The Archaeology of Settlement Abandonment in Middle America

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Abandonment is a recurrent phenomenon in settlements. It is often related to hazards, stemming from either natural or social causes, which may have different effects in sites and regions. Thus, the first step in abandonment research is to determine the archaeological correlates of different types of disasters—natural or social (Manzanilla 1997a); then the type of abandonment process—gradual or abrupt—should be defined, followed by the characterization of the society affected by a particular type of hazard.

As for the first step, natural hazards include floods, droughts, earthquakes, volcanism. Floods may be detected in mud and silt strata covering sites, a phenomenon that is frequent in the Lower Mesopotamian plain, particularly in Ur and Shurrupak (Buringh 1957:37; Jacobsen and Adams 1958; Raikes 1966:61-62) and the Nile Valley (Butzer 1984) but also in coastal Peru because of El Niño–Southern Oscillation effects (Moore 1991; Moseley 1987; Ortlieb and Macharé 1992; Thompson et al. 1984, 1985, 1986). Erosive sequences and vegetational changes may reveal droughts, to which urban centers—such as Teotihuacan in central Mexico or Tiwanaku in Bolivia—were often very vulnerable (García 1974; Manzanilla 1992, 1993b, 1997b; Metcalfe et al. 1989, 1991; Ortloff and Kolata 1993; Paulsen 1976). A long-lasting drought stimulated generalized regional collapse of urban centers in the Near East around 2000 B.C. (Bard 1993; Malek 1986; Rosen 1993; Weiss et al. 1993). Fissures, fractures, faults, and collapse of buildings signal the effects of seismic movements (Vittori et al. 1991). Tephras, lahars, pyroclastic flows, and lava are evidence of volcanism (Sheets and Grayson, eds. 1979).

Abandonment processes may also be related to social and ecological causes. Salinization of soils due to overirrigation or overgrazing, deforestation (O'Hara et al. 1993), raids, warfare, and conquests are ecological or social phenomena that may cause different scales of abandonment in sectors, sites, or regions.

With regard to the second step, two types of abandonment processes, in their various subtypes, are mentioned in this book: gradual and rapid. Gradual abandonment may be triggered by deterioration or salinization of cultivation areas, drought, changes in river courses or exchange routes, nonfulfillment of tributary tasks, messianic movements, or collapse of urban organizations. The amount of objects subtracted from activity areas is related to the portability of the objects and valuables, the distance to the new site, the objects’ personal or economic value, their inaccessibility in the new settlement area, and their requirement for the fulfillment of certain specialized tasks. Rapid abandonment may have different modalities: the most drastic may be due to the destruction of settlements by raids and conquest, volcanic lahars and lava, floods, mud flows, or earthquakes.
There is another type that allows people to take some of their belongings, even though the event may also be dangerous: volcanic ash emissions, differential destruction of sites by invaders, some types of earthquakes, and the like.

The third step in abandonment research is the characterization of the society that is affected by the natural hazard or social conflicts. A disaster is the result of the confluence between a dangerous natural hazard and a vulnerable society (García Acosta 1996:18). The vulnerability of a given society may be assessed by answering the following questions: (1) What was the duration and the geographical scale of impact? (2) What was the settlement hierarchy of the affected system, and what type of settlements were disrupted? (3) What developmental stage was the given society in? Was it in a vulnerable stage with respect to resource access, social integration, regional networking, or centralized authority? (4) Did the society have preventive technological measures regarding the type of hazard or conflict that most commonly affected the region? and (5) What were the consequences of the hazard or conflict? Did it bring about changes in, among other things, settlement patterns, site abandonment, buffering mechanisms for cyclical disasters, massive storage, or integration of symbolic interpretations of these events in myths?

The final effects of natural and social disruptions may be (1) migration, with social effects in the population that migrates as well as in the societies that receive the migrants; (2) devastation of specific areas with respect to their productivity, with consequent changes in productive strategies; (3) hydrological changes with the regional consequences they represent; (4) increase in the sedimentation of nearby areas with consequences for agriculture; and (5) disruption of trade routes.

