4

Why Is Aztec II Black-on-Orange Pottery So Scarce in the Zumpango Region?

A Regional Perspective from the Basin of Mexico on Tula's Collapse and Its Aftermath

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INTRODUCTION

In this chapter, we consider how Early and Middle Postclassic settlement patterning and ceramic distributions in the Basin of Mexico illuminate Tula's collapse in the twelfth century CE and the impact of that collapse on subsequent developments within and around the Basin. Specifically, we focus on the absence of Aztec II Black-on-Orange (B/O) pottery in the far northwestern Basin (the Zumpango region), an area where both Tollan-phase Red-on-Buff and Aztec III B/O ceramics were abundant in the preceding Early Postclassic and subsequent Late Postclassic periods, respectively (see figure 4.1). These questions emerged from the seminal 1979 volume (Sanders et al. 1979) but remain inadequately studied, despite their implications for the sociocultural evolution of the Basin and surrounding regions in highland Mesoamerica.

BACKGROUND

Sanders, Parsons, and Santley (1979) reported that their regional surveys had detected large-scale depopulation during the Middle Postclassic (Early Aztec)

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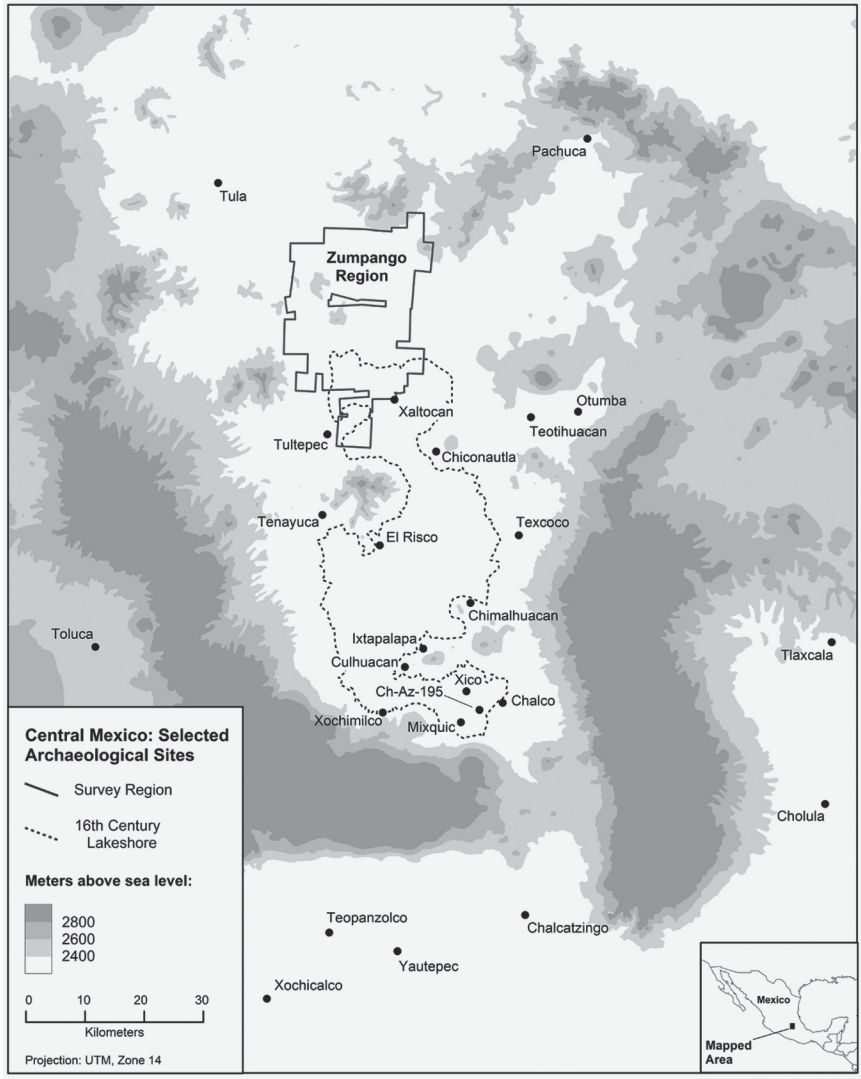


FIGURE 4.1. *Map of Central Mexico, showing principal localities and places mentioned in the text.*

in the Zumpango region (see table 4.1, figure 4.2a). They concluded that this massive loss of population was linked to the turmoil that accompanied the collapse of Tula in the twelfth century. Nevertheless, Parsons (2008) remained uncomfortable with the idea that there could have been such a massive demographic decline in a region that had apparently been so densely inhabited during both the preceding Early Postclassic (see figure 4.2b) and the subsequent Late Postclassic (see figure 4.2c).

Parsons's skepticism concerns the definition of the Late Toltec and Early Aztec phases, which depend heavily on the occurrence of three diagnostic ceramic types with imprecise distributions in space and time throughout the Basin of Mexico: Mazapan Red/Buff (Early Postclassic/Late Toltec, similar to Tollan phase Red/Buff defined at Tula), and Aztec I B/O and Aztec II B/O (lumped together in the Basin surveys to define Middle Postclassic/Early Aztec). Archaeologists defined these ceramic categories in the southern and central Basin during the early and mid-twentieth century (Boas and Gamio 1921; Brenner 1931; Franco 1945, 1949; Franco and Peterson 1957; Griffin and Espejo 1947, 1950; Noguera 1935; Vaillant 1938) and at Tula (Acosta 1940, 1941, 1944, 1945).

TABLE 4.1. Basin of Mexico Epiclassic and Postclassic chronology

600

Years CE	*Major Period*	*Phase*
1520	Late Postclassic/ Late Aztec	Aztec III (Late Aztec)
1400	Middle Postclassic/ Early Aztec	Aztec II-III (?) Aztec II Aztec I (?)
1200	Early Postclassic/ Late Toltec	Aztec I (Early Aztec) Mazapan-Tollan (Late Toltec)
900		Coyotlatelco
600	Epiclassic/Early Toltec	

Some of these early investigators felt there was some degree of chronological overlap and spatial separation between Mazapan and Aztec I, but their views remained suggestive rather than definitive. Based on his work at Tula, Acosta (1952) felt that the chronological relationships between Culhuacan (Aztec I) B/O and Tenayuca (Aztec II) B/O (as defined by Griffin and Espejo 1947, 1950) were unclear. Vaillant (1938) conducted a definitive study of the relationships between these ceramic types based on his excavations at Chiconautla (see figure 4.1) and other Postclassic sites, but never published results of this study.

Studies during subsequent decades (e.g., Mayer-Oakes 1959; Müller 1952; O'Neill 1962; Parsons 1966, 1971; Parsons, Brumfiel, Parsons, and Wilson 1982; Sanders 1965, 1986; Séjourné 1970, 1983; Tolstoy 1958) refined our understanding of these ceramics within the Basin of Mexico and at nearby Tula (Cobean 1978, 1990). Mayer-Oakes's (1959) pioneering stratigraphic excavations at El Risco in the west-central Basin were especially important for determining chronological relationships between Mazapan Red/Buff, Aztec I B/O, and Aztec II B/O. At El Risco, Mayer-Oakes found Mazapan Red/Buff and Aztec I B/O ceramics co-occurring in levels stratigraphically below those with Aztec II B/O pottery. Tolstoy's (1958) seriation of surface collections from the northern Basin suggested a partial chronological overlap between Aztec I and Aztec II B/O. O'Neill's (1962) deep stratigraphic excavations at Chalco, and Séjourné's (1970) at Culhuacan, also indicated partial chronological overlap between Aztec II B/O

