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Teotihuacan

Deborah L. Nichols[1]

Abstract Teotihuacan in the northeastern Basin of Mexico was an unusually large and influential early city and state. This article reviews recent research trends in Teotihuacan from its founding and explosive growth ca. 100 BC into the largest city in Mesoamerica. Biogenetics provide details of how immigration fueled the city's growth and shaped its multiethnic composition and link Teotihuacan to other parts of the central highlands and more distant regions. Urban theory highlights the importance of neighborhoods and how their composition changed. Collective aspects of irrigation, markets, warfare and the military, and ideology encouraged the development of Teotihuacan's corporate governance. Although Teotihuacan politically dominated central Mexico, its control over the regional economy was not as centralized. Beyond its hinterland, Teotihuacan's foreign relations were a mosaic of trade diasporas, diplomatic exchanges, pilgrimages, emulation, and strategic direct interventions of limited duration. As its foreign influence retracted, Teotihuacan faced challenges from its hinterlands and intermediate elites and factions that culminated in the burning and desecration of the urban center. The Epiclassic saw the change from Teotihuacan's regional state to city-states and confederations. Although much reduced in size, Postclassic Teotihuacan retained an enormous legacy that subsequent states sought for their historical validation.

Keywords Urbanism · Mesoamerica · State formation · Collapse · Classic period

> "And above all, it was the city where political power, wealth, and civilization were [was] concentrated" (Florescano 2006a, p. 15).

✉ Deborah L. Nichols
Deborah.l.nichols@dartmouth.edu

[1] Department of Anthropology, Dartmouth College, Hanover, NH 03755, USA

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Introduction

The recent literature on Teotihuacan is expansive and parallels the size and influence of this great early city. Research on Teotihuacan is important not only for what we learn about the city but also its state system, its foreign relations, and its legacy. Teotihuacan is a key site for comparative studies of urbanism and state formation—one of archaeology's "grand challenges" (Kintigh et al. 2014; also Smith 2012). Research on Teotihuacan has shaped and been shaped by significant theoretical and methodological developments in archaeology.

Citing an extraordinarily influential synthesis by Armillas (1950), Millon (1992) noted that 1950 was pivotal in Teotihuacan studies. The following decade saw the inception of the Teotihuacan Mapping Project, the Basin of Mexico settlement pattern surveys, and Proyecto Teotihuacan of the Instituto Nacional de Antropología e Historia's (INAH) (Bernal 1963; Millon 1973; Sanders et al. 1979). These projects reshaped the way we see Teotihuacan and laid the foundation for current Teotihuacan studies and wider understandings of urbanism and state formation (Altschul 1997; López Luján et al. 2005a; Manzanilla 2004b; Matos 2003; Millon 1992; Nichols 1996) (Fig. 1). These projects now serve as a basis for heritage management, salvage archaeology, economic development, and local planning (Webmoor 2005).

Recent large-scale projects on Teotihuacan's major pyramids and apartment complexes focus on governance, urban organization, and ideology (Cabrera and Sugiyama 2004, 2009; Gazzola et al. 2010, p. 345; Gómez 2000, 2013; Manzanilla 2007; Sugiyama and Cabrera 2007; Sugiyama and Sarabia 2011). Equally important

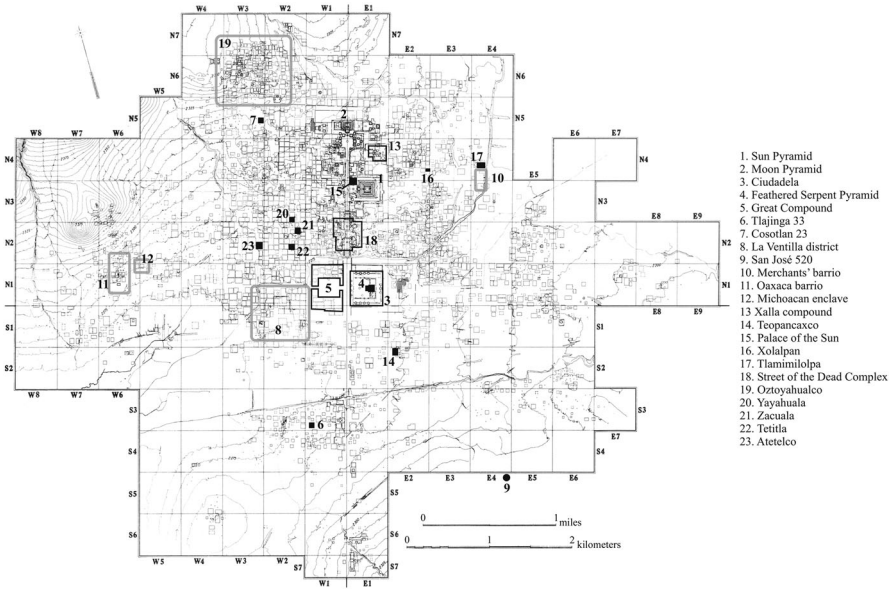

Fig. 1 Teotihuacan map (Millon 1973, modified by Ian Robertson)

are less spectacular investigations and interpretive studies of the city, its hinterlands, and foreign relations. Interdisciplinary research and wider applications of new methods, including soil, dental, and bone chemistry, residue analysis, geophysics and multispectral aerial imagery, and geochemical source studies have revealed new details about environmental changes, resource use, daily life, social relations, immigration, and hinterland and interregional interactions. Recent research on Teotihuacan incorporates diverse theoretical strands, as is characteristic of Mesoamerican archaeology more generally (Gándara 2012; Nichols and Pool 2012).

Books on Teotihuacan by art historians (Headrick 2007; Pasztory 1997) complement Cowgill's (2015) new archaeological synthesis. Recent books on the Feathered Serpent Pyramid (Sugiyama 2005) and the obsidian workshop at the Moon Pyramid (Carballo 2011a) share overlapping themes about politics, religion, and state ideology and its materialization. Linné's (2003a, b) early volumes on Teotihuacan have been reissued.

Topical edited volumes address varied aspects of Teotihuacan, including chronology (Brambila and Cabrera 1998a; Rattray 2001), Maya and Teotihuacan (Braswell 2003a), Teotihuacan's Postclassic legacy (Carrasco et al. 2000a), Classic–Postclassic population changes (Manzanilla 2005c), mortuary practices (González 2009; Manzanilla and Serrano 1999; Rattray 1997; Sempowski and Spence 1994), politics and ideology (Ruiz 2002), Gulf Coast–Teotihuacan relations (Ruiz and Soto 2004), urbanism and architecture (Manzanilla 2012; Ruiz and Torres 2005), and Coyotlatelco and the Epiclassic (Solar 2006c). Exhibitions have brought scholarship to a wider public (Cabrera 2004; INAH 2009; Manzanilla 2004a, b; Sugiyama and Cabrera Castro 2004). Review articles (e.g., Cowgill 2000b, 2001a, b, 2008a; Manzanilla and López Luján 2000; Sugiyama 2012) complement Millon's (e.g., 1993) earlier important syntheses.

I focus on recent trends in Teotihuacan studies and include work regarding Teotihuacan during the Epiclassic and the Postclassic. I conclude with comments about future directions.

Teotihuacan: The City

Neo-evolutionism provided the dominant framework for many archaeologists as the results of the Teotihuacan Mapping Project, the Basin of Mexico settlement pattern project, and INAH excavations began to appear in the 1960s and 1970s. Millon (e.g., 1976) and his colleagues were very critical of that framework. Ensuing debates on the role of prime movers in the origins of Teotihuacan became especially intense concerning the relative importance of material factors—hydraulic agriculture, demography, craft specialization, and exchange—versus politics and religion. The debates abated in the 1990s as theoretical frameworks diversified and incorporated agency, political economy, gender, identity, historical ecology, and ideology. The decline in research on environmental relations and economies in the archaeology of early states noted by Smith (2004) was not as pronounced at Teotihuacan as in other regions. Some debates have been renewed, particularly regarding the dominant language spoken at Teotihuacan, the nature of its writing/

notation system, the role of migration and environmental changes in the city's collapse, and Teotihuacan's foreign influence.

Chronology

The city's chronology remains a point of contention (Table 1). We still know too little about the early history of Teotihuacan. The Formative period in the Basin of Mexico in general has been understudied (Plunket and Uruñuela 2012). During the Late Formative, Cuanalan phase, villages shifted from hillsides to the valley floor; the largest settlement was located near Teotihuacan's springs with their rich agricultural potential (Cowgill et al. 2003, p. 9). Teotihuacan's urban growth took off during the subsequent Patlachique phase (100–1 BC). An elite compound inside the Ciudadela dates to AD 50–150 (Gazzola 2009a, p. 219; Gazzola et al. 2010, p. 345). The Moon Pyramid began with a small platform in the Patlachique phase, oriented 11–12° east of north (Cowgill personal communication, 2012). The

Table 1 Chronology for Teotihuacan Valley

General chronology	Teotihuacan valley	Years
Early Colonial	Aztec IV	AD 1521–1600
Late Postclassic	Late Aztec	
	Aztec III–IV	c. AD ?1450–1521
	Aztec III	AD 1350/1400–1450
Middle Postclassic	Early Aztec	AD 1150–1350
	Aztec II	AD 1150/1200–1350
Early Postclassic	Aztec I	AD 900/1000–1150
	Atlatongo-Tollan	AD 1000–1150/1200
	Mazapan	AD 900–1000?
Epiclassic	Coyotlatelco	AD 650–900
	Early Epiclassic/Oxtotipac	AD ?600–700
Classic	Metepec	AD 550–650
	Late Xolalpan	AD 450–550
	Early Xolalpan	AD 350–450
	Late Tlamimilolpa	AD 250–350
	Early Tlamimilolpa	AD 150–250
	Miccaotli	AD 100–150
Terminal Formative	Tzacualli	AD 1–100
	Patlachique	100–1 BC
	Tezoyuca	200–100 BC
Late Formative	Late Cuanalan	c. 600–200 BC
	Early Cuanalan	650–600 BC
Middle Formative	Chiconautla	900–650 BC
Early-Middle Formative	Altica	?1050–900 BC

platform predates the present urban grid orientation and is one of the earliest dated public structures in the city (Cabrera 2006; Cowgill 2008a, b; Sugiyama 2004a, b; 2012; Sugiyama and Cabrera 2007; Sugiyama and López Luján 2006a, b, 2007). Tunnels in front of the Sun and Feathered Serpent Pyramids are artificial

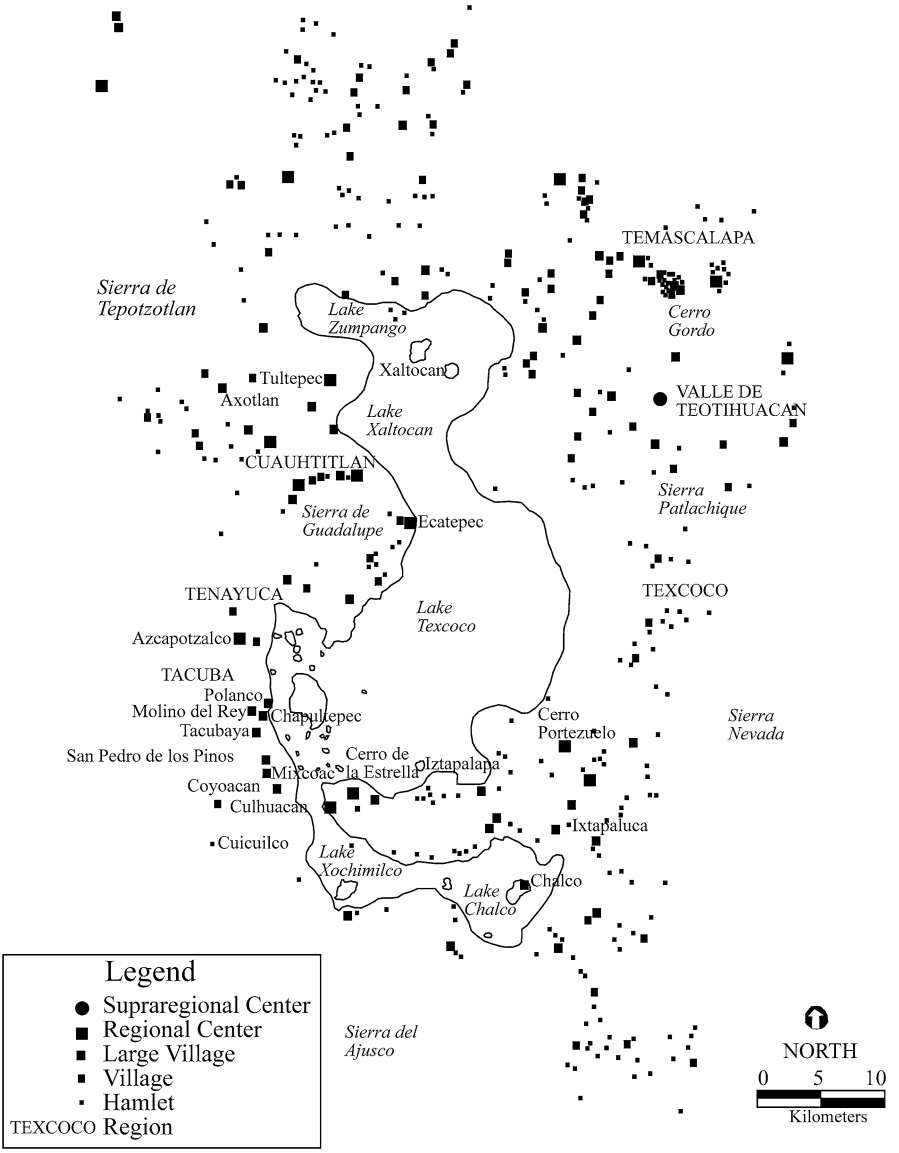

Fig. 2 The Basin of Mexico during the Early Classic period (modified after López Luján 2007; Sanders et al. 1979)

constructions; this and other parallels suggest that similar rituals took place in both (Gómez 2013; Sugiyama and Sarabia 2011; N. Sugiyama et al. 2013, p. 409).

Sugiyama and Sarabia (2011) recently confirmed the existence of older structures and Patlachique ceramics in the Sun Pyramid's fill (N. Sugiyama et al. 2013; Sugiyama 2012, pp. 219–222). Their radiocarbon assays indicate the construction of the pyramid was later than previously thought, perhaps AD 229–330. If the Patlachique and Tzacualli phases are this late, this compression of the Teotihuacan chronology carries significant implications. Although it may be premature at present to revise the Teotihuacan chronology, it is important to resolve the dating of the early and late phases of the Teotihuacan period.

