

Rapidly Abandoned Households at Xochicalco, Morelos, México

RONALD W. WEBB

Latin American Studies Center, Temple University
Department of Anthropology, Pennsylvania State University

KENNETH G. HIRTH

Department of Anthropology, Pennsylvania State University

ABSTRACT

Recent research at Xochicalco, Morelos, Mexico has shown that much of the site was rapidly abandoned at the end of the Epiclassic period. Three residences excavated by the Xochicalco Lithic Project have yielded highly unusual amounts of *de facto* refuse in Epiclassic living surfaces. The careful reconstruction and distribution analysis of this refuse allow Mesoamericanists a view into what household life was like for urban dwellers in Central Mexico ca. A.D. 900. This paper examines the nature of *de facto* refuse found at the site and discusses its significance for household archaeology.

Key words: Xochicalco, Morelos, México, *de facto* refuse, household, rapid abandonment, lithic craft-production.

RESUMEN

Investigaciones recientes en Xochicalco, Morelos, México han evidenciado que muchos sitios fueron abandonados rápidamente al final del período Epiclásico. Tres residencias excavadas por el Xochicalco Lithic Project han proporcionado unos amontonamientos de basura *de facto* altamente inusuales en superficies ocupadas en el Epiclásico. El cuidadoso análisis de reconstrucción y distribución de esta basura permite a los mesoamericanistas una visión desde un conjunto habitacional de cómo fue la vida de los pobladores urbanos en México Central en torno al 900 a.C. Este artículo examina la naturaleza de la basura *de facto* encontrada en el sitio y se discute su significado para la arqueología de conjuntos habitacionales.

Palabras clave: Xochicalco, Morelos, México, basura *de facto*, conjunto habitacional, abandono rápido, producción artesanal lítica.

INTRODUCTION

A principal goal of anthropological archaeology is to reconstruct the lifeways of prehistoric peoples. In Mesoamerica this has been increasingly carried out under the theoretical framework of household archaeology (e.g., Santley and Hirth 1993; Wilk and Ashmore 1988). Included in this framework are analyses of domestic activity areas (e.g., Manzanilla 1986). At Xochicalco (Inomata and Sheets in this issue: Figure 1) the recovery of large quantities of *de facto* refuse directly from activity surfaces in both ceremonial and residential sectors of the site suggest it was rapidly abandoned around AD 900 (Hirth 1984, 2000; Hirth and Cyphers 1988; González and Garza 1994; Webb and Hirth 1998). Analyses of the physical characteristics of these artifacts address questions concerning their function while the spatial distributions relate to activity behavior and household organization.

While researching households many archaeologists have fallen into the fallacy of the «Pompeii premise» where they treat house-floor assemblages as if they were Pompeii-like systemic inventories (Ascher 1968; Binford 1981; Sanders 1993; Schiffer 1985). This involves investigators interpreting the archaeological record as if the site were suddenly frozen in time by a natural catastrophe as occurred with Pompeii's volcanic eruption. Usually, however, this is not so and both natural and cultural transformations have affected the formation of the archaeological record. Thus, the way in which an archaeologist discovers a site may or may not be as it was used by the original inhabitants. To paraphrase Ascher (1968), this may be called the «disorganization of time's arrow» on archaeological sites until the processes are ultimately disrupted by the researcher. In terms of cultural transformations, the patterns of site abandonment and artifact discard are considered to be the most significant (e.g., Schiffer 1985, 1995; Stevenson 1982). It follows, therefore, that the quicker a site is abandoned the less chance there is

ARCHAEOLOGICAL INVESTIGATIONS AT XOCHICALCO

The prehispanic urban center of Xochicalco is located in western Morelos about sixteen kilometers from Cuernavaca (Figure 1). In 1978 Kenneth Hirth initiated the Xochicalco Mapping Project with the objective of defining the size and demographic history of this important site (Hirth 1984: 579; Hirth and Cyphers 1988: 17). Work continued at Xochicalco through the 1980s and 1990s by INAH archaeologists under the direction of Norberto González Crespo. The first seasons of INAH's excavations concentrated on the investigation of access routes into the site and the ditch and rampart constructions that protected the Epiclassic center (González *et al.* 1995). Large scale INAH explorations were undertaken during 1993 and 1994 by the *Proyecto Arqueológico Especial Xochicalco*. This project sought to excavate, consolidate, and restore a major portion of the civic—ceremonial core area as part of the site's development as a tourist destination (Garza and González 1995).

Concurrently, the Xochicalco Lithics Project was initiated in 1992 by Kenneth Hirth to investigate obsidian production areas identified by his earlier mapping project. A secondary goal of the project was to investigate domestic organization at the site during its peak occupation. To these ends three domestic residence/workshops were completely excavated with the purpose of identifying the location(s) of lithic tool production and to collect the full range of household data.

EPICLASSIC XOCHICALCO

The Xochicalco Mapping Project established that the lifespan of the urban center was relatively short. Although there is some evidence that the site was occupied as early as the Middle Formative period, Xochicalco did not develop into a major urban center until about AD 650. (Hirth 2000; Hirth and Cyphers 1988). According to Hirth, Xochicalco began a period of rapid growth around AD 650 which climaxed midway through the Central Mexican Epiclassic period when the site reached its maximum size of four km². It was during this period that Xochicalco grew to the splendor which is evident today thanks to the efforts of INAH's latest project.

The summit of Cerro Xochicalco was the focus of administrative and religious activities and, is here that

the well-known «Pyramid of the Plumed Serpents» and the «Observatory» are located. Residential terraces flank the side of Cerro Xochicalco and spill out onto the adjacent plain below. Hirth's population estimates for the Epiclassic period are between 9,000-15,000 people with much of the populace living on these terraces.

Xochicalco was in decline by the end of the Epiclassic period and was abandoned by AD 900. A rapid and violent end to Xochicalco is indicated by burning in the site's central ceremonial core (González and Garza 1994), the destruction of buildings and sculptures (González and Garza 1994; Sáenz 1964), and the dismemberment of corpses on structure floors (Garza 1994). Excavations by the Xochicalco Mapping Project (Hirth and Cyphers 1988), the Xochicalco Lithics Project (Webb and Hirth 1997, 1998; Webb and van Rossum 1997), and the recent INAH projects (Canto 1994; González and de Vega 1991; González *et al.* 1995; de Vega 1993) have also identified evidence for the rapid abandonment of residential areas of the site. In these instances, still usable ceramic vessels, grinding stones, and other artifacts were discovered directly on the floors of domestic residences. Evidence suggests these residences were abandoned at the same time that temples and monuments were destroyed in the upper ceremonial zone.