The scale may also vary. Macroregional collapses brought about by major climatic changes have recently been proposed by scholars working throughout the Near East (Weiss et al. 1993). By the end of the third millennium B.C. a catastrophic collapse of Early Bronze Age societies from Turkey to India coincided with a severe shift toward a drier climatic era. Volcanic eruptions have also been detected in some of these areas, and lamentations of famine and drought characterize the epoch. Almost all the cities and towns in western Palestine were deserted (Rosen 1993). The decreased frequency and amount of rainfall changed the hydrological regime, eliminating the buffering effect of floodwater farming. Primary data for the study of this climatic change come from pollen, paleolimnology, oxygen isotopes, and geomorphology (Rosen 1993). Evaporation and increased salt deposition, decline of oak pollen, wadi incision, and flooding of valley bottoms are some of the phenomena related to this change.

Why did these societies fail to adapt to the new situation? In the Near East there are great fluctuations in precipitation, stream flow, and crop yield from year to year. Rosen (1993) cites some of the predictable measures societies took: diversification of crops and herd animals, food storage, retention and distribution of information on famine foods, transformation of surplus food into nonperishable items of value that could be traded for food in times of stress, and extension of the social network to allow access to food resources from other regions. He notes several factors that may explain why the agricultural sectors of Early Bronze III society failed to respond successfully to the climatic desiccation at the end of the period: (1) state control over surplus production, (2) nondiversification of subsistence crops, (3) loss of floodwater farming as a buffer, and (4) a slow response time on the part of elite managers.

With these issues in mind, let us address the evidence for the abandonment of a huge metropolis of the Classic horizon in central Mexico, Teotihuacan. Of particular importance is a multifactorial explanation of the fall of the city and the different steps involved in its abandonment.

ABANDONMENT AT TEOTIHUACAN

Teotihuacan was one of the most extensive urban developments of preindustrial times.
Figure 7.1. The city of Teotihuacan. (Redrawn from Millon 1973)
A city of order and cosmopolitan activities, a pilgrimage center, a political capital, and a manufacturing center, it housed one of the largest populations of Mesoamerica. Its abandonment was no ordinary fact, and it shook Classic Mesoamerica in many ways.

The importance of Teotihuacan (Figure 7.1) in the Prehispanic history of central Mexico is such that human groups that came after its collapse referred to it as a mythical place. The Legend of the Fifth Sun is centered in Teotihuacan, where the new sun, or era, began (Sahagún 1969, 2:258-259). Sahagún (1969, 3:209-210) mentions that the Mexica came to Teotihuacan to make sacrifices and to invest a new lord. The relevance of the metropolis in the political scenario of the Classic period stimulates us to discriminate the different elements that are linked to its collapse: fire, dismantling, ritual destruction, violence, abandonment rites, looting, and reoccupation.

**Fire in the Central Portion of the City**

Evidence of fire has been detected by Millon (1988:149-152) in nearly all monumental structures on the Street of the Dead (the city’s main north-south axis) and in temples and associated buildings in the rest of the city. Yet of the 965 apartment compounds examined, only 45 showed clear evidence of burning (5 percent). In general, burning was found in front of and on both sides of the staircases and on top of the temple platforms (Millon 1988:150).

In many cases carbonized wooden beams and jambs have been found on top of floors of the last occupational level, particularly in the Quetzalpapalotl Palace, to the west of the Moon Plaza (Figure 7.2) (floors of the ante-chamber with stains of the carbonized beams and pillars: Acosta 1964:25); the House of the Priests, near the Pyramid of the Sun (Bätres 1906:13); the Viking Group, in the central portion of the Street of the Dead (where an ash layer was found before the structure collapsed, as well as carbonized beams and pillars, alterations in the color of wall paintings, smoke stains, etc.; Armillas 1944); the central plaza of the northern palace (Structure 1D) of the Ciudadela (Jarquín Pacheco and Martínez Vargas 1982:123); the Xalla compound; and Teopancazco, an apartment compound to the southeast of the Ciudadela (I unearthed carbonized wooden beams near portico floors of the last occupation in our 1997 field season; Manzanilla 1998), among other structures.