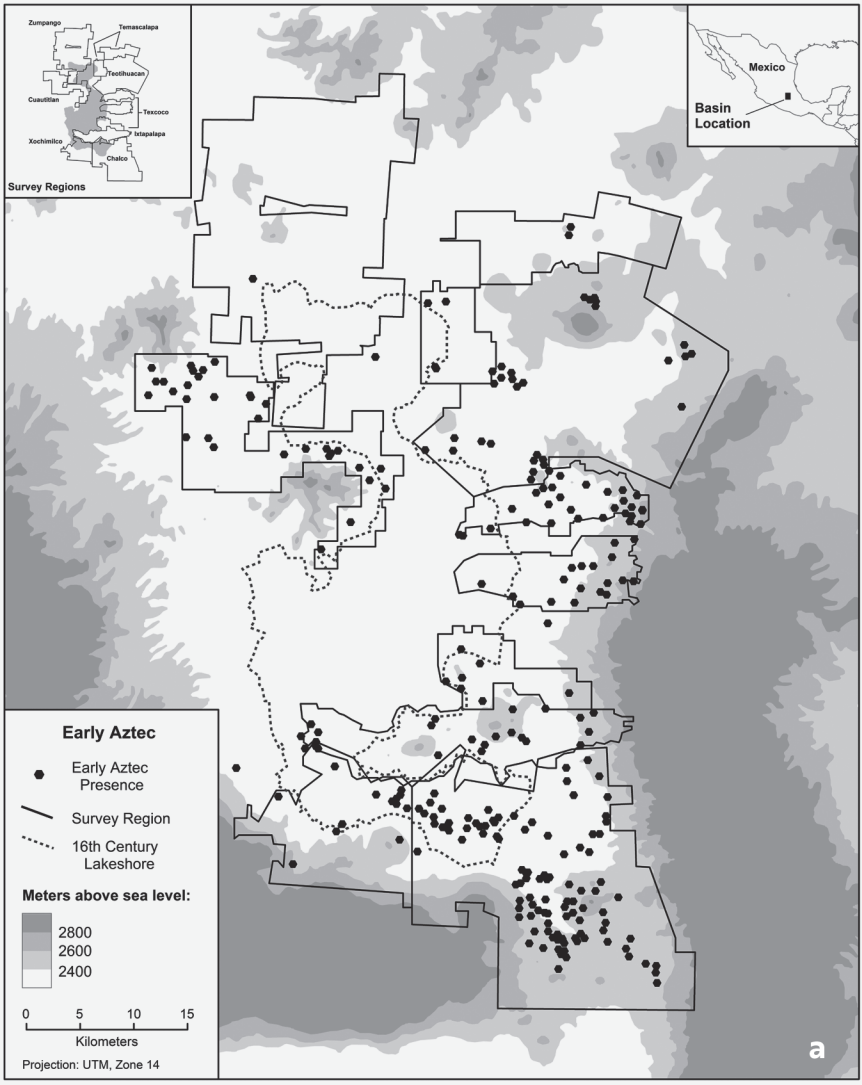
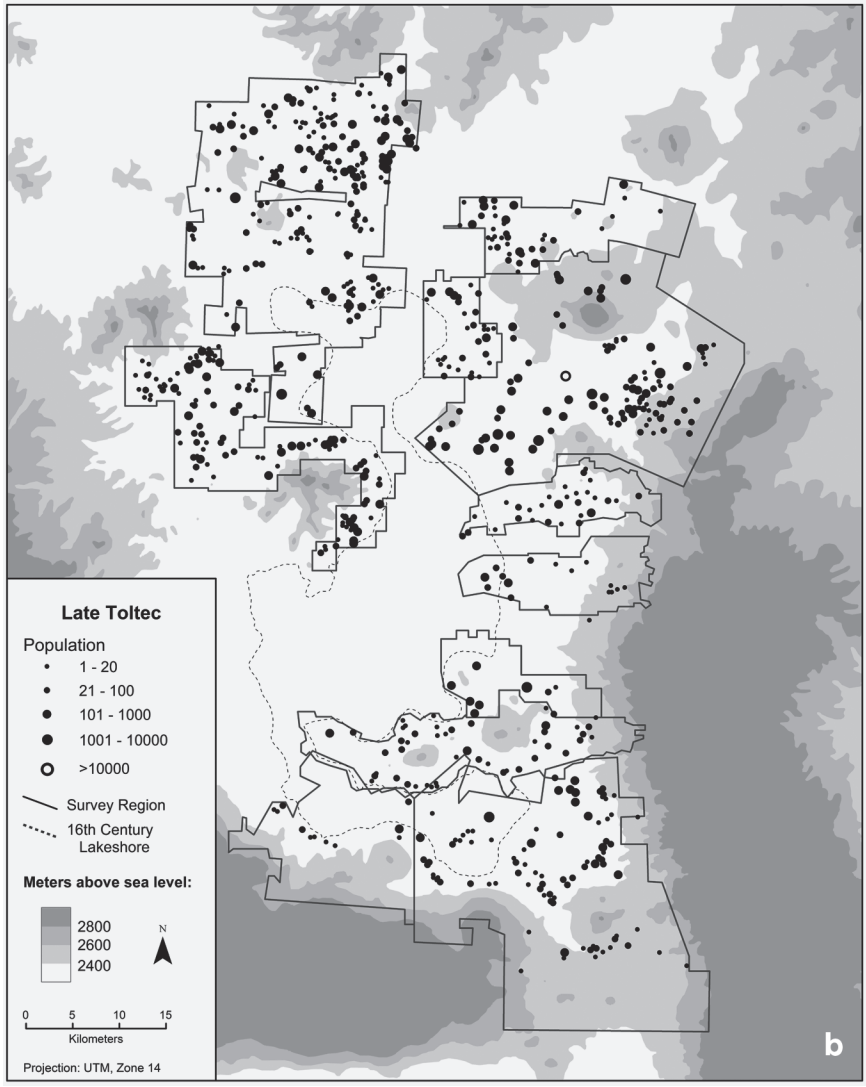


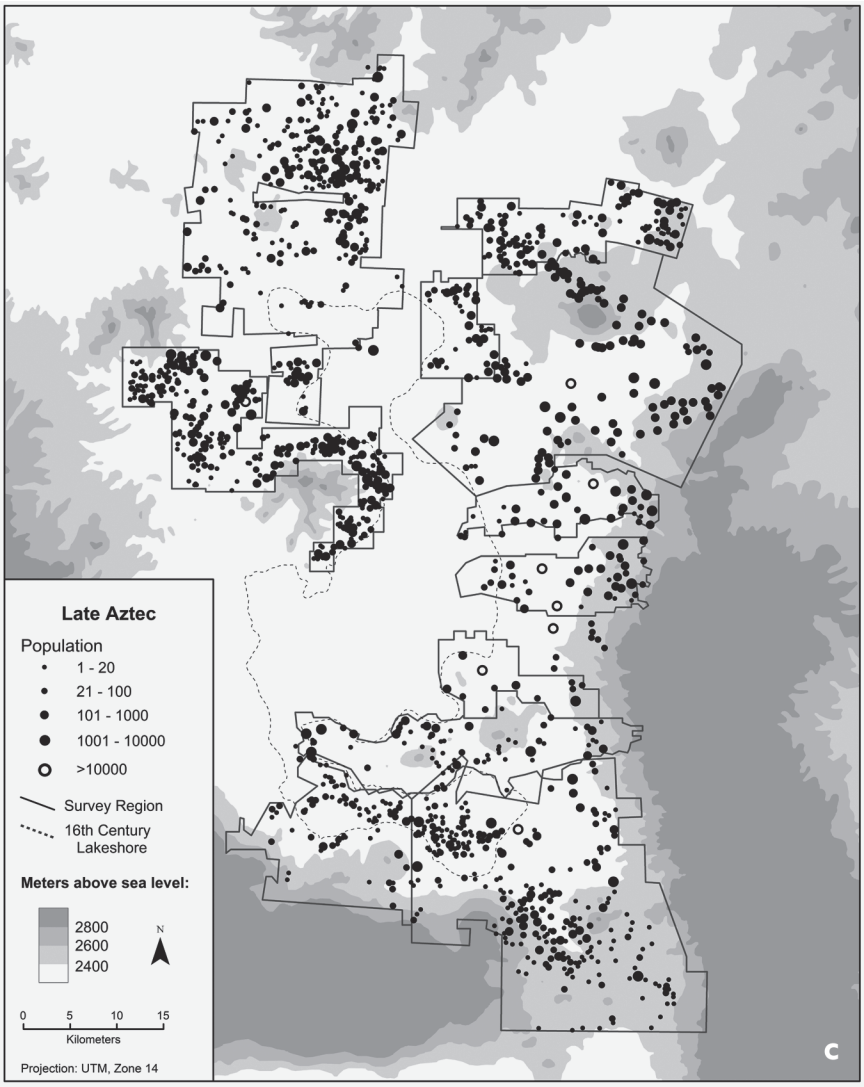
FIGURE 4.2. *Late Toltec and Early, Middle, and Late Postclassic occupation in the Basin of Mexico: (a) Middle Postclassic (Early Aztec) occupation in the Basin of Mexico; (b) Early Postclassic (Late Toltec/Mazapan) occupation in the Basin of Mexico; (c) Late Postclassic (Late Aztec) occupation in the Basin of Mexico; and (d) Late Toltec sites with Early Aztec occupation.*

and later stages of the Aztec I B/O sequence at those sites, a relationship later confirmed by Brumfiel (2005b) at Xaltocan.

The decision by Sanders, Parsons, and Santley (1979) to lump Aztec I B/O and Aztec II B/O together as archaeological indicators of the Middle Postclassic

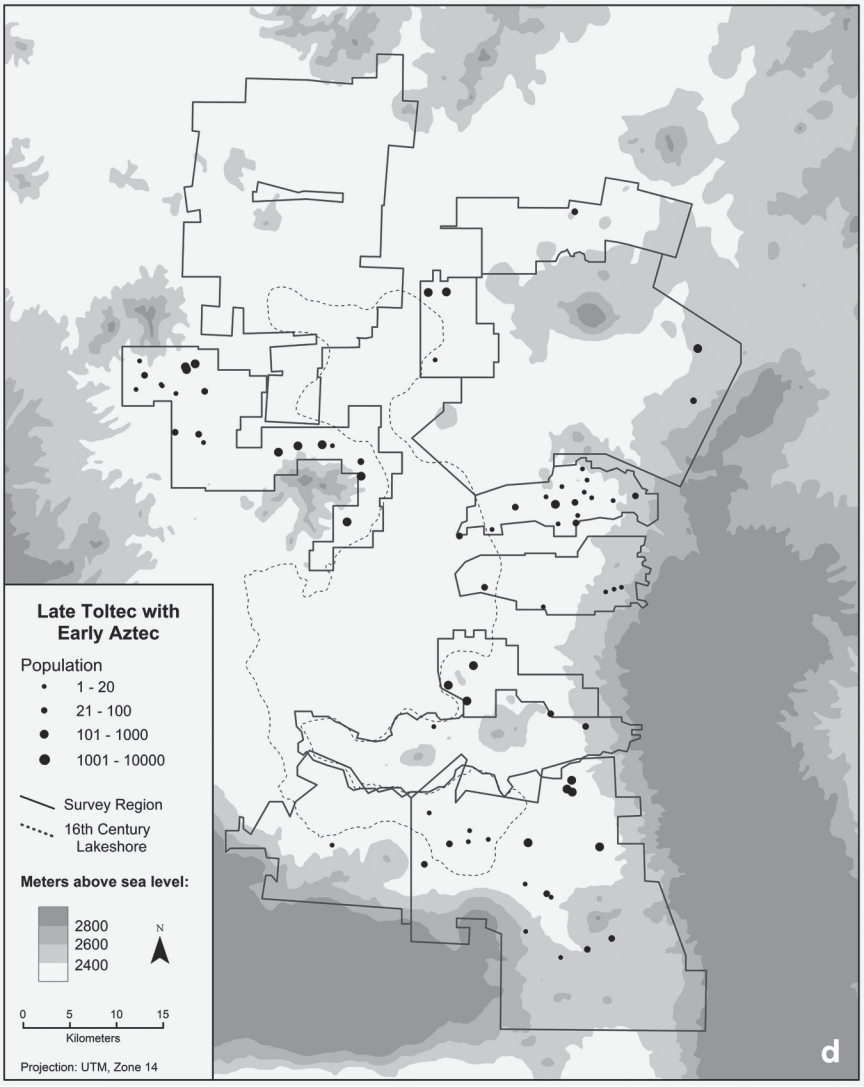


(Early Aztec) overlooked the potential temporal overlap between Aztec I B/O (and possibly even Aztec II B/O) and Mazapan-Tollan Red/Buff, as well as the possibility that Aztec I B/O and Aztec II B/O differed significantly in terms of their absolute chronology. However, apart from the major exception of Xaltocan, Aztec I B/O was never encountered in any quantity until the surveys had extended into the southern Basin. Archaeologists had simply overlooked this potential difficulty until having to confront the virtual absence of *both* Aztec I B/O and Aztec II B/O in the Zumpango region (Parsons 2008).