González and Garza propose (1994) that Xochicalco was abandoned as a result of an internal revolt that brought down the ruling elite as has been suggested for Teotihuacan (Millon 1981, 1988). Related to the notion of an internal revolt, Hirth (2000) proposes the possibility of a breakup within a political confederacy which he believes Xochicalco headed. Yet another possibility, again suggested by Hirth (2000), is that Xochicalco was conquered by another, as yet unidentified, group(s) from elsewhere in Mesoamerica. Though the cause, or causes, for the abandonment of Xochicalco will probably be debated until more extensive regional research has been completed, the fact remains that, when it was abandoned, the site's inhabitants left behind many still-usable possessions which may provide us with insights into the organization of Epiclassic urban households.

OVERVIEW OF THE EXCAVATION RESULTS

During the Xochicalco Lithics Project's 1993 field season large scale excavations were carried out at five areas previously identified by test-pitting as lithic tool

production loci (Hirth 1995). Each of the five areas were labeled as «operations» and given a letter-name to distinguish it from the others: A, G, H, I, and K. Three of these five operations, H, I, and K, have been identified as domestic residence/workshops and are described below (Figure 2).

The excavation of Operations H, I, and K recovered numerous artifacts that were left on the floor of rooms and patios. Significant portions of the floor assemblages consist of utilitarian domestic objects which in-

clude obsidian and chert tools, *manos y metates*, mortars and pestles, and other types of lithics, as well as numerous reconstructible ceramic vessels used in ritual, storage, food preparation, and serving activities. Another substantial portion of the floor assemblage consists of obsidian and chert debitage created in the manufacture of tools as well as grinders and palettes used in that activity. Additionally, the floor assemblages contain green-stone beads and pendants, and imported serving vessels. The amount of still usable ar-



Figure 2. Cerro Xochicalco: Operations H, I and K.

tifacts (*de facto* refuse [Schiffer 1995]) recovered strongly suggest that these residence-workshops were abandoned rapidly (Webb and Hirth 1998).

As mentioned above, Xochicalco was probably abandoned as a result of military conquest. Two separate cultural processes would have affected the composition of floor assemblages created by this event: (1) the type and quantity of items removed by residents fleeing the site, and (2) the looting of residential and ceremonial structures by victorious combatants. Although representing two separate processes, the selection criteria for both are probably sufficiently similar in the way they affected floor assemblages.

Xochicalco's inhabitants who fled the site probably removed a large proportion of high value and portable items (Cameron and Tomka 1993; Deal 1985; Schiffer 1987; Stevenson 1982). We assume they took items that they considered to be the most important and were easily transportable. Nevertheless, as we have noted elsewhere (Webb and Hirth 1998), even at rapidly abandoned sites like Pompeii, research suggests that people made conscious decisions concerning the time they had to depart their homes, how far they had to travel to escape the catastrophe's effects, and how they were going to carry those items they felt were valuable enough to take with them (Allison 1992; Berry 1997). Regardless, the fact that exotic artifacts such as jadeite pendants and imported serving vessels were recovered from *in situ* floor deposits suggest that the quantity of artifacts carried from Xochicalco was limited at best, even if the households had been looted after initial abandonment. Moreover, we believe that nearly all of the more mundane household items, including large ceramic storage vessels and ground-stone tools, remained at the site when its inhabitants abandoned it.

Analysis of floor assemblages involved a careful reconstruction of ceramic vessels recovered from living surfaces. It is interesting that although a considerable amount of time and effort was spent reconstructing ceramic vessels, many remained incomplete at the end of laboratory analysis. We believe, however, that most of these vessels were originally complete and can not be completely refitted because fragments may have been lost during excavation, removed by erosion, or were disturbed by other post-depositional processes. It is also possible that some fractions of vessels were misidentified or misclassified during vessel identification or that we simply were not able to refit the «jig-saw puzzle» that many vessels had become.

Another complicating factor, suggested by ethno-archaeological research, is that people often recycle broken ceramic vessels for a use other than the one for which they were originally created (Deal 1985; Hayden and Cannon 1983; Schiffer 1987). Although it is usually difficult to identify these types of artifacts at most archaeological sites researchers at Ceren have been able to do so (Sheets 1992). At Xochicalco, we are able to identify several artifacts of this type although probably not all.

DESCRIPTION OF DWELLINGS AND ARTIFACT INVESTORIES

Operation H

Operation H is situated on a terrace on the southeastern slope of Cerro Xochicalco (Figure 2). During the 1993 field season a 315.5 m² area was excavated revealing a residential compound composed of four patio groups constructed on two levels (Figure 3). Additionally, an exterior patio located to the south of the dwelling was identified as a craft-activity/trash-disposal area. Distribution analyses of the artifacts suggest that patios were the scene of numerous activities and functions whereas individual rooms were often void of *de facto* refuse. When *de facto* refuse was recovered from rooms it was often of a specific artifact class or task assemblage which would indicate a specific function for that space.

The North Patio in Operation H is of particular interest because it was an area where a great deal of household activity took place including obsidian craft production, stucco working, storage, and food preparation (Figure 4). In the southeast corner of the patio a small lithic processing area was associated with a stockpile of over twenty ground-stone tools, many of which were used in the production of obsidian and chert tools. Evidence for food processing was identified in the northwest corner of the patio where a complete *comal* (ceramic griddle), cooking brazier, and *cántaro* (ceramic vessel with an oval body, long neck, and restricted mouth used to transport and carry liquids) were recovered. In front of Rooms 1 and 2 a large semi-processed mound of lime stucco was uncovered directly on the patio floor. This is especially noteworthy because several stucco-working tools, and recycled storage containers containing stucco, were recovered in areas adjacent to the North Patio. In total, twenty-five pieces of ground-stone, fourteen reconstructible ceramic ves-