Some of this carbonized wood has been sent for radiocarbon dating. Bernal (1965) wonders why the uncalibrated dates range from A.D. 200 to 290 and speculates that the span occurs as a result of the reuse of Tlamilolpa beams by Xolalpan builders. I found similar results in Teopancazco, where the wooden beams gave early dates.

Wolfman (1990) also sampled many burned floors, postholes, and column and doorjamb molds for archaeomagnetic dating. Some came from Structure 1D in La Ciudadela, the Viking Group, and Teopancazco; because of the crossover point, the archaeomagnetic dates concentrate roughly around two possible means: A.D. 310 and 475 (Wolfman 1990:300). Our archaeomagnetic dates from Teopancazco seem to fall at the end of the sixth century A.D. (Hueda 2000) and thus are placed at the end of the Xolalpan phase.

Wolfman argued that if the extensive burning at Teotihuacan occurred ca. A.D. 475-500, the Maya hiatus (around A.D. 534-593) could be seen as a partly related event (Wolfman 1990:301, 303). If the fire is dated before the beginning of the exodus of the population, then it may be seen as an internal revolt, a prelude to the disarticulation of central authority in the city. If it is dated to the end of the city’s history, then all the events possibly related to the collapse may have been intertwined. Some of the events that have been cited include the following (Manzanilla 1995).

1. Nomad incursions. Jiménez Moreno (1959:1066) proposed that Otomi nomad groups inhabiting the northern sector of the valley could have been involved in the burnout of the city’s core.

2. Agricultural collapse and deforestation. Mooser (1968:31) thought that the growth of the city provoked the destruction of
THE ABANDONMENT OF TEOTIHUACAN

Figure 7.2. The central courtyard of the Quetzalpapalotl Palace, with evidence of destruction of the carved pillars. (From Acosta 1964:Figure 37; reproduced by permission of the Instituto Nacional de Antropología e Historia)

nearby forests, and thus originally advantageous natural conditions turned into adverse ones. Millon (1967:48) added that immoderate woodcutting for construction and lime processing produced erosion, causing a decrease in agricultural soil humidity. Recently, Barba (1995) calculated that the city needed 2 million m³ of calcium carbonate for its plastering, and thus 2.2 million m³ of wood to burn the limestone into lime (four times the surface of the valley floor). If persistent drought occurred around A.D. 650 in central Mexico (García 1974; Lorenzo 1968; Manzanilla 1992; Metcalfe et al. 1989; O’Hara et al. 1993), many seminomadic or nomadic groups may have migrated to more benign environments. At that time, the city may have suffered from a lack of food and increasing social deterioration, making it vulnerable to external threats. Isotopic data support the possibility of long-lasting droughts in central Mexico during the sixth and seventh centuries A.D., with consequences for the subsistence strategies of Epiclassic groups in the city (Manzanilla et al. 2000).

3. Powerful marginal groups. Palerm and Wolf (1972:191–193) thought that in the northern frontier of Mesoamerica, increasing aridity would require the organization of irrigation systems and the need for protection against the incursions of nomads, factors that would reinforce military patterns. This power could then be used against ancient civilization centers such as Teotihuacan.

4. Blocking of provisioning networks. Chadwick (1966:2) noted that Mixtecs, Olmeca-Xicallanca, and Chocho-Popoloca (who were in contact with Teotihuacan during its last phases) would have taken advantage of the social unrest in the city to block exchange and access routes.

