Joya center postdates the Tzacauil *sacbe*. As the map in Figure 7 shows, when a platform was built within 5 m of the *sacbe*, there is a gap at that particular spot in the *sacbe*. There are no formal facing stones on the *sacbes* at the edges of these gaps: rather, stones are missing, and fill from the *sacbe* spills into the void. Parsimony permits the conclusion that the builders of the newer platforms created these gaps by taking stone directly from the *sacbe* and using it for the platforms. If such scavenging occurred at the western terminus of the Tzacauil *sacbe*, we should see gaps in the *sacbe* and newer structures adjacent to these gaps. However, the Tzacauil *sacbe* disappears almost completely, and there are no structures close by to suggest scavenging.

DISCUSSION

We now consider political dynamics as inferred from the results presented above, focusing on Tzacauil and its *sacbe*. We stress again that these inferences are provisional. As Stark (1999) has framed the problem, the task is to understand the relation between a monumental complex (Tzacauil) and a nearby center (Yaxuna). One possibility proposed by Stark (2003) is that the monumental complex is the country estate of landed elites. The complexes discussed by Stark, however, are much smaller in volume than Tzacauil.

Rather than a country estate, Tzacauil may instead represent actual dispersal of political power, a possibility Stark also notes. The triadic group atop the Tzacauil acropolis closely resembles contemporary triadic groups at the core of Yaxuna. A comparison with Yaxuna's East Acropolis (Figure 4b) drives home this point. Tzacauil and Yaxuna's East Acropolis relate iconically to one another. One explanation of this similarity is that Tzacauil was a secondary center charged with the duty of administering Yaxuna's eastern hinterland. The close similarity would be an example of a secondary site replicating institutions at the primary center, as has been argued for Monte Albán's administrative outposts in the Valley of Oaxaca (Blanton et al 1981:89; Marcus and Flannery 1996:182–183). Data from the settlement survey suggest that Tzacauil did not carry out administrative duties on behalf of Yaxuna. There is very little Late Preclassic settlement around Tzacauil in need of administration (chronological data from nearby Xauil point to a noncontemporaneous Late or Terminal Classic occupation). Furthermore, in archaeology, the notion of secondary centers acting in concert with primary centers derives from central place models that presume an economizing logic. In central place theory, site hierarchies will be organized spatially in such a way that different types of work (administration, marketing, etc.) can be performed most efficiently (Johnson 1973). Tzacauil does not fit this logic of efficiency. In a central place model, secondary centers are located in such a way that they can administer populations that are distant from the primary center and therefore not efficiently administered by the primary center. Yet Tzacauil is a 30-minute walk from Yaxuna; administrators responsible for settlement further to the east could just as well have resided at Yaxuna itself. Finally, the construction of the Tzacauil *sacbe* required a large expenditure contradictory to any economizing logic.

Other explanations may also account for why a minor center like Tzacauil would be located so close to a major center like Yaxuna. According to Underhill et al. (2008:11), such closeness may reflect "a deliberate strategy of elites to control labor and the movement of subsistence goods (raw materials and/or finished goods) to the center." Underhill draws on this explanation to account for the clustering of minor centers such as Dantu only 2 km distance from Liangchengzhen, the major center of the Shandong province in Northeast China during the Early and Middle Longshan period (2600–1900 B.C.).

Explanations involving secondary centers and the control of labor and goods are top-down in the sense that they would both explain Tzacauil with reference to the needs of authorities at Yaxuna, the regional center. Such top-down approaches can be supplemented by an approach that addresses the dynamic political processes that create such hierarchical relations between center and periphery. In central place theories, as deployed by archaeologists within evolutionary models, secondary centers appear as the inevitable and often universal result of the growing needs of the central place, be it Early Dynastic Eshnunna in Iraq (Flannery 1972; Johnson 1972), or Late Classic Calakmul in Mexico (Marcus 1973). Studies using central place theory often overlook the local level processes involved in the constitution of political authority (Smith 2003). There is indeed a place for local level strategies and dynamics in centralized models. The emergence of elite expression beyond the principal group at Copan in the Late Classic period (Fash 2005), for example, suggests that centralized political landscapes can also contain local strategies not fully dictated by the central place (Plank and Maca 2006). Though the quadripartite layout of Yaxuna's site core at the end of the Preclassic period (Stanton and Freidel 2005) implies a degree of centralized coordination, this does not preclude a less centralized, segmentary view of Preclassic politics (Fox and Cook 1996; Ringle 1999).