Based on the above observations, in the following pages we explore three interrelated questions:

1. Did part of the Early Postclassic (Late Toltec) ceramic assemblage presently defined in the Zumpango region extend chronologically into the Middle Postclassic? If so, our Late Toltec assemblage in that part of the Basin needs refinement to separate Early Postclassic and Middle Postclassic components. This uncertainty was reinforced by the difficulty of defining immediate post-Tollan ceramics outside of Tula itself, where Aztec II B/O occurs in deposits



associated with the era of that center's destruction in the twelfth century (Mastache et al. 2002:42).

2. Was one distinctive variant of B/O pottery,[1] which had been lumped into the Late Aztec (Aztec III B/O) category during the Zumpango survey, chronologically equivalent to Aztec II B/O in this part of the Basin? This variant, which

1 This variant has sometimes been referred to informally as Aztec II-III B/O, but it should not be confused with Franco's (1949, 1957) much differently defined Aztec II-III B/O, which falls clearly into our Aztec III B/O category.

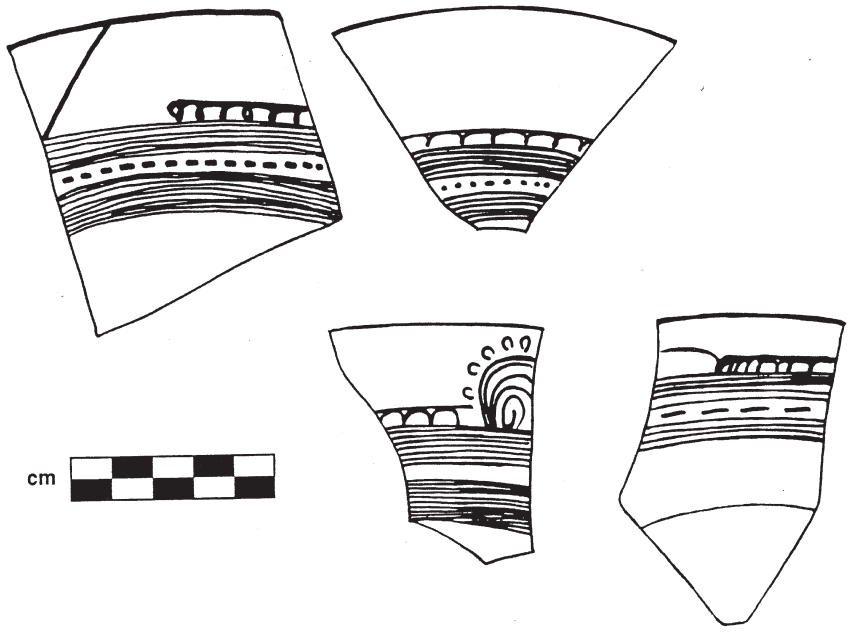


FIGURE 4.3. *Typical Variant D Black/Orange decoration. Adapted from Hodge and Minc (1991:131, figure 3.5).*

looks stylistically intermediate between typical Aztec II and III types, had been distinguished as Variant D of B/O decoration on certain vessel forms by Parsons (1966:plate 32) and by Hodge and Minc (1991:131) (see figure 4.3). Vaillant (1938:541) long ago distinguished at Chiconautla a *late* variant of his Aztec II B/O category (designated as IIc), which appears to be very similar to Variant D.

3. Were Mazapan-Tollan Red/Buff, Aztec I B/O, and Aztec II B/O ceramics in use over different ranges of absolute time in different parts of the Basin of Mexico? If so, then the periods of absolute time defined by their presence would be different in different parts of the Basin.

If any or all of these questions could be answered in the affirmative, the hypothesized Middle Postclassic population loss in the Zumpango region might need to be reconsidered. If, on the other hand, none could be answered in the affirmative, the hypothesized Middle Postclassic population decline would stand on a firmer foundation. Resolving the question of depopulation in the northern third of the Basin of Mexico during the immediate aftermath of Tula's demise in the twelfth century has obvious implications for understanding the nature of that demise.

THE CHRONOLOGY AND DISTRIBUTION OF MAZAPAN-TOLLAN RED/BUFF, AZTEC I B/O, AND AZTEC II B/O CERAMICS

By the late 1980s, there was general consensus on the following. This chronology, with some adjustments in absolute dating, continues to be generally accepted (e.g., Cowgill 1996):

1. Mazapan-phase Red/Buff pottery (or similar variants) occurred throughout the Basin of Mexico, closely related to Tollan-phase material at nearby Tula, and dating to ca. 900–1150 CE;
2. Aztec I B/O that occurred in quantity only in the southern third of the Basin of Mexico and at Xaltocan in the northern Basin was closely related to ceramic types found further south in Morelos (Norr 1987; Smith 1983), as well as to the east and southeast at Cholula and throughout southwestern Puebla (Müller 1978; Noguera 1954; Plunket 1990), probably at least partially contemporary with Mazapan-Tollan and dating to ca. 1000–1250 CE; and
3. Aztec II B/O occurring throughout the Basin of Mexico and at Tula, probably dated to ca. 1200–1350 CE, after which it was everywhere superseded by Aztec III B/O, with the Aztec II B/O generally presumed to be characteristic of Middle Postclassic occupation throughout the Basin.

Reexamination of Late Toltec Collections from the Zumpango Region

Several years ago, Parsons and Robert Cobean reexamined most of the original surface collections from surveyed Late Toltec sites in the Zumpango region. They found that this material is identical to Cobean's Tollan phase at Tula: it includes not only diagnostic Red/Buff pottery, but also most other characteristic ceramic types (Cobean 1978, 1990). Consequently, we assume that the Late Toltec occupation in the Zumpango region is coeval with the duration of the Tollan phase at Tula. If the Tollan phase defined at Tula does not extend into the Middle Postclassic, then neither would the Late Toltec occupation in the Zumpango region. Given Tula's proximity to the Zumpango region (see figures 4.1 and 4.2), this assumption appears reasonable.

The Chronological Status of Aztec II–III (Var. D) B/O

The chronological placement of Aztec II-III (Var. D) B/O remains unclear, but should probably continue to be lumped into the general Aztec III B/O category. It occurs in surface collections throughout the Zumpango region and elsewhere in the Basin of Mexico, but never in clear Aztec II contexts and always closely associated with typical Aztec III B/O and other types of Late Postclassic (Late Aztec) pottery. To be certain how Aztec II-III (Var. D) B/O is distributed in time and space, we would need a full-scale reanalysis of the surface collections from

all Basin surveys, as well as new stratigraphic excavations at key sites. However, at present we have no reason to think that Aztec II-III (Var. D) B/O is coeval with typical Aztec II B/O. Thus, we continue to assume that (Var. D) B/O is Late Aztec in date, although it may well occur early within that phase, and perhaps even begins in the late Middle Postclassic (as Vaillant originally thought).

Early-to-Middle Postclassic Settlement Continuity and Discontinuity in the Basin of Mexico

High occupational continuity might indicate comparative social stability, whereas non-continuity might signal major disruptive forces during the periods when Mazapan-Tollan Red/Buff, Aztec I B/O, and Aztec II B/O ceramics were in use. For example, serious social instability in Middle Postclassic times might have disrupted networks for exchanging ceramics defining Early and Middle Postclassic occupation in the Basin of Mexico.

Settlement survey data indicate varying degrees of occupational continuity at Early-to-Middle Postclassic and Middle-to-Late Postclassic sites in different parts of the Basin. These data indicate a much higher degree of settlement continuity in the southeastern (Chalco region), eastern (Texcoco region), and northwest-central Basin (Cuauhtitlan region) relative to the northern (Zumpango, Teotihuacan, and Temascalapa regions), southwestern (Xochimilco region), and south-central (Ixtapalapa region) parts of the surveyed Basin (see table 4.2). Focusing on Aztec I and II in the Chalco-Xochimilco region, of the 121 sites with an Early Aztec presence, 27.2 percent (33 sites) have only Aztec I B/O, 14.9 percent (18 sites) have only Aztec II B/O, and 16.5 percent (20 sites) have both (see figure 4.4). This co-occurrence had been known for some time at particular sites, such as Culhuacan at the western end of the Ixtapalapa peninsula (Blanton 1972; Boas and Gamio 1921; Brenner 1931; Parsons, Brumfiel, Parsons, and Wilson 1982; Séjourné 1970). Regarding the Mazapan-Aztec I transition in the Chalco-Xochimilco region, 10.9 percent of the Mazapan sites (11 of the 101 sites) have Aztec I B/O, while 10.7 percent (13 sites) of the Early Aztec sites have Mazapan Red/Buff pottery (see figure 4.4). At dozens of sites throughout that region, a distinctive Mazapan-related Early Postclassic (Late Toltec) ceramic assemblage often occurs in surficial association with Aztec I B/O or Aztec II B/O occupations (Parsons, Brumfiel, Parsons, and Wilson 1982). O'Neill's (1962) and Hodge's (2008) excavations at Chalco encountered Mazapan-related Red/Buff ceramics only in trace quantities (see also Parsons et al. 1996). At nearby Xico, however, Mazapan-related Red/Buff, Aztec I B/O, and Aztec II B/O all occur, although most of the Late Toltec (Mazapan-related) occupation is concentrated at the northern end of Xico Island, while the main Early Aztec (mixed Aztec I B/O and Aztec II B/O) settlement occurred less than 200 meters away on an offshore artificial island in the lakebed to the east. At Xico, the Early Aztec settlement

TABLE 4.2. Early and Middle Postclassic settlement continuity and discontinuity at surveyed sites in the Basin of Mexico. Aztec I and II are combined as Early Aztec (EA). Late Aztec (LA) sites areas are defined by the presence of Aztec III B/O pottery. Table entries include sites with no estimated resident population (e.g., ceremonial sites, which are not shown in figs. 4.2b, 4.2c, and 4.2d).

