

Mapping agricultural assemblages in ancient Oaxaca from the domestication of maize to the collapse of Monte Albán

Arthur A. Joyce

To cite this article: Arthur A. Joyce (2020) Mapping agricultural assemblages in ancient Oaxaca from the domestication of maize to the collapse of Monte Albán, *World Archaeology*, 52:3, 353-375, DOI: [10.1080/00438243.2020.1869067](https://doi.org/10.1080/00438243.2020.1869067)

To link to this article: <https://doi.org/10.1080/00438243.2020.1869067>



Published online: 13 Jan 2021.



Submit your article to this journal [↗](#)



Article views: 130



View related articles [↗](#)




View Crossmark data [↗](#)

ARTICLE



Mapping agricultural assemblages in ancient Oaxaca from the domestication of maize to the collapse of Monte Albán

Arthur A. Joyce 

Department of Anthropology, University of Colorado Boulder, Boulder, CO, USA

ABSTRACT

This article examines the religious and political significance of human involvements with maize in ancient Oaxaca using an approach that merges assemblage theory with Peircean semiotics. The article maps changes in an agricultural assemblage involving linked material and semiotic flows among rain, sun, earth, maize, and people from the adoption of domesticates in Oaxaca at about 4000 BCE to after the collapse of the city of Monte Albán at ca. 800 CE. The article examines changes in this assemblage through the emergence of overlapping component assemblages involving ecology, farming, and religion. Drawing on Peircean semiotics, changes in the religious component are explored, especially its overcoding and stratification of the overall agricultural assemblage, centered first at San José Mogote and later at Monte Albán. Changing relations among rain, sun, earth, maize, and humans had broader effects that transformed political life from the Formative period to the Postclassic.

KEYWORDS

Archaeology; Mesoamerica; Monte Albán; assemblage theory; semiotics; religion and politics

For nearly a century Monte Albán, located on a series of mountains in the centre of the Valley of Oaxaca, has been a focus of archaeological research and debate surrounding early expressions of Native American urbanism (Figure 1). Settled at about 500 BCE, Monte Albán was one of the earliest cities in the southern Mexican Highlands (Caso, Bernal, and Acosta 1967; Marcus and Flannery 1996; Joyce 2010). The civic-ceremonial centre of the city was located on its Main Plaza precinct, which remained a place of religious devotion following the collapse of Monte Albán at ca. 800 CE. In this article, I examine Monte Albán's Main Plaza as a place of convergence in relations among maize, rain, earth, sun, and people from before its founding to its immediate post-collapse period. As explored in this article, beginning with the initial domestication of maize, these relations were increasingly crucial to human life and a source of uncertainty and concern that engaged people not only in economic and technological ways, but in religious ones as well. I draw on the new materialisms, particularly the assemblage approach inspired by Deleuze and Guattari (1987; also see DeLanda 2016), along with Peircean semiotics (Peirce 1958–65) to examine ways in which the Main Plaza drew in and/or excluded people and reordered life throughout its history.

This article addresses the Main Plaza of Monte Albán as an assemblage. As argued by Joyce (2020a), even before the arrival of people, Monte Albán was a mountain of creation and sustenance where substances crucial to the growth of maize and therefore to human life were assembled and concentrated including rain, earth, clouds, sky, sun, and water. These materials were most

CONTACT Arthur A. Joyce  arthur.joyce@colorado.edu  Department of Anthropology, University of Colorado Boulder, Hale Science 350, Boulder, CO 80309-0233, USA

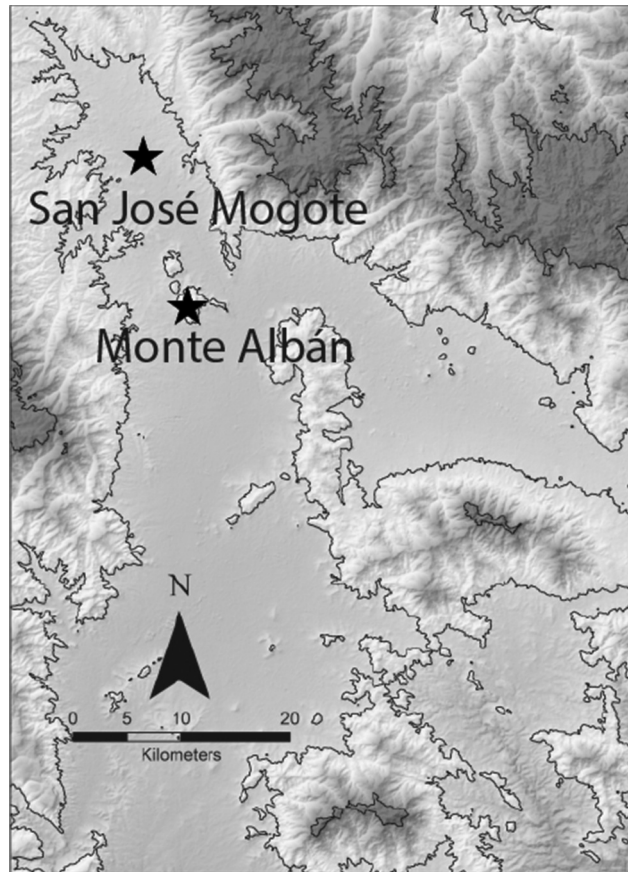


Figure 1. Map of the Valley of Oaxaca showing the locations of Monte Albán and San José Mogote (drafted by Sarah Barber, used with permission).

evocatively expressed on the mountain's summit where the Main Plaza was built and ceremonies performed as part of human attempts to control flows of matter through these critical substances. These material flows simultaneously affected sign relations and semiotic ideologies, becoming a focus of religious practice. Through Monte Albán's approximately 1300 years as an urban centre, this assemblage transformed in ways that had social and political affects by differentiating people and their relations within maize-rain-earth-sun-human assemblages. At ca. 800 CE, however, people abandoned the city and the nobility—an assemblage itself—was detached from the Main Plaza and deterritorialized as hierarchy in the valley declined and authority became more dispersed. At the same time, the Main Plaza was reterritorialized as common people were drawn to the ruined ceremonial centre to channel flows of matter to maize and therefore to humanity through religious acts. Changes in human involvement with substances assembled and concentrated on the Main Plaza were driven by the intertwined physical properties and semiotic affordances of maize and related matter as well as through the increasing dependence of humans on the plant. This article explores the flows of matter and meaning among rain, sun, earth, maize, people, and related phenomena—a process that Deleuze and Guattari (1987, 12–13) refer to as mapping—from initial domestication to after the collapse of Monte Albán. In the next section, I provide further background

for the theoretical approach that I deploy in this article through a basic overview of Deleuzian assemblage theory and Peircean semiotics.

Bridging Deleuzian assemblages and Peircean semiotics

The new materialisms encompass a diversity of approaches that share the goal of decentering the human in understandings of the world and to take more seriously and comprehensively the significance of other-than-human things (Bennett 2010; Harris 2018). Archaeologists have increasingly explored new materialist perspectives, yet it is widely recognized that this scholarship has tended to avoid or deemphasize issues of power, politics, representation, and identity (Bauer and Kosiba 2016; Harris 2018; Van Dyke 2015). Critiques of representationalism combined with a desire to balance the scales and build better understandings of the dynamic, material properties of things—what Bennett (2010) famously described as vibrant matter—has undoubtedly contributed to this condition. At the same time a number of researchers, many drawing on assemblage theory, have begun to explore how politics and meaning are constituted through affective relations within and between assemblages, simultaneously addressing matter and meaning in ways that are ‘more-than-representational’ (Alt and Pauketat 2020; Harris 2018). Peircean semiotics (Peirce 1958–65) in particular holds promise for conceptualizing semiosis within new materialist thought (Harris and Cipolla 2017, 209–212), especially if historicized through concepts such as Keane’s (2018) semiotic ideology (Swenson 2018) and Kohn’s (2013) notion of semiotic hierarchy.

From a new materialist perspective, existence involves flows of matter, energy and ideas that are temporarily drawn together as assemblages, which Hamilakis (2017, 176) describes as ‘temporary co-presences, deliberate arrangements, and articulations of things, beings, enunciations, memories and affects.’ Assemblages are therefore multiplicities made up of a diversity of heterogeneous components that should be seen as dynamic processes, rather than stable essences. Furthermore, components within assemblages are assemblages themselves and can be detached and incorporated into other assemblages and so retain a relative autonomy and heterogeneity. This means that entities are always operating at multiple spatial and temporal scales as assemblages and as components within larger-scale assemblages from atoms to molecules on up to sediment grains and landscapes. The characteristics and dynamism of assemblages are a result both of the properties of and relationships among their constituent elements, which are simultaneously material and expressive, along with capacities to affect and be affected. The properties of assemblages, which define what they can do, are virtual, until actualized by the affective relations within and between assemblages (see Barad 2007; Bennett 2010; DeLanda 2016; Deleuze and Guattari 1987; Harris 2017). Thus, the capacity of a stone axe to till the soil is activated within the assemblage of field and farmer, but is virtual and unexpressed when the axe acts as an offering within a human burial assemblage. Humans are not outside of assemblages, but are themselves components within assemblages, ontologically equivalent to other entities, which is what new materialists refer to as a ‘flat ontology.’ Human distinctions involving sex, gender, status and other forms of identity therefore are constituted through relations within broader assemblages that differentially activate human capacities that are simultaneously material and expressive. From this perspective knowing, sensing, and experiencing emotions are not confined to humans, but are distributed acts embedded within broader material-discursive configurations.

