

# Obsidian Craft Production in Ancient Central Mexico

*Archaeological Research at Xochicalco*

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## Patterns of Stone Tool Consumption in Xochicalco's Civic-Ceremonial Core

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Recent explorations in Xochicalco's civic-ceremonial core by the Proyecto Especial Xochicalco (PEX) under the direction of Norberto González Crespo have compiled a valuable sample of the flaked stone artifacts consumed by the state and its elite during the Gobernador phase (Garza Tarazona and González Crespo 1995).<sup>1</sup> This chapter examines flake stone tool consumption within the civic-ceremonial zone and asks two questions. First, what types of implements were used by elite, and, second, what do the implements indicate about stone tool production and consumption in Xochicalco's elite core? These materials are important because they represent the first assemblage of its kind described for a Central Mexican civic-ceremonial zone. Moreover, they provide a unique view of the range of stone tools consumed by the state just prior to the site's abandonment around AD 900. This sample, when combined with information on the consumption of obsidian and chert tools from domestic contexts, supplies a comprehensive picture of the Gobernador flaked stone tool economy.

This chapter is divided into several sections. First, the civic-ceremonial center is described. This is followed by a description and functional interpretation of the artifacts in terms of their possible military, ceremonial, and domestic uses. While we recognize the limitations and difficulties involved with functional interpretations, they are useful for discussing the demand, consumption, and spatial patterning of flaked stone artifacts used by the Xochicalco elite. The final section of the chapter examines whether these tools were manufactured within the civic-ceremonial center and what this implies about economic procurement within the site.

### CIVIC-CEREMONIAL EXPLORATIONS ON CERRO XOCHICALCO

Excavations by the Proyecto Especial Xochicalco (PEX) between 1993 and 1994 focused on large-scale clearing of the civic-ceremonial architecture in the central core of

Cerro Xochicalco (Figure 10.1). Excavations revealed that this entire area was sacked, burned, and abandoned at the end of the Gobernador phase, around AD 900 (Garza Tarazona and González Crespo 1995; González Crespo and Garza Tarazona 1994; Hirth 2000; Hirth and Cyphers Guillén 1988). Evidence for this event consists of the intentional destruction of major temple buildings (Sáenz 1961, 1962c), the scattered distribution of ceremonial and domestic artifacts on structure floors (Garza Tarazona and González Crespo 1995), and the presence of burned and dismembered corpses within elite buildings (Garza Gómez 1994).

The Xochicalco ceremonial core contained a mixture of ceremonial, civic, and domestic structures. Hirth (2000) characterized this area as a moderate density residential zone that housed a population of between 925 and 1,336 people. This population consisted of the palace elite and their attendant household, resident priests and bureaucrats, and those individuals who worked in this area on a periodic basis. The PEX divided the ceremonial core into six sectors to describe the distribution of material remains. These sectors are (1) the Acrópolis Complex, (2) the Plaza Ceremonial, (3) the Plaza Central, (4) the North Ball Court Complex, (5) the East Ball Court Complex, and (6) Sector A on the northwest corner of the North Hill (Figure 10.2).<sup>2</sup>

The Acrópolis represents the main Gobernador phase palace complex (Garza Tarazona and González Crespo 1995; González Crespo and Garza Tarazona 1994; Hirth, Grant Hirth, and Pauer 2000). It housed the royal family and its retainers and contained rooms and patios that had both domestic and administrative functions (Figure 10.3). The Acrópolis is an internally differentiated residential complex. Domestic rooms were identified on the west side of the Acrópolis, where a small *temascal*, or sweat bath, was used by palace residents. Four granaries are also located in a patio complex on the west side of the palace complex, where food was stored. Structures on the east