Following a dynamic model of political landscapes, we argue that Tzacauil's leaders played an active role in the constitution of power. Monuments may be interpreted as indexical signs of power since the quantity of stone and labor required to build them presumes the presence of leaders with great command of resources (Trigger 1990; compare against.Pauketat 2000). Yet this approach does not consider the specific history or iconicity of triadic groups. Recent research on Early Classic carvings from the C-9 triadic group at Naranjo, located in the Peten, Guatemala, suggests that Naranjo's dynastic rulers, the Sa'al lords, whose claimed lineage extends to the Preclassic period, identified themselves with this particular triadic group (Tokovinine and Fialko 2007). Though these historic texts date to the Classic period, the group itself has a Preclassic period core. The Naranjo data show that the

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press

ancient Maya themselves wrote of the connection between rulership and triadic groups. The best preserved example of a triadic group is group H of Uaxactun, also located in the Peten. The 'mat' icons at the entrance to the group (Valdés 1992) may encode an indexical relation to rulership here and elsewhere in the Maya area since rulers, sometimes glossed as "of the mat," sit on mats. Furthermore, Group H's zoomorphic masks permit the interpretation of this compound as a stage for royal rituals that create and consolidate power (Schele and Freidel 1990). Finally, Freidel and others (Freidel et al. 1993:140; Hansen 1998) note that the triangular arrangement of the three structures in triadic groups is an iconic reference to the three hearthstones of creation. If we accept the premise that triadic groups recall the creation, leaders who perform rituals within them can claim to play a role in creation and the birth of maize, thus moving followers to perceive a relationship of indebtedness.

Such posturing may have had many different goals. The close similarity between Tzacauil's acropolis and acropolis groups in the core of Yaxuna suggests the centripetal and centrifugal forces of the theater state model, in which lesser centers put on ritual performances identical to those of greater centers (Geertz 1979). In this model, Tzacauil's goal would be to siphon followers from other locales. Tzacauil's acropolis and triadic group are not, however, smaller versions of those at Yaxuna. There were a number of triadic groups in Yaxuna's core during the Preclassic period. Each of these may have been the headquarters of a faction vying for prestige and political control (Lucero 2007; Stanton 2000). By building their own triadic group, Tzacauil's leaders may have sought to become an equal player in these struggles. Testing these interpretations should include broad scale excavations on the Tzacauil acropolis in order to detect evidence of theater-state performances (Geertz 1979) or competitive feasting (Dietler and Hayden 2001).

One line of evidence already available—the Tzacauil *sacbe*—suggests that Tzacauil's leaders did indeed seek inclusion in the higher stakes power dynamics at Yaxuna, as opposed to contenting themselves with their station as an outpost. At first glance, this *sacbe* appears to have been an attempt to connect Tzacauil to Yaxuna. This was no ordinary *sacbe*, however. Understanding the nature of this *sacbe* requires putting it into historical context.

The vast majority of *sacbes* in the Maya lowlands are less than 200 m long (Shaw 2001). In the Classic period, polities in the northern lowlands built longer *sacbes*, enabling a variety of classifications of *sacbes* by length and other features (Benavides 1981, Normark 2006, Shaw 2008). In the Late Preclassic period, at the time when the Tzacauil leaders were building what would become a 1.6 km-long *sacbe*, causeways of this length were rare, limited (as far as we know) to the Mirador Basin (Hansen 1991), over 300 km to the south of Yaxuna. Thus, to most people in the vicinity of Yaxuna, the kind of long *sacbe* that the leaders at Tzacauil attempted to construct would have been a novelty. Any discussion of the origins of Tzacauil's *sacbe* therefore treads ground considered by Rosemary Joyce (2004) in her essay on the origins of monumental architecture. Yet whereas Joyce argues that the first monumental architecture in Mesoamerica had no precedent and therefore may have been an unintended consequence of building practices, short causeways dating back to the Middle Preclassic period did exist at Yaxuna (Stanton 2005) as a precedent for the attempted longer causeway at Tzacauil in the Late Preclassic period. Thus, the construction of the Tzacauil causeway represents not the creation of a totally new thing, but an attempt to transpose and transform an already existing thing (Sewell 1992:17). More specifically, the *sacbe* as an architectural form connecting buildings within a site core, a form that had not yet extended more than 300 m at Yaxuna, was being creatively extended to potentially ten times that length to fit a new context and cause: connecting one site to another. Tzacauil was not alone in experimenting with new, *sacbe*-like features. Anderson's (2010) recent mapping of Xtobo, a Middle and Late Preclassic site in the northwest corner of Yucatan, has uncovered a unique ring feature, 300 m in diameter, built of what appear to be *sacbe* fragments.

But what might such a *sacbe* have meant in the Late Preclassic period? What might the Tzacauil leaders have intended in transposing an older form—the *sacbe*—to a new purpose—bridging two sites? Combining ethnohistoric, iconographic, archaeological, and other lines of evidence, Bill Ringle (1999) has argued that Preclassic period causeways were used in processions that enact an ideology of inclusion. Preclassic causeways tend to connect central temples with locales slightly beyond the center. Ringle likens procession along causeways to the common Maya biological/cosmological trope of the circulation of the life force, or '*ch'ulel*,' from heart to extremities. The circulation of this life force, a metaphorical kind of blood, renews life. Using Turner's ritual process, Ringle equates the circulation from center to periphery with a journey from a cultural core to a liminal, natural wilderness. Returning from the periphery to the center renews life but also synthesizes center and periphery. Procession along the *sacbe* imitates this movement from core to periphery and back. The *sacbe* as a sign of inclusion works both symbolically and indexically. It is a symbol because the relation between a stone causeway and the circulation of the life force is arbitrary. It is an index of inclusion because the construction of the causeway physically brought about interaction and contiguity between the *sacbe*'s two endpoints (center and periphery).