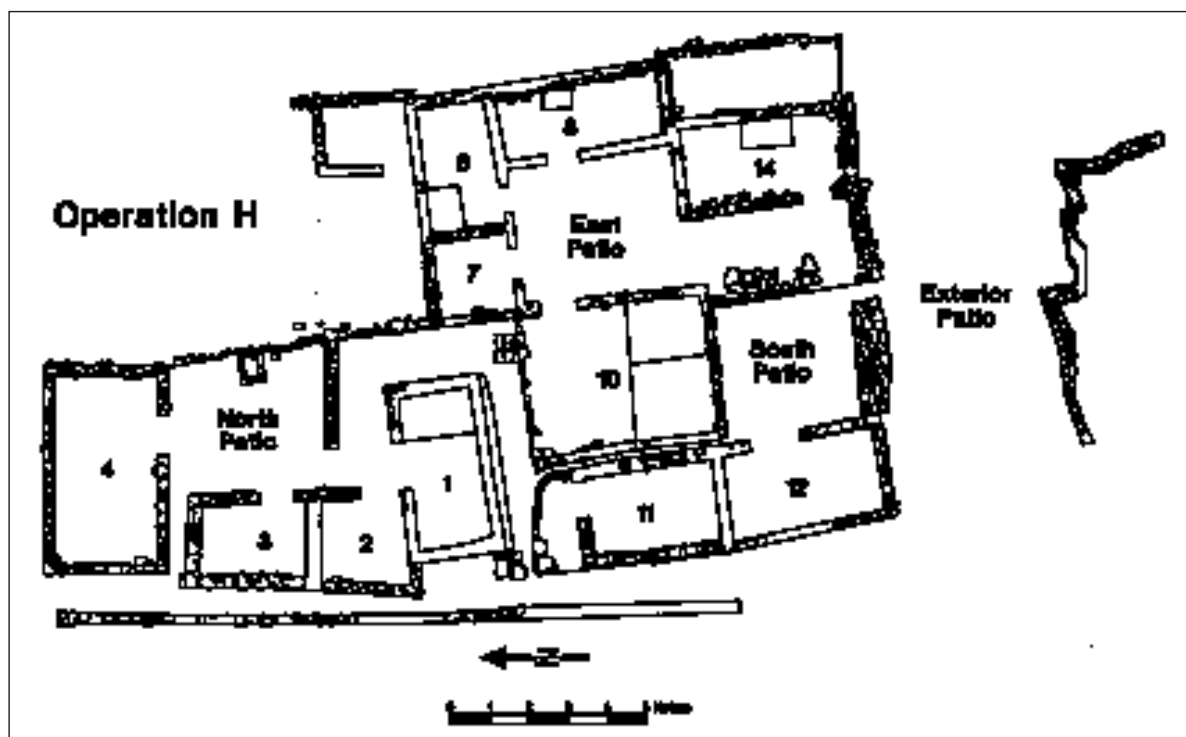


Figure 3. Plan of Operation H.

sels, and large amounts of obsidian and chert debitage were found in the North Patio.

Rooms surrounding the North Patio contained less *de facto* refuse than did the patio itself. However, Rooms 2 and 3 on the western side of the patio provide evidence for stucco working within the compound. The only complete artifacts recovered in Room 3 were discovered near the entryway into the patio area. An artifact cluster located here included a recycled storage vessel with stucco inside, a stucco-spreader, a cobble-grinder, and a small bowl. In addition to this, a stone plumbob and four ceramic vessels were recovered in the southwest corner of the adjacent Room 2.

A significant amount of primary refuse was also recovered from the East Patio of Operation H. Room 7, at the northwest corner of the patio, yielded no *de facto* refuse whatsoever. However, the large amount of lithic debitage in the room suggests that this area was used for limited chert and obsidian tool production. Room 6, in the northeast corner of the patio, contained a small platform/bench less than 1 m² in size where a reconstructible *incensario* (incense burner

used to burn resins) and a small ceramic vase were found on its upper surface. Additionally, a tight grouping of one large *tinaja* (large ceramic vessel used to store water or grain) and five small serving bowls were discovered on the floor of this room. Room 8, on the eastern side of the patio, appears to have been decorated with a ceramic *almena* and a stone sculpture of a head situated above the entryway. But perhaps the most important feature of Room 8 was a small cornice altar located along its eastern wall directly in-line with the entryway from the East Patio. This altar was constructed of stone and adobe and finished with a fine layer of stucco and then painted with wavy red lines and circles. *De facto* refuse found in this room consisted of three *cántaros* grouped together just to the south of the altar and a hammer-stone along the northern wall.

The domestic assemblage of Operation H is large and contains convincing evidence for both obsidian craft production and stucco processing. All told, 100 ceramic vessels have been identified though many were badly broken and eroded. Additionally, over 70

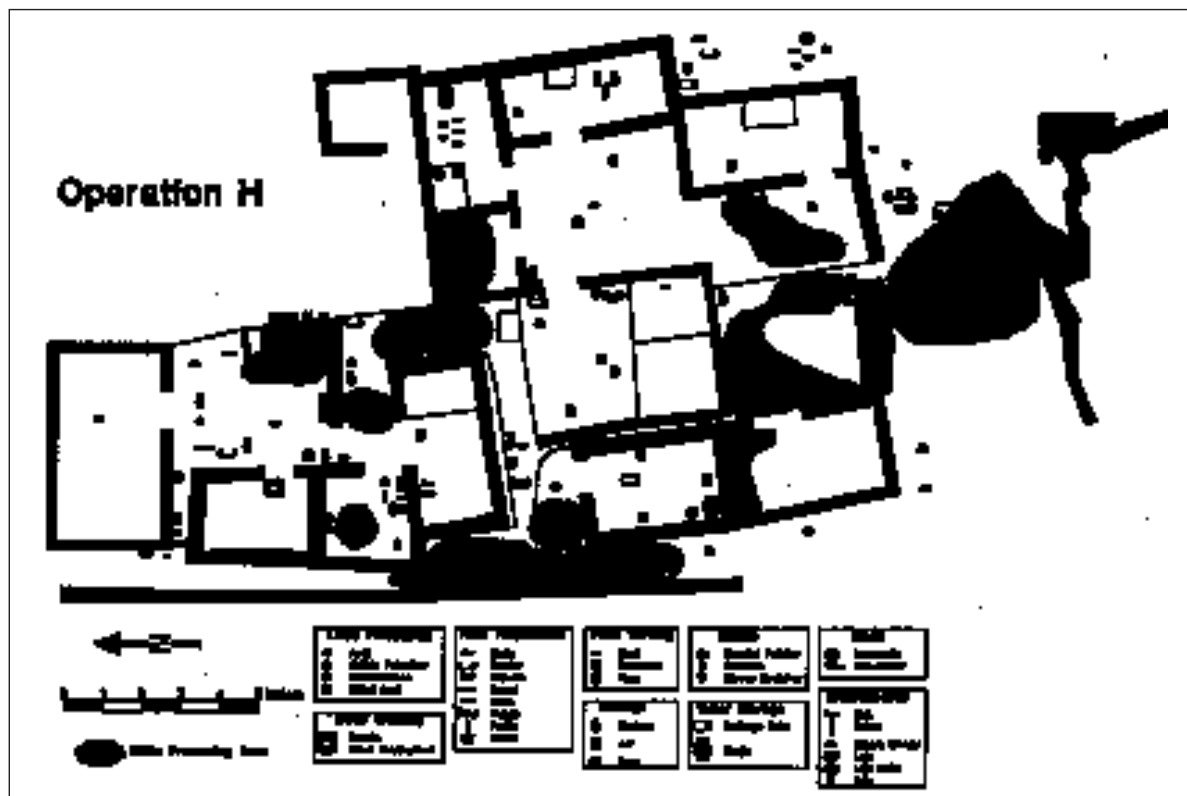


Figure 4. Operation H artifact distribution.