Cowgill's (1996) chronology places the destruction and desecration of the city's major buildings ca. AD 650. Manzanilla (2003, p. 96; see also Hueda-Tanabe et al. 2004; Solar 2006a) draws on archaeomagnetic dates to conclude that the burning and elite collapse happened a century earlier, ca. AD 550. Beramendi-Orosco et al.'s (2009) dates from Teopancazco also put the end of the Xolalpan phase at cal AD 550, as does Cowgill, but he sees good evidence that the major burning occurred at the end of the Metepec phase, ca. AD 650. Given the extensive burning along the Street of the Dead (Millon 1988, pp. 149–152), future work should obtain sufficient dates from enough secure contexts to resolve this issue.

Ecology, Environment, and Economy

Cultural ecology framed the Basin of Mexico settlement pattern surveys that began in the Teotihuacan Valley under Sanders (Sanders et al. 1979; see also Nichols 1996) and continues to provide a useful framework (e.g., Evans 2008). Recent research on human and environmental relations focuses less on the concepts of adaptation and ecosystems and more on the dynamics of human–environmental interactions and historical ecology (McClung de Tapia 2005, 2012). The causes and effects of environmental change are receiving broad attention from archaeologists who propose that environmental factors contributed to Teotihuacan's growth and decline. Multidisciplinary, paleo-environmental research in the Teotihuacan Valley has been a focus of studies by McClung de Tapia (Adriano-Morán, and McClung de Tapia 2008; Cabadas-Báez et al. 2005; Gama-Castro et al. 2004, 2005; González-Arqueros et al. 2013; McClung de Tapia 2005, 2012; McClung de Tapia et al. 2003, 2005a, b). More research is badly needed elsewhere in Teotihuacan's hinterlands (Córdova and Parsons 1996; Frederick et al. 2005).

Beginning ca. 150/100 BC, Teotihuacan grew rapidly and vied with Cuicuilco for regional dominance (Charlton and Nichols 1997, pp. 181–182; Cowgill 2000b, pp. 264–265). Relocation of much of the population of the Basin of Mexico and other parts of central Mexico further fueled Teotihuacan's growth during Tzacualli times, AD 1–100 (Fig. 2). Conventional interpretations attribute the decline of Cuicuilco to volcanic eruptions; however, better dating of the timing and number of eruptions suggests otherwise (Córdova et al. 1994). Siebe (2000) places the final lava flows over Cuicuilco to ca. AD 200/350 *after* most of that city was abandoned. An earlier eruption of Popocatepetl in the middle of the first century degraded agricultural lands, covered villages, and caused people to flee to Teotihuacan and

other urban centers and even might have blocked some of Cuicuilco's trade routes (Plunket and Uruñuela 2004, 2005, p. 95, 2006, 2012, p. 33). While coercion (Spencer and Redmond 2004) and the pull of the growing city may explain the abandonment of settlements elsewhere in the Basin of Mexico, volcanic eruptions also contributed to population dislocations and the massive Terminal Formative influx at Teotihuacan.

Beyond catastrophic environmental events, there is evidence of climatic cycling, especially in the drier northern Basin of Mexico; slight differences in rainfall and temperature can have significant consequences for agricultural productivity (Cabadas-Báez et al. 2005; McClung de Tapia 2000; Metcalfe 2006; Metcalfe and Davies 2007; Metcalfe et al. 2000, 2007). Solleiro-Rebolledo et al. (2006) argue that increased aridity contributed to the early development of irrigation in the Basin. Anthropogenic changes including erosion from swidden cultivation of hillsides likely also encouraged the early use of irrigation in the northern Basin of Mexico (Evans and Nichols in press; Nichols 1982, 1987; Plunket and Uruñuela 2012, p. 10).

Concerns about contemporary climate change have expanded support for climate science research and the development of new paleo-climatic models for central Mexico. Lachiniet et al. (2012) and Stahle et al. (2011) argue that drought contributed to the social and cultural changes from the Classic to the Postclassic. McClung de Tapia (2012), however, has not found evidence in the Teotihuacan Valley for drought-induced environmental changes. There is no simple correlation between social and climate changes as new centers were founded while others retracted during dry periods (Bhattacharya et al. 2015). Further understanding of cultural and climatic changes requires more direct collaboration between climatic scientists and archaeologists.

McClung and colleagues have looked at Teotihuacan's impacts on its environment (Cabrera 2005; McClung de Tapia 2003, 2004, 2005, 2012; McClung de Tapia et al. 2003, 2005a, b). Streams tapped for irrigation were rerouted to accommodate the city's grid, and urban growth removed some farmland from production (Evans and Nichols in press; Nichols et al. 1991, pp. 127–128, 2006). As farmers intensified cultivation of the alluvial plain and piedmont slopes surrounding the city in the Terminal Formative, they removed vegetation, increasing erosion and sedimentation (McClung de Tapia 2003; McClung de Tapia and Aguilar 2001, pp. 114–115). The availability of fuel also might have declined (Biskowski's 1997). The diverse mixed tree and shrub wood used by Teotihuacanos, however, remained relatively stable during the Teotihuacan and Postclassic periods, which suggests that Teotihuacanos managed the growth and consumption of vegetation for fuel (Adriano-Morán and McClung de Tapia 2008) and that the major post-Pleistocene vegetation and soil changes took place earlier in the Formative period when people first cultivated hill slopes (Nichols 2007).

Teotihuacan's environmental footprint extended beyond its immediate hinterland. Limestone for plaster was quarried from the Tula area in the Mezquital Valley north of the Basin of Mexico and perhaps also from the Zumpango area of the northern Basin (Barba et al. 2009; Murakami 2010, pp. 191–192). Barba and Córdova (2010) estimate that a total of 12.2 million m^3 of wood was required to

cook the limestone to produce the plaster used in Teotihuacan. This figure does not include plaster for hinterland settlements (see also Barba 2005).

Manzanilla (2003) suggests that environmental degradation and drought contributed to the city's decline. Sanders (2003) disagreed, arguing that Teotihuacan farmers cultivated hillsides using terraces to control erosion; without terraces, the soil would have washed away centuries before Teotihuacan's decline. "Any erosion would have been the product of the decline of the population in the valley during the Coyotlatelco phase" (Sanders 2003, p. 197). However, no early terracing in the Teotihuacan Valley has been definitely dated to the Teotihuacan period. Environmental degradation is often linked with population growth, but where intensification involves labor-intensive landscape modifications, such as terracing, a decline in the labor force needed to maintain such features can cause serious deterioration as happened after AD 1519 (Córdova 1997; Córdova and Parsons 1996; Fisher 2005). Future studies at Teotihuacan have the potential to contribute much more to the understandings of urbanism, environmental change, and long-term ecological dynamics.

Cultivating Fields

The great concentration of people, including farmers, in the Teotihuacan Valley, while perhaps politically expedient, carried risks. Farmers irrigated fields and households practiced diversified production strategies, combining farming and craft specialization and manufacturing multiple crafts (Stark 2007, pp. 230–233). Maize was a staple crop; however, maguey cultivation played a more important role than previously realized (e.g., Correa-Ascencio et al. 2014; McClung de Tapia 2003, 2004; McClung de Tapia and Tapia Recillas 1998). *Aguamiel* (maguey syrup) and *pulque* (fermented syrup) were widely consumed. Maguey also provided fibers and fuel (Parsons and Parsons 1990; Sheehy 2001). Concentrations of maguey scrapers indicate that some farming households in the city and surrounding countryside specialized in maguey cultivation and processing (Manzanilla 1996, p. 235, 2005a, p. 176; Sanders 1994, p. 63; Sejourné 1966).

In contrast to other world regions where early states and cities developed, prehispanic Mesoamerica lacked large domesticated animals. Nonetheless, Teotihuacanos took advantage of what animals were available. At the Oztoyahualco apartment compound, for example, some families bred turkeys, dogs, and rabbits for commerce and their own use (Manzanilla 1999b).

Too little is known about the farming practices and land tenure of Teotihuacan households (Sanders et al. 1979, p. 125). Early estimates of the number of farmers and craft specialists in the city should be revisited in light of findings that households often engaged in multiple production strategies (Feinman 1999). By 150 BC, floodwater irrigation was widely practiced in the Teotihuacan Valley and organized as small systems likely controlled by local corporate groups. Remains of canals have been found in the city (Cabrera 2005; Evans and Nichols in press; Nichols 1988; Nichols et al. 1991, 2006; Nichols and Frederick 1993; Sanders et al. 1979, pp. 263–269). Hydraulic engineering is evident in the rerouting of the San Lorenzo and San Juan Rivers and other streams to accommodate the grid plan.

Although the ongoing cultivation of fields obscures prehispanic permanent irrigation features, enough open land still remains in the Teotihuacan Valley to make multispectral aerial imagery and geophysical remote sensing methods a priority.

I agree with Scarborough (2003, p. 123) that the state's involvement in water management in the Basin of Mexico usually was temporary and limited to large-scale projects. The massive state reorganization of Teotihuacan entailed significant hydraulic modifications (Angulo 1987; Cabrera 2005; Evans and Nichols in press; Parsons 1991, p. 36; Sugiyama 1993). Such projects created productive agricultural land to support the growing urban population that leaders could strategically allocate as rewards and also to immigrant groups and/or local farming households displaced by urban growth. Irrigated fields also represented a secure source of tribute revenue, although I suspect that water management was mostly the responsibility of local groups. In contrast to Wittfogel's (1957) despots, current theories focus more on cooperation, corporate groups, and collective action (Carballo et al. 2014b; Evans and Nichols in press).

Scarborough (2003, p. 119) sees *chinampa* development, not irrigation, as critical to Teotihuacan's nucleated growth and political centralization. Sanders (1976, pp. 117–118; Sanders et al. 1979, p. 390) also thought that *chinampa*s on a fairly substantial scale were constructed around the San Juan springs in the Late or Terminal Formative. Gamboa (2000) dates agricultural drainage canals to Late Tlamimilolpa/Early Xolalpan and perhaps earlier. More recent work, however, raises the possibility that these features date to the colonial period (McClung de Tapia 2012). Hydraulic modifications of the area around the springs likely took place in both prehispanic and colonial times.

Scarborough (2003) further speculates that canalization for *chinampas* inspired Teotihuacan's grid layout. Integrated orthogonal urban layouts, however, are not confined to cities with drained fields, and considerable evidence links the orientation of Teotihuacan's grid to concepts of time, calendars, and cosmology (e.g., Cowgill 2007a; Galindo and Klapp 2009; Smith 2007, p. 16; Sugiyama 2002, 2010). *Chinampas* are not yet securely dated to the city's early history (Cabrera 2005). In contrast to those (Parsons 1991, p. 36) who think that Teotihuacan's rulers developed deliberate strategies to manage agricultural land and labor, others (e.g., Cowgill 1997) posit a more decentralized political economy. With so many farmers living in the city, land and water disputes must have been a regular feature of urban and rural politics. Farming fields outside the city and managing groups displaced by urban growth and the city's reorganization would have provided leadership opportunities for emerging intermediate elites early in the city's history.

Teotihuacan's rulers linked their political authority with the forces of agricultural fertility (Heyden 2000, p. 180; Manzanilla 2000; Millon 1973, p. 301; Nichols et al. 2006, p. 64; Pasztory 1997, pp. 104–106). Farmers tilled fields watered by rain and irrigation and propitiated these forces in their household rituals. Rulers also conducted rituals essential to these life-sustaining forces on which their own power depended.

Urban Craft Specialization

Specialization and exchange were integral in the early development of complex societies that linked the Teotihuacan Valley with other regions of Mesoamerica even before the city existed (Alex et al. 2012; Stoner et al. 2015). The intensification of production and specialization and commercial/marketplace exchange were key changes in the economy and social relations. Teotihuacan figures prominently in debates about the relationship of politics and economics in the formation of early states.

Specialists at Teotihuacan manufactured an array of utilitarian and sumptuary goods (Table 2). They worked in various contexts within the city, in independent and administered/attached workshops, and sponsored workshops as clients of wealthy patrons (Manzanilla 2009). Most workshops were based in residences—as they were across Mesoamerica in prehispanic times (Cowgill 2007a, pp. 283–284; Feinman 1999)—although some were attached to state institutions (e.g., Carballo 2007b, 2011a; Múnera 1985). Households within the same apartment compound at

Table 2 Production specialization at Teotihuacan

Non-comestible commodities	References
Cosmetics	Doménech-Carbó et al. (2012)
Basketry	Linné (2003a), Manzanilla (1996, p. 239)
Figurines	Goldsmith (1999, 2001), Scott (2001), Sullivan (2004, 2005, 2007)
Grinding tools	Biskowski (1997)
Lapidary and shell working	Cabrera-Cortés (2009), Gazzola (2005), Gómez (2000); Gómez and Núñez (1999, pp. 114–115), Kolb (1987), Romero (2003), Turner (1987, 1992), Velázquez et al. (2009), Widmer (1991)
Mica	Rosa et al. (2011)
Plaster	Barba (2005), Barba et al. (2009), Barba and Córdova (2010), Manzanilla (1996, p. 234), Murakami (2010)
Hide working	Manzanilla (1996, p. 239)
Pottery	Correa-Ascencio et al. (2014), Cabrera-Cortés (2005, 2011), Conides (1997, 2001), Cowgill (2007a, p. 283), Crider (2011, 2013), Hopkins (1995, pp. 143–155), Krotser and Rattray (1980), López (2009), López and Nicolás (2005), Meza and Sánchez (1998), Múnera (1985), Nicolás (2003), Rattray (2001), Sheehy (1998, 2001), Sullivan (2005, 2006, 2007)
Obsidian	Andrews (2002, 2006), Carballo (2007b, 2011a), Carballo et al. (2007), Carballo and Pluckhahn (2007), Charlton (1978), Clark (1986, 2003, 2007), Nelson (2000, 2009), Parry (2001, 2002), Parry and Kabata (2004), Pastrana (2002, 2009), Santley and Arnold (2004, 2005), Santley et al. (1995), Spence (1967, 1981, 1984, 1985, 1986, 1987, 1996a), Spence et al. (1984)
Slate	Villa-Córdoba et al. (2012)
Tailoring, regalia	Manzanilla (2006a, 2009, 2012), Manzanilla et al. (2009, 2010)
Textiles	Cabrera-Cortés (2001), Cowgill (2007a, p. 284), Manzanilla et al. (2011)
Worked bone	Padró (2002), Pérez (2005)

Teotihuacan usually engaged in the same occupations, and there are many examples of multicrafting (e.g., Manzanilla 2006a; Sullivan 2004), often including farming. At the Oztoyahualco apartment compound residents specialized in plaster polishing and bred rabbits. Manzanilla's (1996) identification of rooms that store seeds and plants suggests the residents also farmed. Specialists who mass-produced some kinds of goods lived together in their own neighborhoods or districts, while others were scattered throughout the city (Cowgill 2007a). Manzanilla (2009) argues that the specialists clustered in sectors on the city's periphery geared their production to supplying the urban population. Noble houses supervised the manufacturing of wealth goods that marked social identities, and rulers also controlled embedded or administered workshops that produced items important to their political authority, such as obsidian weapons and ritual eccentrics at the Moon Pyramid workshops (Carballo 2011b).