Survey Area[a]	*LA Sites (no.)*	*EA Sites (no.)*	*LA Sites with EA (%)*	*Late Toltec Sites (no.)*	*EA Sites with Late Toltec (%)*	*Late Toltec Sites with EA (%)*
Chalco	287	103	35.9	90	16.5	20.0
Xochimilco	91	18	19.8	11	5.6	9.1
Ixtapalapa	75	19	25.3	48	15.8	6.3
Texcoco	110	54	49.1	59	27.8	44.1
Teotihuacan	201	30	14.9	198	70.0	4.5
Cuauhtitlan	326	32	9.8	139	75.0	15.1
Temascalapa	168	6	3.6	77	83.3	6.5
Zumpango	302	2	0.7	213	0.0	0.0
Total	1,560	264	16.9	835	33.0	9.5

a. Listed south to north

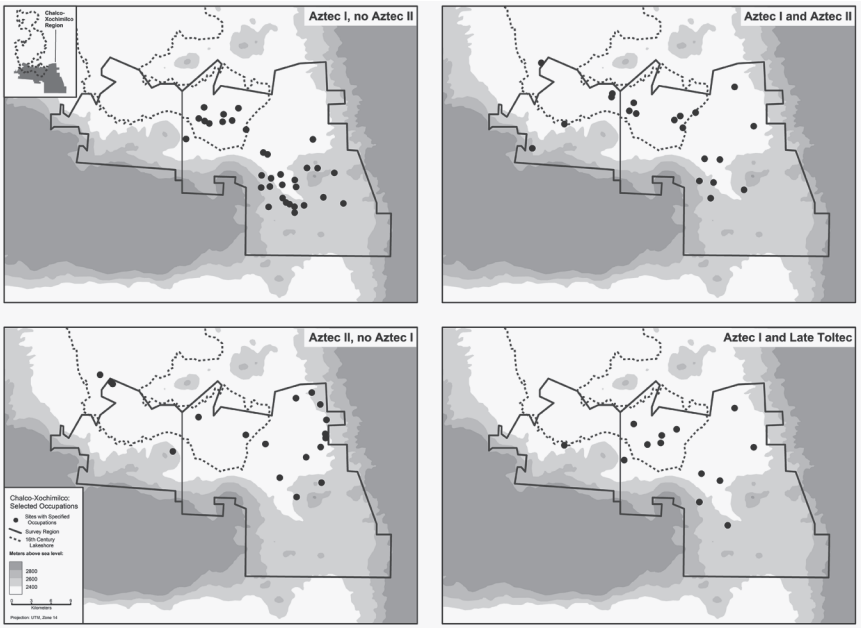


FIGURE 4.4. *Distributions of Aztec I Black/Orange, Aztec II Black/Orange, and Late Toltec (Mazapan-like Red/Buff) surface pottery in the Chalco-Xochimilco Region, southeastern Basin of Mexico.*

overlies a very substantial epiclassic (Coyotlatelco) occupation (Parsons, Brumfiel, Parsons, and Wilson 1982; Parsons, Brumfiel, Parsons, Popper, and Taft 1982; Parsons et al. 1985)—a situation seemingly analogous to what Noguera (1935) encountered at Tenayuca, except that at Tenayuca there was Aztec II B/O overlying the Epiclassic, with both Mazapan Red/Buff and Aztec I B/O present only in trace amounts.

In the Ixtapalapa region, Aztec I B/O has been found in quantity only at the large site of Culhuacan at the western end of the Ixtapalapa peninsula (Blanton 1972), a site where, like Chalco, Aztec II B/O also occurs, along with Mazapan Red/Buff pottery in trace quantities. Apart from Culhuacan, there is little Aztec I B/O anywhere in the western Ixtapalapa region. Farther east on the Ixtapalapa peninsula, Aztec I B/O occurs slightly more frequently in settlements and sometimes sparsely in off-site locations (Richard E. Blanton, personal communication 2006). Mazapan Red/Buff is abundant throughout the Ixtapalapa region (e.g., Tovalín 1998), as it is from there northward in the Basin of Mexico, where Aztec I B/O occurs only in trace quantities—except at Xaltocan in the north-central Basin, where Aztec I B/O is very abundant and where Mazapan-Tollan Red/Buff pottery is scarce (Brumfiel 2005a:133, 137).

Thus, in the southern Basin of Mexico we confront a complicated situation in which Aztec I B/O and Mazapan-like Red/Buff sometimes co-occur in significant quantities in surface collections at the same sites, although these are often spatially separated (but usually not by much distance), and where the two major Aztec I B/O centers, Chalco and Culhuacan, feature only trace amounts of Mazapan pottery even though smaller settlements only a few kilometers away have substantial quantities of both Mazapan-related Red/Buff and Aztec I B/O pottery. As noted earlier, a unique situation exists at Xico, just 3 kilometers west of Chalco, where closely spaced, but physically detached, large concentrations of Mazapan-related Red/Buff and Aztec I and II B/O ceramics occur.

The occasional co-occurrence, in some combination, of Mazapan Red/Buff, Aztec I B/O, and Aztec II B/O in the southern Basin of Mexico contrasts sharply with the extreme discontinuity among these pottery types in the Zumpango region, although there are also relatively low levels of continuity in the Teotihuacan and Temascalapa regions in the northeast. What might be the implications for the Zumpango region of these ceramic distributions in the southern Basin? We can think of three possibilities (which are not necessarily mutually exclusive):

1. There is only partial chronological overlap between Mazapan and Aztec I in the southern Basin, and the Mazapan-related Red/Buff pottery in that region represents an early phase of the Early Postclassic period, which was superseded by an Aztec I ceramic assemblage during the middle and late portions

of that period. Available radiocarbon dates (see tables 4.3 and 4.4) make this alternative unlikely, as Aztec I B/O seems to appear as early as Mazapan Red/Buff within the Basin as a whole. However, because there are still no radiocarbon dates clearly associated with Mazapan-related Red/Buff pottery from the southern Basin, the precise chronological relationships between Aztec I B/O and Mazapan-related Red/Buff in that region remain uncertain.

2. Mazapan Red/Buff and Aztec I B/O ceramic distributions reflect the presence of coeval but culturally and sociopolitically different groups who occupied the same general area but had limited interaction with each other. The concept of multi-group (or multi-ethnic) co-occupation of a single region has been discussed in ethnohistorically based studies in the Basin of Mexico (e.g., Carrasco 1999; Hodge 1984; Jiménez 1954). However, archaeologists have had limited success in assessing *ethnicity* based on material remains.
3. The observed interdigitation of Mazapan-related and Aztec I occupations in the southern Basin may reflect a kind of Mesoamerican *verticality*, analogous to the better-known Andean example (e.g., Murra 1972), in which settlements dependent on different core polities may occupy the same region to exploit resources and/or sociopolitical considerations that complement or extend those of the polities' core areas. Based on ethnohistoric sources, Carrasco (1980) argued that a comparable multi-niche, or archipelago-like, adaptive strategy characterized Late Postclassic highland Mexico. If the interdigitation of Aztec I and Mazapan-related settlements in the Chalco region reflects some sort of multi-ethnic/multi-polity arrangement during the Early Postclassic, then such an archipelago-like arrangement appears to have been abandoned, or much altered, by Middle Postclassic times, when Aztec II B/O pottery is widespread in the southern Basin following the collapse of Tula.
4. Because Aztec II B/O is comparatively rare in the southern Basin of Mexico relative to its greater abundance in the central Basin, and because Aztec I and II frequently co-occur in the southern Basin, "there does not appear to be a distinct phase of Aztec II B/O in the south" and "within the Basin as a whole, . . . these Early Aztec types (Az I and Az II B/O) are largely, if not wholly, contemporaneous" (Minc et al. 1994:140). Considered in this light, scarcity of Aztec II B/O in the northern Basin might reflect forces similar to, but less extreme than, those that produced the relatively weak development of Aztec II B/O in the southern Basin.

RECENT STUDIES

Radiocarbon Dates

Over the past few decades, several radiocarbon dates from Tula and the Basin of Mexico have become available (see tables 4.3 and 4.4). Generally speaking, and ignoring several outliers, these dates suggest that (1) Mazapan-Tollan Red/Buff

TABLE 4.3. Summary of radiocarbon dates. The two Phase 2 dates from Xaltocan (mixed Az I and Az II B/O) are not included in this tabulation.

Phase	*Number of Dates*	*Range of Mid-Point Dates*	*Median Mid-Point Date (with one standard deviation)*
Mazapan-Tollan	11	882–1166 CE	941 ± 58 CE
Aztec I[a]	17	880–1390 CE	1092 ±157 CE
Aztec II[b]	20	1331–1437 CE	1358 ± 73 CE

a. Three extreme outliers have been eliminated (690, 1415, 1425 CE).

b. One extreme outlier has been eliminated (1035 CE).

and Aztec I B/O came into use and were approximately coeval during the tenth and eleventh centuries; (2) Aztec I B/O continued in use into the thirteenth century, while Mazapan-Tollan Red/Buff ceased being produced sometime during the twelfth century; (3) Aztec II B/O began to be used during the later thirteenth century (ignoring the outlying date of 1035 CE from Otumba); and (4) Aztec I B/O and Aztec II B/O overlapped for a short period during the late thirteenth century, while Aztec II B/O continued into the fifteenth century. These dates also suggest that Aztec II B/O had a much shorter duration of use than either Aztec I B/O or Mazapan-related Red/Buff. The lack of Mazapan-related dates from the southern Basin prevents us from establishing precise chronological relationships between Mazapan-related Red/Buff and Aztec I B/O in that region, where the two ceramic types co-occur.