Millon (1988:149) has mentioned that some of the causes of Teotihuacan’s collapse were bad administration of economy and politics, inflexibility toward change, an inefficient bureaucracy, and the deterioration of exchange networks. Many if not all of these factors would have coincided in the last periods of Teotihuacan history. If the government was collective and in the hands of sector heads, often depicted as anonymous priests (whose main function was related to fertility rites, as the mural paintings suggest), one can imagine how the population of the city may have reacted toward drought, soil erosion, and lack of food. The result was population dispersion toward the west, east, and south, although during Coyotlatelco times (A.D.
(600–850) the site was still inhabited, particularly in its central and eastern portions.

Our dates from Late Coyotlatelco occupations in the tunnels to the east of the Pyramid of the Sun (Manzanilla et al. 1996) are placed around A.D. 550–700. I propose that the city’s fall began when its core was set on fire around A.D. 550 (the collapse of the elites), together with the first incursions of the Coyotlatelco groups, perhaps from the Bajio region or farther north (our strontium isotope data suggest that some Epiclassic and Early Postclassic burials from the tunnels to the east of the Pyramid of the Sun are migrants to the valley of Teotihuacan [Price et al. 2000]). It is possible, however, that the Coyotlatelco lived in the city some time before the collapse and participated in the transition and looting. Eventually, the apartment compounds were deserted, and finally, the entire periphery was abandoned.

**Dismantling of Decorative Elements and Cut Stones from Staircases and Altars**

Episodes of political unrest in Teotihuacan (particularly around A.D. 250) may have resulted in the desacralization of structures and looting, as in the destruction and concealment of the Pyramid of the Feathered Serpent. When new construction levels were built, walls were torn down, beams were reused, rooms were filled with adobes and debris, wall stones were dismantled and reused, burials were reopened, and so forth.

For the end of the city’s life, however, many staircases lining the Street of the Dead were dismantled (Bernal 1963:21), particularly those of the Plaza of the Moon. Acosta (1964:24, Figure 23) mentions that the cut stones of the staircase of the Quetzalpapalotl Palace were taken out, except for the first step (Figure 7.3), which had on top of it carved stones (serpent parts, seashells, conical stones, etc.) from a dismantled altar or structure. Similar stones, as well as others in the shape of corncobs and *chalchihuites* (beads of precious green stone), were found in the door between the main patio (the Pillars’ Patio) and Antechamber 1 of the palace.

In Structure 2 of the Street of the Dead Complex (Matos Moctezuma 1980:86), just to the north of the San Juan River, fragments of stucco and carbonized wood were found on top of the floor of the temple, bearing traces of the burned roof. Morelos García (1993:66–67) notes that the feline head
sculptures that decorated the main temple’s *alfarada* (stairway limits) at the West Plaza Compound (part of the Street of the Dead Complex) were dismantled and thrown to the plaza’s floor, together with a carved stone frieze, a feline’s paw and arm, and other objects. The same situation occurred in the main courtyard at Xalla, particularly at the bottom of Structure 2 (Manzanilla and López Luján 2001), which also displayed dismantled feline heads and paws, as well as carved stones that belonged to a frieze.

In apartment compounds such as Xolalpan (to the northeast of the Pyramid of the Sun), Linné (1934:48) found traces of destruction of the main central red altar. The ritual objects related to this structure (ornamented cylindrical and circular plaques, greenstone plaques, theater-type censers, a Huehuetotl’s censer, etc.) were found scattered between the altar and the staircase in the eastern platform.

*Shattering and Ritual Destruction of Vessels and Sculptures*

Many ritual elements have been found on top of the last occupational floors in different parts of the city. Millon (1988:151) mentions the violent burning and destruction of the Puma Group (on the Street of the Dead), with the consequent shattering and scattering of a green onyx sculpture.