Ringle's interpretation suggests that, in attempting to connect Tzacauil to the Yaxuna core by a *sacbe*, Tzacauil's leaders intended to signify their inclusion in Yaxuna's circle of political power. The way this signifying act actually played out encourages a semiotic approach to the builders' intended meaning. As discussed above, semiotic approaches to meaning are open-ended. The Tzacauil *sacbe* demonstrates this in two ways. First, signs can lead to new signs (Keane 2005:186). The Preclassic *sacbes* in the Yaxuna site center connect triadic groups to the site core. If the leaders of Tzacauil wanted to become a political force or express their status as one, they may have felt that they, too, needed a *sacbe* to connect themselves to the Yaxuna core. In the semiotic triad, the sign is the *sacbe*, the object of the sign is political connectedness, and the interpretants are Tzacauil's leaders. The *sacbe* impressed itself upon the leaders as a way to enact their political aspirations of playing a role in local authority. But to get to Yaxuna, the leaders of Tzacauil needed a *sacbe* much longer than those already in existence. So they built a much longer one, and in the process transformed the category of *sacbe* from a short avenue within the core of a site to a long avenue that stretches between and across multiple sites. Thus, refracted through the interpretant, one sign gives life to a new sign.

We now discuss the second way in which the Tzacauil *sacbe* illustrates the open-endedness that a semiotic approach can give to material culture. In semiotics, interpretation of signs is open-ended; it is a matter of negotiation. Signs have an uncertain future: they depend on social context to secure their meaning (Bauer 2002). In the case of the Tzacauil *sacbe*, for whatever reason, people did not finish building the *sacbe*. Following Keane (2005), the futurity

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press

of this project was never secure. It was open to negotiation and challenge. It reached half the distance to Yaxuna's site center and, in the middle of nowhere, faded out in desultory, incomplete segments. There are many potential reasons why the Tzacauil *sacbe* never made it all the way to Yaxuna, none of which can be favored at this point. An archaeologically invisible, unbuilt path may have continued westward to Yaxuna. War or disease may have halted the project. Perhaps the Tzacauil leaders decided, in the middle of construction, that the *sacbe* did not need to go all the way to Yaxuna to be effective as a sign. On the other hand, it may be that leaders at Yaxuna forbade the *sacbe* to get any closer to their site.

Alternatively, as an expression of resistance, the people who provided the labor for constructing the *sacbe* may have given up on the project. This speaks to a failed semiotic ideology in which the justifications for completing the causeway were not compelling. Though building the acropolis and causeway seemed compelling when construction began, leaders could not convince workers to complete the plan, to convert sign to object. In Peirce's parlance, a new interpretant arose; the meaning of the sign changed as it spread among new people with different experience than the leaders, and the idea of the *sacbe* was not favorably received in this new context (Bauer 2002; Parmentier 1994:10). The Tzacauil *sacbe* resembles the fragmentary, apparently unfinished state of Tikal's earthworks. Webster et al. (2007) suggest that local leaders were unable to get outlying communities to commit to the work project and perhaps that that the leaders were not as powerful as once thought (compare against Silverstein et al. 2009).

It should be noted that the volume of stone used to construct the Tzacauil acropolis was about 15 times greater than that used to construct the *sacbe*, implying a much smaller labor commitment for the *sacbe*. Thus, completing the *sacbe* would have required relatively little labor. It would thus seem odd that Tzacauil's laborers would have put in so much work to complete the acropolis but then refused to provide a bit more labor to complete the *sacbe*. Such disobedience, however, might have been an unintended consequence of the construction of the acropolis. The acropolis project may have been pitched as an undertaking with communal benefits. When completed, however, the laborers may have been alienated from the acropolis, exposing it as an instrument that created or reinforced the worker's subordination (i.e., the "tragedy of the commoners") (Pauketat 2000; see also Clark 2003:61; Joyce et al. 2001). Perhaps this unintended alienation spurred the work stoppage.

Whatever the reason for why it was not completed, the premature termination of the Tzacauil *sacbe* illustrates that transposing an old form to a new context has risks (Sahlins 1987). By attempting to transform the cultural category of *sacbe*, the Tzacauil leaders, as Sahlins would have put it (1987:x), ceased to become slaves to their concepts and sought to become masters. Yet modifying a cultural category—taking the idea of the *sacbe* and stretching it at least ten times its normative length so that it extended all the way from Tzacauil to Yaxuna—was a stretch, both literally and figuratively. In the end, the leaders did not master the situation.