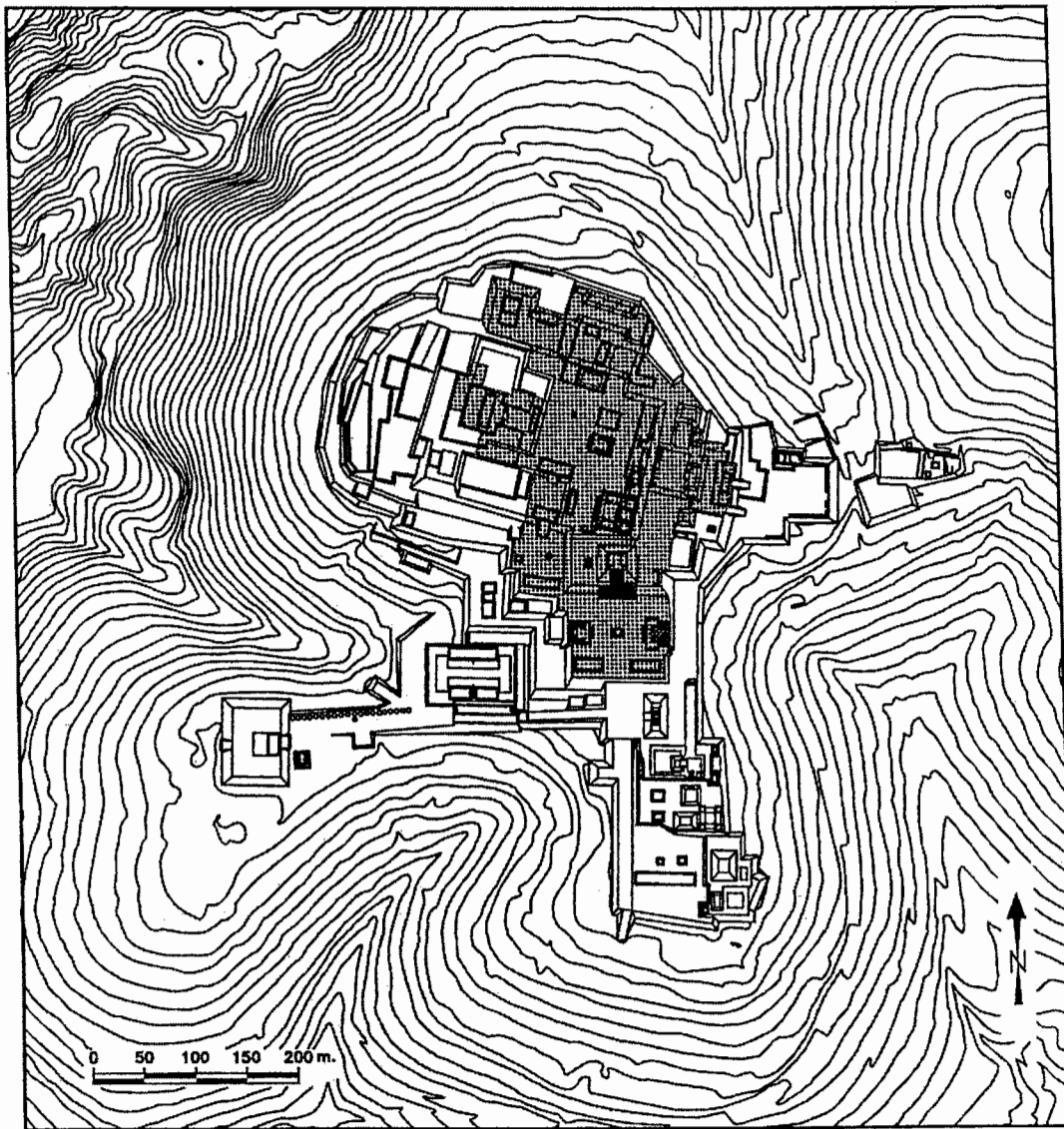


FIGURE 10.1. Excavations by the Proyecto Especial Xochicalco in the civic-ceremonial core of Cerro Xochicalco. Stippling indicates excavated area (from Hirth 2000:Figure 3.7).

side of the Acrópolis had a civic function, flanking the large patio entryway leading into the complex from the Plaza Ceremonial.