In Structure 1D (the northern palace) of the Ciudadela many traces of violent destruction were reported (Jarquin Pacheco and Martínez Vargas 1982:103), especially shattered Tlaloc vases, Tlaloc disks, Huehuetotl’s braziers, masks, theater-type censers, Mezcala figures, obsidian eccentrics, jade beads, decorated slate, zoomorphic sculptures, *candelero* concentrations (one of these had 160 *candeleros* [small, two-chambered ceramic devices] in the central plaza of Structures 1D), and the like.

The frequent find of Huehuetotl’s braziers in the last occupational floors (see the Ciudadela northern palace or Xolalpan) has called to our attention similar finds in peripheral apartment compounds, such as the one I excavated extensively at Oztotyahuclco 15B:N6W3 (Manzanilla 1993a:108), where similar shattered braziers were found in Room 7. Pottery vessels were also broken on top of floors (Figure 7.4)(Manzanilla 1993a:109, Figures 61 and 62).

At Teopancazco (S2E2), an apartment
compound to the southeast of the Ciudadela, I also found a complete Huehueteotl sculpture, facedown nearly on top of the floor of Room 17, as if thrown down from a small pedestal (Figure 7.5); its frontal carving had been effaced. A Tlaloc vase was also found shattered on top of Room 25, with the face of the god toward the floor (Figures 7.6 and 7.7) (Manzanilla 1998). It is interesting to note the same type of behavior in different functional sectors of the city.

Similarly, in the northern room of the Pillars’ Patio of the Quetzalpapalotl Palace a tecali jaguar was found on top of the floor on its left side (Acosta 1964:34).

At Tlalimilolpa, Linné (1942:115) found “a systematic tearing down and breaking up of large and complicated ‘incense burners’ to form part of the filling on top of which the new floors were laid,” which may give us a hint of the renewal behavior in each construction level.

Violence
There are a few hints of violent behavior toward the inhabitants of the city. Batres (1906:15) mentioned that in the House of the Priests, near the Pyramid of the Sun, female and male skeletons were found in different positions, with their stone beads near their heads. In Structure 1D of the Ciudadela, dismembered bodies were dispersed in the western room and the plaza of Group A (including a man who died from a blow to the head), as well as articulated limbs (Jarquin Pacheco and Martinez Vargas 1982:103). These are exceptional examples.

Termination and Abandonment Rites
In studying activity areas at Teotihuacan for 27 years, I have preferred the interpretation of distributional patterns of archaeological, chemical, paleobotanical, palynological, and paleozoological data in specific structures (Manzanilla 1985, 1987, 1988–89, 1993a, 1996; Manzanilla and Barba 1990). Artifacts are mobile, and their location may be disrupted in the diverse circumstances related to the abandonment processes (Cameron 1993), as well as by natural and cultural transforma-
Conclusions. Yet chemical compounds (which are a product of continuous repetitive activities) in stucco floors have been capped in a matrix that does not allow much modification (Barba 1986). Thus, chemical analyses often give us information about past activities, data that are normally lacking in gradual abandonment situations.

Particularly in our anatomy of two Teotihuacan apartment compounds (Oztoy-ahualco 15B:N6W3 and Teopancazco 1NW: S2E2), I have detected what seem to be termination and abandonment ceremonies. Termination rituals involve the “killing” of different types of vessels, mica, figurines, candeleros, lithics, slate, and so on, to end one construction phase before beginning the next; these rituals were clearly documented at Teopancazco, where Late Tlamimilolpa structures were replaced and covered by the
main courtyard (C6) around A.D. 350 (Manzanilla 2000). Large stuccoed tripods were “killed” and delicately placed in the northwestern corner of the main ritual courtyard of the compound (Figures 7.8 and 7.9).

Abandonment rites involve concentrations of candeleros, “killed” vessels, ceramic three-prong braziers, theater-type censers (Figure 7.10), and so on at Teopancazco (Manzanilla 1998), or human mandibles deposited with ceramic pots and seashells in layers (each layer separated by a pile of earth) (Manzanilla 1993a:101, Figure 101). In both Teopancazco and Oztoyahualco I also found “killed” stone vessels (i.e., Manzanilla 1993a:447, Figure 331).