complete ground-stone tools were recovered, many of which were used in pecking and grinding activities associated with obsidian core-blade reduction. Besides the unusual quantities of *de facto* refuse and lithic processing debitage found throughout the excavation one of the most intriguing features of Operation H is Room 8 which apparently had ritual significance within the domestic compound.

Operation I

Operation I, located on the South Hill of Cerro Xochicalco (Figure 2), was identified as a residence-workshop constructed on two platforms separated by a low but steep slope. Associated with these two platform constructions was a much smaller midden/platform at the southeast of the lower of the two. In total, excavations in Operation I uncovered approximately 317 m² of surface area (Figure 5).

The upper platform was dominated by a large structure containing two patio groups separated by a thick masonry wall. Patio Group 1 consisted of a central open-patio and six rooms. Only a few sherds and a small scatter of obsidian debitage were found in the open patio itself though a complete *mano y metate* were discovered together in a corner near the entrance to Room 7 (Figure 6). In Room 7 only a few scattered ceramic sherds were recovered along with a single cobble-grinder and a concentration of obsidian debitage. Room 35 was so small (0.9 x 2.3 meters) that it almost constitutes a large wall-niche. However, in this relatively small space, a large grinding palette and a large storage jar were recovered; a complete *mano y metate* and a cobble-grinder were discovered at the entrance to this room.

Rooms 9 and 18, located on the western side of the group, differ greatly in the amount of associated *de facto* refuse. The only complete artifacts recovered in Room 9 were two cobble – grinders found at opposite

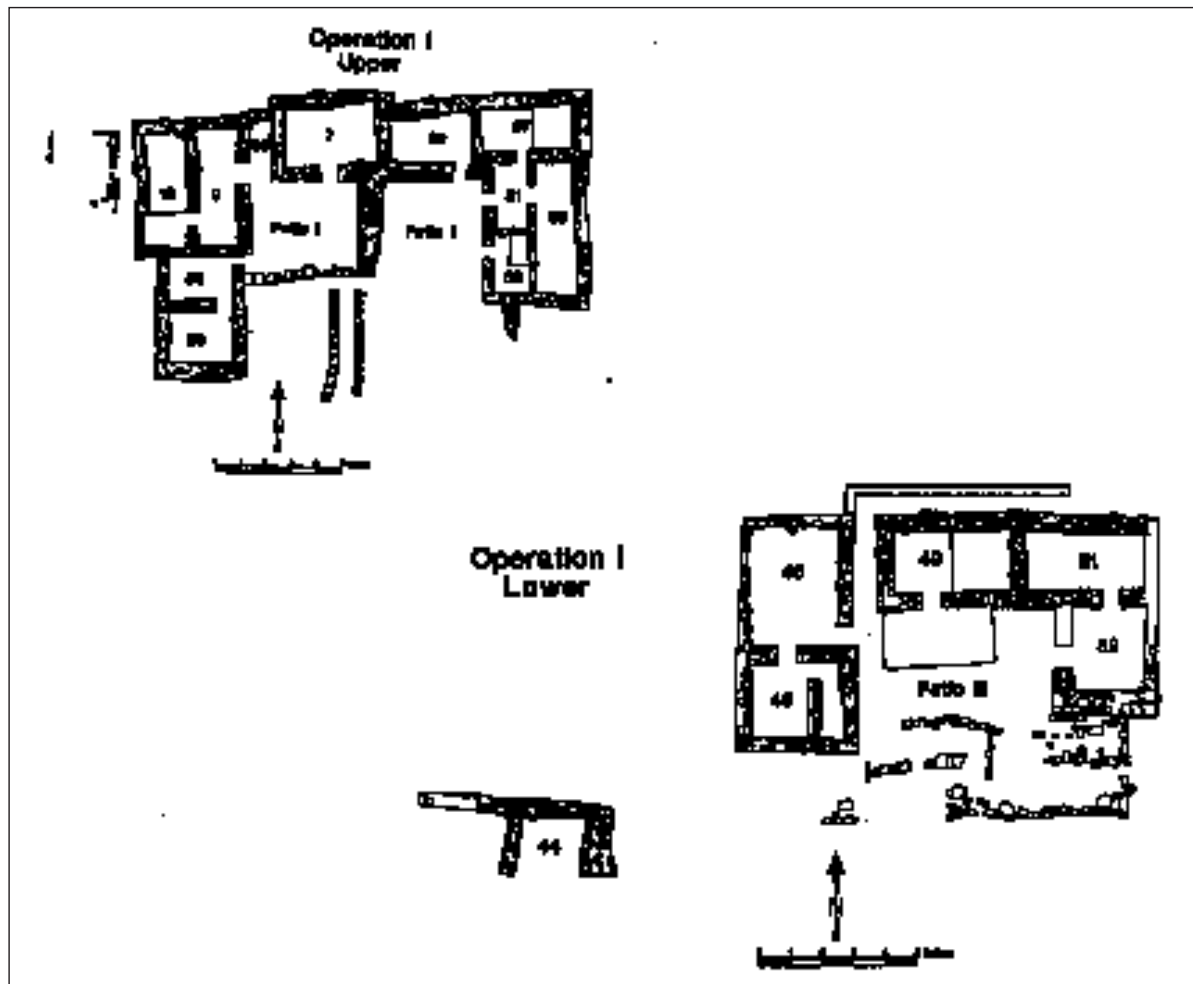


Figure 5. Plan of Operation I.

ends of the room. Room 18, on the other hand, yielded several in situ artifacts including a stone celt and two storage jars partially supported by a large stone slab on the floor. Additionally, one *mano*, two cobble-grinders, and two stone chisels were recovered from the top of a raised platform bench, which comprised almost two-thirds of the room's available floor area.