The artifact sample from the Acrópolis is small, much of which was recovered from two important features known as Elements 1 and 77.<sup>3</sup> These features were found in Patio 1 of the North Ball Court Complex and consist of large deposits of cultural debris piled against the base of the Acrópolis's north facade (Figure 10.3). Stratigraphic evidence suggests that these materials were dumped in Patio 1 from the Acrópolis when the civic-ceremonial center was sacked and abandoned (Silvia Garza Tarazona, personal communication June 2002). The artifacts from these features are considered part of the Acrópolis sample.

The Plaza Ceremonial is the site's main ceremonial

and administrative precinct. It contains the Pyramid of the Plumed Serpent (Structure XI-1), with its elaborately decorated bas-relief facades, and Structure XI-2, with its brilliantly painted stucco facades (González Crespo and Garza Tarazona 1994; Hirth 2000; Smith 2000b). Three important administrative buildings are located at the southeast corner of the Plaza Ceremonial. These include the Temple of the Stelae (Structure XI-4), with its three elaborately carved stelae (Smith 2000a); adjacent Structure XI-9, containing the bodies of people who were dismembered during the violent abandonment of the site (Garza Gómez 1994); and Structure XI-7, which controlled entrance into and out of the Plaza Ceremonial. Two structures also had domestic functions: Structure XI-3, along the east side of the plaza, which may have been occupied by religious functionaries,<sup>4</sup> and Structure XI-6,

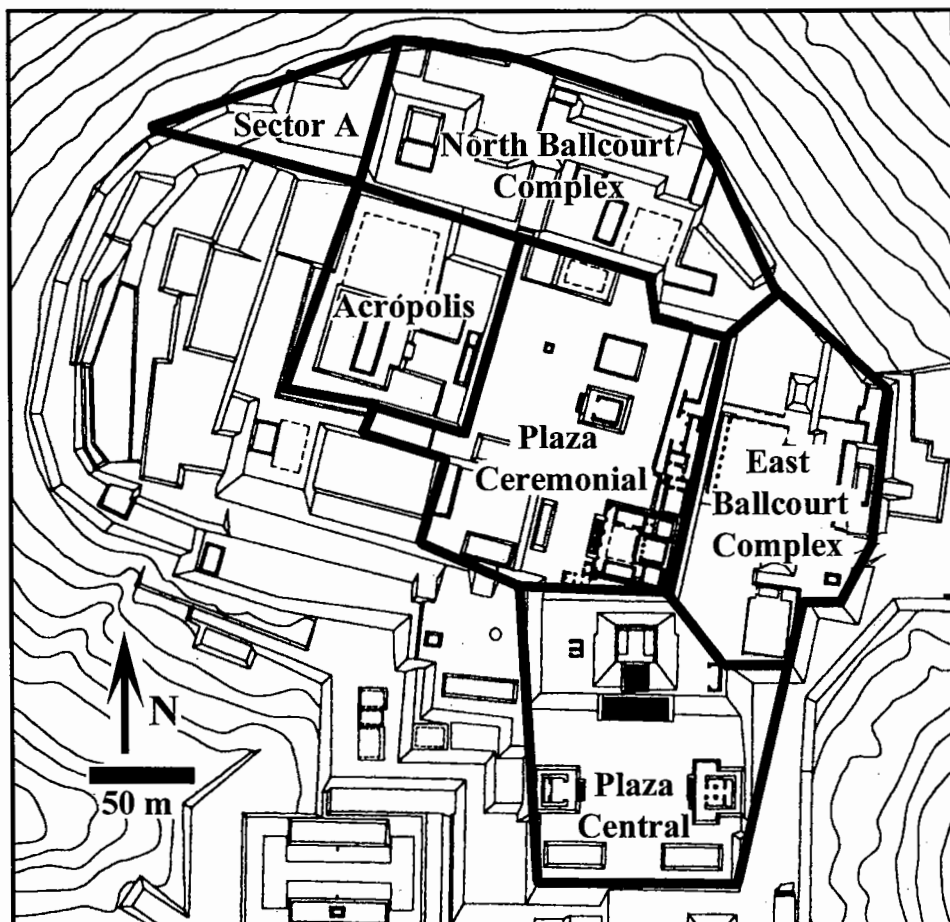


FIGURE 10.2. The six excavation sectors in the civic-ceremonial center.

located at the northwest corner of the Plaza Ceremonial (Figure 10.3).