Yet even though the *sacbe* failed to reach a notable destination and therefore may not have been used as intended, this does not mean that it had no consequences whatsoever. Here we enter an archaeology of inhabitation, which considers how people engaged with the built landscape and how old features participated in new processes, regardless of why a feature was originally built (Barrett 1999; Hendon 2010). In semiotic terms, the *sacbe* as sign loses its initial symbolic meanings (among them a proposal of political connectedness) but retains its indexical meanings; indexical signs keep a meaningful relation to their object even if people cease to recognize the index as a sign (Parmentier 1994:6). Though unfinished, the *sacbe* did not melt into air, mutely entering archaeological context as a forgotten ruin. We propose that the *sacbe* projected into people's lives even when in disuse and that it motivated new constructions. The portion of the *sacbe* that did get built had an impact well after it was built because it regionalized a previously unmarked space. For Giddens (1984:118), regionalization transforms a less differentiated space into a more differentiated space. The *sacbe* accomplishes this in many ways. It divides an open space into two sides: the north side of the *sacbe* and the south side. The *sacbe* also directs attention to the east where it begins and to the west where it ends. To the east, of course, is the massive acropolis. The *sacbe*, emanating from that acropolis, indexes the strategies and once potent authority of those affiliated with the acropolis. Thus, as the *sacbe* projects westward, politics and power project themselves as well, materialized by the *sacbe*. The fact that the *sacbe* is merely provisional, that it falls short of its presumed destination, does not reveal itself except at its end point.

When we say that the *sacbe* motivated new constructions, we propose that, despite its failure to stabilize Tzacauil's provisional claims to authority, it succeeded in transforming structure. Following the logic of structuration, in which actions produce and reproduce the conventions that guide new actions, the act of experimenting with the length of *sacbes* transformed the category of *sacbe*. In the end, it became possible to build long *sacbes* that did not exist before. (Followers of Peirce may recognize this as a sinsign generating a legisign.) The Tzacauil *sacbe* experiment was not forgotten, but rather served as the model for the Joya *sacbe*, built parallel to the Tzacauil *sacbe* at a distance of 60 m to the north, which did succeed in connecting Joya to Yaxuna. Moreover, the Tzacauil *sacbe*, the first long *sacbe* in the northern lowlands, may have served as a model for even longer *sacbes* such as Sacbe 1 between Yaxuna and Coba or the *sacbes* in the vicinity of Izamal (32, 18, and 12 km long, respectively), located only 60 km to the northwest. Though the Tzacauil *sacbe* resembles the Tikal earthworks in the sense of its fragmentary, unfinished nature (Webster et al. 2007), the Tikal earthworks contrast sharply in that no later communities attempted to build anything quite like them.

CONCLUSION

The survey to the east of Yaxuna documented three new sites (Tzacauil, Xauil, and Joya) and two new *sacbes* (one anchored at Tzacauil, the other at Joya). Both Tzacauil and Joya have evidence of Late Preclassic occupation, though Joya is larger and longer-lived. Xauil was occupied in the Late and/or Terminal Classic period. The most conspicuous structure in the survey is the Tzacauil acropolis, which supports a triadic group. A *sacbe* began at the western edge of the acropolis and ended 1,700 m to the west without reaching a clear destination. The fact that a raised causeway was not necessary to get from Yaxuna to Tzacauil suggests that this *sacbe* carried political and/or religious meaning. In this paper, we have argued that the leaders of Tzacauil attempted to become a faction vying for authority at Yaxuna, a regional center during the Preclassic period. We also argue that the unfinished *sacbe* indicates that these attempts were not entirely successful. This result is not a surprise given that the projected *sacbe* was much longer than any previous *sacbe* in the area, already exceeding the expectations of what was intelligible and feasible.

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press

We have used a semiotic approach to interpret the causeway. This approach works particularly well with material culture and, because of its compatibility with structuration theory, provides a framework for understanding innovations such as the unprecedented appearance of the long *sacbe*. The *sacbe*'s abrupt termination highlights the fact that all practices involve risk, especially those practices that transpose familiar structures to unfamiliar contexts. This risk exposes an instability that exists on multiple levels. Not only are durable aspects of the built environment never guaranteed to bring about the kind of authority intended, but the norms and conventions are also subject to being broken or cited in unpredicted ways (Butler 1993). Thus, both aspects of structure—rules and resources—risk melting, a condition that characterizes all social action.

RESUMEN

Este ensayo presenta una aplicación de la teoría semiótica de C.S. Peirce y la teoría de estructuración de Anthony Giddens a los resultados de un recorrido sistemático hecho a pie al este del sitio arqueológico de Yaxuna, en el estado de Yucatan. Los datos de este recorrido sugieren que un grupo localizado en el sitio de Tzacauil compitió por la influencia política en la época preclásica a través de la construcción de una acrópolis a tres kilómetros de Yaxuna. Este grupo también inició, pero no concluyó, una nueva construcción experimental: un sacbé de larga distancia entre Yaxuna y la acrópolis de Tzacauil. Un aspecto central en la teoría de estructuración es la inestabilidad en las prácticas sociales. Las reglas pueden cambiar cuando se transponen a contextos nuevos. Al mismo tiempo, los recursos duraderos, como son calzadas y grupos de acrópolis, no aseguran la estabilidad de las coaliciones que se forman para construir estos edificios. A pesar del gasto de recursos y de mano de obra, como nunca antes visto al este de Yaxuna, Tzacauil fue eclipsado por un sitio vecino llamado Joya. Aunque nunca terminaron de construir la calzada, la gente de Tzacauil sí tuvo éxito en transformar el concepto convencional de calzada. Estos acontecimientos apoyan la perspectiva semiótica porque muestran que la materialidad es contingente: tiene el potencial de que la gente involucrada puede o no trabajar para lograrlo.