The processes through which assemblages come together consist of territorialization or the gathering of flows, and coding, which involves the ordering of flows and the creation of form within assemblages (Deleuze and Guattari 1987). Both assemblage processes are involved in what Deleuze

and Guattari (1987) term stratification whereby relations within assemblages are intensified, fixed, and stabilized creating strata, which are characterized by a greater degree of durability and boundedness. Assemblages and strata are not static, however, and there is always the potential for constituent flows to be drawn away (deterritorialized) into other assemblages (reterritorialization) and/or to be disordered (decoding) and potentially reordered (recoding). The maize plant therefore can be seen as a territorialization of the seed and its genetic material together with water, solar radiation, and nutrients from the earth that is coded, fixed, and stratified in the growth of the plant. When an ear of corn is harvested and consumed by a person it is deterritorialized from the plant and reterritorialized within the human.

The expressive aspects of assemblages have been increasingly explored by new materialists through Peircean semiotics (e.g., Peirce 1958-65), which is attractive because of its non-Cartesian, relational approach to semiosis based on Peirce's theory of synechism, which stresses the continuity of existence, and thus parallels Deleuzian thought (Crellin et al. 2021; Harris and Cipolla 2017). Peirce's writings, like those of Deleuze, are challenging, but the basics of his approach views sign relations as triadic involving the sign, object, and interpretant. The sign signifies the object, but importantly sign-object relations go beyond the arbitrariness of the symbol—the focus of Saussurean semiotics—to include icons and indexes, which are materially motivated signs. An icon relates to its object through relations of resemblance (e.g., a portrait), whereas an index is motivated by a spatiotemporal contiguity with its object that can be causal in nature (e.g., smoke indexing fire). The interpretant is a translation of a sign into a more developed one through the medium of some sign-interpreting agency. The interpretant can in turn become the basis for a new sign-relation thereby generating a continuous series of enchainment through the process of semiosis. The meaning of a sign, which Peirce describes as the final interpretant, emerges from the translation of the sign into a broader set of sign relations that are patterned, habitual or lawlike. The interpretant need not be human, although throughout Peirce's writings interpreting-agencies were restricted to living beings, which would contradict the flat ontology of Deleuze, and which continues to be the dominant view within semiotics. Peirce, however, hinted at the possibility that semiosis extended into the non-living world (Deely 1990, 2001). Semioticians have debated whether interpretants can be non-living entities (Nöth 2001) and Deely (1990, 2001) in particular, has argued for this extension in his theory of physiosemiosis, which he saw as the 'final frontier of semiotic inquiry' (Deely 2001, 27).¹

The Vibrancy of Maize and the Insecurity of the Human Condition

Assemblages that brought together people and teosinte, the wild precursor of maize, probably date to the arrival of humans in Mesoamerica at the end of the Pleistocene. By ca. 7000 BCE evidence from southwestern Mexico indicates the beginnings of maize domestication (Piperno et al. 2009). During the remainder of the Archaic period (8000–1900 BCE) and into the Early Formative (1900–800 BCE) assemblages involving people and maize along with aspects of climate, landscape, and technology contributed to the constitution and transformation of both humans and maize through affective relationships involving cultivation, domestication, and consumption, among others. Maize does not appear to have become a human dietary staple in most regions, however, until the latter part of the Early Formative between 1400 and 1000 BCE (Lesure, Sinensky, and Wake 2021; Rosenswig et al. 2015). The relatively low reliance on maize until this time is likely due to the small cob and kernel size of early maize as well as the plant's physiochemical properties, which limit the biologically effective nutritional value of the plant. This limitation can be undone if maize kernels

are treated with alkali, a process known as nixtamalization (Bressani and Scrimshaw 1958), which may have begun around 1000 BCE (Cheetham 2010). Relations between people and maize also transformed human diet, health, labour regimes, and patterns of settlement and land use (Kennett, Voorhies, and Martorana 2006; Lesure et al. 2014; Rosenswig et al. 2015).

Despite the capacity of maize and other domesticates to increase subsistence resources available to people and to expand human reproductive capacities, there were also significant deterritorializing aspects due to the risks and uncertainties created by the dynamics of maize-focused agriculture. Throughout Mesoamerica maize yields were particularly sensitive to variation in rainfall as well as to the timing of the onset of the rainy season (Kirkby 1973; Nichols 1987). Soil fertility was linked to a complex set of relationships with climate, geology, landuse, vegetation, hydrology, and topography (Kirkby 1973; McNeill and Winiwarter 2010). Agricultural techniques, management strategies, and demography intersected with rain and soil to affect maize yields (e.g., Fedick 1996; Mueller, Joyce, and Borejsza 2012). Human dimensions of agriculture were in turn affected by markets, warfare, trade, political economy, religion, and long-term climatic processes. Human-maize relationships and dependencies were therefore, linked to the vibrancy of numerous materials whose affective relations constituted agricultural assemblages in Mesoamerica.

The variability of maize yields and the risk and uncertainty that it created for human populations were particularly extreme in semiarid highland regions such as the Valley of Oaxaca where maize was first adopted at about 4000 BCE. With the exception of the most fertile humid lands along drainages on the valley floor, water conditions in the Valley of Oaxaca are marginal for maize (Kirkby 1973; Nicholas 1989). The single most important factor in agricultural success is the amount of rainfall and the timing of its onset at the beginning of the rainy season, along with the ability of farmers to match management decisions to these conditions. Much of the land above the valley floor is also subject to erosion and higher elevations in drier parts of the valley are especially challenging when it comes to maize growth. These problems were mitigated to an extent through irrigation and terrace technologies, although maize productivity was still unpredictable and highly variable.

From the perspective of assemblage theory, human-maize relationships occurred within agricultural assemblages consisting of people, maize, rain, earth, sun, clouds, sky, land use, geology, farming and food processing technologies and practices, and beginning by about 1000 BCE, deities, divine forces, and religious acts. These assemblages increasingly came together, or in Deleuzian terms were territorialized, through the Archaic and Formative periods as humans became dependent on maize and maize on humans. Drawing on Eduardo Kohn's (2013, 165–174) notion of semiotic hierarchy, I conceptualize this agricultural assemblage as eventually consisting of a series of emergent, nested, and overlapping component assemblages involving ecology, farming, and religion. In contrast to Kohn's (2013) perspective, however, relations among these assemblages were recursive with each shaping the other and hence their relations were non-hierarchical (i.e., rhizomatic from the perspective of Deleuze and Guattari 1987; also see DeLanda 2016: Chapter 3).² Prior to human involvement with teosinte, there was a purely ecological assemblage involving material and semiotic flows from sun, rain, and the nutrients of the earth to plants and back again through evapotranspiration and decay. The intersection of tropical weather patterns, plant genetics and physiology, and the growth cycle of teosinte ordered, or in Deleuzian terms coded (Deleuze and Guattari 1987, 41) these flows thereby stratifying the assemblage. It is important to emphasize that this ordering involved flows of linked matter and interpretation, both human and non-human. In this sense, farming practices such as cultivation, irrigation, and terracing involved emergent chains of interpretants emanating from the biosemiosis of plant growth and its indexing of material flows

from sun, rain, and earth. Following Kohn (2013), farming can be seen as an emergent assemblage, sorting and concentrating flows of matter and meaning, but overlapping with, nested within, and dependent upon antecedent, non-human ecological assemblages involving teosinte/maize. Likewise, the ecological assemblage became enmeshed with farming as flows of matter and meaning from rain and earth to maize were increasingly affected by human interventions.

Yet the flows of matter and energy through these assemblages continued to be variable and unpredictable creating the potential for de-coding and deterritorialization. Periods of drought reduced maize productivity, which caused hardships for people; overuse of the land did the same. The water, nutrients, carbon dioxide, solar radiation, and biomass—the machinic assemblage in Deleuze and Guattari's terms (1987, 88)—were crucial for human life, yet these were also expressive and meaningful assemblages. Rainfall, earth, and sun stimulating the growth of maize and therefore human sustenance; the lack of these resulting in the death of the plant as well as insecurity and hunger for people.

In addition to the development of irrigation, terracing, and nixtamalization that dealt with some of the uncertainties of maize agriculture, the expressive aspects of agricultural assemblages gave rise to another emergent assemblage overlapping with, nested within, and affected by the earlier farming and non-human ecological ones. This emergent religious assemblage represented and integrated some of these antecedent forms, but took on increasingly moral elements as an emergent property of symbolic semiosis (cf. Kohn 2013) centred on the narrative of a sacred covenant between humans and divine aspects of rain, earth, and maize. This emergent form involved an overcoding and further stratification of the broader agricultural assemblage through religious practices and semiotic ideologies as maize became more important to human communities (Joyce 2020a; Rosenswig et al. 2015; Taube 1996, 2000). Overcoding refers to the ability of symbolic systems such as the sacred covenant to translate and overlay a new code on previously existing ones. The visible flows of matter central to the ecological and farming components of the agricultural assemblage involving maize, sun, rain, earth, and people came to signify in the religious assemblage an invisible world of vitality, a life force through which all living beings were animated. Life in Mesoamerican worlds was therefore produced and transacted through ongoing relations among a great diversity of animate beings. This vitality defined what it was to be sacred and the acts through which these forces were transferred, transformed, and concentrated among beings were the focus of religious experience (see Joyce 2020a, 2020b for relational definitions of these concepts). Because versions of such a relational ontology are found throughout Native America today, and ethnohistoric and archaeological evidence indicates that they were widespread at the time of European Contact (Furst 1995; Kosiba, Janusek, and Cummins 2020; Zedeño 2009), it seems likely that similar ontologies have considerable time depth, perhaps preceding the domestication of maize and even human entry into the Americas. Until the period from 1000 to 500 BCE, however, there is little archaeological evidence for these relationships perhaps because they were not coded as densely, or in more enduring ways.