Compared to its sister patio to the west, Patio 2 yielded significantly more complete artifacts. Evidence for lithic production was found in the patio as well as a number of ground-stone tools. Reconstructible ceramics included two water drainage tubes, one jar, one hand-held censer, one *tecomate* (a globular neckless

ceramic vessel), one *incensario*, two *tejos* (small ceramic disks possibly used in games), and a cooking brazier found next to a *comal*. Room 57, at the northeast corner of the patio, yielded two very large *tinajas* from the lower floor. Room 22, yielded no evidence of craft activity though an obsidian polyhedral core was found at the center of the room near three whole jars and bits and pieces of several other vessels. The only other room in the group to have *de facto* refuse within it was Room 33. Complete artifacts found here included a *cántaro*, associated with a bowl which may have served as its lid, a single *tejo*, a small serving bowl near the doorway, and a stone *mano*.

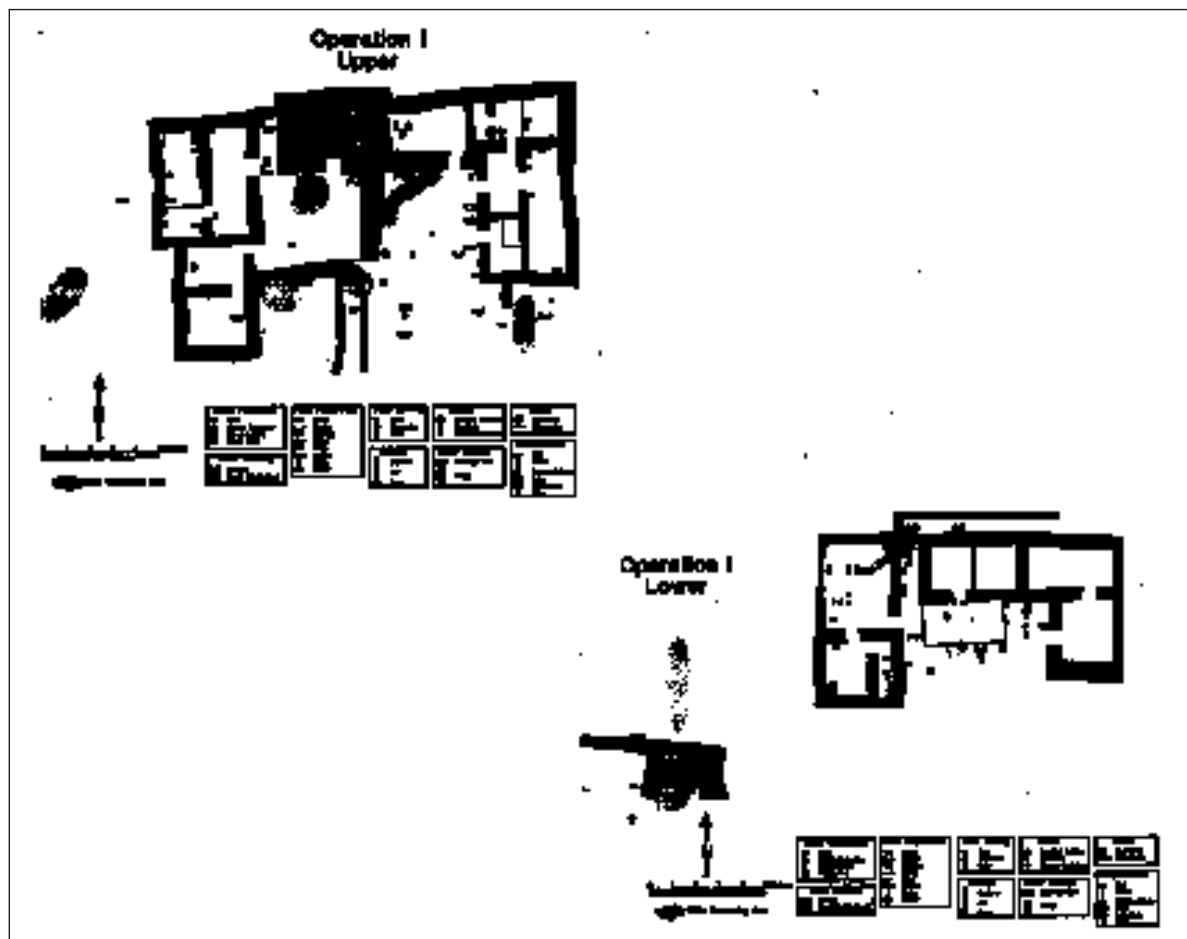


Figure 6. Operation I artifact distribution.

The lower platform of Operation I has only one patio group which consists of a central open space surrounded by five rooms. Several ceramic vessels were discovered on the surface of a raised platform area in the patio in front of the doorway of Room 49. A large number of whole ceramic vessels and ground-stone tools were identified within the patio including three serving bowls stacked inside one another located at the southeast corner of the raised platform. Two of these vessels were relatively common red-rimmed bowls but the third was a Micaceous Grey bowl believed to have been imported from Guerrero. Moreover, the Micaceous Grey bowl was found at the bottom of the stack and had four obsidian blade sections in it.

Other complete artifacts were discovered in and

around Patio 3 including a stack of ground-stone tools which included eleven cobble-grinders, an anvil, a handled-polisher, three storage jars associated with a long ceramic drainage tube, and a serving bowl. Rooms 45 and 46 of the patio group appear primarily to have been used for storage purposes. Room 45 yielded four complete ceramic *tapas* (ceramic lids), four *tejos*, two storage jars, two beautiful vases, and one highly unusual basin. Materials from Room 46 included the remains of a large *tinaja*, one small *olla*, four cobble-grinders, and two stone celts.

In summary, Operation I contained 59 complete ceramic vessels which is somewhat less than was identified in the other two operations. Nevertheless, the distribution of those vessels, as well as that of the ot-

her recovered artifacts, may be easier to read in terms of domestic use and household organizational patterns. Most complete artifacts were found against walls or located in smaller niche or corner areas likely indicating storage location. Additionally, the distribution of lithic debitage associated with obsidian and chert tool production appears to be restricted to only a few areas. Several of the rooms in Operation I did not contain floor assemblage artifacts whereas others were cluttered with the whole ceramic vessels and ground-stone artifacts.