ACKNOWLEDGMENTS

The research discussed in this paper was supported by two separate funds within the College of Arts and Sciences at the University of Kentucky, as well as the Selz Foundation. Carrie Todd, Matt Davidson, Leigh Anne Ellison, Henrik Petersson, and Trent Stockton worked hard to help acquire the data discussed in this paper. We thank Don Ignacio, the comisario ejidal of Yaxunah, for facilitating the survey of Yaxunah ejido land and the Consejo de Arqueología (INAH) for permits. Different versions of this paper were presented at Harvard University, the University of Colorado at Boulder, and the University of Kentucky. Archaeologists at all three of these institutions greatly improved this paper with their valuable feedback. Hutson thanks Jamie Forde (Colorado) and Jason Ur (Harvard) for facilitating visits to their departments. We thank Elizabeth Graham and an anonymous reviewer well versed in semiotics for useful suggestions for revision.

REFERENCES

Anderson, David
2010 *Xtobo, Yucatan, Mexico: The Study of a Preclassic Community*. Unpublished Ph.D. dissertation, Department of Anthropology, Tulane University, New Orleans.

Ashmore, Wendy
1981 Some Issues of Method and Theory in Lowland Maya Settlement Archaeology. In *Lowland Maya Settlement Patterns*, edited by Wendy Ashmore, pp. 37–70. University of New Mexico Press, Albuquerque.

Barrett, John C.
1999 The Mythical Landscapes of the British Iron Age. In *Archaeologies of Landscape: Contemporary Perspectives*, edited by Wendy Ashmore and A. Bernard Knapp, pp. 253–265. Blackwell, Malden, MA.

Bauer, A.A.
2002 Is What You See All You Get? Recognizing Meaning in Archaeology. *Journal of Social Archaeology* 2:37–52.

Benavides Castillo, Antonio
1981 *Los caminos de Coba y sus implicaciones sociales*. Instituto Nacional de Antropologia e Historia, Centro Regional Sureste, Coleccion Cientifica, Mexico City.

Berman, Marshall
1988 *All that is Solid Melts into Air: The Experience of Modernity*. Viking Penguin, New York.

Blanton, Richard E., Stephen A. Kowalewski, Gary M. Feinman, and Jill Appel
1981 *Ancient Mesoamerica: A Comparison of Change in Three Regions*. Cambridge University Press, Cambridge, MA.

Bolles, David, and William J. Folan
2001 An Analysis of Roads Listed in Colonial Dictionaries and their Relevance to Pre-hispanic Linear Features in the Yucatan Peninsula. *Ancient Mesoamerica* 12:299–314.

Bourdieu, Pierre
1990 *The Logic of Practice*. Translated by Richard Nice. Stanford University Press, Stanford, CA.

Brainerd, George
1958 *The Archaeological Ceramics of Yucatan*. Anthropological Records 19. University of California, Berkeley.

Butler, Judith
1993 *Bodies that Matter: On the Discursive Limits of Sex*. Routledge, New York.

Chase, Diane Z.
1990 The Invisible Maya: Population History and Archaeology at Santa Rita Corozal. In *Pre-Colombian Population History in the Maya Lowlands*, edited by T. Patrick Culbert and Don S. Rice, pp. 199–214. University of New Mexico Press, Albuquerque.

Chippindale, Christopher
1993 Ambition, Deference, Discrepancy, Consumption: The Intellectual Background to a Post-processual Archaeology. In *Archaeological Theory: Who Sets the Agenda?*, edited by Norman Yoffee and Andrew Sherratt, pp. 27–36. Cambridge University Press, Cambridge, MA.

Clark, John E.
2003 Mesoamerica Goes Public: Early Ceremonial Centers, Leaders, and Communities. In *Mesoamerican Archaeology*, edited by Rosemary A. Joyce and Julia Hendon, pp. 43–72. Blackwell, London.

Conkey, Margaret W.
1989 The Structural Analysis of Paleolithic Art. In *Archaeological Thought in the Americas*, edited by C.C. Lamberg-Karlovsky, pp. 135–154. Cambridge University Press, Cambridge, MA.

Dietler, Michael, and Brian Hayden (editors)
2001 *Feasts: Archaeological and Ethnographic Perspectives on Food, Politics, and Power*. Smithsonian Institution Press, Washington, DC.

Fash, William L.
2005 Toward a Social History of the Copan Valley. In *Copan: The History of an Ancient Maya Kingdom*, edited by E. Wyllys Andrews IV and William L. Fash, pp. 73–102. School of American Research, Santa Fe.