Palka (this volume) raises the interesting issue of the different reactions of diverse socio-economic groups to the factor that stimulates abandonment. At Dos Pilas in the Petén, people of higher socioeconomic rank may have abandoned their houses more quickly because they were affected first by warfare and were forced to leave. Lower-rank farmers were affected by environmental degradation. At Teotihuacan both factors may have been related in the sixth century A.D., when internal revolts were occurring against the ruling elite at the same time as large-scale environmental degradation due to deforestation and a long-lasting drought. Thus the core of the city was burned, with much abandonment-rite debris and de facto refuse in place, whereas the periphery was abandoned with some haste. In apartment compounds of the northwestern portion of the city I have detected, for example, stucco mixtures—with basalt and scoria polishers—ready to be used in repairing graves, which were left on top of the floors when the site was abandoned (Manzanilla 1993a:168).

I would expect that internal revolts and warfare with other ethnic groups would leave
different patterns. In the case of internal revolts, even if large-scale rapid abandonment ensued, there might have been some chance to carry belongings away. That may be the type of case that Inomata exposed with respect to Aguateca. In ethnic warfare there is a greater possibility for sudden abandonment and the sacking of remaining valuables. This pattern is very frequent in Near Eastern archaeology during the Chalcolithic and Bronze Ages (Manzanilla 1986).

**Looting**

Offering pits are consistently sacked throughout Teotihuacan. Armillas (1944) remarked that in the Viking Group all the offerings had been looted, and in one case this was done during Teotihuacan times, because new floors had been constructed on top. In general, owing to the fixed position of the offerings in front of the staircases or in the corners, it is clear that they were sacked in Prehispanic times. Some looters' tunnels were also dug in those centuries (Bernal 1963:31). In the Quetzalpapalotl Palace large looting pits were detected, many of which bore frequent examples of carved stones from the Pillars' Patio (Acosta 1964:32).

**Reoccupation or Continued Occupation**

Acosta (1972:149) believed that the violent destruction of the ceremonial core ended the urban history of the site but that some groups continued living in the apartment compounds in the periphery for two or three more generations. In many places one finds large amounts of Coyotlatelco pottery in the debris of the last Teotihuacan constructions, such as the Street of the Dead, Tetitla, and Atetelco (Armillas 1950; Bernal 1963); when the elite apartment compounds were totally ruined, the Mazapa people buried their dead on top of the debris (Armillas 1950; Linné 1934, 1942).

From our explorations in quarry tunnels immediately to the east of the platform of the Pyramid of the Sun, one may conclude that the Coyotlatelco people were living in Teotihuacan in the sixth century A.D. They were burying their dead in these tunnels, and they were certainly looting Teotihuacan ritual contexts (Manzanilla et al. 1996). Perhaps, as with the Akkadian people living in the outskirts of the Early Dynastic cities of Sumer, they participated in the collapse of the Teotihuacan way of life and continued living in the partially deserted city. I suspect that there was not a continuous Coyotlatelco settlement in the city but perhaps clusters of people looting and dismantling former Teotihuacan buildings. There is scant evidence of Coyotlatelco structures and activity areas (some of which have been dug by my team in the tunnels to the east of the Pyramid of the Sun). There is also some evidence that small Coyotlatelco groups were living on top of the last Teotihuacan floors in some of the apartment compounds. But there are no data whatsoever of large Coyotlatelco settlements and constructions, as have been found in Tlapizahuitl, for example (Tovalin Ahumada 1992).

**CONCLUSIONS**

Teotihuacan, with its 20 km², is still a vast field of inquiry with respect to its last years of existence. In this chapter I have tried to give an idea of the recurrence of behavior in ritual and domestic contexts in the city. Yet much work remains to be done to elucidate when and why the vast Classic metropolis collapsed, and who was involved in this extraordinary event.