The North Ball Court Complex is located north of the Plaza Ceremonial (Figure 10.2). This area contains several important structures and patio areas, including the large northern ball court (Structure X<sub>3-11</sub>);<sup>5</sup> Patio 2, with its large temascal (Structure X<sub>2-12</sub>);<sup>6</sup> and Patio 3, which includes Structure X<sub>2-10</sub>, a large water cistern. Patio 1 is located at the west end of the complex and contains the shaft opening of the Observatory Cave (X<sub>2-15</sub>), Structure X<sub>2-14</sub> that may have had calendric functions (Hirth, Grant Hirth, and Pauer 2000:207), and three rooms constructed along the northern facade of the Acrópolis. Most of the structures in this area apparently had civic-ceremonial functions except for Structure X<sub>2-9</sub>, located in Patio 4 at the east end of the complex. Artifacts recovered here indicate that it may have been a kitchen area, used to prepare food and drink consumed in this patio (Canto Aguilar 1994).

Sector A is located along the north side of the Acrópolis and west of the North Ball Court Complex (Figure 10.2). Excavations here recovered a large amount of material from Gobernador phase midden deposits and postaban-

donment erosional accumulations. We believe that many of the artifacts in Sector A came from the Acrópolis or the North Ball Court Complex.

The East Ball Court Complex (Figure 10.2) occupies the eastern portion of the North Hill and includes Ball Court Structure X<sub>5-1</sub> and the associated structures on terraces X<sub>2</sub> and X<sub>5</sub>.<sup>7</sup> Three temple mounds (structures X<sub>2-5</sub>, X<sub>2-6</sub>, and X<sub>2-8</sub>) overlook the ball court. A large patio (X<sub>2-7</sub>) defined by narrow roofed corridors dominates terrace X<sub>2</sub>. A sunken patio (Structure X<sub>2-4</sub>) is located in the southeast corner of terrace X<sub>2</sub> (Figure 10.3).

The Plaza Central is located at the southern side of the North Hill (Figure 10.2). The dominant structure in this plaza is the Great Pyramid (Structure X<sub>2-1</sub>), rising 12 m high. The imposing character of the pyramid was enhanced by a stairway constructed down the side of terrace X<sub>2</sub> to the surface of the Plaza Central. Five additional structures are located in the Plaza Central, including structures X<sub>3-1</sub> and X<sub>3-2</sub>, on its eastern and western sides; structures X<sub>3-4</sub> and X<sub>3-5</sub>, at its southeastern and southwestern corners; and a low platform supporting the Stela of the Two Glyphs (X<sub>3-3</sub>), at its center (Figure 10.3). The Plaza Central probably was the main assembly area within