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press

Flannery, Kent V.
1972 The Cultural Evolution of Civilizations. *Annual Review of Ecology and Systematics* 3:399–425.
Folan, William
1983 Archaeological Investigations of Coba: A Summary. In *Coba: a Classic Maya Metropolis*, edited by William Folan, Ellen Kintz, and Larraine Fletcher, pp. 1–10. Academic Press, New York.
Folan, William J., Jacinto M. Hau, Joyce Marcus, W. Frank Miller, and Raymundo Gonzalez Heredia
2001 Los Caminos de Calakmul, Campeche. *Ancient Mesoamerica* 12: 293–298.
Folan, William J., Joyce Marcus, and W.F. Miller
1995 Verification of a Maya Settlement Model through Remote Sensing. *Cambridge Archaeological Journal* 5:277–283.
Fox, John W., and Garrett W. Cook
1996 Constructing Maya Communities: Ethnography for Archaeology. *Current Anthropology* 37:811–821.
Freidel, David A., Linda Schele, and Joy Parker
1993 *The Maya Cosmos: Three Thousand Years on the Shaman's Path*. Quill, New York.
Freidel, David A., Charles K. Suhler, and Ruth Krochock
1990 *Yaxuna Archaeological Survey: A Report of the 1989 Field Season and Final Report on Phase One*. Southern Methodist University, Dallas.
Geertz, Clifford
1979 *Negara: The Theatre State in Nineteenth-Century Bali*. Princeton University Press, Princeton, NJ.
Giddens, Anthony
1979 *Central Problems in Social Theory*. University of California Press, Berkeley.
1984 *The Constitution of Society*. University of California Press, Berkeley.
Gillespie, Susan D.
2008 History in Practice: Ritual Deposition at La Venta Complex A. In *Memory Work: Archaeologies of Material Practice*, edited by Barbara J. Mills and William H. Walker, pp. 109–137. SAR Press, Santa Fe.
Hansen, Richard D.
1991 The Road to Nakbe. *Natural History* 5(91):8–14.
1998 Continuity and Disjunction: The Pre-Classic Antecedents of Classic Maya Architecture. In *Function and Meaning in Classic Maya Architecture*, edited by Stephen D. Houston, pp. 49–122. Dumbarton Oaks, Washington, DC.
Harvey, David
1990 *The Condition of Postmodernity*. Blackwell, Oxford.
Healy, Paul F., Christopher G.B. Helmke, Jaime J. Awe, and Kay S. Sunahara
2007 Survey, Settlement, and Population History at the Ancient Maya Site of Pacbitun, Belize. *Journal of Field Archaeology* 32:17–39.
Hendon, Julia
2010 *Houses in a Landscape: Memory and Everyday Life in Mesoamerica*. Duke University Press, Durham, NC.
Hodder, Ian
1982 Theoretical Archaeology: A Reactionary View. In *Symbolic and Structural Archaeology*, edited by Ian Hodder, pp. 1–16. Cambridge University Press, Cambridge, MA.
1986 *Reading the Past*. Cambridge University Press, Cambridge, MA.
1989 This is Not an Article about Material Culture as Text. *Journal of Anthropological Archaeology* 8:250–269.
Hodder, Ian, and Scott R. Hutson
2003 *Reading the Past*. 3rd ed. Cambridge University Press, Cambridge, MA.
Houck, Charles W. J.
2006 Cenotes, Wetlands, and Hinterland Settlement. In *Lifeways in the Northern Lowlands: New Approaches to Maya Archaeology*, edited by Jennifer P. Mathews and Bethany A. Morrison, pp. 56–76. University of Arizona Press, Tucson.
Hutson, Scott R.
2009 Proyecto Arqueológico Sacbe de Ucí-Cansahcab: Report of the 2009 Field Season. Manuscript submitted to the Consejo de Arqueología, Instituto Nacional Antropología e Historia, Mexico City.
Hutson, Scott R., David Hixson, Aline Magnoni, Daniel E. Mazeau, and Bruce H. Dahlin
2008 Site and Community at Chunchucmil and Ancient Maya Urban Centers. *Journal of Field Archaeology* 33:19–40.
Hutson, Scott R., Aline Magnoni, Travis Stanton, Donald Slater, and Scott Johnson