By the Middle Formative period maize, rain, and earth not only came to signify a shared vitality, but powerful deities as well (Taube 1996, 2000). The origins of maize and the transferral of vitality involving people, rain, earth, clouds, wind, and other related phenomena were a fundamental component of Mesoamerican creation narratives, elements of which first appear by ca. 1000 BCE (Joyce 2000). In Mesoamerican creation stories, the current world was the result of a sacred covenant whereby people petitioned deities for agricultural fertility and prosperity in return for sacrificial offerings (Monaghan 1990; Tedlock 1996). Death was perhaps the ultimate form of sacrifice as corpses were interred in the earth where they were consumed by the gods (López Austin 1988:321;

Monaghan 1990). Since humans in turn consumed the gods as maize, earth, and rain, both sides of the exchange can be seen as forms of sacrifice through which vital forces were transferred. The risk and uncertainty associated with human dependence on maize was therefore mediated through ongoing sacrificial acts.

Various kinds of sacrificial rituals including human sacrifice, autosacrifice, earth offerings, and the burning of incense become prominent in the archaeological record beginning around 1000 BCE (Grove 1999; Joyce 2000, 2020b; Joyce et al. 1991).³ Human and autosacrifice transferred vitality from the blood and heart where it was most concentrated. Sometimes bloodstained paper or human hearts were burned, which like incense, released vitality as smoke creating clouds and rain (Schaafsma and Taube 2006). Earth offerings were ritually interred materials, which like the burial of people at death were capable of being consumed thereby transferring vitality to the building and to associated divinities, including earth and rain (Joyce 2020b; López Luján 2005; Mock 1998). Perhaps the most overt Formative-period expression of the sacred covenant is Stela 21 from the site of Izapa on the Pacific coast of Mexico (Figure 2). This monument depicts a noble holding a knife in one hand and a decapitated head in the other as the sacrifice brings forth rain from a sky band above (Guernsey 2018).

Other references to creation narratives that appear around 1000 BCE include the mountain of creation and sustenance and the quatrefoil motif (Grove 1999; Guernsey 2010). In Mesoamerican creation narratives, the mountain of creation and sustenance was the place where deities retrieved maize for the first humans (López Austin and López Luján 2009). These sacred mountains were

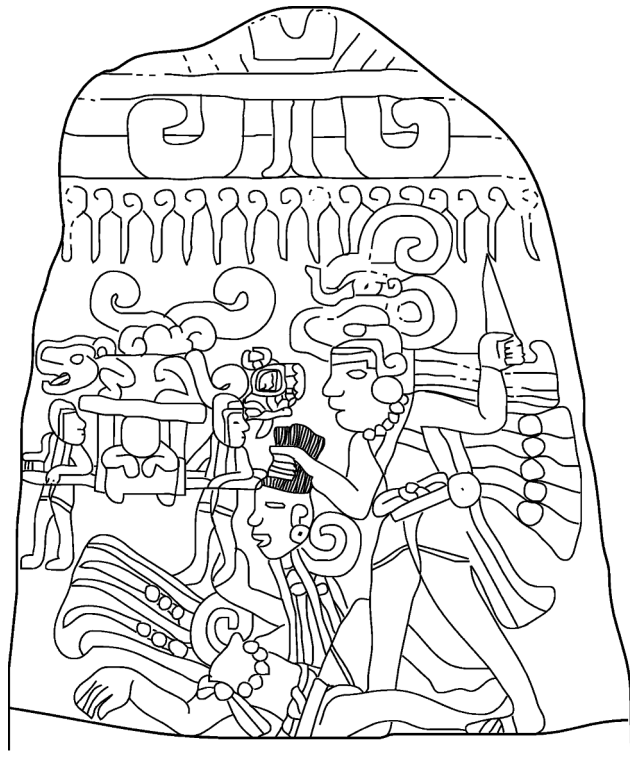


Figure 2. Stela 21 from the site of Izapa (redrawn from Norman 1976: Figure 3.20); “Courtesy of the New World Archaeological Foundation.

liminal places where sky, earth, underworld and ancestors merged as well as being sources of rain and fertility where sacrifices were performed. A related concept, the quatrefoil motif, signified the centring of the world through the merging of sky, earth, and underworld and was associated with caves, water, fertility, ancestors, and creation narratives, especially that of the Maize God.

The religious overcoding of the agricultural assemblage

As in much of Mesoamerica, a new religious assemblage in the Oaxaca Valley began to emerge during the Middle Formative period through ritual acts that enchain a series of interpretants linked to antecedent farming and ecological assemblages (Joyce 2020a). A hill within the site of San José Mogote, located 12 km north of Monte Albán, may have been a place where people more intensely experienced flows of matter and vitality within the broader agricultural assemblage. The hill, designated Mound 1, rose into the sky, making it a place where sky, rain, earth, and related phenomena converged (Figure 3a). The ways in which people began to modify the hill suggest that Mound 1 was an ideal place in which to ritually influence the unpredictable flows of matter and vitality from rain and earth to maize, and eventually to people. At about 700 BCE people built

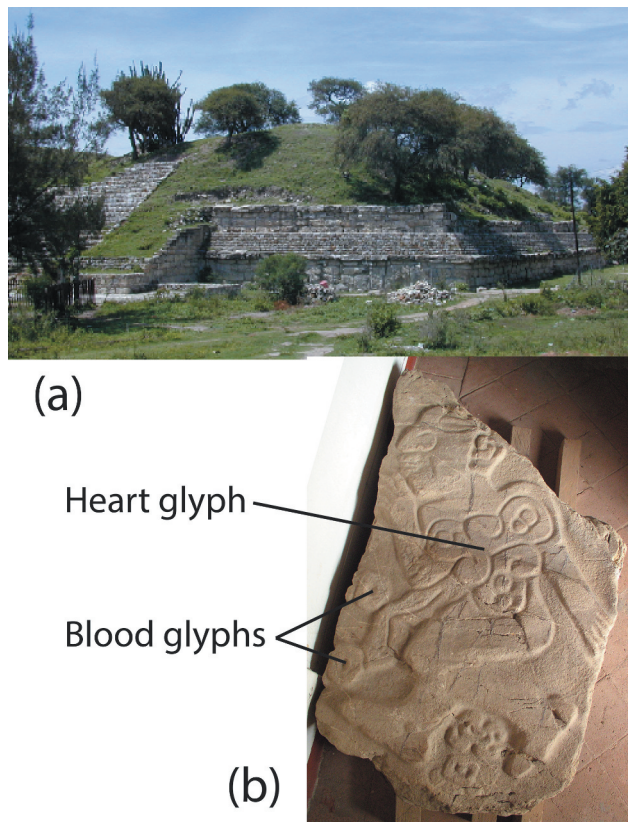


Figure 3. Mound 1 at San José Mogote (a) photograph of Mound 1 (Photograph by Arthur Joyce; from Joyce and Barber 2015: Figure 6 © The Wenner-Gren Foundation for Anthropological Research); (b) Photograph of Monument 3 from San José Mogote showing a victim of human sacrifice (photograph by Arthur Joyce; from Joyce and Barber 2015: Figure A20).

a platform on Mound 1 on which a temple was constructed (Flannery and Marcus 2015). Shortly before the construction of the platform, people interred the first earth offerings known in the Valley of Oaxaca, which in this case consisted of human remains along with ceramic vessels, marine shell, jadeite beads, and red pigment.

Following the construction of the temple, evidence from Mound 1 indicates the continuation of earth offerings as well as other sacrificial practices including autosacrifice, the burning of incense, and the first evidence for human sacrifice in the Valley of Oaxaca (Flannery and Marcus 2015). A carved stone monument depicted a victim of heart sacrifice showing the person's excised heart marked with a sign entailing the meaning of 'precious' (Urcid 2010, 153), perhaps referencing the heart as the place where vitality was most concentrated (Figure 3b). Human interments in tombs may have been another form of earth offering. The spatial differentiation within San José Mogote created by Mound 1 as well as the building's durability and visibility was an important factor in increasing social status differentiation and probably in the emergence of a noble identity (Joyce 2020a).

The archaeological evidence indicates that Mound 1 was the Valley of Oaxaca's first mountain of creation and sustenance. The mound drew together or territorialized the sky, clouds, and rain above and the earth, ancestors and offerings interred within, making it a centre place and *axis mundi*. This inference is reinforced by the presence of a quatrefoil motif on a painted gourd vessel left as an earth offering. Another quatrefoil may have been expressed through ceramic vessels placed beneath each corner of the floor of the Mound 1 temple. Ritual practices increasingly coded affective relations among the entities assembled on Mound 1 and allowed people to meet their obligations to the earth and rain thereby facilitating the growth of maize and the well-being of humanity. The bundling of powerful objects and ancestors within an animate building constructed through communal labour drew together the collective actions and histories of the families of San José Mogote thereby constituting and transforming community identity and politics (Joyce 2020a). As a mountain of creation and sustenance, Mound 1 was a focal point within an emerging religious assemblage that was simultaneously a component of the broader agricultural assemblage and a gathering through which the San José Mogote community was constituted. This inference is expressed more directly by an earth offering interred beneath the floor of a temple on Mound 1 later in the Formative period (Marcus and Flannery 1996). The offering consisted of a tableau of anthropomorphic effigy vessels depicting the story of the Rain Deity freeing maize from the mountain of creation and sustenance to feed humanity (Urcid 2018).