Stylistic, Stratigraphic, Neutron-Activation, and Distributional Studies

Aztec I B/O: Stylistic analyses have indicated that there are three regional variants of Aztec I B/O in the Basin of Mexico: Chalco, Mixquic, and Culhuacan (Hodge 1998; Hodge and Minc 1991; Minc et al. 1994). These variants were previously subsumed within a general Culhuacan type. Stylistic and neutron activation analyses show that in the southern Basin Aztec I B/O was produced and distributed primarily within local marketing areas, thus accounting for the predominance of local stylistic variants within different subregions (Hodge and Minc 1991). However, at Xaltocan in the north-central Basin, most Aztec I B/O pottery corresponds to the Culhuacan variant and was imported from production zones well south of Xaltocan (Brumfiel 2005b; Hodge and Neff 2005). Thus, Xaltocan is unusual both in its location at the extreme northern edge of where Aztec I B/O pottery occurs in quantity and in imported pottery from well outside the local area. Brumfiel (2005b) suggested that this importation probably reflects the need of Xaltocan elites to establish alliances with counterparts in polities further south in the Basin.

Stratigraphic excavations at Xaltocan (Brumfiel 2005a) show that Aztec I B/O preceded Aztec II B/O at that site for a considerable time prior to a substantial

TABLE 4.4. Calibrated radiocarbon dates (mid-points only) from Tula and the Basin of Mexico for Mazapan/Tollan, Aztec I, and Aztec II sites. The Tlalpizahuac site is situated north of Chalco, near the northeastern shore of Lake Chalco. For multiple-intercept dates, only the central intercept is shown and is indicated as "ca."

Site[a]	*Mazapan-Tollan (CE)*	*Aztec I B/O (CE)*	*Aztec II B/O (CE)*	*Reference*
Tula	ca. 1110			García 2004:366–67
Tula	1166			García 2004:366–67
Xaltocan (Phase 1)[b]		880		Parsons et al. 1996:225
Xaltocan (Phase 1)[b]		960		Parsons et al. 1996:225
Xaltocan (Phase 1)[b]		970		Parsons et al. 1996:225
Xaltocan (Phase 1)[b]		990		Parsons et al. 1996:225
Xaltocan (Phase 2)[b]		1235 (mixed Az I & Az II)		Parsons et al. 1996:225
Xaltocan (Phase 2)[b]		1300 (mixed Az I & Az II)		Parsons et al. 1996:225
Xaltocan (Phase 3)[b]			1395	Parsons et al. 1996:225
Xaltocan (Phase 3)[b]			1425	Parsons et al. 1996:225
Cuauhtitlan	896			García 2004:366–67
Cuauhtitlan			ca. 1331	García 2004:366–67
Cuauhtitlan			1437	García 2004:366–67
Cuauhtitlan			1437	García 2004:366–67
Tenayuca			1230	García 2004:366–67
Teotihuacan			1422	García 2004:366–67
Teotihuacan	1007			García 2004:366–67
Teotihuacan	1012			García 2004:366–67
Teotihuacan	1020			García 2004:366–67
Otumba			1035	Charlton et al. 2000:258; Nichols and Charlton 1996:237
Otumba			1300	Charlton et al. 2000:258; Nichols and Charlton 1996:237
Otumba			1270	Charlton et al. 2000:258; Nichols and Charlton 1996:237
Otumba			1285	Charlton et al. 2000:258; Nichols and Charlton 1996:237
Texcoco			1411	García 2004:366–67
Culhuacan			1262	García 2004:366–67
Culhuacan			1282	García 2004:366–67

continued on next page

TABLE 4.4.—*continued*

Site[a]	*Mazapan-Tollan (CE)*	*Aztec I B/O (CE)*	*Aztec II B/O (CE)*	*Reference*
Culhuacan			1418	García 2004:366–67
Chimalhuacan			ca. 1365	García 2004:366–67
Tlalpizahuac	882			García 2004:366–67
Tlalpizahuac	894			García 2004:366–67
Tlalpizahuac	896			García 2004:366–67
Tlalpizahuac	ca. 902			García 2004:366–67
Tlalpizahuac	956			García 2004:366–67
Chalco			1282	García 2004:366–67
Chalco			1400	García 2004:366–67
Chalco			1455	García 2004:366–67
Chalco		ca. 1100		Parsons et al. 1996:221
Chalco		1210		Parsons et al. 1996:221
Chalco		1290		Parsons et al. 1996:221
Xico		976		García 2004:366–67
Xico		999		García 2004:366–67
Xico		1262		García 2004:366–67
Ch-Az-195		690		Parsons et al. 1996:223
Ch-Az-195		960		Parsons et al. 1996:223
Ch-Az-195		1035		Parsons et al. 1996:223
Ch-Az-195		ca. 1075		Parsons et al. 1996:223
Ch-Az-195		1290		Parsons et al. 1996:223
Ch-Az-195		1395		Parsons et al. 1996:223
Ch-Az-195		1415		Parsons et al. 1996:223
Tlalmanalco			1403	García 2004:366–67

a. Listed north to south

b. For Xaltocan dates, Phase 1=Pure Aztec I B/O, Phase 2=Mixed Aztec I B/O and Aztec II B/O; Phase 3=Pure Aztec II B/O.

chronological overlap between Aztec I and II near the end of the Aztec I sequence there. As noted, radiocarbon dates from Xaltocan indicate that Aztec I B/O may have first appeared as early as the tenth century, and probably continued well into the fourteenth century before it was entirely replaced by Aztec II B/O (Brumfiel 2005a; Parsons et al. 1996).

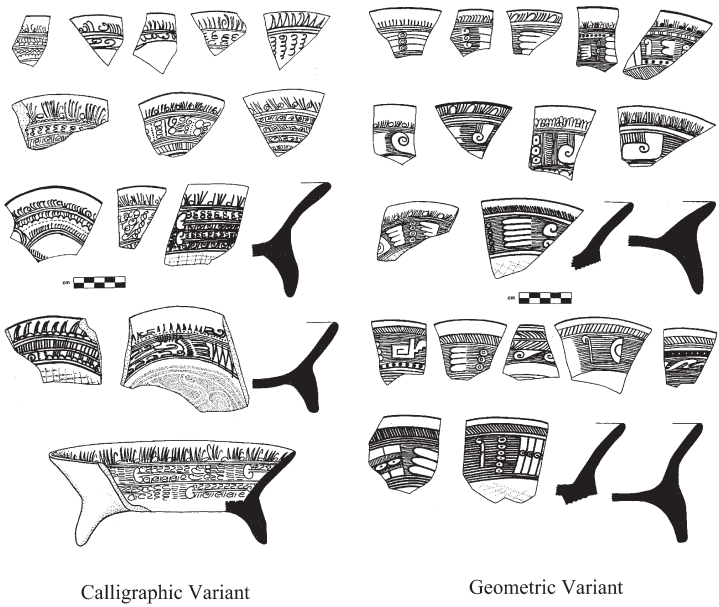


FIGURE 4.5. *Calligraphic and Geometric variants of Aztec II Black/Orange. Adapted from Minc et al. (1994:146–47, figures 6.5, 6.6).*

The Xaltocan sequence thus replicates the general stratigraphic relationships between Aztec I B/O and Aztec II B/O that were revealed earlier in excavated sequences at Chalco (Hodge 2008; O'Neill 1962; see also Parsons et al. 1996) and at Culhuacan (Séjourné 1970, 1983) in the southern Basin: a long period of Aztec I B/O without Aztec II B/O and only traces of Mazapan-Tollan Red/Buff, overlain by a shorter period with both Aztec I B/O and Aztec II B/O, which is then overlain by levels of only Aztec II B/O of relatively short duration. Furthermore, as noted earlier, both Xaltocan and Culhuacan occur in areas surrounded by settlements with abundant Mazapan-Tollan Red/Buff pottery, and with only traces of Aztec I B/O. Even in the Chalco region, where Aztec I B/O occurs widely in small settlements well away from the Chalco center, there is significant Mazapan-related Red/Buff pottery.

As previously noted, Mazapan-Tollan–phase pottery is scarce at Xaltocan. Thus, during much (perhaps most) of the Early Postclassic, Xaltocan was a sociopolitical *island* whose inhabitants used Aztec I B/O ceramics and only traces of Mazapan pottery. Many contemporary surrounding settlements, which used Mazapan/Tollan-phase ceramics and only trace amounts of Aztec I B/O pottery (see figures 4.1 and 4.2a), were just a few kilometers distant. Just as striking, during the earlier part of the subsequent Middle Postclassic, inhabitants of Xaltocan

possibly continued to use Aztec I B/O, gradually replacing this pottery with Aztec II B/O at a time when massive depopulation may have been happening just a few kilometers to the north.

Aztec II B/O: Within the Basin of Mexico, Aztec II B/O pottery is now known to vary in style and place of production. Using samples selected from the original survey collections from the Texcoco, Ixtapalapa, and Chalco regions, Hodge and Minc (1991) distinguished two main stylistic variants within the broad Aztec II (Tenayuca) B/O category: Calligraphic and Geometric (see figure 4.5). These apparently coeval variants partially overlap spatially within the Basin, although they tend to be differentially distributed to some extent:

> Geometric Black-on-Orange is primarily concentrated within the northern Texcoco survey region; occurrences outside this zone are fairly low density. Calligraphic Tenayuca shows a marked concentration closely confined to . . . the area of Culhuacan; lower density occurrences are found throughout the Texcoco and Chalco Regions as well. (Hodge and Minc 1991:156–57).

On the basis of their neutron-activation analysis, Minc and colleagues (1994:158) found that, in contrast to the variants of Aztec I B/O, which show relatively localized distributions within the Basin, ". . . the Calligraphic and Geometric types [of Aztec II B/O] apparently circulated through spatially more extensive market networks. The market territories of these two types overlapped to a considerable extent . . ."

The Minc and colleagues (1994) study indicates a strong contrast between the more local exchange systems of the Early Postclassic regional economies that distributed Aztec I B/O pottery and the more expansive and broadly overlapping Middle Postclassic exchange networks that distributed Aztec II B/O pottery. This implies that if there were any significant number of people in the Zumpango region during the Middle Postclassic, Aztec II B/O pottery should have found its way to them in quantities proportionate to the size and density of the consuming population.