A comprehensive review of the varied scales and contexts of urban manufacturing is beyond the scope of this paper, but some examples of ceramic manufacturing are instructive. Urban workshops specialized in making different types of pottery and ceramic goods (Hopkins 1995; Meza and Sánchez 1998; Rattray 2001). South of the San Lorenzo River is a district of apartment compounds that manufactured San Martín Orange cooking pots and amphorae for storage, perhaps of pulque (Correa-Ascencio et al. 2014; Sheehy 2001; Sullivan 2006; Widmer and Storey 1993). These were independent workshops (Cabrera-Cortés 2011). We do not yet know if there were any formal organizations of specialists crosscutting apartment compounds, although the cluster of potters in the Tlajinga district suggests some supra-household organization. In Tlajinga 33, a few families of lapidary specialists founded the compound in Early Tlamimilolpa. By Late Xolalpan they manufactured San Martín Orange pottery as a compound-wide activity (Hopkins 1995; Sheehy 1998; Widmer and Storey 1993). Manzanilla (2009, p. 31) suggests that elite barrio centers such as La Ventilla took over lapidary production for regalia, removing it from the hands of poorer, independent specialists.

Independent potters did not just manufacture "utilitarian" ceramics but also made ritually charged vessels. Cabrera-Cortés (2005) investigated such a ceramic workshop, Site 520, on the southeast edge of the city with a firing area and substantial quantities of manufacturing debris from bowls, cylindrical vessels, and Storm God effigies. These potters lived in simple houses of stone, adobe, and perishable materials. Although they did not build Teotihuacan-style compounds, they followed Teotihuacan burial practices.

In contrast to residential workshops of the relatively poor independent potters at Tlajinga 33 and Site 520, other potters manufactured composite theater censers and *adornos* in a walled enclosure attached to the north side of the Ciudadela (Cowgill 2007a, p. 283; Múnera 1985). These fancy censers were ceremonial items linked with political authority (Carballo 2011a, p. 29; Manzanilla 2009, p. 31). Specialists working as part of a rotational labor tax also could have left the manufacturing debris found in state buildings. This would explain the presence of manufacturing debris (of censers and other types of ritually charged goods) in both residences and public structures (Cabrera-Cortés 2011; Carballo 2011b, p. 148; Múnera 1985;

Sullivan 2007). Through attached craft production and/or labor taxes, leaders asserted some control over the production of objects and symbols associated with their political authority and sacred propositions of war, sacrifice, and their ancestors.

The scale and methods of manufacturing intensified as the city grew. At Cosotlan 23, 1 km west of the Moon Pyramid, potters initially shaped figurines by hand. Later, during the Tlamimilolpa phase, they began to mass-produce them using molds (Barbour 1975; Goldsmith 2001; Sullivan 2007). Sullivan (2006, 2007) recovered over 6,000 figurine fragments along with molds in surface collections and documented the shift to mass production. Figurine production continued at Cosotlan 23 into the Postclassic, though on a smaller scale.

Textiles held an important place in the political economy of Mesoamerica and as multivalent expressions of identity. Cabrera-Cortés (2001) thinks few raw fibers were processed in the city; most fiber came into Teotihuacan as yarn/thread. Ceramic spindle whorls do not appear until the Epiclassic. In surface collections at Cosotlan 23, Sullivan (2007) recovered significant numbers of small, perforated ceramic disks with holes similar in size to later cotton spindle whorls. The possibility that these may be ceramic spindle whorls warrants further investigation. Molds standardize whorl sizes and, by extension, thread sizes and signal an expanded role for textiles and greater specialization.

In the south-central Gulf Coast, spinners began to employ ceramic spindle whorls by the Terminal Formative. During the Early Classic, the growing social significance of textiles prompted increases in Gulf Coast cotton production, some of which likely was exported to Teotihuacan, along with other Gulf Coast prestige goods, including seashells and lustrous ware pottery. Stark et al. (1998, p. 28) suspect cotton came to Teotihuacan through administered trade or elite gift exchanges. Garments depicted on ceramic figurines and in murals and the presence of tailors' workshops in barrio centers such as Teopancazco and La Ventilla show the social significance of cloth (Cabrera 1998; Barbour 1975; Goldsmith 2001; Manzanilla 2006a; Romero 2003). Such fine textiles were worn by elites who also exchanged them as gifts (Cowgill 2007a, p. 284).

Of Teotihuacan's craft specialties, the obsidian industry has attracted the most attention. Based on analyses of the Teotihuacan Mapping Project collections, Spence in a series of articles in the 1980s (e.g., 1981, 1989) developed a model of Teotihuacan's urban obsidian industry that involved independent household, local, and regional workshops, as well as state-administered precinct workshops (Table 2). Santley (1983, 1984; Santley et al. 1986; see also Sanders and Santley 1983) carried Spence's model further to argue that Teotihuacan attempted to monopolize obsidian production in Mesoamerica through discriminatory pricing and colonization. Clark (1986, 2003) strongly criticized the models because the unsystematic surface collections are not suitable for assessing the scale and intensity of obsidian manufacturing. He felt this led archaeologists to exaggerate the scale of Teotihuacan obsidian's industry. Subsequent replication experiments indicate that a relatively small number of knappers could have supplied the urban population and surrounding settlements (e.g., Andrews 2006; Moholy-Nagy 1990).

In the face of Clark's critique, Santley (Santley and Alexander 1992) modified his position as his own analyses showed that most obsidian tools at rural sites in the

Teotihuacan Valley were not made at urban workshops (Santley et al. 1995). Santley and Alexander (1992, 1996) suggest that Teotihuacan workshops produced obsidian tools primarily for urban consumers and for export to Teotihuacan's hinterlands and that the intensity of Teotihuacan's foreign trade in obsidian was less than Santley had previously supposed. Spence (1996a) argued that most obsidian objects from the Basin of Mexico in the Maya lowlands during the Early Classic were distributed as gifts and played only a minor role in the Teotihuacan obsidian industry, although such exchanges might have been important in sustaining economically valuable relationships (Spence 1996a, p. 35; White et al. 2001).

Important new research on the scale of obsidian consumption and manufacturing at Teotihuacan addresses Clark's critique. Andrews (2002) analyzed a concentration on the northeast edge of the city and confirmed Spence's (1986, p. 4) interpretation that knappers there imported macrocores to make prismatic cores and blades, projectile points, eccentrics, and bifacial and unifacial tools. Andrews characterizes the knappers as generalized specialists. He (2006) also examined the San Martín obsidian concentration that Spence had identified as a possible regional workshop and concluded that the specialists were not full-time, although they made a wide range of obsidian goods (Andrade and Arellano 2011).

Spence also interpreted a surface concentration of obsidian in the large-walled plaza attached to the west side of the Moon Pyramid as a state-administered workshop for making darts. Carballo's (2007b, 2011a) analyses support Spence's interpretation; the excavated concentrations represent episodic workshop dumps—similar to those at Tula (Healan 1992, p. 240)—from manufacturing military darts, bipointed knives, and eccentrics used in pyramid offerings. We now know that the Aztec practice of placing armories and weaponry workshops in temple precincts that outfitted elite military orders dates back to at least Teotihuacan times (Carballo 2011a; García-Des Lauriers 2008; Hassig 1988, p. 105).

Some surface concentrations identified by Spence represent loci where obsidian tools were consumed in large amounts in other manufacturing activities. Many blades were used, not manufactured, at Cosotlan 23 where figurines were made (Sullivan 2007). Similarly, in the Merchants' Barrio obsidian tools were used in some undetermined production involving hematite (Iceland 1989, p. 125).

Most obsidian at Teotihuacan came from the nearby Otumba (Barranca de los Estetes) source or the Pachuca source prized for its high-quality green obsidian. Limited geochemical studies have been done of obsidian from Teotihuacan (see Carballo 2012, p. 122), but they confirm attributions to these sources based on surface color. Preforms and tools were manufactured in Classic period-apartment compounds and camps at the Pachuca source for export to the city and elsewhere (Pastrana and Domínguez 2009).

When Millon designed the Teotihuacan Mapping Project in the 1960s, lithic studies had not yet incorporated replication experiments and analysis of reduction sequences (Healan 2002). Although the Mapping Project collections are not suitable to determine the scale and intensity of manufacturing, they successfully identified unusual obsidian concentrations. Cobean (2002, p. 199) thinks the problems with survey collections have been exaggerated and points out that the tons of obsidian imported along with Thin Orange and other nonlocal pottery suggest the existence

of distribution systems that transported substantial volumes of goods over great distances. The recent findings of dense subsurface deposits of obsidian debris at Teotihuacan and technological analyses bear out Cobean's point (Carballo 2011a, pp. 121–124). Both independent and state-administered workshops as Spence proposed were present. Ongoing investigations in the Tlajinga include excavations of residential obsidian workshops designed to collect data to model the scale of core-blade manufacturing (Carballo et al. 2014a).

Distribution Systems

The variety of urban craft workshops, wide distribution of goods and raw materials, size of the urban population, and scale of state institutions indicate the operation of multiple distribution systems, including commercial and marketplace exchange, administered trade, and some system of state finance/tax (Kurtz 1987; Murakami 2015). Identifying market systems requires configurational/locational, distributional, and contextual evidence (Hirth 1998). Research at Teotihuacan has focused more on context and distribution. No marketplace has been unequivocally identified at Teotihuacan. Millon (1992) thought the Great Compound held the central marketplace, but this has not been tested. Archaeologists have developed protocols at lowland Maya cities to identify marketplaces that could be applied at Teotihuacan (Chase and Chase 2014; Coronel et al. 2015).

Manzanilla (1997) previously doubted that marketplace exchange and tribute systems had developed at Teotihuacan and proposed a "temple-centered" redistribution model where priests controlled craft specialization and long-distance trade. Others counter that temple-centered redistribution alone could not have met the needs of a city as large as Teotihuacan (Blanton et al. 1993, pp. 212–213; Cowgill 2001b, p. 15; Kurtz 1987; Millon 1992, pp. 376–377; Sanders and Santley 1983; Spence 1987; Trigger 2003, pp. 374, 403). Compositional studies of ceramics indicate market exchange between regional centers in the Basin of Mexico, as well as with Teotihuacan (Clayton 2013; Nichols et al. 2013). Manzanilla (2009) argued that barrio centers organized as noble houses of intermediate elites perhaps *oikos* economies centered on patron–client relations. She suggests that the collapse of Teotihuacan triggered greater separation of the economy from the control of political elites, the growth of tributary states, and the development of marketplace exchange. Resolving debates about Teotihuacan's economy will require a multimethod approach, including expanded application of geochemical source studies, continuing technological and contextual studies of craft production, and an effort to identify marketplaces, even if such evidence is ambiguous (Chase and Chase 2014).

Teotihuacan was a primate city par excellence—leading archaeologists to presume that it's regional economy was highly centralized and politically dominated by the capital. Millon (1981, p. 221; also Sanders et al. 1979) saw exchange relations between Teotihuacan and its inner hinterland (the Basin of Mexico) organized as a solar market system with little horizontal flow of goods: "Administrative intervention in the exchange process may have been an important source of state revenues." Santley (1983, Santley and Alexander 1992, 1996; Santley et al. 1986) argued for a dendritic central place system. The initial

advantages of concentrating the Basin's population in the city, including farming households, outweighed the costs of underdeveloping some of its hinterlands, especially the southern Basin where rainfall is higher and maize farming less risky. Such a strategy would have facilitated direct state control over production while simplifying redistribution (Parsons 1991, p. 39). Even those who see marketplace exchange as one aspect of Teotihuacan's economy often think it existed in the context of strong political control.

Models of Teotihuacan's relations with its hinterlands, however, require more testing. Recent compositional studies show there were multiple ceramic-production zones in the Basin of Mexico that made Teotihuacan-style pottery. Azcapotzalco, the next largest regional center in the Basin, and Cerro Portezuelo, a minor center in the southeast Basin of Mexico, both manufactured pottery similar to that produced at Teotihuacan (Branstetter-Hardesty 1978; Clayton 2013; Ma 2003; Nichols et al. 2002, 2013). Portezuelo was first occupied in the Late Formative and likely was not founded by Teotihuacan (Clayton 2013; Nichols et al. 2013). Although exchange with Teotihuacan increased as the city expanded, Teotihuacan did not dominate Cerro Portezuelo's economy. Cerro Portezuelo also had important exchange relations with the western Basin of Mexico (likely with Azcapotzalco) and imported obsidian from Michoacán as well as Pachuca (Parry and Glascock 2013). The compositional data suggest the development of overlapping market networks within the Basin of Mexico and horizontal exchanges of ceramics between smaller centers. In the face of recent findings, we now must reconsider the dominance often attributed to Teotihuacan over the regional economy (e.g., Benitez 2008; Golitko and Feinman 2015, p. 221).

Stark et al. (1998) proposed that early states of the Classic period in Mesoamerica encouraged specialization and markets within their immediate domains but doubt that market exchange between independent polities was significant. For others (Blanton 1983; Blanton et al. 1993, pp. 210–214; Manzanilla 1997, Smith 2004, p. 93), specialists and entrepreneurs intensified market exchange and commerce across and within political boundaries when Teotihuacan and other regional Classic states collapsed. Trigger (2003) argued for the early development of markets in city-state systems. The many farmers who lived in cities created demand for goods, which encouraged craftworkers to make higher-quality goods available to all, not just for the government and upper classes (Trigger 2003, p. 403). On the other hand, Brumfiel and Earle (1987) linked the emergence of markets to elites and financing state economies. Teotihuacan significantly influenced but did not centrally control the regional economy, and current work is clarifying its commercial and tribute systems.