Following Peirce, the religious overcoding of the agricultural assemblage involved the generation of repetition and patterning in the meaning and identity of people and things, or what Lele (2006, 55) terms regulative habits in the creation and interpretation of signs.⁴ These regulative habits were constituted through the semiotic mediation of matter in the nested farming and ecological assemblages and in particular, the patterned flows of matter among rain, earth, maize and people, which had a 'motivating' effect on signs as specified by a semiotic ideology. As argued by Keane (2018) semiotic ideology refers to the reflexivity inherent in sign use including 'the underlying assumptions about what signs are, what functions signs do or do not serve, and what consequences they might or might not produce' (Keane 2018, 4). These assumptions include presuppositions about what kinds of beings animate the world and can act as agents of signification, whether signs are arbitrary (symbols) or are linked to their objects (icons and indexes), and whether manipulating a sign can affect its object. The semiotic ideology that emerged in Middle Formative Oaxaca involved a process of dicentization whereby the relationship of resemblance between consumption and growth in both maize and people was taken as an index of the flows of a more general vitality (Ball 2014).

Through dicentization the visible material flows within agricultural assemblages—the growth of maize through inputs of rain, sun, and earth as well as human growth through the consumption of maize—became indexical icons of a more general vitality shared by all living things that was embedded within the broader narrative of the sacred covenant.

Among modern Mixtec peoples of Oaxaca these flows of vitality are manifest as a series of complex metaphors connecting beings within agricultural assemblages in ways that demonstrate their linkage through a shared vital force whose exchangeability was often seen in alimentary terms (Monaghan 1995). So for example, maize is the daughter of earth and rain, while the planting and growth of maize is equated with human gestation and development. The exchange of vitality that occurs in sacrificial acts, originating with the sacred covenant, is described by Monaghan's (1995) interlocutors as 'we eat the earth and the earth eats us.' There is ample evidence that similar metaphors extend well back into the prehispanic era (Freidel, Schele, and Parker 1993; Joyce 2000; Monaghan 1990; Schaafsma and Taube 2006; Sellen 2011) and the evidence from Mound 1 at San José Mogote strongly suggests their presence. The religious assemblage that emerged in Middle Formative Oaxaca therefore simultaneously gave rise to new material and semiotic flows, although ones that were embedded in and constrained by antecedent farming and non-human ecological assemblages. As standardized in the narrative of the sacred covenant, the religious assemblage translated and overlaid the pre-existing coding of the ecological and farming assemblages.

On Mound 1, human intervention in flows of vitality occurred through a variety of novel forms of sacrifice, including earth offerings and human sacrifice. Sacrificial rituals were interpretants that mediated offerings (sign) and vitality (object) as well as complex signs, simultaneously iconic of the transferral of a shared vitality by alimentary processes, but also indexical, as these acts pointed to their intended effects (the transfer of vitality among rain, earth, maize, and people). Flows of vitality through sacrifice on the mountain of creation and sustenance involved a chain of semiosis, of interpretative acts, both condensing and amplifying Peircean sign modalities including interpretants as emotional (the initial shock of human sacrifice), energetic (the transfer of vitality through breakage, burial, death), and logical (manifesting the sacred covenant). Likewise certain offerings, acts, or practitioners, alone or in combination may have been causally necessary and therefore indexical in the release of vitality to animate or sustain other beings (cf. Zedeño 2009). In this sense the manipulation of the sign (offering) through acts of burial, breakage, or burning affected the object (vital force) through its release and transferral to another being. Through properties such as scarcity, expressivity, and difficulty in acquisition, the objects offered in sacrifice likely indexed a differential capacity to release vitality. Likewise, the nature of sacrificial offerings indexed the differential abilities of ritual sponsors and/or practitioners to mobilize vitality. Some offerings may have been simultaneously indexical and/or iconic of what was sought in the sacrificial exchange (the brilliance of jade resembling the colour of maize, ceramic vessels indexing human sustenance, smoke iconic of clouds and indexing rain, or human bodies and blood resembling the substance ultimately sought through sacrifice).

The territorialization and overcoding of relations among people, maize, rain, and earth that coalesced as a mountain of creation and sustenance at San José Mogote may have also drawn attention to even more impressive mountains easily visible only 12 km to the south (Joyce 2020a). As a series of mountains in the centre of the valley, Monte Albán included many key elements of the mountain of creation and sustenance that had converged on Mound 1, although with an even greater semiotic density and intensity of expression. Rising nearly 400 metres above the valley floor, Monte Albán projected far into the sky and was at times during the rainy season enveloped in rain,



Figure 4. Photograph of the west side of the Main Plaza of Monte Albán during the rainy season (photograph by Arthur Joyce).

clouds, and mist (Figure 4). Water emerged from beneath the surface of the earth in the form of springs. These characteristics gave Monte Albán a virtual capacity as yet unexpressed, to be a powerful place of sacrifice and human intervention in flows of vitality through the Oaxaca Valley's agricultural assemblage. The confluence of earth, sky, clouds, wind and rain as well as its centrality within the valley therefore may have made Monte Albán a prominent and powerful mountain of creation and sustenance even before the arrival of people.⁵

Monte Albán and the recoding of the religious assemblage

Monte Albán was founded at ca. 500 BCE by people from San José Mogote and nearby communities (Marcus and Flannery 1996). During its first several Centuries people were drawn to Monte Albán and the site grew into the region's largest community, reaching 442 ha with an estimated population of 10,000–20,000 by the Late Formative period (300–100 BCE). As at San José Mogote, although on a much larger scale, the summit of the highest mountain at Monte Albán was the place where earth and rain converged most intensively (Joyce 2020a). It was here that people constructed the Main Plaza precinct, an infrastructure designed to impede and harness the deterritorializing effects of the unpredictability in flows of matter/vitality to maize. The result would provide a greater durability and intensity to the religious component of the agricultural assemblage, while also intensifying urbanity, sacrality, and social differentiation (Joyce 2020a). The religious movement that drew people from the valley floor to Monte Albán in turn deterritorialized and reterritorialized the farming and ecological components of the overall agricultural assemblage. Patterns of landuse were transformed as people increasingly

relied on both residential and agricultural terraces to control erosion in the piedmont settings in which people increasingly lived and farmed (Nicholas 1989).

Evidence from the buildings, offerings, and imagery associated with the Main Plaza of Monte Albán demonstrates that it was a focus of sacrificial ceremonies designed to invoke the sacred covenant and intervene in affective flows within the broader agricultural assemblage. Incense burners and earth offerings placed within buildings demonstrate other kinds of sacrifice. A series of semasiographic programmes carved in stone extended the temporal reach of the autosacrificial and human sacrificial ceremonies performed on the plaza (Urcid 2011; Urcid and Joyce 2014). Other imagery refers to flowing water, rain, and possibly the Rain Deity. A stone-lined cistern near the centre of the plaza captured rainwater that flowed from the roofs of nearby buildings and was conveyed to the cistern by tunnels reinforcing the association between the mountaintop, earth, rain, and water (Urcid 2018). Sacrificial ceremonies by this time not only involved communication with earth and rain, but also with ancestors who were likely petitioned for success in warfare (Urcid 2011). The Main Plaza and the acts, human and otherwise that converged there, may therefore be considered a focal point in the religious component of the agricultural assemblage where flows of matter/vitality among rain, earth, sun, clouds, maize, people, offerings, and ancestors were mediated through sacrifice.

During the first several centuries of the Main Plaza its accessibility made it possible for people throughout the city and beyond to participate in ceremonies carried out there (Joyce 2000). Yet there is some discordance relative to the identity of the people involved in sacrificial assemblages focused on the plaza (Joyce 2020a, 2020b). During the early years of Monte Albán the evidence suggests a differentiation of sacrificial rituals led by nobles on the one hand and prominent commoners on the other. While short epigraphic texts and imagery from the Main Plaza suggest that human sacrifice was restricted to powerful nobles, a semasiographic programme inset in the façade of Building L-sub suggests that important rituals involving autosacrifice and communication with ancestors (Figure 5) were likely conducted by an age-based hierarchical group of non-nobles (Urcid 2011). Likewise, during the Main Plaza's first few centuries, most objects emplaced as earth offerings in buildings were relatively modest. The diversity in ritual practitioners was mirrored by



Figure 5. Photograph of in situ orthostats from Building L-sub with horizontal figures depicting ancestors and vertical ones depicting young adults performing autosacrifice (photograph by Arthur Joyce; from Joyce and Barber 2015: Figure A3).



Figure 6. Photo of System M, a temple-patio-adoratorio complex on the Main Plaza of Monte Albán (photograph by Arthur Joyce; from Joyce 2010: Figure 7.7).

a blurring of the boundaries between status groups based on evidence from residences and human interments at the site (Joyce 2010, 141–146).