Operation K

Operation K was located on a terrace on the south hill of Cerro Xochicalco (Figure 2) and is divided into North and South patio groups. A total of 222 m² of

area was excavated in and around this domestic unit (Figure 7). The South Patio Group consists of eleven rooms organized around, or linked to, a central open patio. The northern portion of South Patio was slightly elevated and divided from the southern portion by a low retaining wall and a two-stone step. *De facto* refuse from this section of the patio was almost nonexistent and consists only of one ceramic vase and two cobble – grinders (Figure 8). One of these grinders was found in association with the only identified area of lithic production in this patio group.

The southern portion of this patio differs from the northern part in several ways. The foremost is the presence of two stone box features, each of which served a very different function from the other. The first of these features is a large stone block with a square hole cut into its top which we believe served as a roof-post base for a perishable roof that may have covered

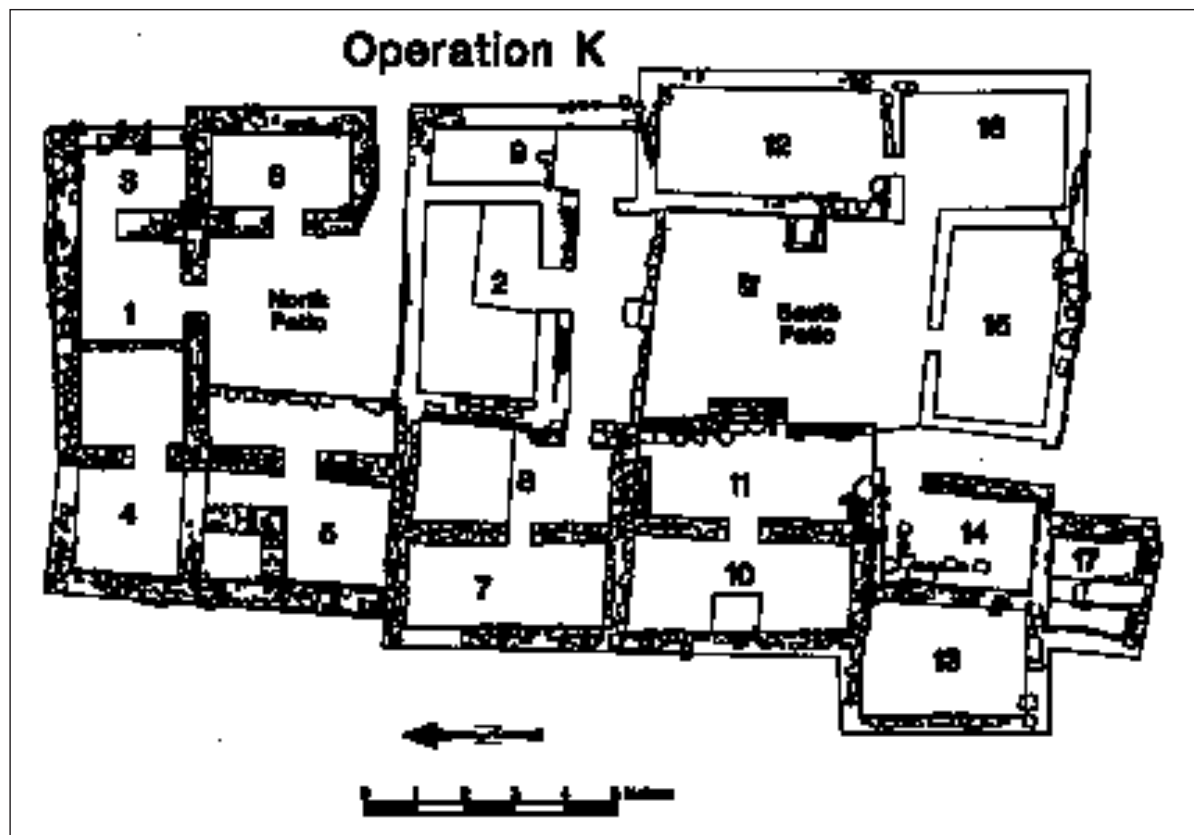


Figure 7. Plan of Operation K.

The only room in the South Patio Group that was not readily accessible from the patio is Room 17. Entry into the room is via a small doorway on its south wall. Both the east and west walls of the room have elevated benches which are separated by a narrow walkway. Along the center of the north wall a cavity where heated stones were placed. A stack of fire-cracked rock which may have been used for this purpose was found on top of this feature. Four complete vessels were found between the benches in this room which consist of a decorated *cántaro*, an *olla* (ceramic vessel with neck, a globular or spherical body, and often handles used primarily in storage and food preparation), a *cazuela* (shallow ceramic vessel with a large mouth used for cooking), and a *brasero*. We have previously suggested (Webb and Hirth 1998) that, based on the architecture and associated *de facto* refuse, this room served as a *temazcal*, or sweat-bath, for members of the household.

In summary, Operation K contained less evidence of lithic craft production than the other two operations. Most of the lithic-tool production that did occur took place in the North Patio Group. Excavations in this operation yielded a total of 77 reconstructible ceramic vessels of which almost 60% were serving vessels (i.e., large bowls, small bowls, and vases) which is a much higher percentage than found in the other two compounds. Such a high relative percentage of serving vessels, especially in the South Patio, may indicate the presence of feasting activities. Also of particular note in the South Patio group are the stone box which may have served as a sink or storage area for serving ware and the proposed *temazcal* with its specific artifact task assemblage still intact.

XOCHICALCO HOUSEHOLD ORGANIZATION AND ACTIVITY AREAS

Domestic residences at Xochicalco generally consist of multiple rooms arranged around open patios. These patios served as places for food preparation, ritual, rainwater collection, refuse disposal, and various craft activities. All rooms open onto these patios and were only entered by first going through this open space. Some rooms have raised benches that probably were used as sleeping areas. It is likely, however, that all sleeping areas did not have benches and that rooms with benches may have been used for other activities as well such as storage or household ritual.

At Xochicalco it appears that food preparation was primarily done in the patios. However, a distinction can be made between areas where grains were processed by grinding and where the actual cooking took place. Grinding areas have been identified in all operations by the presence of *manos y metates*, mortars, and pestles. In Operation I three complete *metates* were found and two of these in direct association with complete *manos*. Unlike many other Mesoamerican sites, cooking areas at Xochicalco could not be identified from hearths. At Xochicalco, like Teotihuacan (Manzanilla 1993) and Tula (Diehl 1983), much of the cooking appears to have been conducted with comales, cazuelas, or roughly finished bowls over ceramic braziers. In the three operations, all braziers, with the exception of one apparently being stored in a corner of Operation H's North patio, were found in direct association with either a *comal* or *cazuela*.