Households, Compounds, and Neighborhoods

The reorganization of Teotihuacan following the influx of people was an audacious effort to create a new sense of place within a structured political landscape (Smith 2003, p. 168). Between AD 200 and 300, the multifamily apartment compound replaced earlier types of urban residences. The apartment compound, unique to Teotihuacan, became "the most well defined integrated unit in the city's structure"

(Spence 2002, p. 54; also Millon 1976). Domestic rituals, the burial of ancestors in apartment compounds, shared occupations and ethnicities, and marriage and kinship ties connected the daily lives of people residing in the same compound and the apartment compound linked them to the Teotihuacan state (Manzanilla 2002a, b, 2004c; Manzanilla et al. 1999; Manzanilla and Serrano 1999). In reorganizing the city, the Teotihuacan state not only created something new but also drew on familiar village architecture that Angulo (2007, pp. 93–94) and Plunket and Uruñuela (2002a, b) link with lineage organization. Older forms include the three-temple complex and *talud* and *tablero* facades, "a symbolic divide between the underground quarters of the deceased" and their living descendants who occupy the surface (Plunket and Uruñuela 2005, p. 98). Angulo (2007) suggests that three-temple complexes served as chiefly civic and administrative centers and that early governance at Teotihuacan consisted of a coalition of chiefs.

Many think a corporate house model rather than lineages better characterizes the organization of apartment compounds, although the distinction between them perhaps has been overplayed (Cowgill 2008a, b; Manzanilla 2009; Watanabe 2004). The composition of apartment compounds shows some flexibility (Carballo 2011b, p. 154). They became a signature of urban life at Teotihuacan but apparently did not persist beyond the collapse of the Teotihuacan state. The 2,000+ apartment compounds in the city housed both rich and poor, nobles and commoners. They provided a standardized residential form but varied internally and expressed status, class, occupational, and ethnic differences between families within and between compounds in the city and hinterlands (Manzanilla 2006a, 2009; Millon 1976; Sanders 2008). Rural villages in the Teotihuacan Valley also were heterogeneous. Recent excavations near Acolman found Teotihuacan apartment compounds, but with dirt floors (also present at Tlajinga 33), while compounds were plastered in other rural villages (Charlton 2000; Charlton and Charlton 2007; Charlton et al. 2002, 2005). Moreover, not all Teotihuacanos lived in apartment compounds. An example of what Robertson (2008) calls "insubstantial structures" is Site 520, with houses built mostly of perishable materials (Cabrera-Cortés 2005).

Sanders and Evans (2005, p. 305) argue that such smaller households form a larger proportion of Teotihuacan residences than usually thought and that middle/intermediate class families occupied most apartment compounds in the city. If so, Teotihuacan had an unusually large intermediate class for a preindustrial city; Sanders and Evans (2006) speculate they controlled agricultural land in the Teotihuacan Valley cultivated by tenant farmers, many of whom were immigrants. Manzanilla (2009) also suspects patron–client relations were important in the economies of barrio centers. Craft specialization, the special political and religious role of the city, and the military also contributed to the growth of its intermediate class.

Apartment compounds of intermediate elites, such as Teopancazco, also housed servants, retainers, and specialists of lower status (Manzanilla 2006a, 2015). At Teopancazco, specialists made clothing, regalia, and jewelry for wealthy patrons. The La Ventilla barrio provides another view of intermediate elites (Cabrera 1998; Cabrera and Gómez 2008; Gómez 2000; Gómez and Núñez 1999).

Within a compound, each family occupied its own suite of rooms for cooking, dining, storage, and sleeping, as well as areas for conducting funerary rites and burying their dead. Patios were centers of household religious cults focused on patron or domestic deities (Manzanilla 2002a, b, 2009). The interdisciplinary approach developed by Manzanilla (2005a, 2015) and colleagues to identify activities in Teotihuacan apartment compounds offers a valuable model more generally for household archaeology. Along with work, kinship, and ethnicity, as shared experiences, rituals also fostered a corporate identity among compound members, reinforced their responsibilities to ancestors, and socialized the next generation (Barba and Manzanilla 2007; Manzanilla 2002a, b; Sempowski 1994, 1999). Some Teotihuacan state rituals had parallels and roots in household and compound practices. Termination rituals were not exclusive to state or public buildings but also were practiced when apartment compounds were remodeled or abandoned—this illustrates how leaders at Teotihuacan and in other early states appropriated household rituals, paraphernalia, and symbols (Carballo 2007a; Carballo and Pluckhahn 2007; Manzanilla 2002a, b, c; Plunket and Uruñuela 2002a, b).

Teotihuacanos marked their connection to their residences by burying some of their deceased members there (Cabrera 1999a, b; Cid and Torres 1999; Sempowski 1994, p. 30). Although burials associated with state buildings, such as the sacrificed warriors at the Feathered Serpent Pyramid, have received much attention, Teotihuacan burials and mortuary practices in residential contexts also have been the subject of important recent studies that provide a wealth of information about social relations, ethnicity, health and demography, and ritual practices (Brumfiel 1998; Cabrera 1999a, b; Clayton 2007, 2009, 2011; Gómez and Núñez 1999; Headrick 1999; Manzanilla 2002b, 2005c; Manzanilla and Serrano 1999; Storey 2006).

Status differences existed within as well as between apartment compounds (Cowgill 1997, p. 137–138; Manzanilla 2004b, 2009), even in compounds of relatively low status. Widmer and Storey (1993) think most statuses at Tlajinga 33 were linked to achievement. They attribute a reduction over time in burial offerings to a decline in the overall status of the apartment compound, possibly associated with a shift from lapidary working to making San Martín Orange pottery. They conjecture that mass production of standardized pottery provided less opportunity for individual status distinctions. Although males dominated higher statuses within Tlajinga 33, women held a considerable range of statuses; some were buried with impressive offerings (Storey and Widmer 1999).

Until recently, Teotihuacan studies had not contributed much to understanding gender relations in early states. Only a handful of articles on Teotihuacan focus on gender (Brumfiel 1998; De Lucia 2008; Clayton 2011; Hendon 1999; Joyce 2000; Sempowski 1994; Spence and Gamboa 1999; Spence et al. 2005). One reason is the limited depiction of individuals in Teotihuacan iconography, coupled with the absence of royal dynastic texts. Sempowski (1994, pp. 178–180) emphasizes differences between men and women in burial offerings especially in the richest graves. Others see less disparity, especially among groups within the city and between the city and hinterlands, even though there were gender differences in

mortuary rituals between groups (Clayton 2009, 2011). Brumfiel (1998) and De Lucia (2008) argue that social thought did not emphasize gender differences in Teotihuacan society. Brumfiel reasoned that the Teotihuacan state focused on lines of authority within apartment compounds, with heads of compounds serving as intermediaries between the state and households. Consistent with Teotihuacan's corporate emphasis and notions of collectivity, compound identity was often more important than marked expressions of individuality (De Lucia 2008).

Women buried at Tlailotlacan held high status within the Oaxaca Barrio, which Spence and Gamboa (1999) attribute to the especially important role they played in the biological and social reproduction of the Zapotec enclave as a minority community. Maintaining Zapotec mortuary practices in tombs provided greater opportunity for the expression and reinforcement of authority than Teotihuacan burials in simple individual pits (Spence and Gamboa 1999, p. 193). Women in the Merchants' Barrio also generally had high status perhaps linked with textile production (Spence et al. 2005, p. 179). Most women in the barrio were local, whereas most of the men were immigrants. Foreign traders married local women from prominent Teotihuacan families, and women enhanced their status by managing their family's affairs, including household rituals, when men were gone on extended trading expeditions. Clearly, Teotihuacan offers great potential to refine theories of gender relations and state formation; examining patterns of disease, health, and stress across gender, class, and ethnicity and between the city and its hinterlands are avenues deserving fuller exploration.

Immigration played an important role in the city's growth and its multiethnic composition, which included ethnic barrios. The well-known Oaxaca (Zapotec) Barrio and the Merchants' Barrio continue to be the subject of research (Croissier 2007; Gómez and Gazzola 2009; Rattray 2001, 2004, Spence 2002, 2005; Spence et al. 2004, 2005; White et al. 2000b, 2004a). We now have a much richer view of the city's ethnic complexity and immigration, including from western Mexico, Oaxaca, the Gulf Lowlands, and central Mexico (Gómez 2002; Manzanilla 2011, 2015; Michelet and Pereira 2009; Plunket and Uruñuela 2012; Price et al. 2000; Spence 2005; Spence et al. 2004, 2013; White et al. 2002, 2003, 2007). Gómez (2002; Gómez and Gazzola 2007, 2009) has identified a West Mexico barrio near the Zapotec barrio on the western periphery of Teotihuacan (White et al. 2004a). Taube (2003) discusses the Maya presence at Teotihuacan (Clayton 2005; Rattray 2005). Biogenetic studies (e.g., Álvarez-Sandoval 2014) have opened a new window on ancient migration and Teotihuacan's relationship with both its hinterlands and more distant areas; such immigration had economic, political, social, and demographic dimensions that have yet to be fully explored.

Within the urban heterogeneity of Teotihuacan, over time, neighborhoods became more homogeneous (Robertson 2001, 2005). Increasing residential segregation would have added to social tensions in the city, although wealth differences between apartment compounds were not greatly marked (Smith et al. 2014). Another source of tension is the contradiction between the multiethnic city, Teotihuacan's corporate ideology and strategy, and the growing importance of intermediate elites (Manzanilla 2006a).

Palaces and Governance

At the upper end of Teotihuacan's heterogeneous society were rulers whose palaces have been the subject of recent discussions (Cowgill 2003a, 2006; Evans 2006; Manzanilla et al. 2005; Sanders and Evans 2005). Early excavations often did not distinguish room functions, which complicate identifying palaces at Teotihuacan (Manzanilla 2004c, p. 141). The first candidates are the compounds that flank the north and south sides of the Feathered Serpent Pyramid inside the Ciudadela, both with very symmetrical plans (Cowgill 2007a; Sanders and Evans 2006). Their symmetry suggests some form of dual leadership, but Sanders and Evans (2006) express reservations about these buildings because their layout is not consistent with the range of activities—social, residential, and bureaucratic—found in a palace (also Cowgill 1983). Kowalski (1999) finds the absence of mural paintings in these buildings odd for a royal palace. Murals, however, were present in the early but not the latest stages of the buildings, consistent with a change in function (de la Fuente 1995). The termination of the Feathered Serpent Temple signaled a change in governance, and the royal palace shifted to the Avenue of the Dead Complex between the Ciudadela and Sun Pyramid, the second and clearest candidate for a Teotihuacan palace (Cowgill 2007a; Sanders and Evans 2006).

The 12-ha Avenue of the Dead complex created: "a city within a city, a little like the Forbidden City of Late Imperial Beijing" Cowgill (2007a, p. 290). It offers residential spaces and a multitude of facilities for other functions that are expected of a palace. The idea that the Temple of the Feathered Serpent was associated with an early cult of rulership at Teotihuacan has gained wide acceptance (Cabrera et al. 1991; Cowgill 1997, pp. 151–152; Millon 1992; Sugiyama 2002; 2004a, 2005). Following this line of reasoning, Cowgill (2007a, p. 290) and others (Sanders and Evans 2005, 2006, p. 267) see the move to the Avenue of the Dead complex as a rejection of a rulership cult and change to more depersonalized, corporate bureaucrats. This scenario is certainly plausible, although even in its early history, Teotihuacan rulers were never as personified as Classic Maya kings and queens. Hoopes (2005, p. 9) interjects a cautionary note with examples where corporate and network strategies would not be easily distinguished on the basis of archaeological remains.

The Xalla complex, a walled enclosure between the Sun and Moon Pyramids that includes 4.5 ha of plazas, platforms, and pyramids (López Luján et al. 2005b; Manzanilla and López Luján 2001), is a third candidate for a palace at Teotihuacan (Cowgill 2007a, pp. 290–291; Manzanilla 2006a, p. 34). It might have been the ruler's palace before the Ciudadela became the city's administrative center (Sanders and Evans 2006, p. 256). However, Xalla's construction began in Early Tlamimilolpa, a little later than the initial construction of the complexes flanking the Feather Serpent Pyramid. If so, then where did Teotihuacan's rulers reside in the early part of the city's history? Another possible palace, the Plaza de las Columnas, includes the tallest unexcavated buildings in the city and is under investigation by Saburo and Nawa Sugiyama.

Manzanilla (2006a) focuses on another aspect of Teotihuacan governance—intermediate elites and barrio centers. She sees formal barrio or neighborhood

divisions within the city as important; each barrio had its own central apartment compound occupied by intermediate elites that sponsored full-time specialists. Cowgill (2007a) is less sure about the significance of barrio organization. Manzanilla (2007, 2009) argues Teopancazco represents a barrio center. Excavations confirm that the compound supported attached/sponsored craft specialists (tailors) who made regalia and headdresses for priests and the military with imported materials from the Gulf Coast. Teopancazco even imported fish from the Gulf Coast (Galicia and Azúa 2013). She argues that powerful houses such as Teopancazco developed their own direct relations with other regions to obtain goods and raw materials, unmediated by state authorities or the Merchants' Barrio, which contributed to the fragmentation of Teotihuacan's corporate structure during the Xolalpan phase (Manzanilla 2009).

In an innovative approach to studying bureaucracy, Murakami (2015) calculated labor expenditures for construction of apartment compounds and major state buildings and analyzed the use of cut stone and lime plaster. Based on his labor calculations, some form of corvée labor must have developed at Teotihuacan. In Tlamimilolpa and Early Xolalpan, use of cut stone blocks was highly restricted to major public buildings, but by Late Xolalpan times intermediate-status compounds had the wealth and positioning to directly obtain such restricted materials. At the same time, the compositional variation in lime plaster increased markedly, suggesting wider access to the raw materials and production. Murakami (2010) argues that these changes reflect less central control of state bureaucracy. Increasing commerce also could have contributed to these trends.

Intermediate elites include military officials, and the late 20th century saw a growing recognition both theoretically and empirically of the importance of the military and sacrifice at Teotihuacan and warfare as a strategy of the Teotihuacan state (Cabrera 2002; Cabrera et al. 1991; Carballo 2011a; Cowgill 2003b; Headrick 2003, 2007; Stanton and Brown 2003; Sugiyama 2005; Sugiyama and López Luján 2006a; White et al. 2002). Spencer and Redmond (2004) argue that aggressive territorial expansion was a key element in the formation and development of the Teotihuacan state. To carry out conquests and maintain control of conquered areas requires both a powerful military and an effective administrative structure that tribute from conquered areas could have financed (Spencer and Redmond 2004, p. 194).