The diversity in human participation in sacrifice on the Main Plaza ended, perhaps abruptly and violently, during the Terminal Formative period (100 BCE–200 CE). At this time a temple was burned and the semasiographic programmes, including the one on Building L-sub, were dismantled with some monuments damaged and buried under new buildings (Urcid 2011; Urcid and Joyce 2014). The cistern was buried and ritually terminated by an elaborate ceremony involving feasting, earth offerings, and human sacrifice. For the first time elaborate residences that housed nobility were built on the plaza as the identities of nobles and non-nobles were increasingly differentiated (Joyce 2010). Buildings were constructed that closed-off the plaza and a structure on its northwest corner may have served as a control point (Martínez López and Markens 2004). A wall for defence and/or monitoring of access was built around parts of the site. The materials sacrificed as earth offerings on the Main Plaza became far more exotic and valuable including objects made from jade, marine shell, turquoise, and whale ribs along with mosaic masks, elaborate ceramics, and human skeletal remains perhaps from sacrificial victims (Joyce 2020b). Most of the offerings found in public buildings were in restricted locations that limited participation. Through indexical and iconic sign relations, the materials within offerings invoked different elements of the sacred covenant including humans merging with deities (deity masks), sacrifice and ancestors (human and animal remains, red pigment), water/rain (shell, greenstone, whale bone), maize and fertility (greenstone, flower

ornaments), and perhaps food and drink (ceramic vessels and possibly their contents). Overall, Terminal Formative changes in material practices and signification associated with the Main Plaza suggest a partial decoding and deterritorialization of the religious assemblage that had emerged several centuries before with the founding of Monte Albán followed by a reterritorialization and recoding involving elite-focused sacrificial practices that continued to overcode the farming and ecological assemblages. As discussed below, however, these changes gave rise to flows that would escape overcoding (Deleuze and Guattari 1987, 448–449) to become components of smaller-scale, localized assemblages outside of Monte Albán and perhaps within the city as well.

The recoding by which new forms of elite-centred ordering overwrote earlier practices, which began in the Terminal Formative, continued during the Classic period (200–800 CE) with the Main Plaza increasingly becoming a focus of elite domestic life as numerous residences of nobility were constructed in and around the plaza (Joyce 2010). Blanton's (1978, 63–66) spatial study shows that by the Late Classic the Main Plaza was largely closed-off. Although some large-scale gatherings likely continued on the plaza, rituals were increasingly focused on restricted spaces including temple-patio-adoratory complexes (TPAs), two-room temples, and a ballcourt. TPAs consisted of a temple elevated on a platform that faced an enclosed or sunken patio with an ancestor memorial in the centre (Figure 6). TPAs were places of sacrifice and communication with deities and ancestors (Urcid 2018). Elaborate earth offerings continued to be placed in public buildings and in elite residences. Imagery on carved stone monuments and tomb murals memorialized rulers shown with captives destined for sacrifice (Figure 7) as well as ruling genealogies and offerings made to ancestors (Urcid 2005). It is likely that by the Classic period human involvement in the flows of matter/vitality on the Main Plaza was largely focused on nobility and especially the rulers of Monte Albán. In this regard, the relations of Monte Albán's nobility with the sacred mountain, its animate beings, and sacrificial acts likely changed from indexing the affordances of their social circumstances to being iconic of their essence as nobility. Such a process of rhematization, where there is a shift in the focus of a sign



Figure 7. Classic period carved stone monuments from the Main Plaza of Monte Albán showing a ruler and a captive destined for sacrifice (photograph by Arthur Joyce).

from indexical to iconic, would have altered semiotic ideologies and created or reinforced an ontological distinction between nobles and commoners (cf. Keane 2018, 75).

Outside of Monte Albán, however, evidence suggests material and semiotic flows that escaped the overcoding of the religious assemblage on the Main Plaza creating a space for contestation. For example, assemblages involving nobles, rain, earth, maize, ancestors and sacrifice became prominent in larger communities throughout the Valley of Oaxaca (Lind and Urcid 2010; Urcid 2005). Commoners in the valley emplaced modest earth offerings in their houses during dedicatory and termination rituals (Faulseit 2012; Feinman, Nicholas, and Maher 2008). Following the collapse of the city at ca. 800 CE, ritual practices of common people at Monte Albán would once again become part of the religious assemblage centred on the Main Plaza.

Semiotic ideology and the reterritorialization of the Main Plaza

Monte Albán collapsed at ca. 800 CE and the religious assemblage on the Main Plaza was once again deterritorialized, as people abandoned the site. There has been considerable debate concerning the collapse and post-collapse changes in the Oaxaca Valley (Faulseit 2012; Joyce 2010, 249–252). Much of the debate stems from issues with the regional ceramic chronology that have handicapped the ability of archaeologists to identify Early Postclassic remains (800–1200 CE), although research has begun to identify ceramic diagnostics for this period (Markens 2004). The evidence suggests that Monte Albán was largely abandoned and that population was dispersed in smaller communities within the valley. The social hierarchy seems to have diminished, although researchers disagree on the degree of inequality and the presence of powerful, local rulers. Climate change and anthropogenic landscape degradation have been implicated in the collapse throughout Mesoamerica, which raises the possibility that these were deterritorializing forces that ramified through the agricultural assemblage as a whole, including its religious component. It is possible that declines in the productivity of maize due to climate change or human impact was a deterritorializing force throughout the agricultural assemblage that included people coming to question the efficacy of the powerful sacrificers and/or sacrificial rituals carried out on the mountain of creation and sustenance. The resulting abandonment of Monte Albán and perhaps a demographic decline throughout the valley likely triggered further changes in land use and therefore in the farming and ecological assemblages (cf. Borejsza and Joyce 2017; Joyce and Goman 2012; Mueller, Joyce, and Borejsza 2012).

Despite the abandonment of Monte Albán by its human residents, the mountaintop continued to assemble powerful substances including rain, earth, sky, and clouds as it had prior to the arrival of humans. Ruined buildings continued to have a capacity to affect that periodically drew people to the plaza (cf. Hamann 2002). Early Postclassic earth offerings have been found in TPAs in and around the Main Plaza (Herrera Muzgo 2002; Winter 2003); in some cases these offerings overlay earlier ones. The offerings in the TPAs were not a single deposit, but were the result of repeated rituals over the course of several centuries (Caso, Bernal, and Acosta 1967:399–403; Herrera Muzgo 2002, 351–356). The accumulation of offerings is impressive with over 2000 objects recovered from both the *Patio Hundido* TPA on the North Platform and from the South Platform TPA. The offerings were recovered from the adulatory and along the western sides of the TPAs in building collapse as well as in the fill of late modifications of these structures. The offerings were dominated by ceramics with the most common consisting of incense burners (*sahumadores*) and miniature vessels (Figure 8). Offerings also included lithics, especially penates and obsidian blades, along with stone beads, pendants, projectile points, and perforators as well as shell ornaments.



Figure 8. Early Postclassic offerings from Monte Albán (photograph by Arthur Joyce).

The most common objects signified sacrifice. Obsidian blades indexed autosacrificial bloodletting. Penates were small anthropomorphic stone figures resembling dead people with their eyes closed, possibly mummy bundles. The *sahumadores* indexed the burning of incense as a sacrifice to the gods. Miniature ceramic vessels were used as offerings in mortuary rituals and at sacred places like caves, mountaintops, altars, and ruins (Herrera Muzgo 2002, 348).

Like sunken or enclosed courts throughout Mesoamerica, the material properties of TPAs likely afforded indexical and iconic sign relations with caves. Like caves, TPAs projected into the earth and accumulated water at least during the rainy season. Ethnographic and ethnohistorical data show that indigenous people throughout Mesoamerica associate caves with sacred mountains (Barbaras et al. 2005; Brady 2005) and the juxtaposition of the temple platform and sunken court in TPAs may have been iconic of this association. Caves have been associated with people from earlier cycles of creation and with the origins of rain, rain deities, and especially rain serpents as well as with agricultural fertility (Beals 1935:189–190; Monaghan 1995:108–109; Parsons 1936). Today offerings are made in caves to contact ancestors; to petition deities for fertility, health and prosperity; and to bring harm to enemies. Cave offerings from the Postclassic to the present day have included miniature ceramic vessels, the burning of candles and incense, and the sacrifice of animals (Barbaras et al. 2005; Parsons 1936, 295–296).

Early Postclassic offerings deposited in TPAs indicate that people continued to be drawn back to the rain-earth-sky-cloud assemblage on the summit of the mountain of creation and sustenance to make sacrifices to deities and ancestors. The character of these offerings differs from those of the Terminal Formative and Classic periods given the scarcity of prestigious objects within Early Postclassic offerings and the prevalence of utilitarian ceramic forms, often rendered in miniature. Similar offerings have been found in ruined Classic-period public buildings at other sites in the valley (Faulseit 2012) and there is some overlap with objects found in Late Classic residential offerings (Feinman, Nicholas, and Maher 2008). The abandonment of Monte Albán detached the nobility from the religious assemblage centred on the Main Plaza; in some cases noble families even removed their ancestors from tombs presumably to transport them to their new homes (Winter 2003, 115). Semiotic ideologies changed as nobles were detached from their connection to the Main Plaza and the flows of matter/vitality that converged there. Sacrificial rituals and objects on the Main Plaza

could no longer signify the essence of nobility. Instead, people periodically climbed to the summit of the mountain of creation and sustenance and amid the decaying buildings emplaced offerings to the earth and rain to petition them for fertility and well-being. Similar to the early history of the plaza, offerings once again indexed the abilities of common people to mobilize vitality in sacrifice.