2012 Memory and Power at Joya. In *Power and Identity in Archaeological Theory and Practice: Case Studies from Ancient Mesoamerica*, edited by Eleanor Harrison-Buck, pp. 39–52. University of Utah Press, Salt Lake City.
Johnson, Gregory A.
1972 A Test of the Utility of Central Place Theory in Archaeology. In *Man, Settlement, and Urbanism*, edited by Peter J. Ucko, Ruth Tringham, and George W. Dimbleby, pp. 769–785. Duckworth, London.
1973 *Local Exchange and Early State Development in Southwestern Iran*. Anthropological Papers No. 51. Museum of Anthropology, University of Michigan, Ann Arbor.
Johnston, Kevin J.
2004 The Invisible Maya: Minimally Mounded Residential Settlement at Itzán, Petén, Guatemala. *Latin American Antiquity* 15:145–175.
Joyce, Arthur A., Laura A. Bustamante, and Marc N. Levine
2001 Commoner Power: A Case Study from the Classic Period Collapse on the Oaxaca Coast. *Journal of Archaeological Method and Theory* 8: 343–385.
Joyce, Rosemary A.
2004 Unintended Consequences? Monumentality as a Novel Experience in Formative Mesoamerica. *Journal of Archaeological Method and Theory* 11:5–29.
Keane, Webb
2003 Semiotics and the Social Analysis of Material Things. *Language and Communication* 23:409–425.
2005 Signs Are Not the Garb of Meaning: On the Social Analysis of Material Things. In *Materiality*, edited by Daniel Miller, pp. 182–205. Duke University Press, Durham, NC.
Lucero, Lisa J.
2007 Classic Maya Temples, Politics, and the Voice of the People. *Latin American Antiquity* 18:407–428.
Marcus, Joyce
1973 Territorial Organization of the Lowland Classic Maya. *Science* 180:911–916.
Marcus, Joyce, and Kent V. Flannery
1996 *Zapotec Civilization*. Thames and Hudson, London.
Marx, Karl, and Friedrich Engels
1967[1872] *The Communist Manifesto*. Penguin, Middlesex.
Muhs, Daniel R., James R. Budahn, Joseph M. Prospero, and Steven N. Carey
2007 Geochemical Evidence for African Dust Inputs to Soils of Western Atlantic Islands: Barbados, the Bahamas, and Florida. *Journal of Geophysical Research* 112(2):F02009.
Normark, Johan
2006 *The Roads in Between: Causeways and Polyagentive Networks at Ichmul and Yo'okop, Cochuah Region, Mexico*. Department of Archaeology, Göteborg University, Göteborg.
O'Brien, Michael J., and Dennis Lewarch
1992 Regional Analysis of the Zapotec Empire, Valley of Oaxaca. *World Archaeology* 23:264–282.
Parmentier, Richard J.
1994 *Signs in Society: Studies in Semiotic Anthropology*. Indiana University Press, Bloomington.
2009 Troubles with Trichotomies: Reflections on the Utility of Peirce's Sign Trichotomies for Social Analysis. *Semiotica* 177(1/4):139–155.
Pauketat, Timothy R.
2000 The Tragedy of the Commoners. In *Agency in Archaeology*, edited by Marcia-Anne Dobres and John Robb, pp. 113–129. Routledge, London.
Pauketat, Timothy R., and Susan M. Alt
2003 Mounds, Memory, and Contested Mississippian History. In *Archaeologies of Memory*, edited by Ruth M. Van Dyke and Susan E. Alcock, pp. 151–179. Blackwell, Malden, MA.
Peirce, C.S.
1998 *The Essential Peirce: Selected Philosophical Writings, Vol. 2 (1893–1913)*. Indiana University Press, Bloomington.
Perry, Eugene, Guadalupe Velazquez-Oliman, and Richard A. Socki
2003 Hydrogeology of the Yucatan Peninsula. In *The Lowland Maya Area: Three Millennia at the Human-Wildland Interface*, edited by Arturo Gomez-Pompa, M.F. Allen, Scott L. Fedick, and J.J. Jimenez-Osornio, pp. 115–138. Food Products Press, New York.
Plank, Shannon E., and Allan Maca
2006 PAPAC and the Study of Copan's Urban Renovation under Yax