In his overview of Early and Middle Postclassic ceramics in the Basin of Mexico, García (2004) distinguishes four regional variants of the Aztec II ceramic assemblage (including B/O and other ceramic types): (1) the northern Basin (primarily the Cuauhtitlan region), (2) the south-central Basin (the Culhuacan area), (3) the eastern Basin (mainly the Texcoco region), and (4) the southeastern Basin (mainly the Chalco region). In his view, these distributions reflect the existence of four separate regional polities. García's spatial divisions of Aztec II ceramic assemblages are suggestive of larger economic and sociopolitical forces that might have operated during the Middle Postclassic. However, we are presently unable to relate them clearly to the calligraphic and geometric groupings proposed by Minc and colleagues (1994). It is notable in this regard that analysis by Minc and colleagues

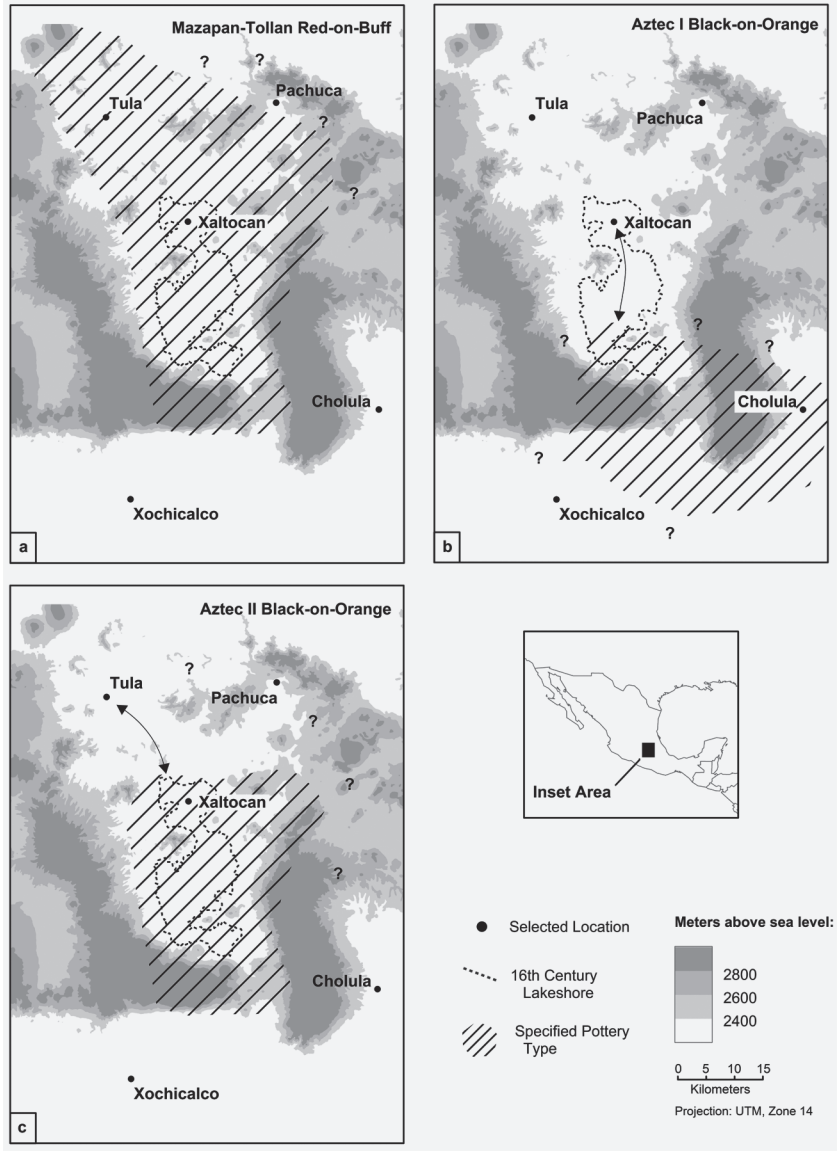


FIGURE 4.6. *Distributions of Mazapan-Tollan Red/Buff (a), Aztec I Black/Orange and closely related types (b), and Aztec II Black/Orange (c) in and around the Basin of Mexico.*

relied on samples from the eastern and southern Basin of Mexico and, unlike García's, did not include sherds from the northern or western Basin.

Whatever the case, a large, dense, and seemingly politically centralized Aztec II occupation has been noted by García, Brumfiel, and ourselves in the Cuautitlan

region, at Xaltocan, and along the eastern shore of Lake Xaltocan (see figure 4.4). Geographically, within the Basin of Mexico, this occupation appears to have extended up to, *but not beyond*, the northern shores of Lake Xaltocan-Zumpango.

Aztec I B/O and Aztec II B/O outside the Basin of Mexico: The geographic distribution of Mazapan-Tollan Red/Buff, Aztec I-related B/O, and Aztec II B/O pottery in neighboring regions around the Basin of Mexico helps explain the distribution of these styles in the Basin of Mexico (see figure 4.6). In particular, we note occurrences north of the Basin, in and around Tula and Pachuca, as well as occurrences south at Cholula and at sites in Morelos.

McCafferty (2001) has shown that his "Chalco Black/Orange," a local variant of Aztec I B/O from Cholula (see figure 4.1), constituted a minor sub-type within his Cocoyotla Black-on-Natural ceramic type characteristic of the Middle and Late Tlachihualtepetl phase (roughly corresponding to Early Postclassic in the Basin of Mexico). The presence of Aztec I B/O pottery, or of closely related ceramics, in western Puebla outside Cholula itself, remains to be fully defined, although Plunket (1990) has reported closely related pottery in the Atlixco Valley of southwestern Puebla.

Although excavations at Chalcatzingo in eastern Morelos have revealed significant quantities of Aztec I B/O (Norr 1987), excavations and surveys at Xochicalco and Yautepec in western Morelos, have found only trace amounts of it (Hare and Smith 1996; Smith 2000). However, at Yautepec, Smith notes an abundance of what he calls Tepozteco Black-on-White, "which is like Aztec I in vessel form and design motifs, but decorated in black on white" (Michael Smith, personal communication 2006). Smith also reports substantial quantities of a very similar type that he calls Morelos-Puebla Black-on-Orange at the Teopanzolco site in northwestern Morelos, "which is exactly like Aztec I in everything but paste."

These studies indicate that there is a broad band of pottery closely related to Aztec I B/O immediately south and southeast of the Basin of Mexico, extending from western Morelos eastward into southwestern Puebla. The stylistic variability of this pottery within this Morelos-Puebla region is probably generally comparable to that observed by Minc and colleagues (1994) for Aztec I B/O within the Basin. The variability of Aztec I-like B/O pottery throughout the southern Basin of Mexico, Morelos, and southwestern Puebla probably reflects localized exchange networks embedded within small regional polities who shared certain broad traditions of ceramic production and decoration during the Early Postclassic.

Surveys and excavations in the Toluca and Tula Regions (Cobean and Mastache 1999; Mastache and Crespo 1974; Mastache et al. 1982, 2002; Michael Smith personal communication 2006; Sugiura 2005; Yoko Sugiura personal communication 2006) have revealed only trace amounts of Aztec I B/O. Although some Aztec II B/O has long been known at Tula, investigations there suggest that this pottery type may occur primarily in restricted localities within a Middle Postclassic center

that was much reduced in size and importance relative to its Early Postclassic peak (Mastache et al. 2002:42). With the apparent exception of Tula, Aztec II B/O pottery in significant quantities apparently occurs exclusively within the Basin of Mexico and at the Teopanzolco site in northwestern Morelos (Michael Smith, personal communication 2006). Interestingly, Norr (1987:406) found no Aztec II B/O at Chalcatzingo in eastern Morelos, a locality where Aztec I B/O is abundant (but where Mazapan-like Red/Buff is absent). In other surrounding regions, Aztec II B/O is quite scarce (Yoko Sugiura, personal communication 2006, regarding the Toluca Region; Geoffrey McCafferty, personal communication 2006, regarding Cholula; Kenneth Hirth, personal communication 2006, regarding western Puebla and eastern Morelos). At present, we have no information about the occurrence of Aztec II B/O in Tlaxcala, east of the Basin.

The apparent absence of significant quantities of Aztec II B/O pottery outside the Basin of Mexico, except nearby Tula and Teopanzolco, suggests that the Middle Postclassic exchange networks that distributed Aztec II B/O widely within the Basin did not extend much beyond the Basin itself (unlike those of the Late Postclassic). Also apparently absent were the kind of shared cultural norms which seem to have produced generic similarities that during Early Postclassic times linked (1) Aztec I B/O with coeval pottery in the Morelos-southwestern Puebla region to the south and southeast of the Basin of Mexico; and (2) Mazapan-Tollan Red/Buff with (still poorly defined) regions to the north and west of the Basin.

CONCLUSIONS

In the preceding pages, we considered implications of the absence of Aztec II B/O pottery in the Zumpango region given available information on the distributions in time and space of Mazapan-Tollan Red/Buff, Aztec I B/O, and Aztec II B/O ceramics, both within the Basin of Mexico and in other parts of Central Mexico that hosted Early and Middle Postclassic occupations. Recent stratigraphic, stylistic, radiocarbon, and geochemical studies complement older settlement pattern data from the Basin and help to resolve (though also complicate) some uncertainties about chronological, spatial, and cultural relationships among these three ceramic types.

Our study considered some old problems and raised some new ones:

1. The lack of Aztec II B/O pottery in the Zumpango region represents a virtual absence of population there during the Middle Postclassic. It is likely that there were also significant population losses in the northeastern Basin of Mexico (Temascalapa and Teotihuacan regions) and probably in the adjacent Tula region as well. This Middle Postclassic population loss in the northern Basin contrasts with the southern and central Basin where substantial occupation persisted from Early Postclassic through Late Postclassic, and where a

generally higher degree of settlement continuity suggests a greater degree of overall sociopolitical stability.

2. Available radiocarbon dates suggest that the span of absolute time when Aztec II B/O was used may have been little more than a century, from the early-mid-fourteenth century into the mid-fifteenth century. This contrasts with the apparently much longer time spans of both Mazapan-Tollan Red/Buff and Aztec I B/O. Thus, the Middle Postclassic depopulation of the northwestern Basin may not have lasted much more than three generations. If Aztec II-III (Var. D) B/O is late Middle Postclassic in age, the regional population abandonment may have endured no more than two generations.
3. Radiocarbon dates suggest that Mazapan-Tollan Red/Buff and Aztec I B/O pottery largely overlap in time, although Aztec I B/O seems to persist longer, overlapping for a short period near the end of its use with Aztec II B/O.