Water collection and water storage also were important activities within residential compounds. This is due to the fact that the area only receives an average of 100 cm. of rainfall/year, 90% of which occurs between June and September. One way in which water was collected within domestic compounds was from the rooftops where it was channelled via long ceramic tubes into large storage jars placed along the walls of patios. Of the seven ceramic tubes identified in our excavations, six were found along the walls of patios and five of these in association with large ceramic storage jars. Water, either collected in this manner or brought in with *cántaros* from the Río Tembembe at the base of Cerro Xochicalco, was then stored in large ceramic vessels. These large water storage containers, often over 1-meter high and 1/2 meter in diameter, were then stored under roofed over areas and interior rooms which probably served to keep the water cool.

Throughout all three operations it appears as though rooms served as either general storage and/or sleeping areas. Many vessels and tools were stored against or hanging on walls in both rooms and patios. In Operation K this is clearly seen in Room 10 where a stone *incensario*, though not found directly on the Epiclassic living surface, is believed to have fallen from a niche in the wall. Additionally, in Room 18 of Operation I two complete stone chisels appear to have fallen onto a sleeping bench shortly after abandonment. It should come as no surprise that many artifacts were stored off of the floor. Investigators at Cerén have suggested that approximately 60% of the tools at this site were stored on hooks, pegs, or in baskets above the floor (Sheets 1992). Researchers at

Aguateca have also suggested that part of the *de facto* refuse found at that site was originally kept above floor levels (Inomata and Striver 1998).

Obsidian craft production is represented at Xochicalco by workshops in both domestic and non-domestic contexts (Hirth 1995). All three of the residence compounds excavated by the Xochicalco Lithics Project exhibit evidence of obsidian-tool production. The data suggest that most lithic production took place along corridors or within patios within residential compounds. Additionally, evidence for other types of craft activity was recovered in the form of chert-tool production, lapidary work, and stucco processing.

CONCLUSION

The Xochicalco Mapping Project, directed by Hirth, identified 118 single component Epiclassic residences (Hirth and Cyphers 1988) of which only a handful have been tested by excavation. Besides the three domestic compounds discussed in this paper only one other has been completely excavated and the results published (de Vega 1993; González and de Vega 1991; González *et al.* 1995). This compound, excavated by INAH archaeologists as part of a larger project aimed at the investigation of access into the site, also yielded large amounts of *de facto* refuse from the living surfaces. Additionally, a few other residences at the site have been partially excavated and the results published (Hirth and Cyphers 1988; Canto 1996) with similar archaeological signatures.

The three compounds excavated by the Xochicalco Lithic Project were the result of a sample of areas that showed promise of shedding light onto questions of lithic tool production. The *in situ* artifacts recovered from these workshop/residences included a great deal of lithic debitage as well as the many stone tools and ceramic vessels.

In terms of how the data from rapidly abandoned residences at Xochicalco can aid other researchers in their interpretations of more gradually abandoned sites we can make several recommendations and cautions. First, as suggested by researchers at Cerén and Aguateca, many vessels and tools at Xochicalco were stored against or hanging on walls and this potential should not be overlooked at other sites. Second, as suggested by ethnoarchaeological research in southern Mesoamerica (e.g., Deal 1985) many broken ceramic vessels at Xochicalco were reused for purposes other than those for which they were originally

intended. Third, evidence from Xochicalco support hypotheses made by others (Healan 1992; Moholy-Nagy 1990) that workshops for the production of finished products are usually located near or at the craftpersons home. Moreover, when workshops are located at or near the home, manufacturing activity competes for space with other activities. Fourth, finished artifacts will have different use contexts than debitage and end up in different discard contexts. Fifth, lithic-debitage disposal areas may also serve as places of lithic tool production. Sixth, the assumption by many archaeologists that spatially discrete, non-overlapping, activity archaeologists should be evident in households is not supported by the data from Xochicalco where activities were conducted in areas that conjoined or overlapped one another. Our analysis suggests that though there may be general activity traits, such as food preparation in patios, a great deal of activity was done where one could find an unoccupied space. Though at odds with the idea that activity areas will be discrete from one another this characteristic meshes nicely with the idea that domestic workshops compete for space with other household activities. Seventh, another assumption held by many archaeologists not supported by the Xochicalco data concerns the hindrance potential of chipped-stone debitage. It appears that Xochicalco craftspeople were less concerned with the potential hazards of obsidian and chert debitage than was previously suspected. This may be a real-life phenomena or may be related to the abandonment experience. Eighth, and last, evidence suggests that Xochicalco residences maintained an average of between 75 and 80 ceramic vessels for household use. Such a number does not seem unreasonable for an extended family household such as is hypothesized for Xochicalco (Hirth 2000).

Though our household sample may not be large we believe that the rich floor assemblages recovered from abandoned residences at Xochicalco provide information on urban life in Epiclassic Central Mexico not available thus far from other sites. The household data provided by the Xochicalco Lithic Project provide valuable insights into how urban households were organized in pre-Columbian Mesoamerica. Because Xochicalco was abandoned in a rapid and relatively unplanned manner a large amount of *de facto* refuse was left behind. It is believed that the floor assemblages from Xochicalco residence-workshops may serve as reference data that will aid in the identification of gradually abandoned residences at other urban centers in Central Mexico.