The Teotihuacan military likely formed ranked orders that Headrick (2007, p. 190) suggests were associated with temples as in Aztec times (Carballo 2011a; García-Des Lauriers 2008). She sees the Teotihuacan military as a unifying force that crosscut kin groups. The military also likely provided opportunities for upward mobility including for foreign-born persons, a pattern also seen in modern societies with large numbers of immigrants (Hassig 1992; Spence et al. 2004, pp. 12–13). Cowgill (1997, p. 145) cautions not to underestimate the motivational power of ideology.

Headrick argues that Teotihuacan governance involved a triad of a king and the military orders of bird and canine warriors. Others continue to think Teotihuacan governance was based on dual leadership (e.g., Manzanilla 2004c, p. 140; Sanders and Evans 2006). Cowgill (2007b) and Millon (1992) favor a single ruler, perhaps

selected by a council of leading families or other collective form of governance. Cowgill (2011) recently proposed that a ruler elected/chosen by a council, a Teotihuacan republic, replaced earlier hereditary rulers, a change consistent with collective action theory (Carballo et al. 2014b).

Pyramids, Politics, Religion, and Ideology

Politics and religion were intertwined in all early states; there has been so much recent research on this subject that the first Teotihuacan Mesa Redonda was devoted to ideology and politics (Ruiz 2002). Following the Feathered Serpent Project, archaeologists began new investigations around and inside the Moon Pyramid (Cabrera 2009; Cabrera and Sugiyama 2004, 2009; Spence and Pereira 2007; Sugiyama and Cabrera 2007) and the Sun Pyramid (Sugiyama and Sarabia 2011; N. Sugiyama et al. 2013). Gómez's (2013) ongoing excavations of the tunnel to the Feathered Serpent Pyramid inside the Ciudadela have drawn international attention (INAH 2014). These projects grew out of interests to better understand the nature of Teotihuacan rulership and ideology and the history of these massive buildings.

The Moon Pyramid was the first of the three great pyramids to be built. It was constructed in seven stages, with the fourth enlargement during the third century AD representing a ninefold increase in size that implies a substantial increase in political centralization (Sugiyama and Cabrera 2007, p. 123). The current urban grid system was established by this time. Four burial complexes, each with one or more sacrificial victims and wealth objects, have been excavated but none of them appears to be the tomb of a ruler. For Cowgill (2008a), this leaves open the question of whether Teotihuacan had a king or some other form of governance.

Burial 5 includes the highest-ranking grave yet found at Teotihuacan and the first from the top rather than the bottom of a pyramid. Sugiyama and López Luján (2007, p. 134) think the three individuals were very high-status foreigners, perhaps Maya rulers, warriors, merchants, or ambassadors, brought back to Teotihuacan as war captives (White et al. 2007). Such sacrifices were a statement of state military power and authority (Sugiyama and López Luján 2007, p. 142). Both wild and captive powerful carnivores also were sacrificed (N. Sugiyama 2013; N. Sugiyama et al. 2015; Valdez et al. 2010). Sacrifices in public buildings were part of ceremonies that commemorated important events (Cabrera and Serrano 1999). Perhaps the expansions of the Moon Pyramid were linked with inaugurations of rulers and/or major conquests?

Teotihuacan was a place of origins, the first Tollan (Carrasco et al. 2000b). The Sun Pyramid overlies an artificial cave and is associated with the Storm God, time, astronomy, the sun, and the Pleiades (Aveni 2000; Millon 1993, p. 35; Sload 2007; Sugiyama 2005; N. Sugiyama et al. 2013, p. 409). Because of these associations, Fash et al. (2009, p. 213) posit the pyramid's semi-detached platform, or *adosada,* as the site of New Fire ceremonies. The New Fire ceremonies were undertaken not only at the end of a 52-year cycle but when new cities, houses, and temples were founded and new authorities came to power. Thus, the Sun Pyramid was a place of investiture and pilgrimage.

The Feathered Serpent Pyramid was the last large temple added to the Street of the Dead ca. AD 200–250; its façade links the creation of a watery underworld with sacred warfare and sacrifice and authority and rulership (Sugiyama 2002, 2004a, b, 2005, Sugiyama et al. 2004). Dedication of this temple included offerings of elaborately sacrificed warriors, some of whom had lived at Teotihuacan since childhood, while others moved to Teotihuacan from elsewhere but resided in or around the city (White et al. 2002). Half the sacrificed warriors had lived in a foreign locale some time during their lives. Perhaps they were war captives. Cowgill (2008a) suggests from their attire that they were foreigners selected to be royal guards.

The central tomb of the Feathered Serpent Pyramid had been tunneled into and looted in Teotihuacan times (Cabrera 1999a, 2004; Cabrera and Cowgill 2002; Cabrera and Serrano 1999; Cowgill 1998, 2001a). Cowgill (1997) and Millon (1992, p. 396) think a Teotihuacan ruler was buried there. Sugiyama (2005) suggested the looted tomb was a multiple sacrificial burial and that the strongest candidate for a royal tomb is a burial, also looted, in front of the pyramid. Millon (1992, p. 396), on the other hand, speculated that it was the successor of the ruler who started the pyramid who was buried there. Although the question of a royal tomb in the Feathered Serpent Pyramid has yet to be resolved, these analyses offer new views of Teotihuacan's state ideology and new approaches to the archaeological analysis of public architecture (Cowgill 2000a).

Shortly after the Feathered Serpent Pyramid was built, it was desecrated and ritually terminated around AD 300, and the *adosada* was constructed. This series of events is now generally accepted, perhaps too uncritically, as evidence of a change to a more corporate form of rulership (Sugiyama et al. 2004; also Cabrera 2009; Cabrera and Cowgill 2002). Ritual ideology as expressed by the pyramid's architecture and offerings connected early political authority at Teotihuacan with creation of the watery underworld and sacred warfare and sacrifice.

Some scholars see the absence of depictions of Teotihuacan rulers as exceptional, while others link it with a corporate worldview in contrast to lowland Classic Maya kingdoms (e.g., Pasztory 1997). The lack of representations of rulers at Teotihuacan, however, is not unique for prehispanic central Mexico or other world regions, such as the Indus Valley. Alternatively, both Cowgill (1997) and Headrick (2007) think scholars have failed to recognize representations of Teotihuacan rulers. Headrick (2007, p. 96) proposes that imagery (much of it reconstructed) in the central portico of the White Patio at Atetelco, which Millon (1992, p. 369, 1993, p. 31) interpreted as a military ward, represents a king flanked by military orders. Pasztory (1997) argued that Teotihuacan avoided individual representations to promote integration and a utopian worldview. Cowgill (2008a, p. 968) counters, "Teotihuacan probably was not utopian in any sense of the word."

Headrick (2007, p. 19) offers a different perspective that parallels Marxian views of ideology: the unified worldview so promoted by the Teotihuacan state masked divisions within Teotihuacan society. She argues that competition between lineages or houses (Gillespie 2000) made it difficult for Teotihuacan's rulers "to establish incontestable dynasties; they forced them into a position of articulating their roles, more than their individual personhood" (Headrick 2007, p. 70). This is an important

insight, although I find Headrick's (2007) analogy to Islamic *jihad* misplaced because all early state warfare had ritual and religious dimensions (Webster 1998). She and Manzanilla (2006a; see also Cowgill 2007b) direct attention to divisions within Teotihuacan society obscured by the façade of its political ideology. The fact that Teotihuacan's rulers were powerful does not mean Teotihuacan society was devoid of factions and internal competition and tensions (Millon 1992, p. 340). Following the work of Paulinyi (2001), Florescano (2006b, p. 297) suggests that the lineage/faction associated with the tassled headdress and Tlaloc was the rival or successor to the Plumed Serpent lineage and that these lineages/factions competed for control of the city.

The reorganization of the city powerfully expressed Teotihuacan's place in the cosmos and the strength of its rulers (e.g., Cowgill 2002, 2007a; Morante López 2005; Sugiyama and Sarabia 2011; Šprajc 2000). It was an archetype of a cosmogram that later states followed (Florescano 2006b). Sugiyama (2010, 2012) sees evidence of a master plan that employed standardized units of measurement with cosmological significance, although Millon (1992) and Cowgill (2007a) think the city's layout developed gradually. The influx of people to Teotihuacan provided the labor and resources for this undertaking and a need to create a new expression of state and society. Teotihuacan offers an early example of Scott's (1998) state strategies of legibility that try to standardize and simplify local practices and the environment, to make societies more "legible" and governable. Teotihuacan counters Scott's (1998, p. 2) claim that early states were unable to devise such strategies (Barbour and Millon 2005; Nichols 2007). Smith (2003), Yoffee (2005), and Cowgill (2004) advocate seeing Teotihuacan and other early cities not simply as derivative of economic, political, or other developments, but as having been created to further the interests of powerful individuals and groups. The new state order at Teotihuacan forged new arrangements of both public and domestic spaces to create a new urban place. The large number of farmers and crafters living in ancient cities such as Teotihuacan also shaped early urbanism (Trigger 2003, p. 403).

Just as Formative period villagers propitiated forces of fertility, Teotihuacan's rulers aligned themselves with such forces so vital to an agrarian society (Evans and Nichols in press; N. Sugiyama et al. 2013). Pasztory (1997, pp. 84–94) argues that the so-called Great Goddess represented the principal deity of Teotihuacan and was associated with the Sun Pyramid, although Berlo (1992) linked the goddess with the Moon Pyramid. In the best known depiction in the Tetitla murals, water, seeds, and green stones flow forth from the hands. Recently, Paulinyi (2006) and Cowgill (1997, pp. 145–150, 2007b), have challenged the status of the goddess as a central state deity, its gender affiliation, and even whether the images represent a single deity.

Hinterlands and the Teotihuacan State

By the first century AD, Teotihuacan had unified the Basin of Mexico politically and become the capital of the Basin's first integrated regional system (Charlton and Nichols 1997, pp. 184–188; Millon 1981, pp. 221–222, 1988, p. 102, 1992, p. 344; Sanders et al. 1979, p. 114). Formative-period patterns of community interaction in

the Basin coupled with the early development of production specialization and reliance on irrigation foreshadowed subsequent collective action and, in the view of Drennan and Haller (2007), the centralization of the Teotihuacan system (Carballo et al. 2014b). The Teotihuacan state has been variously modeled as a city-state, a regional state, an amalgam of elements of both a city-state and a regional state, a hegemonic city-state, and an empire (Blanton et al. 1993, p. 135; Charlton and Nichols 1997, p. 184; Cowgill 1999, 2001b; Hassig 1992; Manzanilla 1999a; Trigger 2003, p. 97; Smith and Montiel 2001; Yoffee 1997). The varied characterizations attempt to account for the high degree of urbanism and unusual concentration of so much of the regional population in the city, along with the presence of regional centers and hinterland villages with Teotihuacan-style architecture and material culture to varying degrees and Teotihuacan's dynamic foreign interactions. One reason for these divergent interpretations is lack of knowledge about the governance of regional centers, even in Teotihuacan's own hinterlands.

The unprecedented relocation of most of the Basin's population, along with immigrants from other parts of central Mexico and beyond to Teotihuacan and the concentration of public building make Teotihuacan an exemplar of a primate center—a capital of what many see as a highly centralized regional system, economically, politically, and ideologically (Cowgill 2000b, pp. 263, 285, Cowgill 2001a, p. 725, 2001b, p. 14, 2003a, p. 38; Millon 1981, pp. 222–223; Sanders et al. 1979, p. 108). Soon afterward, the Basin was selectively resettled. Most archaeologists view the resettlement as a state-administered recolonization program. Sanders et al. (1979, p. 115) suggested they designed their strategy to break down former loyalties by avoiding previous centers and to maximize resource exploitation, although the agriculturally rich southeastern Basin remained only lightly occupied. Teotihuacan administered its immediate hinterlands either directly or indirectly through secondary centers such as Azcapotzalco (Millon 1981, p. 222). Primate systems typically impede the lateral flow of goods between regional centers and lead to the development of solar market systems. At the time this model was proposed, there were limited data from outside the northeastern Basin.

García (2002; García et al. 2005) directed excavations at Axotlan, a site near Cuauhtitlan in the northwestern Basin of Mexico that Sanders (Sanders and Gorenflo 2007; Sanders et al. 1979) designated a Teotihuacan administrative center because of the presence of Teotihuacan-style apartment compounds. Artifacts, architecture, rituals, and burial practices show close ties to Teotihuacan, probably because of its interest in the permanent irrigation sources of the area (Clayton 2007, 2013; García et al. 2005; Nichols 1980). Biogenetic analyses of burials would contribute to better understanding of the founding of Axotlan and other regional centers and their relationship to Teotihuacan. Unlike Axotlan, which was abandoned after the Tlamimilolpa phase, Cerro de la Estrella expanded considerably during the Epiclassic (Pérez 2004). Teotihuacan-style architecture and pottery, along with local ceramic types (Nichols et al. 2013; Parsons et al. 1982) also have been found at Huixtoco (Gamboa and Vélez 2005), another Tlamimilolpa phase settlement in the southeast Basin.

Cerro Portezuelo was a small Teotihuacan period center in the southeast Basin with occupations from the Late and Terminal Formative through the early colonial period. It subsequently became one of the largest Epiclassic centers in the Basin. In the 1950s, Brainerd found a buried Teotihuacan-period platform, along with burials, offerings and domestic artifacts. No residences, contemporary with Teotihuacan, however, were excavated, but poorly preserved Teotihuacan-style murals decorated the platform (Clayton 2013; Hicks 2013; Nichols et al. 2013; Nicholson and Hicks 1961). Most Teotihuacan-style pottery at the site was made in the southeast Basin, but Cerro Portezuelo also imported ceramics from Teotihuacan and the western Basin, probably from Azcapotzalco where composition studies indicate Teotihuacan-style pottery also was produced (Clayton 2013; García 2002, 2004; Ma 2003; Nichols et al. 2013). Cerro Portezuelo imported obsidian from Michoacán and Pachuca in the Teotihuacan period (Parry and Glasock 2013). Contrary to the solar market model, lateral exchanges of goods took place between secondary and small centers in the Basin. Cerro Portezuelo seems not to have been as closely connected with Teotihuacan as Axotlan, perhaps because of the political marginality of the southeast Basin, once part of Cuicuilco's domain, to the Teotihuacan state system (Nichols et al. 2013).