   The geographic distribution of Mazapan-Tollan Red/Buff, Aztec I-related B/O, and Aztec II B/O pottery in and around the Basin of Mexico suggests two Early Postclassic sociocultural *spheres*: (a) a northern sphere, identified archaeologically by the distribution of Tollan-Mazapan Red/Buff; and (b) a southern sphere, identified archaeologically by the distribution of Aztec I-related B/O pottery. There is a projection of Aztec I B/O from its core region in the southeastern Basin northward into Xaltocan during the Early Postclassic, and a similar northward projection of Aztec II B/O into Tula during the Middle Postclassic. By the Middle Postclassic both of the Early Postclassic ceramic spheres had disappeared, with Aztec II B/O everywhere replacing Mazapan-Tollan Red/Buff and Aztec I B/O, although the distribution of Aztec II B/O outside the Basin of Mexico is apparently quite restricted.
4. The implications of these ceramic distributions remain to be more fully ascertained, but the southeastern Basin of Mexico stands out as a sociocultural frontier between the northern and southern spheres. The most significant *players* in this macro-regional configuration were probably Tula and Teotihuacan in the north, and Cholula and Xochicalco (or one of the other Morelos centers) in the south. Recent estimates of Teotihuacan's Mazapan-phase population (15,233, Gorenflo and Sanders 2007:218 [based on an estimate by Ian Robertson]; 30,000, Cowgill 1996:330) indicate that this center was more important during Early Postclassic times than previously thought.
5. The southeastern Basin of Mexico shows a spatial association of Mazapan Red/Buff and Aztec I B/O, in both urban and rural settlements, that exists nowhere else in the Basin. If these two ceramic complexes were coeval in the southeastern Basin, then some form of multi-polity/multi-ethnic use of that region possibly occurred there (perhaps analogous to Andean verticality). During the Early Postclassic, Xaltocan was a densely settled island where Aztec I B/O pottery was abundant in a region where Mazapan-Tollan Red/

Buff pottery predominated elsewhere. This configuration might indicate that, as in the southeastern Basin, some sort of multi-group occupation had also occurred in the northern Basin during the Early Postclassic. In this setting, Tula and Xaltocan would have played complementary roles, with Xaltocan controlling direct access to lacustrine resources at the southern edge of Tula's dominance, but lacking direct access to the rich lime and mineral resources of localities in the north controlled by Tula. In this scenario, the collapse of Tula in the twelfth century would have removed a major component in such an arrangement and could have led to the collapse of an entire regional economic structure, especially in a comparatively arid region (like the far northern Basin of Mexico) that may have depended on access to food resources from more humid zones farther south.

6. Although, strictly speaking, we lack good population estimates for the Early Aztec occupation in the Basin of Mexico,[2] the number of sites where Early Aztec archaeological remains occur provide a sense of the magnitude of population decline during this period (see table 4.2). An analysis of the finalized settlement pattern data for the Basin argued that for the region as a whole, major demographic events—changes that would introduce a large imbalance between fertility and mortality, or massive migration into or out of the Basin—would not have been necessary to account for the estimated shifts in population (Gorenflo 2015). But that study focused solely on periods for which more precise population estimates exist. Introducing substantial Middle Postclassic depopulation likely would change that conclusion, particularly in the Zumpango region, where there was virtually no Early Aztec occupation.
7. We have discussed the Middle Postclassic population decline in the Basin of Mexico in general, and in the Zumpango region in particular, as associated with the fall of Tula, located ca. 20 km to the northwest. We suggested that pre-Columbian occupation in the northern third of the Basin would have been risky for an economy based largely on intensive agriculture, owing largely to the low rainfall that tends to occur in the region, ranging from about 680 mm annually in the southern part of the Zumpango region to less than 500 mm per year in the northeastern Temascalapa region (Sanders et al. 1979:map 2). Other research proposes that any substantial population in these parts of the Basin of Mexico would have required some sort of adaptive specialization consistent with low precipitation and integrated within a broader regional market system that provided access to other resources not locally available (Gorenflo 2015).

   The Late Postclassic regional settlement system, dominated by Tenochtitlan with its city-state building blocks, provided the basis for broad economic inte-

2 Early Aztec populations are difficult to estimate because Early Aztec ceramic types are typically found within larger and more densely occupied Late Aztec sites where they are often obscured on the surface by heavy admixture with Late Aztec pottery.

gration during a time when the Zumpango region was densely occupied. The Early Postclassic regional settlement system in the northwestern Basin, dominated by nearby Tula, likely provided an integrated regional economic system as well, and during that period the northern Basin hosted considerable occupation. The intervening Middle Postclassic, a period after the demise of Tula but before the full emergence of the Triple Alliance that administered the Aztec empire, likely lacked such regional economic integration, especially within a region previously dominated by Tula. The relatively wetter southern Basin of Mexico, a region of persisting Middle Postclassic occupation, would have provided broader and lower-risk opportunities for agriculture, and a higher degree of self-sufficiency, not present in the north. The relatively drier northern Basin could not have met subsistence demands for any substantial occupation.

In sum, we envision the abandonment of the Zumpango region during Middle Postclassic times as a comparatively short-lived phenomenon caused by a combination of ecological and sociopolitical factors. The far northwestern Basin of Mexico was occupied by large, dense populations only when centralized polities provided an overarching organizational framework that integrated specialized producers of complementary products. Hence, the Zumpango region was sparsely occupied during periods of relatively weak or uncentralized polities (Formative, Epiclassic, and Middle Postclassic), and much more densely occupied during periods of relative strong, centralized polities (Classic, Early Postclassic, Late Postclassic).

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REFERENCES

Acosta, José. 1940. "Exploraciones en Tula, Hidalgo, 1940." *Revista mexicana de estudios antropológicos* 4:172–94.

Acosta, José. 1941. "Los últimos descubrimientos arqueológicos en Tula, Hidalgo, 1941." *Revista mexicana de estudios antropológicos* 5:239–43.

Acosta, José. 1944. "La tercera temporada de exploraciones arqueológicas en Tula, Hgo., 1942." *Revista mexicana de estudios antropológicos* 6:125–64.

Acosta, José. 1945. "La cuarta y quinta temporada de exploraciones arqueológicas en Tula, Hgo." *Revista mexicana de estudios antropológicos* 7:23–64.

Acosta, José. 1952. "Review of Griffin and Espejo (1947, 1950)." *Boletín bibliográfico de antropología americana* 15:76–77.

Blanton, Richard E. 1972. *Prehispanic Settlement Patterns of the Ixtapalapa Peninsula Region, Mexico*. Occasional Papers in Anthropology, no. 6. Department of Anthropology, The Pennsylvania State University, University Park.

Boas, Frans, and Manuel Gamio. 1921. *Album de colecciones arqueológicas*. Museo Nacional de Arqueología, História y Etnografía, Mexico City, Mexico. Reprinted 1990, Instituto Nacional de Antropología e Historia, Mexico City.

Brenner, Anita. 1931. *The Influence of Technique on the Decorative Style in the Domestic Pottery of Culhuacan*. Columbia University Contributions to Anthropology, vol. 13. Reprinted in 1969 by AMS Press, New York.

Brumfiel, Elizabeth M. 2005a. "Opting in and Opting Out: Tula, Cholula, and Xaltocan." In *Settlement, Subsistence, and Social Complexity: Essays Honoring the Legacy of Jeffrey R. Parsons*, edited by Richard E. Blanton, 63–88. Cotsen Institute of Archaeology, University of California, Los Angeles.

Brumfiel, Elizabeth M. 2005b. "Ceramic Chronology at Xaltocan." In *Production and Power at Postclassic Xaltocan*, edited by Elizabeth M. Brumfiel, 117–52. Serie Arqueología de México, University of Pittsburgh and Instituto Nacional de Antropología e Historia, Pittsburgh, Pennsylvania, and Mexico City.

Carrasco, Pedro. 1980. "La aplicabilidad a Mesoamérica del modelo andino de verticalidad." *Revista de la Universidad Complutense* 117:237–43.

Carrasco, Pedro. 1999. *The Tenocha Empire of Ancient Mexico: The Triple Alliance of Tenochtitlan, Tetzcoco, and Tlacopan*. University of Oklahoma Press, Norman.

Charlton, Thomas H., Deborah L. Nichols, and Cynthia Otis Charlton. 2000. "Otumba and Its Neighbors: Ex Oriente Lux." *Ancient Mesoamerica* 11:247–65.

Cobean, Robert H. 1978. "The Pre-Aztec Ceramics of Tula, Hidalgo, Mexico." PhD dissertation, Department of Anthropology, Harvard University, Cambridge, MA.

Cobean, Robert H. 1990. *La cerámica de Tula, Hidalgo*. Instituto Nacional de Antropología e História, Mexico City.

Cobean, Robert H., and Alba Guadalupe Mastache. 1999. *Tepetitlán: A Rural Household in the Toltec Heartland*. Serie Arqueología de México, University of Pittsburgh and Instituto Nacional de Antropología e Historia, Pittsburgh, Pennsylvania, and Mexico City.

Cowgill, George L. 1996. "Discussion." *Ancient Mesoamerica* 7:325–31.

Franco, José Luís. 1945. "Comentarios sobre tipología y filogenía de la decoración negro sobre color natural del barro en la cerámica 'Azteca II.'" *Revista mexicana de estudios antropológicos* 7:163–86.

Franco, José Luís. 1949. "Algunos problemas relativos a la cerámica Azteca." *El México antiguo* 7:162–208.

Franco, José Luís, and Frederick A. Peterson. 1957. *Motivos decorativos en la cerámica azteca*. Serie Científica, no. 5. Museo Nacional de Antropología, Mexico City.