Conclusions

In this article, I apply a Deleuzian approach to assemblage theory to examine Monte Albán, and especially its summit, as a focal point in a religious component of a broader agricultural assemblage. The incorporation of Peircean semiotics as historicized through Keane's (2018) concept of semiotic ideology and Kohn's (2013) notion of semiotic hierarchy has facilitated the exploration of meaning within assemblages. From this perspective, the agricultural assemblage in Oaxaca involved linked material and semiotic flows among rain, sun, earth, sky, and plant that constituted agencies long before the arrival of people in the Valley of Oaxaca. Rather than anchored to an essence, the nature of this ecological assemblage transformed from within and without through changes in relations involving climate, tectonics, erosion, and biological competition. As people entered the Valley of Oaxaca and slowly began to cultivate crops, including maize, a new farming assemblage emerged involving human interventions in flows of matter and meaning among sun, rain, earth, maize, and people. I argue that farming can be seen as an emergent assemblage, sorting and concentrating flows of matter and meaning, but nested within, dependent upon, and altering the antecedent, non-human ecological assemblage. These flows, however, were variable and unpredictable, creating deterritorializing forces that carried risk and uncertainty. As maize became more important to human communities, the expressive aspects of the agricultural assemblage were more densely coded through religious practice and semiotic ideology with flows of matter through rain, earth, maize and people signifying a shared and transferrable vitality. The flows of matter/vitality through the farming and ecological assemblages therefore became increasingly linked to sacrificial ceremonies that were in turn dependent on the acquisition of powerful sacrificial substances including exotic goods and human captives. Central to this emerging religious assemblage was the mediation of the risk and uncertainty associated with human dependence on maize through sacrificial acts that could concentrate, direct, divert, and stabilize flows of matter/vitality to maize.

The religious assemblage that first emerged on Mound 1 at San José Mogote included new ways for people to concentrate, direct, divert, and stabilize flows of matter/vitality to maize through sacrificial acts. Changing relations within agricultural assemblages were therefore encoded in ritual practices as well as anchored and entextualized in the narrative of the sacred covenant. The spatial limitations of Mound 1 also began to restrict participation in sacrificial ceremonies through which people intervened in the flows of matter/vitality that converged and were concentrated there. These spatial characteristics created a virtual capacity to differentiate humans that began to be realized with the appropriation of Mound 1 by a single resident family or corporate group.

Prior to the settlement of Monte Albán, the gathering of earth, sky, clouds, sun, wind and rain as well as the centrality of these mountains within the valley made Monte Albán a prominent and powerful mountain of creation and sustenance. As interpretants, the visibility as well as the dense confluence and materialization of substances crucial to human life made Monte Albán, and particularly its summit, a special place of semiosis (Swenson 2018). Although a non-human assemblage at this time, these characteristics gave Monte Albán a virtual capacity as yet unexpressed, to be a powerful place of sacrifice and human intervention in flows of vitality through the Oaxaca Valley's agricultural assemblage. The occupation of Monte Albán at ca. 500 BCE and the construction of

a ceremonial centre focused on sacrifice further territorialized and coded this emerging religious component of the agricultural assemblage. As people were increasingly drawn to Monte Albán, patterns of land use and demography in the valley were altered, which in turn transformed both the farming and agricultural assemblages.

While still semiotically embedded in flows of matter from rain, sun, and earth to maize, which was the core of the farming and ecological assemblages, the emergent religious assemblage increasingly overlaid these patterns with a focus on flows of vitality among sacrificial objects, divinities, and people as entextualized in the sacred covenant. This overcoding provided openings to those who could control the acquisition of exotic goods to be sacrificed as earth offerings, and who had the resources to take captives for sacrifice and sponsor sacrificial ceremonies. The Main Plaza of Monte Albán and its ceremonial buildings and spaces also held the capacity to increasingly differentiate people according to access to the divine. While these distinctions were initially relatively modest at San José Mogote, human differentiation and the creation of hierarchy intensified through the early years of Monte Albán. The association between certain corporate groups, the mountain of creation and sustenance, and the powerful sacrifices afforded by the mountain would have begun to regularize, restrict, and eventually naturalize the ability to carry out sacrifices and to inhabit the sacred mountain resulting in a degree of reterritorialization and recoding. Rather than an index of the conditions that enabled people to affect vitality through sacrifice, sacrificial rituals and an association with the Main Plaza became iconic of the essence of a distinct category of people identified as nobility. This transition therefore involved a change in semiotic ideology from one that directed an indexical reading of the sign-object relation of sacrifice and sacrificer to an iconic one. Given the importance of maize to human life, these intertwined material and semiotic changes not only transformed human identities, but altered other intersecting assemblages involving political and economic relations in the Valley of Oaxaca and beyond (Joyce 2020a). Yet evidence suggests that other communities in the Valley of Oaxaca escaped the overcoding of the religious assemblage centred on Monte Albán's Main Plaza, providing openings for contestation and transformation.

The collapse of Monte Albán detached nobility and partially deterritorialized the religious assemblage centred on the Main Plaza. The materiality of the Main Plaza no longer afforded a semiotic ideology that attributed sacrifice on the plaza to an essentialized characteristic of nobility. Yet the summit of the sacred mountain was still a powerful component of the broader agricultural assemblage with a virtual capacity to afford human intervention in flows of matter/vitality through sacrifice. In the Early Postclassic the Main Plaza assemblage was rapidly reterritorialized as groups, no longer restricted to nobility, were drawn to the summit to burn incense and emplace earth offerings.

Relations within agricultural assemblages were therefore simultaneously material and meaningful. It is crucial to focus on the material aspects of this assemblage such as the uncertainty of maize growth and the ways in which the durability and visibility of the Main Plaza at Monte Albán extended its spatial and temporal reach (Joyce 2020a). Yet as an anthropologist, my interests lie in the involvement of people within assemblages and this must involve meaning and the ways in which matter motivates semiotic relations and ideologies. Thus, Monte Albán gathered rain, earth, sun, sky, clouds, time, and space in ways that enchain a network of interacting signs that had previously emerged as human-maize dependencies intensified around 1000 BCE and which were powerfully expressed on the mountaintop. Relations among material signs constituted Monte Albán and especially the Main Plaza as a place of creation, sustenance, and sacrifice fundamental to human

existence, which has continued from before the arrival of people to the present day. To excise the semiotic from the material dynamism of agricultural assemblages would be as problematic as attributing Monte Albán's rich history solely to human agency, or viewing the matter that came together there as solely representational.

This article demonstrates that issues of politics, religion, and meaning can be addressed through an approach that combines Deleuzean theory with Peircean semiotics. Peircean semiotics provides a sophisticated approach to semiosis that is more-than-representational and non-anthropocentric and which fits within the broader perspective provided by Deleuzean theory. Both approaches are relational and stress continuities between the material and meaningful, the human and other-than-human, that do away with Western binaries, essentialism, and human exceptionalism. Both approaches achieve these goals by collapsing the fundamental binary of nature-culture that has dominated archaeological thought, while providing a set of relational concepts that are more concordant with Native American ontologies. These features help us to break the Cartesian mirror that has reflected back to us as 'evidence' Western biases about existence that obscure understandings of the past.

Notes

1. For example, by extending Peirce along the lines argued by Deely (1990, 2001), the patterned distribution of sediment in fluvial stratigraphy can be seen as an interpretant of the indexical relationship between the sorting of sediment and the flow of a stream. Fluvial stratigraphy as a complex sign in turn could give rise to an enchainment in the form of sedimentary rock. That Deleuze and Guattari (1987, 41) used this example to illustrate how their process of stratification intensifies and stabilizes an assemblage, potentially provides an additional link between assemblage theory and Peircean semiotics.
2. As discussed by Kohn (2013, 170-174) semiotic hierarchy involves the hierarchical relationship of representational modalities in that relationality goes only in a single direction with symbols dependent upon indexes and icons, and indexes in turn dependent on icons. The concept of semiotic hierarchy partially corresponds with Deleuze's and Guattari's (1987: Chapter 3) division between physical, organic, and linguistic strata with symbolic representation limited to the latter. In thinking through the nested components of the agricultural assemblage discussed in this article, I am drawing more specifically on Kohn's (2013, 165-174) application of semiotic hierarchy to the nested and emergent realms of forest ecology, household and national economy, and spirit masters of the Runa in the Ecuadorian Amazon. Based on my reading, these represent emergent and overlapping assemblages with a mutual relationality and hence are non-hierarchical and ontologically flat. Although these realms involve a mix of representational modalities, only those involving humans include the symbolic. Likewise, in ancient Oaxaca symbolic modalities are increasingly present in the farming and religious components of the agricultural assemblage providing the later in particular, with the capacity to overcode.
3. Evidence from the Olmec site of El Manatí suggests that sacrificial practices may have begun in this region several hundred years earlier, although they differ in many ways from religious practices that become more common later in the Formative period (Ortiz Ceballos and Rodríguez Martínez 1999).
4. Although Deleuze and Guattari (1987:531, n41) view sign-object relations as involving territorialization/deterritorialization rather than stratification, Peircean Thirdness, including the concept of the interpretant, relate more broadly to coding (Crossland and Bauer 2017) because they involve patterning and habit, which within human worlds includes conventions of meaning that create order and regularity. These conventions include aspects of indexical and iconic sign relations as reflected in Keane's (2018) semiotic ideology as well as in symbolic conventions.

5. If Monte Albán was a mountain of creation and sustenance even before it was settled by people, it raises the possibility that Mound 1 at San José Mogote may have been inspired by Monte Albán, rather than the reverse (Javier Urcid, personal communication 2020).

Acknowledgments

I would like to thank Ed Swenson and Craig Cipolla for inviting me to contribute to this issue of *World Archaeology*. I would also like to thank Stacy Barber, Craig Cipolla, Ollie Harris, Ed Swenson, Javier Urcid, and two anonymous reviewers for comments on earlier drafts of this paper. I am particularly indebted to Ollie Harris for ongoing discussions on Deleuzian theory.

Disclosure statement

No potential conflict of interest was reported by the author.

Notes on contributor

Arthur Joyce is Professor of Anthropology at the University of Colorado Boulder. He directs long-term interdisciplinary archaeological and palaeoecological research in the southern Mexican state of Oaxaca on issues of politics, materiality, urbanism, religion, ecology, and the preceramic.