Teotihuacan-type apartment compounds have been found at rural sites in the Teotihuacan Valley (Charlton 2000; Charlton et al. 2002, 2005; Charlton and Charlton 2007; also Charlton 1987), along with evidence of local ceramic manufacturing (Boulanger et al. 2008). The rural compounds, however, did not all follow the Teotihuacan grid orientation, in contrast to the compounds at Axotlan, perhaps an indication of closer state involvement with administrative centers such as Axotlan. Occupants of rural sites and hinterland centers also were heterogeneous in wealth and status, although the variation was not as great as in the city (Charlton et al. 2005; Clayton 2009, 2013; Hicks 2013).

Findings from hinterland villages and centers reinforce Spence's (2005) point that we should not conflate politics and economics and not assume Teotihuacan politics was necessarily dominant, despite the city's position as a primate center. Craft production was not restricted to Teotihuacan; composition studies document multiple production zones in the Basin of Mexico for Teotihuacan-style ceramics, and Teotihuacan was not the sole supplier of obsidian. Goods moved between Teotihuacan and its hinterlands and vice versa, *and* goods also moved between smaller centers in the Basin indicating that market exchange did not follow a solar pattern. Subregional networks for ceramics perhaps developed as early as the Late-Terminal Formative (Nichols et al. 2013).

Urbanism creates rural hinterlands that cities everywhere draw on—for goods, resources, and people—and Teotihuacan was no exception. Teotihuacan had administrative centers in the Basin of Mexico, and people with close ties to the city occupied at least some of them (Clayton 2009, 2011, 2013). Although Teotihuacan attracted migrants as a political, administrative, pilgrimage, and economic center, most migration into the city probably was not directly controlled by the state. Spence's (2005) model of Zapotec enclaves in Early Classic central Mexico moves archaeological thinking away from state-centric views of migration, ethnogenesis, and early city-hinterland relations (Goldstein 2005). The flow of materials and

people from the hinterland to city is not automatic, and more attention should be paid to Teotihuacan's hinterlands. Disruption of such flows because of the growing power of hinterland centers and elites and social tensions within the city likely were important factors in Teotihuacan's collapse (Manzanilla 2009, 2011). Comparison of hinterland settlements would provide a fuller picture Teotihuacan society beyond the city and the organization of the Teotihuacan state. Attention to chronology is important to improve understanding the dynamics of its hinterland relations. Further compositional along with stylistic and morphological analyses of ceramics, obsidian, and other materials would provide new details of patterns of interaction. A very important future research program lies in comparative isotopic and genetic studies of burials from Teotihuacan's hinterlands.

Foreign Relations and Interregional Interactions

Teotihuacan's interregional relations continue to spark debate and have been the subject of recent books and articles (Gómez and Spence 2013). Teotihuacan was a multiethnic city. Rattray (2004, 2005) and Spence (1996b) discuss the Merchants' Barrio, an enclave or colony with connections to the Gulf Coast and also to the Maya region. Ruiz and Soto (2004) bring together papers dealing with the diverse interactions between the Gulf Coast and Teotihuacan (also Cowgill and Neff 2004; Daneels 2002). Arnold and Pool (2008) look at southern and central Veracruz (Arnold and Santley 2008; Santley and Arnold 2004, 2005; Stark 2008). The Zapotec enclave at Teotihuacan, where Croissier (2003, 2007) excavated a two-room Oaxaca-style temple built with Teotihuacan construction techniques, was part of a diaspora in central Mexico. Also, on the western periphery of the city was a barrio with ties to West Mexico (Michoacán) and Oaxaca (Gómez 1998, 2002; Gómez and Gazzola 2009; also Gamboa 1998).

Carballo and García-Des Lauriers (2008; also Brambila and Crespo 2002; Darras and Faugère 2007; David et al. 2007; Faugère 2007a, b) discuss early ties between Teotihuacan and the Basin of Mexico and areas to the north and west.Settlement reorganization in southern Querétaro and murals at the site of El Rosario suggest a direct Teotihuacan presence ca. AD 400 (Moreno 2012). Filini (2004; Filini and Cárdenas 2007) discusses trade relations between the Cuitzeo region of Michoacán and Teotihuacan.

Carballo and Pluckhahn (2007) provide new details of Teotihuacan's corridor through Tlaxcala to the east and south. Sugiura (2005, also Díaz 1998) examined how portions of the Valley of Toluca became part of Teotihuacan's outer hinterlands. Healan (2012) reviews Teotihuacan's expansion into the Tula region, along with Zapotec enclaves, and Teotihuacan's subsequent retraction, which reflected its growing difficulties with hinterlands. Teotihuacan incorporated cotton-producing areas of Morelos (Hirth 2000; Smith and Montiel 2001). Although Puebla contributed to the flow of immigrants to Teotihuacan, Teotihuacan apparently did not control Cholula or southern Puebla where Thin Orange ceramic workshops were located (Plunket and Uruñuela 1998; 2005; also Plunket and Blanco 1989; Rattray 1990).

Articles in Braswell's (2003a) volume present evidence and varied viewpoints about the nature of interactions between Teotihuacan and the Maya highlands and lowlands. Beyond replaying old themes, I see several important developments. The first is tighter definition of different types of influence and interactions. The second is application of new methods, such as compositional, isotopic, and DNA studies, to systematically assess interactions.

Maya scholars remain divided on whether Teotihuacan had a direct presence in the Maya highlands and lowlands. Most agree, however, that Teotihuacan did not significantly shape the long-term development of Maya kingdoms (Braswell 2003a, b, c; Fash and Fash 2000; Marcus 2003). Most authors in Braswell's volume disagree with the idea that Teotihuacan had a direct presence in the Maya region. Cowgill (2003b), however, sees the internalist–externalist dichotomy shifting in response to new evidence. Chronological refinements are another reason for the shifting views.

Cowgill (2003b) and Millon (1988) had been cautious about accepting evidence of direct Teotihuacan presence beyond its immediate borders, in part because of limited knowledge of the organization of the Teotihuacan state within its own hinterlands. Cowgill (2003b) also cautioned that the Teotihuacan state was not simply an early version of the Aztec empire. They doubted Santley's (1994; Santley and Alexander 1996; Santley and Arnold 2004, 2005; Santley et al. 1987) interpretation of a Teotihuacan colony at Matacapan. Spence (1996b) suggested Matacapan better fits a model of a terminal in a trade diaspora. Stoner and Pool (2015) argue that Matacapan's leaders employed central Mexican ideology to bolster loyalty of local subjects.

Kaminaljuyú in highland Guatemala has been interpreted as a Teotihuacan colony, a merchant colony, a port-of-trade, or a case of local emulation and international elite interactions (Sanders and Michels 1977; Wright et al. 2010). Braswell (2003c) finds data from Kaminaljuyú inconclusive. Recent isotopic studies of tomb burials identified skeletons of local children, but decapitated skulls and peripheral skeletons were mostly people from the Maya lowlands; two individuals were either from or traveled to central Mexico (Wright et al. 2010; also White et al. 2000a). This evidence indicates more intensive interaction between Kaminaljuyú and the Maya lowlands but also direct relations with central Mexico, most likely Teotihuacan.

Stuart's (2000) translation of texts referring to an "arrival of strangers from the west" in AD 378, which coincided with the disappearance of Tikal's king, refueled debate about a direct Teotihuacan presence in the southern lowlands and possible meddling in dynastic successions at Tikal and Copán. Stuart argues that the new king, Yax Nuun Ayiin, was of Teotihuacan descent, perhaps the son of a Teotihuacan ruler (Martin and Grube 2000, pp. 24–53). The founder, K'inich Yax K'uk' Mo', of Copán's dynasty, however, (Sharer 2001, 2003), most likely came from Caracol in the central lowlands, although he also might have journeyed to Teotihuacan (Buikstra et al. 2004; Chase and Chase 2011; Price et al. 2010; Stuart 2007). Many Mayanists see Teotihuacan influence as emulation by local rulers and elites (e.g., Borowicz 2003; Iglesias Ponce de León 2003; Laporte 2001, 2003; Wright 2005). Smith and Montiel (2001, p. 267) suggest that Maya elites adopted

Teotihuacan symbolism and perhaps undertook pilgrimages to the city to legitimize new dynasties, and in some cases, they formed alliances with Teotihuacan (also Estrada-Belli et al. 2006; Fash and Fash 2000; Fash et al. 2009).

Santley's (1983) notions of a Teotihuacan economic empire were exaggerated. Cowgill (2003b, pp. 315–316) is now convinced that for a brief time Teotihuacan or people closely connected to Teotihuacan interfered with the politics of Tikal and Copán and established a few colonial outposts (Hassig 1992; Manzanilla 2006a; Smith and Montiel 2001). Cowgill (2003b) sees Teotihuacan–Maya interactions as dynamic that began in first century AD, perhaps a century earlier, as mostly indirect. Relations of relative equality became more unequal as Teotihuacan sought trading partners, including those on the Gulf and Pacific Coasts. Cowgill detects a change in interactions ca. AD 350 that perhaps lasted for 100 or 150 years and involved direct interventions by Teotihuacan-related people backed by armed forces in selected places: Matacapan on the Gulf Coast, the Cerro Bernal district and Mirador in Chiapas, Montana/Los Chatos in coastal Guatemala and selected Maya centers, including Tikal, Copán, Kaminaljuyú, Río Azul, and perhaps elsewhere. The Azatemo stela depicting a Teotihuacan-style warrior suggests a military presence in Guerrero (Taube 2011, p. 104). Bove (2002; Bove and Medrano Busto 2003) sees evidence of a Teotihuacan colony at Montana. The absence of locally made Teotihuacan-style utilitarian pottery suggests to Cowgill (2003b) an incursion of soldiers or perhaps merchants from Teotihuacan. He doubts that Teotihuacan had sufficient resources to sustain an empire for very long. In fact, Teotihuacan's presence outside central Mexico was short-lived.

Teotihuacanos engaged in multiple kinds of interregional interactions depending on their internal politics, their strategic interests, and the foreigners with whom they engaged (Marcus 2003). Spence's (1996a, 2005) model of trade diasporas offers an alternative to state colonization that is not incompatible with direct paramilitary–merchant presence in other areas, as Cowgill (2003b) has suggested on the Pacific Coast (also García-Des Lauriers 2007). Other cases involved elite and diplomatic exchanges, pilgrimages, and trade and emulation (e.g., Marcus and Flannery 1996; Taube 2003, 2004; Winter et al. 1998; for coastal Oaxaca see Joyce 2003). Stoner and Pool (2015) reconceptualize the variable interactions between the Tuxtla's and Teotihuacan.

Over two decades ago, Stark (1990) laid out a series of alternative models of interregional interaction and their test criteria, including imperialism with direct or indirect administration, co-option of local elites, alliance, elite relations, patronage, prestige competition, and market exchange. Archaeologists have made headway in developing research designs to understand the "diverse mosaic" of Teotihuacan's interregional relations. Biogenetic and geochemical compositional analyses have become especially important when linked with contextual studies. We should consider this mosaic from multiple perspectives—local leaders and communities—as well as from Teotihuacan's viewpoint, and, as in Spence's diasporic model, bear in mind that interactions were not always directly or exclusively state controlled. Intermediate elites, merchants, craft specialists, and commoner migrants also forged interregional relationships.

Collapse

The collapse of ancient societies has garnered much public attention (e.g., Diamond 2005). Teotihuacan's foreign interactions began to retract ca. AD 450/500, and there is evidence of increasing political and economic problems in its outer hinterlands and in the Basin of Mexico as well (Cowgill 1977, p. 185, 2003b, 2012; Gazzola 2009b; Hirth 2000, p. 253; Hirth and Swezey 1976, p. 150; Mastache et al. 2002, p. 45; Millon 1988, p. 135; Pérez 2004; Sanders 2003, p. 196). The areas under Teotihuacan's direct control already had begun to shrink by the Metepec phase, and the population of the city itself was declining (Cowgill 1996, p. 327, 2006; Sanders 2003, p. 193). The fiery destruction and desecration of major buildings has been dated two centuries earlier than the older conventional date of AD 750 (Beramendi-Orosco et al. 2009). Resolving the dates of the destruction directly bears on understanding the city's collapse.

Teotihuacan's great size and the absence of nearby rivals during its early history contributed to its long period of dominance. Sociopolitical relations generally have been given more weight than environmental processes in explaining Teotihuacan's collapse because of the Basin of Mexico's capacity for agricultural intensification as seen in the Late Postclassic (Cowgill 2006). Manzanilla (2003), however, suggests that environmental degradation from deforestation, especially if combined with drought, made the city more vulnerable to external threats. Sanders (2003) disputed the idea that environmental degradation posed a serious problem, arguing that the city's collapse and declining population that was unable to maintain landscape modifications, such as terraces, precipitated degradation (Córdova and Parsons 1996). McClung de Tapia et al. (2003, 2005b) found evidence of increased erosion and deforestation, but it seems most correlated with the city's *early* rapid growth. On the other hand, the fact that following Teotihuacan's collapse, most Epiclassic centers in the Basin were in low-lying areas,near marshes and/or floodplains prompted Parsons (2006, pp. 73–74) to posit a possible role for "climatic change, environmental stress, and the changing importance of aquatic resources in the organizational collapse of Classic Teotihuacan."

Manzanilla (2003, see also Gazzola 2009b) also cites disruption of provisioning networks as groups on the periphery took advantage of Teotihuacan's weakening power. She explored sources of tensions within Teotihuacan including the multiethnic make up of the city and increasing challenges to Teotihuacan's corporate rulership by intermediary elites (Manzanilla 2007, 2015). Through innovative statistical analyses, Robertson (2001, 2005) documented how residential segregation increased in the city and this, too, would have heightened social tensions.

Despite initial advantages of its hyper-nucleation, Millon (1988, pp. 219–220) wondered if the inflexibility of Teotihuacan's rulers to explore other strategies led to underutilization of the rich agricultural resources of the southern Basin (Parsons et al. 1982) and contributed to the city's collapse. As a sign of Teotihuacan's difficulties, even with increased immigration, the number of Tlajinga 33's poor nonagricultural specialists declined. We do not know if the patterns at Tlajinga 33

were characteristic of other urban compounds. As the integrity of Teotihuacan as an economic and social power was severely compromised, rival polities exploited and profited from Teotihuacan's demographic problems (Storey 2006, pp. 293–294; also White et al. 2004b).