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press

Pasaj. Paper presented at the 71st Annual Meeting of the Society for American Archaeology, San Juan, Puerto Rico.
Preucel, Robert W.
2006 *Semiotic Archaeology*. Blackwell, Oxford.
Preucel, Robert W., and Alexander. A. Bauer
2001 Archaeological Pragmatics. *Norwegian Archaeological Review* 34(2):85–96.
Pyburn, K. Anne
1990 Settlement Patterns at Nohmul: Preliminary Results of Four Excavation Seasons. In *Precolumbian Population History in the Maya Lowlands*, edited by T. Patrick Culbert, and Don S. Rice, pp. 183–197. University of New Mexico Press, Albuquerque.
Rice, Don S., and Prudence M. Rice
1990 Population Size and Population Change in the Central Peten Lakes Region, Guatemala. In *Pre-Colombian Population History in the Maya Lowlands*, edited by T. Patrick Culbert and Don S. Rice, pp. 123–148. University of New Mexico Press, Albuquerque.
Ringle, William M.
1999 Pre-classic Cityscapes: Ritual Politics among the Early Lowland Maya. In *Social Patterns in Pre-Classic Mesoamerica*, edited by David C. Grove and Rosemary A. Joyce, pp. 183–223. Dumbarton Oaks, Washington, DC.
Sahlins, Marshall
1987 *Islands of History*. University of Chicago Press, Chicago.
Schele, Linda, and David A. Freidel
1990 *A Forest of Kings: The Untold Story of the Ancient Maya*. William Morrow, New York.
Sewell Jr., William H.
1992 A Theory of Structure: Duality, Agency and Transformation. *American Journal of Sociology* 98(1):1–29.
Shaw, Justine M.
2001 Maya Sacbeob: Form and Function. *Ancient Mesoamerica* 12: 261–272.
2008 *White Roads of the Yucatan: Changing Social Landscapes of the Yucatec Maya*. University of Arizona Press, Tucson.
Shaw, Justine M., and David Johnstone
2001 The Late Classic at Yaxuná, Yucatán, Mexico. *Mexicon* 23(1):10–14.
Silverstein, Jay, David L. Webster, Horacio Martinez, and Alvaro Soto
2009 Rethinking the Great Earthwork of Tikal: A Hydraulic Hypothesis for the Classic Maya Polity. *Ancient Mesoamerica* 20:45–58.
Silverstein, Michael
1976 Shifters, Linguistic Categories, and Cultural Description. In *Meaning in Anthropology*, edited by Keith H. Basso and Henry A. Selby, pp. 11–56. University of New Mexico Press, Albuquerque.
Singer, Milton
1984 *Man's Glassy Essence: Explorations in Semiotic Anthropology*. Indiana University Press, Bloomington.
Smith, Adam T.
2003 *The Political Landscape: Constellations of Authority in Early Complex Polities*. University of California Press, Berkeley.
Stanton, Travis W.
2000 *Heterarchy, Hierarchy, and the Emergence of the Northern Lowland Maya: A Study of Complexity at Yaxuna, Yucatan, Mexico*. Ph.D. dissertation, Southern Methodist University, Dallas.
2005 Formative Maya Causeways: Incipient Internal Site Design at Yaxuna, Yucatan, Mexico. *Mono y Conejo* 3:32–35.
Stanton, Travis W., and Traci Ardren
2005 The Middle Formative of Yucatan in Context: The View from Yaxuna. *Ancient Mesoamerica* 16:213–228.
Stanton, Travis W., and David A. Freidel
2005 Placing the Centre, Centring the Place: The Influence of Formative Sacbeob in Classic Site Design at Yaxuna, Yucatan. *Cambridge Archaeological Journal* 16:225–249.
Stanton, Travis, Scott R. Hutson, and Aline Magnoni
2008 Proyecto interacción político en el centro de Yucatan: Primera temporada de campo. Report submitted to the Consejo de Arqueología, Mexico City.
Stark, Barbara L.
1999 Formal Architectural Complexes in South-Central Veracruz: A Capital Zone? *Journal of Field Archaeology* 26:197–225.
2003 Cerro de las Mesas: Social and Economic Perspectives on a Gulf Center. In *El urbanismo en mesoamérica, Vol. 1*, edited by William T. Sanders, Alba Guadalupe Mastache, and Robert H. Cobean, pp. 391–421. Instituto Nacional Antropología e Historia, Mexico City.
Suhler, Charles K., Traci Ardren, and David Johnstone
1998 The Chronology of Yaxuna: Evidence from Excavation and Ceramics. *Ancient Mesoamerica* 9:167–182.
Suhler, Charles K., and David A. Freidel
1998 Life and Death in a Maya Warzone. *Archaeology* May/June:28–34.
Tilley, Christopher
1991 *Material Culture and Text: The Art of Ambiguity*. Routledge, London.
Tokovinine, Alexander, and Vilma Fialko
2007 Stela 45 of Naranjo and the Early Classic Lords of Sa'aal. *PARI Journal* 7(4):1–14.
Tourtellot, Gair
1988 *Excavations at Seibal, Department of Peten, Guatemala: Peripheral Survey and Excavation Settlement and Community Patterns*. Memoirs of the Peabody Museum of Archaeology and Ethnology, No. 16. Peabody Museum of Archaeology and Ethnology, Harvard University, Cambridge, MA.
Trigger, Bruce
1990 Monumental Architecture: A Thermodynamic Explanation of Symbolic Behavior. *World Archaeology* 22:119–132.
Underhill, Anne P., Gary M. Feinman, Linda M. Nicholas, Hui Fang,
Fengshi Luan, Haiguang Yu, and Fengshu Cai
2008 Changes in Regional Settlement Patterns and the Development of Complex Societies in Southeastern Shandong, China. *Journal of Anthropological Archaeology* 27(1):1–29.
Valdés, Juan A.
1992 El crecimiento de la civilización maya del área central durante el preclásico tardío: Una vista desde el grupo H de Uaxactun. *U tz'ib* 1(2):16–31.
Van Dyke, Ruth M.
2004 Memory, Meaning and Masonry: The Late Bonito Chacoan Landscape. *American Antiquity* 69:413–431.
Villa Rojas, Alfonso
1934 The Yaxuna-Coba Causeway. *Contributions to American Archaeology* 2(9):187–208.
Vogt, Evon Z.
1968 Some Aspects of Zinacantan Settlement Patterns and Ceremonial Organization. In *Settlement Archaeology*, edited by Kwang C. Chang, pp. 154–173. National Press Books, Palo Alto, CA.
Webster, David L., T. Murtha, Kirk D. Straight, Jay Silverstein, Horacio
Martinez, Richard Terry, and Richard Burnett
2007 The Great Tikal Earthwork Revisited. *Journal of Field Archaeology* 32:41–64.
Yaeger, Jason, and Marcello A. Canuto
2000 Introducing an Archaeology of Communities. In *The Archaeology of Communities: A New World Perspective*, edited by Marcello A. Canuto and Jason Yaeger, pp. 1–15. Routledge, London.

https://doi.org/10.1017/S0956536112000211 Published online by Cambridge University Press