REFERENCES

- ALLISON, Penelope M. 1992. «Artefact Assemblages: Not the «Pompeii Premise»». In *Papers of the Fourth Conference of Italian Archaeology*, Eds. E. Herring, R. Whitehouse and J. Wilkins, pp. 49-56. London.
- ASCHER, Robert. 1968. «Time's arrow and the archaeology of a contemporary community». In *Settlement Archaeology*, Ed. K. C. Chang, pp. 43-52. National Press Books. Palo Alto.
- BERRY, Joanne. 1997. «Household artefacts: Towards a re-interpretation of Roman domestic space». In *Domestic Space in the Roman World: Pompeii and Beyond*, Eds. R. Laurance and A. Wallace-Hadrill, pp. 183-195. Portsmouth. Rhode Island.
- BINFORD, Lewis R. 1981. «Behavioral archaeology and the «Pompeii Premise»». *Journal of Anthropological Research* 37: 195-208.
- CAMERON, Cathy M. and Steve A. TOMKA. 1993. *Abandonment of Settlements and Regions: Ethnoarchaeological and Archaeological Approaches*. Cambridge University Press. Cambridge.
- CANTO AGUILAR, Giselle. 1996. «Análisis de una unidad doméstica de Xochicalco, Morelos». In *Memoria: III Congreso Interno del Centro INAH Morelos*, pp. 59-63. Acapantzingo, Cuernavaca, Morelos, México.
- DEAL, Michael. 1985. «Household pottery disposal in the Maya Highlands: An ethnoarchaeological interpretation». *Journal of Anthropological Archaeology* 4: 243-291.
- DE VEGA NOVA, Hortensia. 1993. «Interpretación de un conjunto habitacional en Xochicalco, Morelos». *Cuadernos de Arquitectura Mesoamericana* 24: 19-28.
- DIEHL, Richard A. 1983. *Tula: The Toltec Capital of Ancient Mexico*. Thames and Hudson. London.
- GARZA GÓMEZ, Isabel. 1994. «Evidencias de sacrificio humano en Xochicalco, Morelos». In *Memoria: III Congreso Interno del Centro INAH Morelos*, pp. 59-63. Acapantzingo, Cuernavaca, Morelos, México.
- GARZA TARAZONA, Silvia and Norberto GONZÁLEZ CRESPO. 1995. «Xochicalco». In *La Acropolis de Xochicalco*, pp. 89-143. Instituto de Cultura de Morelos. México.
- GONZÁLEZ CRESPO, Norberto and Silvia GARZA TARAZONA. 1994. «Xochicalco». *Arqueología Mexicana* 2 (10): 70-74.
- GONZÁLEZ CRESPO, Norberto and Hortensia DE VEGA NOVA. 1991. «Proyecto Xochicalco: Interpretación de una subunidad habitacional». *Boletín del Consejo de Arqueología*, pp. 114-117. INAH. México D.F.
- GONZALEZ CRESPO, Norberto, Silvia GARZA TARAZONA, Hortensia de VEGA NOVA, Pablo MAYER GUALA and Giselle CANTO AGUILAR. 1995. «Archaeological investigations at Xochicalco, Morelos 1984 and 1986». *Ancient Mesoamerica* 6: 223-236.
- HAYDEN, Brian and Aubrey CANNON. 1983. «Where the garbage goes: Refuse disposal in the Maya Highlands». *Journal of Anthropological Archaeology* 2: 117-163.
- HEALAN, Dan M. 1992. «A comment on Moholy-Nagy's «The misidentification of lithic workshops»». *Latin American Antiquity* 3 (3): 240-242.
- HIRTH, Kenneth G. 1984. «Xochicalco: Urban growth and state formation in central Mexico». *Science* 225 (4662): 579-586.
- . 1995. «The investigation of obsidian craft production at Xochicalco, Morelos». *Ancient Mesoamerica* 6: 251-258.
- . 2000. *Ancient Urbanism at Xochicalco: The Evolution and Organization of a Prehispanic Society*. University of Utah Press. Salt Lake City.
- HIRTH, Kenneth G. and Ann CYPHERS GUILLÉN. 1988. *Tiempo y asentamiento en Xochicalco, México*. Universidad Nacional Autónoma de México. México D.F.
- INOMATA, Takeshi and Laura R. STRIVER. 1998. «Floor assemblages from burned structures at Aguateca, Guatemala: A study of Classic Maya households». *Journal of Field Archaeology* 25: 431-452.
- MANZANILLA, Linda. 1986. *Unidades Habitacionales Mesoamericanas y sus Areas de Actividad*. Universidad Nacional Autónoma de México. México D. F.
- MANZANILLA, Linda (Ed.). 1993. *Anatomía de un Conjunto Residencial Teotihuacano en Oztoyahualco*. Universidad Nacional Autónoma de México. Mexico D. F.
- MILLON, Rene. 1981. Teotihuacan: City, state, and civilization». In *Handbook of Middle American Indians. Supplement 1: Archaeology*, Ed. J. A. Sabloff, pp. 198-243. University of Texas Press. Austin.

- . 1988. «The last years of Teotihuacan dominance». In *The Collapse of Ancient States and Civilizations*, Eds. N. Yoffee and George Cowgill, pp. 102-164. University of Arizona Press. Tucson.
- MOHOLY-NAGY, Hattula. 1990. «The misidentification of Mesoamerican lithic workshops». *Latin American Antiquity* 1 (3): 268-279.
- PLUNKET, Patricia y Gabriela URUÑUELA. 1998. «Preclassic household patterns preserved under volcanic ash at Tetimpa, Puebla, Mexico». *Latin American Antiquity* 9 (4): 287-309.
- SÁENZ, César. 1964. Últimos descubrimientos en Xochicalco. INAH, Dirección de Monumentos Prehispánicos Informe 12. México D.F.
- SANDERS, William T. 1993. «Mesoamerican household archaeology comes of age». In *Prehispanic Domestic Units of Western Mesoamerica*, Eds. R. S. Santley and K. G. Hirth, pp. 275-284. CRC Press. Boca Raton.
- SANTLEY, Robert S. and Kenneth G. HIRTH (Eds.). 1993. *Prehispanic Domestic Units in Western Mesoamerica: Studies of the Household, Compound, and Residence*. CRC Press. Boca Raton.
- SCHIFFER, Michael B. 1985. «Is there a «Pompeii premise» in archaeology?». *Journal of Anthropological Research* 41 (1): 18-41.
- . 1987. *Formation Processes of the Archaeological Record*. University of New Mexico Press. Albuquerque.
- . 1995. *Behavioral Archaeology: First Principles*. University of Utah Press. Salt Lake City.
- SHEETS, Payson D. 1992. *The Ceren Site: A Prehistoric Village Buried by Volcanic Ash in Central America*. Harcourt Brace College Publishers. Fort Worth.
- STEVENSON, Marc G. 1982. «Toward an understanding of site abandonment behavior: evidence from historic mining camps in the southwest Yukon». *Journal of Anthropological Archaeology* 1: 237-265.
- WEBB, Ronald W. and Kenneth G. HIRTH. 1997. Urban household organization: An example from Epiclassic Mexico. Paper presented at the 96th Annual Meeting of the American Anthropological Association. Washington D.C.
- . 1998. Xochicalco and the «Pompeii premise». Paper presented at the 63th Annual Meeting of the Society for American Archaeology. Seattle.
- WEBB, Ronald W. and Peter VAN ROSSUM. 1997. Obsidian craft industry and domestic production. Paper presented at the 62th Annual Meeting of the Society for American Archaeology. Nashville.
- WILK, Richard R. and Wendy ASHMORE (Eds.). 1988. *Household and Community in the Mesoamerican Past*. University of New Mexico Press. Albuquerque.