ORCID

Arthur A. Joyce  <http://orcid.org/0000-0002-6769-3900>

References

- Alt, S. M., and T. R. Pauketat, eds. 2020. *New Materialisms Ancient Urbanisms*. New York and London: Routledge.
- Ball, C. 2014. "On Dicontentization." *Journal of Linguistic Anthropology* 24 (2): 151–173.
- Barad, K. 2007. *Meeting the Universe Halfway*. Durham & London: Duke University Press.
- Barbaras, A., M. Winter, M. D. C. Castillo, and N. Moreno. 2005. "La Cueva del Diablo: Creencias y rituales de ayer y de hoy entre los zapotecos de Mitla, Oaxaca." *Diario de Campo* 76: 1–24.
- Bauer, A. M., and S. Kosiba. 2016. "How Things Act: An Archaeology of Materials in Political Life." *Journal of Social Archaeology* 16 (2): 115–141. doi:10.1177/1469605316641244.
- Beals, R. L. 1935. "Two Mountain Zapotec Tales from Oaxaca." *Journal of American Folklore* 48 (188): 189–190. doi:10.2307/535424.
- Bennett, J. 2010. *Vibrant Matter: A Political Ecology of Things*. Durham, North Carolina: Duke University Press.
- Blanton, R. E. 1978. *Monte Alban: Settlement Patterns at the Ancient Zapotec Capital*. New York: Academic Press.
- Borejsza, A., and A. A. Joyce. 2017. "Convergence and Divergence as Problems of Explanation in Land Use Histories." In *The Archaeology of Human-Environment Interactions*, edited by D. A. Contreras, 25–57. New York and London: Routledge.
- Brady, J. E., ed. 2005. *The Maw of the Earth Monster: Mesoamerican Ritual Cave Use*. Austin: University of Texas Press.
- Bressani, R., and N. S. Scrimshaw. 1958. "Effect of Lime Treatment on in Vitro Availability of Essential Amino Acids and Solubility of Protein Fractions in Corn." *Journal of Agricultural and Food Chemistry* 6 (10): 774–778. doi:10.1021/jf60092a010.
- Caso, A., I. Bernal, and J. R. Acosta. 1967. *La Cerámica de Monte Albán*. Mexico: Memorias del Instituto Nacional de Antropología e Historia No. 13.

- Cheetham, D. 2010. "Corn, Colanders, and Cooking: Early Maize Processing in the Maya Lowlands and Its Implications." In *Pre-columbian Foodways: Interdisciplinary Approaches to Food, Culture, and Markets in Ancient Mesoamerica*, edited by J. E. Staller and M. D. Carrasco, 345–368. New York: Springer-Verlag.
- Crellin, R. J., C. N. Cipolla, L. M. Montgomery, O. J. T. Harris, and S. V. Moore, eds. 2021. *Archaeological Theory in Dialogue: Situating Relationality, Ontology, Posthumanism, and Indigenous Paradigms*. London and New York: Routledge.
- Crossland, Z., and A. Bauer 2017. "Im/Materialities: Things and Signs." *Semiotic Review* (4). <https://semioticreview.com/ojs/index.php/sr/article/view/9>
- Deely, J. 1990. *Basics of Semiotics*. Bloomington: Indiana University Press.
- Deely, J. 2001. "Physiosemiosis in the Semiotic Spiral: A Play of Musement." *Sign Systems Studies* 29 (1): 28–48.
- DeLanda, M. 2016. *Assemblage Theory*. Edinburgh: Edinburgh University Press.
- Deleuze, G., and F. Guattari. 1987. *A Thousand Plateaus: Capitalism and Schizophrenia*, Translated by B. Massumi. Minneapolis: University of Minnesota Press.
- Faulseit, R. 2012. "State Collapse and Household Resilience in the Oaxaca Valley of Mexico." *Latin American Antiquity* 23 (4): 401–425. doi:10.7183/1045-6635.23.4.401.
- Fedick, S. L., ed. 1996. *The Managed Mosaic: Ancient Maya Agriculture and Resource Use*. Salt Lake City: University of Utah Press.
- Feinman, G. M., L. M. Nicholas, and E. F. Maher. 2008. "Domestic Offerings at El Palmillo: Implications for Community Organization." *Ancient Mesoamerica* 19 (2): 175–194. doi:10.1017/S0956536108000333.
- Flannery, K. V., and J. Marcus. 2015. *Excavations at San José Mogote 2: The Cognitive Archaeology*. Prehistory and Human Ecology of the Valley of Oaxaca, vol. 6. Ann Arbor, MI: Museum of Anthropology, University of Michigan Memoirs, Number 40.
- Freidel, D. A., L. Schele, and J. Parker. 1993. *Maya Cosmos: Three Thousand Years on the Shaman's Path*. New York: William Morrow.
- Furst, J. L. 1995. *The Natural History of the Soul in Ancient Mexico*. New Haven, CT: Yale University Press.
- Grove, D. C. 1999. "Public Monuments and Sacred Mountains: Observations on Three Formative Period Sacred Landscapes." In *Social Patterns in Pre-Classic Mesoamerica*, edited by D. C. Grove and R. A. Joyce, 255–299. Washington, D.C: Dumbarton Oaks.
- Guernsey, J. 2010. "A Consideration of the Quatrefoil Motif in Preclassic Mesoamerica." *Res: Anthropology and Aesthetics* 57/58: 75–96.
- Guernsey, J. 2018. "Captive Representations and Social Discourse at Izapa and in Late Formative Southeastern Mesoamerica." *Ancient Mesoamerica* 29 (2): 333–346. doi:10.1017/S0956536118000093.
- Hamann, B. 2002. "The Social Life of Pre-Sunrise Things." *Current Anthropology* 43 (3): 351–382. doi:10.1086/339526.
- Hamilakis, Y. 2017. "Sensorial Assemblages: Affect, Memory and Temporality in Assemblage Thinking." *Cambridge Archaeological Journal* 27 (1): 169–182. doi:10.1017/S0959774316000676.
- Harris, O. J. T. 2017. "Assemblages and Scale in Archaeology." *Cambridge Archaeological Journal* 27 (1): 127–139. doi:10.1017/S0959774316000597.
- Harris, O. J. T. 2018. "More than Representation: Multiscalar Assemblages and the Deleuzian Challenge to Archaeology." *History of the Human Sciences* 31 (3): 83–104. doi:10.1177/0952695117752016.
- Harris, O. J. T., and C. N. Cipolla. 2017. *Archaeological Theory in the New Millennium*. London: Routledge.
- Herrera Muzgo, T. A. 2002. "Ritos postclásicos en Monte Albán." In *La Religión de los Binnigula'sa'*, edited by V. de la Cruz and M. Winter, 343–370. Oaxaca: IEEPO-IOC.
- Joyce, A. A. 2000. "The Founding of Monte Albán: Sacred Propositions and Social Practices." In *Agency in Archaeology*, edited by M.-A. Dobres and J. Robb, 71–91. New York: Routledge Press.
- Joyce, A. A. 2010. *Mixtecs, Zapotecs, and Chatinos: Ancient Peoples of Southern Mexico*. Malden, MA: Wiley-Blackwell Press.
- Joyce, A. A. 2020a. "Assembling the City: Monte Albán as a Mountain of Creation and Sustenance." In *New Materialisms Ancient Urbanisms*, edited by S. M. Alt and T. R. Pauketat, 65–93. New York and London: Routledge.
- Joyce, A. A. 2020b. "Animating Public Buildings in Formative-Period Oaxaca: Political and Ontological Implications." In *Sacred Matter: Animism and Authority in Pre-Columbian America*, edited by S. Kosiba, J. W. Janusek, and T. B. F. Cummins, 327–356. Washington, DC: Dumbarton Oaks.
- Joyce, A. A., and S. B. Barber. 2015. "Ensoulement, Entrapment, and Political Centralization: A Comparative Study of Religion and Politics in Later Formative Oaxaca." *Current Anthropology* 56 (6): 819–847. doi:10.1086/683998.