In addition to challenges from intermediate elites and tensions within the city, Hirth (2000; Hirth and Swezey 1976, p. 150) thinks Teotihuacan's problems began with "regionalization" of its hinterlands and growing power of regional elites who diverted resources from Teotihuacan's market network. Support for this view comes from Teotihuacan's retraction from the Tula area before the city collapsed. As another example, during the Teotihuacan period, Cerro Portezuelo imported obsidian from Michoacan and ceramics from the Western Basin, as well as from Teotihuacan (Healan 2012; Nichols et al. 2013). It still remains unclear if the growth of regional centers was a cause or effect of Teotihuacan's collapse (Cowgill 2006).

Millon (1988, p. 156) suspected people in the city burned and destroyed public buildings. Cowgill (1997, pp. 156–157) and López Luján et al. (2006, p. 32) favor neighboring polities possibly allied with Teotihuacan dissidents: those who destroyed Teotihuacan politically annihilated the rulers of the metropolis and ritually terminated all sources of supernatural power. They think people who lived at Teotihuacan would not have engaged in such destruction. Further understanding of Teotihuacan's collapse will require research projects focused at both Teotihuacan and hinterland settlements.

Epiclassic and Postclassic Teotihuacan

Teotihuacan's legacy persisted throughout the Postclassic, long after the destruction of its public buildings and state symbols and the loss of population. This collapse reshaped the landscape of central Mexico. Interest in cyclic or episodic aspects of state formation, fragmentation, collapse, and regeneration has risen in recent years (e.g., Charlton and Nichols 1997; Marcus 1998; Schwartz 2006; Yoffee 2005). Archaeologists have turned more attention to the Epiclassic in central Mexico, important for understanding both the collapse of the Teotihuacan state and the development of Postclassic city-states (Faugère 2007a; Manzanilla 2005c; Solar 2006a, b, c).

Epiclassic (AD 600/650–900)

Soon after buildings on the Street of the Dead were sacked and burned, the city's population dropped dramatically (Cowgill 1996). Rattray (2001, p. 435) suggests the city was briefly abandoned. The retracting Teotihuacan state system fragmented, and new polities were founded, which established the city-state as the dominant political form of the Postclassic (Charlton and Nichols 1997, pp. 190–194; Cowgill 1996, p. 329; Diehl 1989, p. 16; García 2004; Parsons 2006; Rattray 1996; Sanders et al. 1979, pp. 129–131). Exchange relations and production systems were restructured; the Pachuca obsidian source once dominated by Teotihuacan saw only

limited use during the Epiclassic (Carballo 2011a; Healan 1997; Pastrana 1998, pp. 240–254; Spence and Parsons 1972). Production of bifaces of Otumba obsidian continued in workshops at Teotihuacan, with some exports going to other Epiclassic settlements in the Basin of Mexico (Charlton and Spence 1983, pp. 64–65; García 1991, pp. 385–388; Nelson 2000, 2009; Rattray 1981, 1987, 1996). Construction of Teotihuacan-style apartment compounds ended. Blanton et al. (1996) see a shift from corporate to network strategies of political economy following Teotihuacan's collapse; there was a rejection of the ideology of the centralized regional state (Crider 2011). However, we know little about the form or structure of governance of Epiclassic polities in the Basin of Mexico.

Epiclassic, Coyotlatelco pottery at Teotihuacan is widely distributed, (Crider et al. 2007, p. 126; Gamboa 1999; Gómez and Cabrera 2006; Manzanilla 2005b; Manzanilla et al. 1996; Moragas 1998, 1999; Ortega 2005). We do not have an adequate understanding of this phase of Teotihuacan's history. Some Early Classic buildings were reused, including around and on the Sun Pyramid platform; squatters occupied some apartment compounds, while others resided in small, dispersed houses and caves behind the Sun Pyramid (Gómez and Cabrera 2006, pp. 222–233; Manzanilla and Arrellín 1999). Some individuals buried in the caves were foreign born and others lived their entire lives at Teotihuacan (Manzanilla et al. 1996).

Manzanilla (2005b, p. 263) suggested that northern migrants using Coyotlatelco Red-on-natural pottery began moving to Teotihuacan in Late Xolalpan times. Beekman and Christiansen (2003, pp. 144–145) also postulated that Coyotlatelco-using groups settled in the Basin of Mexico before Teotihuacan's collapse, as they did at Tula (Healan 2012; Hernández and Healan 2012). Archaeologists have done substantial research during the last decade on the painted Coyotlatelco decorative pottery style that first developed northwest of the Basin of Mexico (Beekman 2010a; Bonfil 2005; Brambila and Crespo 2005; Braniff 2005; Crider et al. 2007, pp. 127–129; García et al. 2006; Jiménez Betts 2007; López and Nicolás 2005; Manzanilla 2005b; Mastache and Cobean 1989; Migeon and Perreira 2007; Montoya 2008; Nelson and Crider 2005; Paredes 2005; Rattray 1998a, b, c). El Bajío is often cited as the source area; Hernández and Healan (2012) marshal clear evidence pointing in particular to the eastern bajío that had long-standing interactions with the Basin of Mexico (Beekman and Christensen 2003, 2011; Cowgill 2008a; Fournier 2006; Fournier and Bolaños 2007, pp. 504–505; Fournier et al. 2006).

Sugiura (2006) and Fournier and Bolaños (2007, pp. 510–511) conclude that the Basin of Mexico and Toluca were the core areas for the Coyotlatelco ceramic complex that incorporated both foreign and local elements. Sugiura points out if archaeologists focus only on the red-on-natural decorated pottery, then Coyotlatelco ceramics appear to be new and intrusive (see also Crider 2011). The hybridity view has gained traction, but not everyone agrees (Cowgill 2013).

The collapse of Teotihuacan prompted population shifts, but there is much debate about the scale of population movements and migration as a cause versus effect of Epiclassic culture change. Regional settlement data show a pattern of population dispersal from Teotihuacan leading to growth of some existing settlements and founding of new ones (Blanton et al. 1993, pp. 135–138; Charlton and Nichols

1997, pp. 190–194; Diehl 1989, p. 16; Gorenflo 2006; Parsons 2006; Sanders 2006; Sanders et al. 1979, pp. 129–137). In contrast, Cowgill (2013) and others (e.g., Beekman and Christensen 2003, pp. 144–145, 2011; Rattray 1996) argue that significant migration and ethnic replacement took place in the Epiclassic. Others take a more middle-ground position of migrants mixing with local populations (e.g., López and Nicolás 2005; Manzanilla (2005b). Hernández and Healan (2012) suggest small groups moved into the Basin from the north and west, perhaps including the northern Toluca Valley and Tula region, and coexisted with local populations. Beekman and Christensen (2011, p. 160) point out that the changes in material culture were not simply because local residents moved out of places such as the southern Mezquital (southern Hidalgo and Querétaro) but because of the collapse of "the symbolic capital of the visual corpus" of the Teotihuacan state and a desire to express a social identity not associated with a failed state. Biogenetic studies indicate significant population movement between the Classic and Postclassic, perhaps even more than with the rise of Aztec city-states (González-José et al. 2002). Increasing aridity is one factor behind migration from the Bajío (Beekman and Christensen 2011).

The degree of cultural continuity, or lack thereof, between Early Classic Teotihuacan and the Epiclassic is integral to this debate. The existence of a transitional ceramic phase in the Basin of Mexico has been debated for decades (Crider 2011, 2013; Crider et al. 2007; García 2004; Manzanilla and López 1998; Parsons and Sugiura 2012; Rattray 2001; Sanders 2006; Sugiura 2006). Sanders (1986, 2006, p. 185) even questioned the status of Metepec that Rattray (2001) defined as the final Teotihuacan phase. He proposed that an Early Epiclassic transitional phase, Oxtotipac, was the final phase of the city as a large population center. Recent comparative studies of Epiclassic and Early Postclassic pottery from central Mexico have advanced the ceramic phasing (Crider 2011, 2013; Fournier and Bolaños 2007; Fournier et al. 2006; García et al. 2006; Gaxiola 2006; Sugiura 2005). Crider (2011, pp. 166–170) convincingly differentiates an Early Epiclassic phase that precedes the appearance of Coyotlatelco decorated pottery. A distinctive Southern Basin Early Epiclassic pottery complex may partially overlap Metepec (see also García et al. 2006; Gaxiola 2006). If this transitional pottery complex were associated with migrants moving into caves behind the Sun Pyramid and at Oxtotipac, as Crider suggests, that would explain why such ceramics are not present everywhere at Teotihuacan. The Early Epiclassic pottery complex also signals a marked decline in ceramic exchange between subregions of the Basin of Mexico (Crider 2011, 2013; Nichols et al. 2013).

Despite Cowgill's (1996) downward population estimate, Teotihuacan still seems to have been among, if not the, largest Epiclassic settlement cluster in the Basin. Cyphers (2000) and Sanders (2006) interpret the distribution of the Coyotlatelco decorated pottery as evidence of Teotihuacan's continuing but reduced influenced in the Epiclassic. Other archaeologists doubt it was still so influential (Blanton et al. 1993, pp. 137–138).

The Epiclassic settlement clusters representing small polities or city-states can be differentiated from each other by unoccupied spaces between them and by local ceramic variation documented in the last decade (Crider 2011, 2013; Fournier and

Bolaños 2007; García 2004, pp. 351–354; Gaxiola 2006; López and Nicolás 2005; López et al. 2006; Parsons and Sugiura 2012; Sterpone 2004; Rattray 2006; Sugiura 2006; see also Cobean 1990, pp. 174–177). Interaction was most intense among adjoining settlement clusters in the Basin, a pattern consistent with Hirth's (2000, p. 247) argument that city-state confederations, which became so important in Postclassic politics, initially developed during the Epiclassic, perhaps for self-defense in the fragmented and volatile environment of Teotihuacan's collapse (García 2004, p. 353; Nichols et al. 2006, 2013; Parsons 2006; Plunket and Uruñuela 2005; Rattray 2006).

The weakening of state power after the Classic period is widely viewed as a catalyst for increased market exchange and commercialization during the Postclassic. With results from Crider's (2011) research and the recent Cerro Portezuelo project (Crider 2013; Nichols et al. 2013), there now is substantial neutron activation analysis (NAA) data for the Epiclassic. Despite the widespread Coyotlatelco decorated style, there was very limited exchange of pottery between subregions of the Basin of Mexico during the Epiclassic (Crider 2013; Crider et al. 2007; Nichols et al. 2002, 2013). Pottery was made at Teotihuacan, and minor amounts were exported, but nothing on the scale of Early Classic ceramic production (Gómez and Cabrera 2006; Rattray 2006). The composition data are consistent with solar markets; the movement of pottery between settlement clusters and subregions of the Basin was the *lowest* of any time during the Classic or Postclassic. A retraction in ceramic exchange followed the collapse of Teotihuacan as potters left the city, also perhaps because of competition and hostilities between Epiclassic polities. At the same time, obsidian imports from Michoacán increased.

Postclassic

During the Early Postclassic (AD 900–1150), the Teotihuacan Valley comprised a single state centered at Teotihuacan (Sanders 1986, p. 525). Cowgill (1996) estimates its Early Postclassic population at 30,000, although it might have been lower (ca. 20,000). Sanders (1986) divided the Early Postclassic in the Teotihuacan Valley into two subphases, with the distinctive Mazapan/Mazapa wavy-line red-on-natural pottery diagnostic of the first subphase. López and Nicolás (2005, p. 285; López 2009) place its origins in the Teotihuacan Valley, but incorporating influences from the Bajío (Manzanilla 2005b). Crider (2011) identified a variant of Mazapan Wavy-line that was made at Teotihuacan. Sanders recognized a second, Atlatongo subphase characterized by local imitations of Tula decorated pottery that marked the incorporation of the Teotihuacan Valley into Tula's sphere. Smith and Montiel (2001) questioned the idea of Toltec imperialism and even its regional influence in the Basin of Mexico, but this was prior to Crider's (2011, 2013) study of Early Postclassic ceramics and compositional analyses (Crider et al. 2007, Nichols et al. 2013).

Although Aztec claims of Toltec grandeur were exaggerated, Tula's interactions with Teotihuacan were significant during the Early Postclassic (Crider 2011; Nichols 2013b). Teotihuacan was a historically important and venerable place to Tula. Mastache et al. (2009) characterize Tula's evocation of Teotihuacan, as "neo-

Teotihuacanism." Crider (2011) has greatly clarified Early Postclassic pottery complexes at Teotihuacan and worked out the concordance with Tula. There are, however, important regional differences in the early phase, Mazapan complex; for example, sloppy red/natural pottery is distinctive to Teotihuacan and the northeastern Basin where it was produced. Mazapan wavy-line is now known to have a wider distribution, but Crider has linked local variants to different composition groups, one of which was centered at Teotihuacan (Bey 1986, p. 210; Crider 2011, pp. 291–300, 2013).

There are clear affinities between the Mazapan and Atlatongo–Tollan pottery complexes at Teotihuacan and Tula ceramics, including imports from the Tula region. With Tula's expansion, the Pachuca obsidian source was again intensively mined and exported to the Teotihuacan Valley (Domínguez and Pastrana 2006). A dramatic decrease in Late Tollan cream slip pottery at Teotihuacan and other sites suggests that Tula's influence and control beyond the northwest corner of the Basin waned before the end of the Early Postclassic (Crider 2011, p. 399). Despite an increase in commerce, strong political/ethnic barriers or other differences restricted exchanges of ceramics between sites with Aztec I pottery and sites such as Teotihuacan with Mazapan–Tollan ceramics (García 2004, fig. 3.2, also Brumfiel 2005; Brumfiel and Hodge 1996; Crider 2011; Crider et al. 2007; Nichols et al. 2002, 2013; Parsons et al. 1996; Parsons and Gorenflo in press).

We do not know much about the organization of Teotihuacan in the Early Postclassic. People continued to live in caves behind the Sun Pyramid, including both local and foreign-born individuals (Manzanilla et al. 1996; Nicolás 2003). Cowgill (1996, p. 330) estimates an Early Postclassic population of 30,000 people in the area encompassed by the Teotihuacan Mapping Project. Sanders and Murdy (1987) think the population was smaller, 5,000 to 10,000, about the size of the Late Postclassic Aztec town. The largest area of settlement is Las Palmas, east of the Sun Pyramid (Elson and Mowbray 2005; Linné 2003b).

Aztec Teotihuacan: *Altepetl* and Town

As Tula's influence retracted, the Middle Postclassic was a time of political fragmentation in the Basin; some Aztec city-states can be traced back to AD 1150–1250. The Early Postclassic state centered at Teotihuacan broke into small city-states (Nichols 2013b). The Teotihuacan Mapping Project surveyed the area of Late Postclassic Teotihuacan (Evans and Sanders 2000; Sanders and Evans 2000, 2001a), although Sanders' crews only examined the center of the town (La Villa) and two of its attached barrios (Evans et al. 2000, p. 236). Modern and colonial occupation, along with the dense remains of the Early Classic city, obscures the Aztec town (Ortega 2005). The 20-km^2 area of Early Classic Teotihuacan includes an extensive Aztec occupation comparable to the modern and early colonial settlements (Evans et al. 2000, p. 235).