García, Raúl Ernesto. 2004. "De Tula a Azcapotzalco: Caracterización arqueológica de los Altepetl de la Cuenca de México del Posclásico Temprano y Medio, a través del estudio cerámico regional." Tesis de doctorado, Facultad de Filosofía y Letras, División de Posgrado, Universidad Nacional Autónoma de México, Mexico City.

Gorenflo, L. J. 2015. "Compilation and Analysis of Pre-Columbian Settlement Data in the Basin of Mexico." *Ancient Mesoamerica* 26:197–212.

Gorenflo, L. J., and William T. Sanders. 2007. *Prehispanic Settlement Pattern Data from the Cuautitlan, Temascalapa, and Teotihuacan Regions, Mexico*. Occasional Papers in Anthropology, no. 30. Department of Anthropology, The Pennsylvania State University, University Park.

Griffin, James B., and Antonieta Espejo. 1947. "La alfarería correspondiente al último período de ocupación nahua del Valle de México, I." *Memorias de la Academia Mexicana de la Historia* 6(2):3–20.

Griffin, James B., and Antonieta Espejo. 1950. "La alfarería correspondiente al último período de ocupación nahua del Valle de México, II." *Memorias de la Academia Mexicana de la Historia* 9(1):3–54.

Hare, Timothy S., and Michael E. Smith. 1996. "A New Postclassic Chronology for Yautepec, Morelos." *Ancient Mesoamerica* 7:281–97.

Hodge, Mary G. 1984. *Aztec City States*. Memoirs of the Museum of Anthropology, no. 18. University of Michigan, Ann Arbor.

Hodge, Mary G. 1998. "Archaeological Views of Aztec Culture." *Journal of Archaeological Research* 6:197–238.

Hodge, Mary G., ed. 2008. *Place of Jade: Society and Economy in Ancient Chalco*. Serie Arqueología de México, University of Pittsburgh and Instituto Nacional de Antropología e Historia, Pittsburgh, Pennsylvania, and Mexico City.

Hodge, Mary G., and Leah D. Minc. 1991. *Aztec-Period Ceramic Distribution and Exchange Systems*. Report submitted to the National Science Foundation. National Science Foundation, Washington, DC.

Hodge, Mary G., and Hector Neff. 2005. "Xaltocan in the Economy of the Basin of Mexico: A View from Ceramic Tradewares." In *Production and Power at Postclassic Xaltocan*, edited by Elizabeth M. Brumfiel, 319–48. Serie Arqueología de Mexico, University of Pittsburgh and Instituto Nacional de Antropología e Historia, Pittsburgh, Pennsylvania, and Mexico City.

Jiménez, Wigberto. 1954. "Síntesis de la historia precolonial del Valle de México." *Revista mexicana de estudios antropológicos* 14:1:219–36.

Mastache, Alba Guadalupe, and Ana María Crespo. 1974. "La ocupación prehispánica en el área de Tula, Hgo." In *Proyecto Tula*, edited by Eduardo Matos Moctezuma, pt. 1, 71–104. Instituto Nacional de Antropología e Historia, Mexico City.

Mastache, Guadalupe, Ana María Crespo, Robert H. Cobean, and Dan M. Healan. 1982. *Estudios sobre la antigua ciudad de Tula*. Instituto Nacional de Antropología e Historia, Mexico City.

Mastache, Alba Guadalupe, Robert H. Cobean, and Dan M. Healan. 2002. *Ancient Tollan: Tula and the Toltec Heartland*. University Press of Colorado, Boulder.

Mayer-Oakes, William J. 1959. "A Stratigraphic Excavation at El Risco, Mexico." *Proceedings of the American Philosophical Society* 103(3):332–73.

McCafferty, Geoffrey G. 2001. *Ceramics at Postclassic Cholula, Mexico: Typology and Seriation of Pottery from the UA-1 Domestic Compound*. Monograph no. 43. Cotsen Institute of Archaeology, University of California, Los Angeles.

Minc, Leah D., Mary G. Hodge, and M. James Blackman. 1994. "Stylistic and Spatial Variability in Early Aztec Ceramics: Insights into Pre-Imperial Exchange Systems." In *Economies and Polities in the Aztec Realm*, edited by Mary G. Hodge and Michael E. Smith, 133–73. Institute for Mesoamerican Studies, State University of New York, Albany.

Müller, Florencia. 1952. "Las cerámicas del horizonte-culturales locales." In *The Civilizations of Ancient America: Selected Papers of the 29th International Congress of Americanists*, edited by Sol Tax, 43–51. University of Chicago Press.

Müller, Florencia. 1978. *La alfarería de Cholula*. Instituto Nacional de Antropología e Historia, Mexico City.

Murra, John V. 1972. "El 'control vertical' de un máximo de pisos ecológicos en la economía de las sociedades andinas." In *Visita de la Provincia de León de Huánuco en 1562. I: Ortiz de Zuñiga, Visitador*, edited by John V. Murra, vol. 2, 427–76. Universidad Nacional Hermilio Valdizán, Huánuco, Peru.

Nichols, Deborah L., and Thomas H. Charlton. 1996. "The Postclassic Occupation at Otumba: A Chronological Assessment." *Ancient Mesoamerica* 7:231–44.

Noguera, Eduardo. 1935. "La cerámica de Tenayuca y las excavaciones estratigráficas." In *Tenayuca*, 141–201. Secretaría de Educación Pública, Departamento de Monumentos, Mexico City.

Noguera, Eduardo. 1954. *La cerámica arqueológica de Cholula*. Editorial Guarania, Mexico City.

Norr, Lynette. 1987. "Postclassic Artifacts from Tetla." In *Ancient Chalcatzingo*, edited by David C. Grove, 525–46. University of Texas Press, Austin.

O'Neill, George Caracena. 1962. "Postclassic Ceramic Stratigraphy at Chalco in the Valley of Mexico." PhD dissertation, Department of Anthropology, Columbia University. University Microfilms, Ann Arbor.

Parsons, Jeffrey R. 1966. "The Aztec Ceramic Sequence in the Teotihuacan Valley, Mexico." PhD dissertation, Department of Anthropology, University of Michigan, Ann Arbor.

Parsons, Jeffrey R. 1971. *Prehistoric Settlement Patterns in the Texcoco Region, Mexico*. Memoirs of the Museum of Anthropology, no. 3. University of Michigan, Ann Arbor.

Parsons, Jeffrey R. 2008. *Prehispanic Settlement Patterns in the Northwestern Valley of Mexico: The Zumpango Region*. Memoirs of the Museum of Anthropology, no. 45. University of Michigan, Ann Arbor.

Parsons, Jeffrey R., Elizabeth M. Brumfiel, and Mary G. Hodge. 1996. "Developmental Implications of Earlier Dates for Early Aztec in the Basin of Mexico." *Ancient Mesoamerica* 7:217–30.

Parsons, Jeffrey R., Elizabeth M. Brumfiel, Mary Hrones Parsons, and David J. Wilson. 1982. *Prehispanic Settlement Patterns in the Southern Valley of Mexico: The Chalco-Xochimilco Region*. Memoirs of the Museum of Anthropology, no. 14. University of Michigan, Ann Arbor.

Parsons, Jeffrey R., Elizabeth M. Brumfiel, Mary Hrones Parsons, Virginia Popper, and Mary Taft. 1982. *Late Prehispanic Chinampa Agriculture on Lake Chalco-Xochimilco, Mexico*. Preliminary report submitted to the National Science Foundation the Instituto Nacional de Antropología e Historia. Museum of Anthropology, University of Michigan, Ann Arbor.

Parsons, Jeffrey R., Mary Hrones Parsons, Virginia Popper, and Mary Taft. 1985. "Chinampa Agriculture and Aztec Urbanization in the Valley of Mexico." In *Prehistoric Intensive Agriculture in the Tropics*, edited by I. S. Farrington, 49–96. BAR International Series, no. 232. British Archaeological Reports, Oxford.

Plunket, Patricia. 1990. "Arqueología y etnohistoria en el Valle de Atlixco." *Notas Mesoamericanas* 12:3–18.

Sanders, William T. 1965 *The Cultural Ecology of the Teotihuacan Valley, Mexico*. Department of Sociology and Anthropology, The Pennsylvania State University, University Park.

Sanders, William T., ed. 1986. "The Toltec Period Occupation of the Valley," pt. 1: "Excavations and Ceramics." In *The Teotihuacan Valley Project Final Report*, vol. 4. Occasional Papers in Anthropology, Department of Anthropology, The Pennsylvania State University, University Park.

Sanders, William T., Jeffrey R. Parsons, and Robert S. Santley. 1979. *The Basin of Mexico: Ecological Processes in the Evolution of a Civilization*. Academic Press, New York.

Séjourné, Laurette. 1970. *Arqueología del Valle de México*, vol. 1: *Culhuacán*. Instituto Nacional de Antropología e Historia, Mexico City.

Séjourné, Laurette. 1983. *Arqueología e história del Valle de México, de Xochimilco a Amecameca*. Siglo Veintiuno, Mexico City.

Smith, Michael E. 1983. "Postclassic Culture Change in Western Morelos, Mexico: The Development and Correlation of Archaeological and Ethnohistorical Chronologies." PhD dissertation, Department of Anthropology, University of Illinois, Champaign/Urbana. University Microfilms, Ann Arbor.

Smith, Michael E. 2000. "Postclassic Developments at Xochicalco." In *Archaeological Research at Xochicalco*, vol. 2: *The Xochicalco Mapping Project*, edited by Kenneth G. Hirth, 167–83. University of Utah Press, Salt Lake City.

Sugiura, Yoko. 2005. *Historia de los asentamientos en el Valle de Toluca*. Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México, Mexico City.

Tolstoy, Paul. 1958. "Surface Survey in the Northern Valley of Mexico: The Classic and Postclassic Periods." *Transactions of the American Philosophical Society* 48(5):1–101.

Tovalín, Alejandro. 1998. *Desarrollo arquitectónico del sitio arqueológico de Tlalpizahuac*. Serie Arqueología, Instituto Nacional de Historia y Anthropología, Mexico City.

Vaillant, George C. 1938. "A Correlation of Archaeological and Historical Sequences in the Valley of Mexico." *American Anthropologist* 40:535–73.