- Joyce, A. A., and M. Goman. 2012. "Bridging the Theoretical Divide in Holocene Landscape Studies: Social and Ecological Approaches to Ancient Oaxacan Landscapes." *Quaternary Science Reviews* 55: 1–22. doi:10.1016/j.quascirev.2012.08.003.
- Joyce, R., R. Edging, K. Lorenz, and S. Gillespie. 1991. "Olmec Bloodletting: An Iconographic Study." In *The Sixth Palenque Round Table, 1986*, edited by M. G. Robertson and V. Fields, 143–150. Vol. VIII. Norman: University of Oklahoma Press.
- Keane, W. 2018. "On Semiotic Ideology." *Signs and Society* 6 (1): 64–87. doi:10.1086/695387.
- Kennett, D. J., B. Voorhies, and D. Martorana. 2006. "An Evolutionary Model for the Origins of Agriculture on the Pacific Coast of Southern Mexico." In *Behavioral Ecology and the Transition to Agriculture*, edited by D. J. Kennett and B. Winterhalder, 103–136. Berkeley: University of California Press.
- Kirkby, Anne V. T. 1973. *The Use of Land and Water Resources in the Past and Present Valley of Oaxaca, Mexico*. Museum of Anthropology, Memoirs, No. 5. Ann Arbor: University of Michigan.
- Kohn, E. 2013. *How Forests Think: Toward an Anthropology beyond the Human*. Berkeley: University of California Press.
- Kosiba, K., J. W. Janusek, and T. B. F. Cummins, eds. 2020. *Sacred Matter: Animism and Authority in Pre-Columbian America*. Washington, DC: Dumbarton Oaks.
- Lele, V. P. 2006. "Material Habits, Identity, Semiotic." *Journal of Social Archaeology* 6 (1): 48–70. doi:10.1177/1469605306060561.
- Lesure, R. G., L. S. Martin, K. J. Bishop, B. Jackson, and C. M. Chykerda. 2014. "The Neolithic Demographic Transition in Mesoamerica." *Current Anthropology* 55 (5): 654–664. doi:10.1086/678325.
- Lesure, R. G., R. J. Sinensky, and T. Wake. 2021. "The End of the Archaic in the Soconusco Region of Mesoamerica: A Tipping Point in the Local Trajectory toward Agricultural Village Life." In *Preceramic Mesoamerica*, edited by J. C. Lohse, A. Borejsza, and A. A. Joyce. London: Routledge (in press).
- Lind, M., and J. Urcid. 2010. *The Lords of Lambityeco: Political Evolution in the Valley of Oaxaca during the Xoo Phase*. Boulder: University Press of Colorado.
- López Austin, A. 1988. *Human Body and Ideology: Concepts of the Ancient Nahuas*. Vol. 1. Salt Lake City: University of Utah Press.
- López Austin, A., and L. López Luján, eds. 2009. *Monte Sagrado: Templo Mayor*. Mexico City: Instituto Nacional de Antropología e Historia y Universidad Nacional Autónoma de México.
- López Luján, L. 2005. *The Offerings of the Templo Mayor of Tenochtitlan*. revised ed. Translated by R. Bernard. Albuquerque: Ortiz de Montellano and Thelma Ortiz de Montellano. University of New Mexico Press.
- Marcus, J., and K. Flannery. 1996. *Zapotec Civilization*. London: Thames and Hudson.
- Markens, R. 2004. "Ceramic Chronology in the Valley of Oaxaca, Mexico, during the Classic and Postclassic Periods and the Organization of Ceramic Production." Ph.D. dissertation. Ann Arbor, Michigan: Department of Anthropology, Brandeis University, University Microfilms.
- Martínez López, C., and R. Markens. 2004. "Análisis de la función político-económico del conjunto Plataforma Norte lado poniente de la Plaza Principal de Monte Albán." In *Estructuras políticas en el Oaxaca antiguo*, edited by N. M. Robles García, 75–99. Mexico: Instituto Nacional de Antropología e Historia.
- McNeill, J. R., and V. Winiwarter, eds. 2010. *Soils and Societies: Perspectives from Environmental History*. Cambridge: White Horse Press.
- Mock, S. B., ed. 1998. *The Sowing and the Dawning: Termination, Dedication, and Transformation in the Archaeological and Ethnographic Record of Mesoamerica*. Albuquerque: University of New Mexico Press.
- Monaghan, J. 1990. "Sacrifice, Death, and the Origins of Agriculture in the Codex Vienna." *American Antiquity* 55 (3): 559–569. doi:10.2307/281286.
- Monaghan, J. 1995. *The Covenants with Earth and Rain*. Norman: University of Oklahoma Press.
- Mueller, R. G., A. A. Joyce, and A. Borejsza. 2012. "Alluvial Archives of the Nochixtlán Valley, Oaxaca, Mexico: Age and Significance for Reconstructions of Environmental Change." *Palaeogeography, Palaeoclimatology, Palaeoecology* 321–322: 121–136. doi:10.1016/j.palaeo.2012.01.025.
- Nicholas, L. M. 1989. "Land Use in Prehispanic Oaxaca." In *Monte Albán's Hinterland, Part II: Prehispanic Settlement Patterns in Tlacolula, Etla, and Ocotlán, the Valley of Oaxaca, Mexico*, edited by S. Kowalewski, G. Feinman, L. Finsten, R. Blanton, and L. M. Nicholas, 449–505. Ann Arbor: Memoirs of the University of Michigan Museum of Anthropology No. 23.

- Nichols, D. L. 1987. "Risk and Agricultural Intensification during the Formative Period in the Northern Basin of Mexico." *American Anthropologist* 89 (3): 596–616. doi:10.1525/aa.1987.89.3.02a00040.
- Norman, V. G. 1976. "Izapa Sculpture." *Papers of the New World Archaeological Foundation num. 30, part 2*. Provo: New World Archaeological Foundation.
- Nöth, W. 2001. "Protosemiotics and Physicosemiosis." *Sign Systems Studies* 29 (1): 13–27.
- Ortiz Ceballos, P., and M. C. Rodríguez Martínez. 1999. "Olmec Ritual Behavior at El Manati: A Sacred Space." In *Social Patterns in Pre-Classic Mesoamerica*, edited by D. C. Grove and R. Joyce, 225–254. Washington, D.C.: Dumbarton Oaks.
- Parsons, E. C. 1936. *Mitla: Town of the Souls*. Chicago: University of Chicago Press.
- Peirce, C. S. 1958–65. *Collected Papers of Charles Sanders Peirce*, Edited by C. Hartshorne, P. Weiss, and A. W. Burks. Cambridge: Harvard University Press.
- Piperno, D. R., A. J. Ranere, I. Holst, J. Iriarte, and R. Dickau. 2009. "Starch Grain and Phytolith Evidence for Early Ninth Millennium BP Maize from the Central Balsas River Valley." *Proceedings of the National Academy of Sciences of the USA* 106 (13): 5019–5024. doi:10.1073/pnas.0812525106.
- Rosenswig, R. M., A. M. VanDerwarker, B. J. Culleton, and D. J. Kennett. 2015. "Is It Agriculture Yet? Intensified Maize-use at 1000 Cal BC in the Soconusco and Mesoamerica." *Journal of Anthropological Archaeology* 40: 89–108. doi:10.1016/j.jaa.2015.06.002.
- Schaafsma, P., and K. A. Taube. 2006. "Bringing the Rain: An Ideology of Rain Making in the Pueblo Southwest and Mesoamerica." In *A Pre-Columbian World: Searching for A Unitary Vision of Ancient America*, edited by J. Quilter and M. Miller, 231–285. Washington, D.C.: Dumbarton Oaks.
- Sellen, A. 2011. "Sowing the Blood with the Maize: Zapotec Effigy Vessels and Agricultural Ritual." *Ancient Mesoamerica* 22 (1): 71–89. doi:10.1017/S0956536111000095.
- Swenson, E. R. 2018. "Trace, Revelation, and Interpretant in Archaeological Research: The Graffiti of Huaca Colorada, Peru." *Signs in Society* 6 (2): 349–378. doi:10.1086/696799.
- Taube, K. 1996. "The Rainmakers: The Olmec and Their Contribution to Mesoamerican Belief and Ritual." In *The Olmec World: Ritual and Rulership*, edited by J. Guthrie, 83–103. Princeton, NJ: Art Museum, Princeton University.
- Taube, K. 2000. "Lightning Celts and Corn Fetishes: The Formative Olmec and the Development of Maize Symbolism in Mesoamerica and the American Southwest." In *Olmec Art and Archaeology: Social Complexity in the Formative Period*, edited by J. E. Clark and M. Pye, 297–337. Studies in the History of Art, vol. 58. Washington, D.C.: National Gallery of Art.
- Tedlock, D. 1996. *Popol Vuh*. 2nd ed. New York: Simon and Schuster.
- Urcid, J. 2005. *Zapotec Writing: Knowledge, Power, and Memory in Ancient Oaxaca*. Crystal River, FL: Foundation for the Advancement of Mesoamerican Studies.
- Urcid, J. 2010. "El Sacrificio Humano En El Suroeste De Mesoamérica." In *Nuevas Perspectivas sobre elsacrificio humano entre los Mexicanos*, edited by L. López Luján and G. Olivier, 115–163. Mexico City: Instituto Nacional de Antropología y Universidad Nacional Autónoma de Méxi.
- Urcid, J. 2011. "Las oráculos y la guerra: El papel de las narrativas pictóricas en el desarrollo temprano de Monte Albán (500 a.C.-200 d.C.)." In *Monte Albán en la encrucijada regional y disciplinaria: Memoria de la quinta Mesa Redonda de Monte Albán*, edited by N. M. Robles García and Á. Rivera Guzmán, 163–240. Mexico City: Instituto Nacional de Antropología e Historia.
- Urcid, J. 2018. "Ritual and Society in Ancient Central Oaxaca (350–850 CE)." In *Real Fake: The Story of a Zapotec Urn*, edited by J. Jennings and A. T. Sellen, 31–71. Toronto: Royal Ontario Museum.
- Urcid, J., and A. A. Joyce. 2014. "Early Transformations of Monte Albán's Main Plaza and Their Political Implications, 500 BC-AD 200." In *Mesoamerican Plazas*, edited by K. Tsukamoto and T. Inomata, 149–167. Tucson: University of Arizona Press.
- Van Dyke, R. M. 2015. "Materiality in Practice: An Introduction." In *Practicing Materiality*, edited by R. M. Van Dyke, 3–32. Tucson: University of Arizona Press.
- Winter, M. 2003. "Monte Albán and Late Classic Site Abandonment in Highland Oaxaca." In *The Archaeology of Settlement Abandonment in Middle America*, edited by T. Inomata and R. W. Webb, 103–119. Salt Lake City: University of UTA Press.
- Zedeño, M. N. 2009. "Animating by Association: Index Objects and Relational Taxonomies." *Cambridge Archaeological Journal* 19 (3): 407–417. doi:10.1017/S0959774309000596.