By the Middle Postclassic (AD 1150–1350), Teotihuacan was the capital of a small city-state with its own ruler. Azcapotzalco briefly interrupted Teotihuacan's royal line when it conquered the town in 1420, but the famous Acolhua ruler, Nezahuacoyotl, reestablished the royal line in 1428, and through intermarriage

Teotihuacan's ruling dynasty became linked with Texcoco (Ixtlixóchitl 1985; also Sanders and Evans 2001b, p. 906). Evans et al. (2000, p. 253) estimate the Late Postclassic town had a population of at least 7,000–8,000 to 12,000–15,000 people. In addition to being an administrative and religious center, Teotihuacan held a weekly market and both obsidian and ceramics were produced in the town (Spence 1985). It lay at the head of a permanent irrigation system extending from the springs at Teotihuacan to the shore of Lake Texcoco, watering about 5,800 ha in 1519 (Sanders 1976; Sanders et al. 1979).

Garraty (1998, 2000, 2006a, b) studied Aztec ceramics from Teotihuacan and found a continuous distribution of household wealth, with elites distributed over all parts of the Teotihuacan Mapping Project survey area that includes a possible Aztec palace. He initially interpreted this as supporting Lockhart's (1992) modular model of *altepetl* organization. It would be useful to combine Sanders' survey data and the Teotihuacan Mapping Project data for a fuller test of the model (Garraty 2000, p. 336). Based on his analysis, Garraty (2006a, p. 373) thinks the urban center during the Middle Postclassic was located southeast of the Ciudadela and that Teotihuacan's shifting political affiliations prompted moving the town center to its present location. Teotihuacan paid tribute to both Texcoco and Tenochtitlan (Nutall 1926, p. 68).

Building on Hodge et al. (1992, 1993; Minc et al. 1994), recent stylistic and composition studies of Aztec ceramics provide valuable new data on production, distribution, and the Aztec political economy of the Teotihuacan Valley (e.g., Charlton et al. 2007; Garraty 2006b; Neff and Glascock 2000; Neff et al. 2000; Nichols 2013a, b; Nichols et al. 2002, 2009, 2013; Nichols and Charlton 2002; Plunket et al. 2005; Rodríguez et al. 2009). Garraty (2006b) found that most Aztec plain ware pottery at Teotihuacan was made in the local composition group, with some imports from the Texcoco region and minor amounts from the southeast Basin, consistent with a pattern of overlapping markets. By the Late Postclassic (AD 1350–1521), Teotihuacan had become incorporated into a northern Acolhua exchange sphere in which it was one of two head administrative centers in the Teotihuacan Valley; the other was nearby Otumba (Carrasco 1999, pp. 265–266; Charlton et al. 2000; Garraty 2006b, p. 177; Minc 2006; Nichols and Charlton 1996). The Late Postclassic saw increasing imports of Aztec III Black-on-orange pottery, especially from the Tenochtitlan composition group to the Teotihuacan Valley, a shift linked to the development of a hierarchical regional market network and Aztec imperialism. Canoes transported goods across Lake Texcoco to Chiconautla at the mouth of the Teotihuacan Valley; from there they were carried inland to Teotihuacan and other market centers (Hassig 1985; Nichols et al. 2009). Teotihuacan also lay on an important trade route to the Gulf Coast. Obsidian core-blade workshops were dispersed at Teotihuacan and associated with both elite and commoner residences (Spence 1985). A workshop near the Late Postclassic town center had the highest ranking of elite pottery in Garraty's (2006b) study, and he suggests it might have been associated with merchants.

Otumba surpassed Teotihuacan as the largest *altepetl* in area in the Teotihuacan Valley during the Late Postclassic, and its capital town became an important manufacturing center with a resident enclave of *pochteca* (long-distance merchants)

(Nichols 2013a). Blanton (1996) argues that Texcoco encouraged Otumba's growth because Teotihuacan's great historical legacy made it a potential rival. Also, by the Late Postclassic, the Otumba obsidian source no longer was in Teotihuacan's domain.

Late Postclassic Teotihuacan was not exceptional in size or organization but remained a very important religious and historical center (Boone 2000). Maps from the sixteenth century record the location of Teotihuacan's great pyramids and refer to them as the oracle of Moctezuma (Webmoor 2007). The Aztec ruler Moctezuma is claimed to have made a pilgrimage every 20 days to the oracle, the Mexica god of war, Huitzilopochtili (Boone 2000, pp. 386–387; Kubler 1982, p. 45; Nuttall 1926, p. 68). The Mazapan Map labels the Ciudadela "place of burials in honor of the sun" (Boone 2000, p. 373).

Teotihuacan held special importance as an ancient place of history. Carrasco et al. (2000a) devoted a volume to Teotihuacan's Postclassic legacy as the first Tollan (Boone 2000; López Austin and López Luján 2000; Nichols 2013b). It was the place of creation for the Fifth Sun and, according to Taube (2000a), represents the "creed" that supporting the sun required the active participation of people, especially warriors. In their migration account, the Mexica associate themselves with the Toltecs of Culhuacan and thus acquired a prestigious ancestry linked to Teotihuacan (Heyden 2000). Mexicas copied Teotihuacan sculpture and architecture, concepts of urban planning, and excavated at Teotihuacan for antiquities they incorporated as offerings at the Templo Mayor (Carrasco et al. 2000a; also Fash et al. 2009; Umberger 1996, pp. 89–90). People at the Postclassic Otomí capital of Xaltocan, in the northwestern Basin of Mexico, collected and curated Early Classic figurines from Teotihuacan, as did people at Postclassic Teotihuacan (Brumfiel 2005; Manzanilla et al. 1996; Overholtzer and Stoner 2011). Although a rejection of Teotihuacan state symbols followed the destruction of the Early Classic city, later peoples, from commoners to rulers, sought historical connections with Teotihuacan giving rise to antiquarianism. Teotihuacan played a key role in the historical validation of Mexica imperialism and other Postclassic states (Boone 2000; Nichols 2013b; Umberger 1987, 1996). As Orozco vividly depicted in his famous mural, Teotihuacan's pyramids continue to link the past, archaeology, and nation building (Fash 2013).

Nicholson (2000) and Sugiyama (2000) trace the origins of the Aztec feathered serpent to Teotihuacan; "it offers one of the most notable examples of the Aztec ability to synthesize and express the complex iconographic and ideological traditions it inherited from earlier civilizations" (Nicholson 2000, p. 160). Teotihuacan's feathered serpent image is a widely recognized symbol of modern Mexico.

Teotihuacan and New Spain

Charlton (2007) helped launch modern historical archaeology in central Mexico with his research in the Teotihuacan Valley. Sanders et al. (2001, pp. 906–917) provide a recent summary of the political geography of the *cacicazgo* of Teotihuacan during the colonial period. The Mazapan maps made by native map

makers document changes and continuities at Teotihuacan during the 16th century—depicting the pyramid ruins, a nopal cactus field, a possible ballcourt, Catholic churches and shrines, Spaniards, and Nahuas (Kubler 1982, pp. 50–51). Münch (1976) traced a three-century history of the Teotihuacan royal family after the conquest. Drawing on Munch's work, Sanders and Price (2003; Sanders et al. 2001) discuss how the descendants of Teotihuacan's prehispanic rulers *expanded* their landholdings after the Spanish conquest and retained palace estates and private holdings into the 1820s. They continued the Aztec practice of marrying politically powerful families. Also important was their proximity to markets and Mexico City, the production of such cash crops as wheat, maguey, and barley, and later their shift to renting lands to Spaniards (Sanders et al. 2001, p. 917). During the mid-1800s, family members divided the landholdings, and by 1917, the descendants of Teotihuacan's royal line were peasants who owned little or no land (Gamio 1922).

Sanders et al. (2001, p. 917) discussion of the *cacicazgo* of Teotihuacan closes with observations about the intense competition for Indian lands and labor among Indian elites, the Spanish crown, the Catholic Church, and Spanish entrepreneurs that lasted for three centuries. The first to lose was the Indian aristocracy, followed by the Spanish state after the War of Independence, and the church a few decades later. *Criollo* entrepreneurs held their position until the Agrarian Revolution in the twentieth century. Because the Teotihuacan Valley retained more of its rural landscape than other parts of the Basin of Mexico in the mid-twentieth century, Teotihuacan's extensive remains were accessible to modern archaeology.

Not the Final Word

Teotihuacan was a place of historical importance to the Aztecs, and its legacy continues to shape conceptualizations and expressions of history. Yet scholars strongly disagree about what languages were spoken at Early Classic Teotihuacan. Not everyone agrees that Teotihuacan even possessed a writing system (Colas 2011, pp. 13–15). I find it difficult to think that a city the size of Teotihuacan with its complex regional and foreign interactions, including with other contemporary literate civilizations, never developed a writing system. Cabrera (2000) argues that glyphs found on the patio floor of an apartment compound in the La Ventilla barrio were part of a writing system ancestral to Postclassic central Mexican codices. For Taube (2000b, 2001), Teotihuacan was the canonical source of Postclassic Nahuatl culture (see also Browder 2005). Glyphs include dates in the 260-day calendar, toponyms, and what Taube (2011) calls emblematic glyphs that may represent titles and personal names. He argues that writing developed during the period of Teotihuacan's explosive growth.

Cowgill (1992, 1999) argues that glyphic correspondences do not necessarily mean that a Nahua language was spoken at Teotihuacan before the Epiclassic. Florescano (2006a, p. 15), a historian, thinks that Teotihuacanos spoke an ancient Nahua language. Hill (2001, 2010, 2011a, b), a linguist influenced by Bellwood (2001), proposes that the spread of proto-Uto Azteca speakers took place early as part of a northward expansion of farming groups from central Mexico. She cites

Dakin and Wichmann's (2000) interpretation of the word for *cacao* (chocolate) used in Classic Maya inscriptions as borrowed, likely from Teotihuacan. Kaufman and Justeson (2007), however, dispute their interpretation and instead argue that Teotihuacan elites spoke a language from the Mixe-Zoquean family. If correct, then Cowgill (2013) places the movement of Nahuatl speakers into Teotihuacan shortly before it's collapse AD 550–650. A consensus on this question has not been reached. "Totonakan, Nawan, and a now extinct form of Mixe-Zoquean seem likely candidates for languages originally spoken at Teotihuacan… the Early Classic texts at Teotihuacan recorded one or several languages" (Nielsen and Helmke 2011, p. 348; see also Beekman 2010b). Nielsen and Helmke argue that glyphs on the floor of the Plaza de los Glifos in the La Ventilla barrio are not toponyms but are related to curing rituals and disease-causing agents. The final word has yet to be written on Teotihuacan's languages and writing system.

Concluding Thoughts

Teotihuacan continues to have great importance. The archaeological zone attracts 4 million visitors each year, and UNESCO designated Teotihuacan a World Heritage Site (Kruetzer 2006; Manzanilla 2006b; Webmoor 2005). The richness of Teotihuacan studies stems from the importance of the ancient city and state, its legacy, and broad comparative and innovative scholarship. Current research at Teotihuacan crosses disciplines from physics to art history. Today, archaeology contains diverse theoretical perspectives with strands of both modernism and postmodernism, processual, "processual-plus" (Hegmon 2003), and post-processual archaeology and culture history, all reflected in research on Teotihuacan. Such theoretical pragmatism and pluralism is necessary to explain such complex social phenomena (Gándara 2012). There is a risk, however, especially in the face of a proliferation of journals and edited volumes, that each approach only engages its own terms of reference and not opposing viewpoints. As intense as some debates about Teotihuacan became in the late twentieth century, they also prompted much research.

Following broader trends in social theory, agency and practice have become central conceptual frameworks, opening the door to approaches with a subject-centered and system-centered focus (Nichols and Pool 2012). Blanton and Fargher (2008) and Carballo et al. (2014b) have drawn attention to the explanatory potential of collective action theory for Teotihuacan. Much exciting recent work at Teotihuacan engages the intersection of the natural and social sciences (e.g., Smith et al. 2012), while interests in ideology, ritual authority, cognitive archaeology, and materiality track across the boundary of the social sciences and more humanistic and interpretive approaches (Pasztory 2005). Social forces also shape Teotihuacan archaeology and scholarship (Kelly 2011; Webmoor 2005). Crosscutting different theoretical perspectives continues to be a strong commitment to empirical research; perhaps the sheer size of the ancient city grounds its modern scholars.

Research on Teotihuacan has contributed to the development of new methods for studying ancient urbanism, including statistical analyses of neighborhoods, residue

studies of floors, use of energetics to study bureaucracy, isotopic and aDNA analyses, and deploying robots, drones, and magnetometers (e.g., Barba 2005; Feder 2004; INAH 2014; McClung de Tapia and Barba 2011; Murakami 2015; Pecci et al. 2012; Price et al. 2008; Robertson 2001). The findings question widely held assumptions about early cities and deep human history. This large, complex, multiethnic city was built and managed using human labor and stone tools, which flies in the face of "stone age" stereotypes (Smith et al. 2012).

The greatest challenge to further advance understanding Teotihuacan is the rapid pace of development in central Mexico without commensurate increases in resources for archaeology; this is a problem worldwide. The controversy over building a Wal-Mart store in San Juan Teotihuacán highlights the difficult challenges of cultural heritage preservation and management in the face of rapid growth (McKinley 2004; *New York Times* 2012). Little did anyone in the mid-twentieth century anticipate the rate of site destruction in the Basin of Mexico during the last half-century.

Teotihuacan cannot be understood in isolation, and it exemplifies the value of multiscalar studies making research in its hinterlands important (Smith et al. 2012). Wider application of new remote-sensing methods will aid in detection and mapping subsurface remains both in the city and its hinterlands. Chronology is still very important and should include investigations on the Formative period and the city's early history and the Epiclassic and Early Postclassic (Brambila and Cabrera 1998b). Household archaeology will continue to be a priority to capture the heterogeneity of Teotihuacan society and contribute to comparative studies (Carballo 2011b). Older collections will become even more valuable, increasing the challenges for long-term storage. Electronic databases and publishing will transform the dissemination of research about Teotihuacan and almost certainly facilitate new research methods and directions.

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