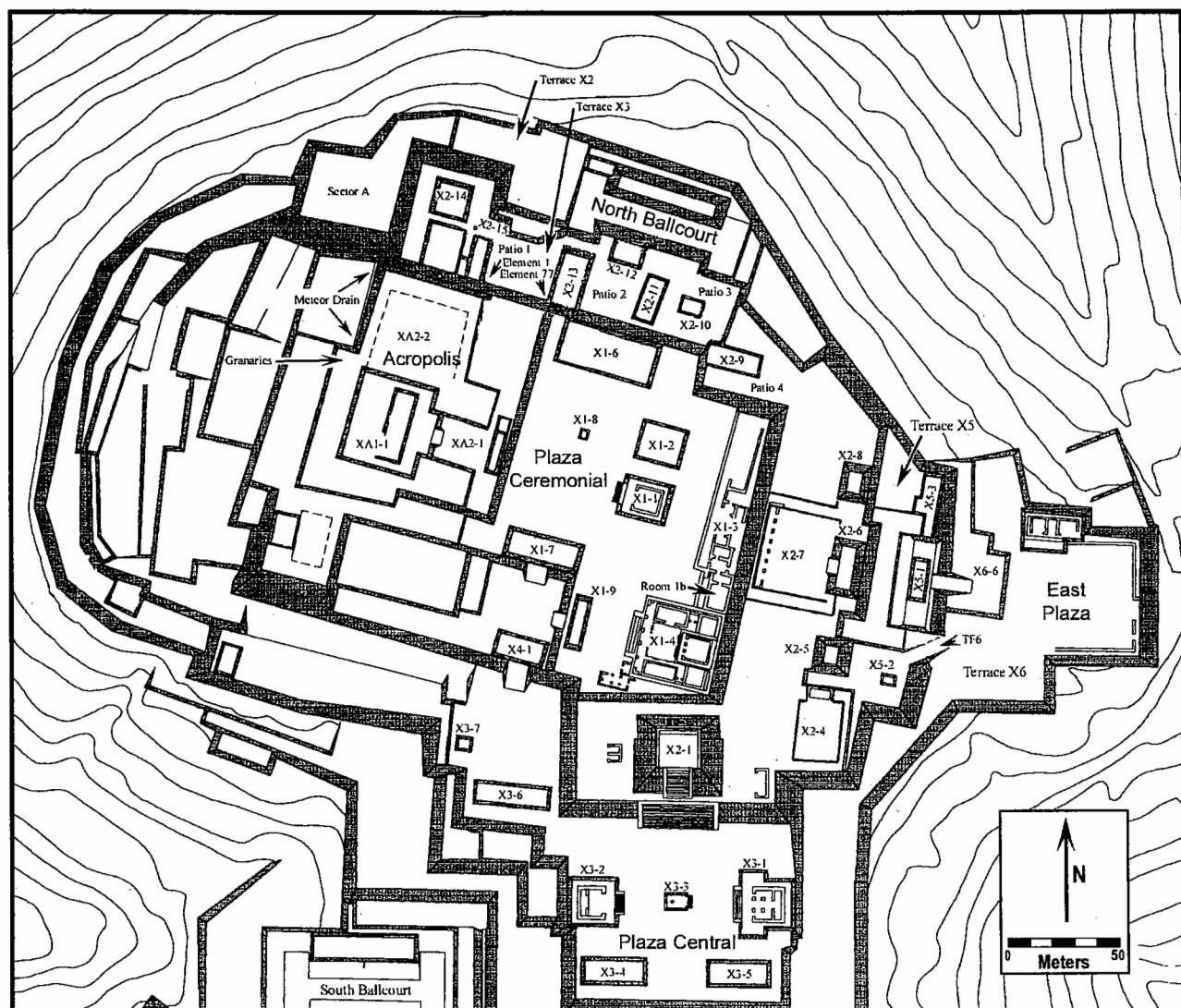


FIGURE 10.3. Civic-ceremonial structures and features on the North Hill of Cerro Xochicalco.

Xochicalco (González Crespo and Garza Tarazona 1994; Hirth 1984b; Hirth and Cyphers Guillén 1988:105).

A total of 2,134 flaked stone artifacts were recovered from these excavations that were analyzed by Andrews during the summer of 2002 (Table 10.1). This collection is referred to here as the *elite assemblage* and contains artifacts produced using blade, bifacial, expedient flake, and lapidary technologies. Artifacts made of gray obsidian dominate the assemblage (89 percent), but green obsidian (8 percent), chert (3 percent), and red obsidian (<1 percent) are also present. Not surprisingly, most artifacts were produced using blade technology ( $N = 1,747$ ; Table 10.1). The rest of the assemblage consists of bifacial ( $N = 283$ ), expedient flake ( $N = 13$ ), lapidary ( $N = 15$ ), and technologically undiagnostic ( $N = 76$ ) artifacts. A large sample of these materials ( $N = 1,455$ ) was analyzed and coded for size.<sup>8</sup>

A small percentage (5.7 percent) of these materials ex-

hibit evidence of thermal damage in the form of fractures, crazing, and spalling (Table 10.2). Two blade segments even appear to have melted (Photo 10.1). This type of thermal damage is typically associated with extreme heat (Ahler 1983; Crabtree and Butler 1964; Domanski et al. 1993; Luedtke 1992) that probably was produced when the civic-ceremonial center was burned at abandonment.<sup>9</sup> Although most heat-damaged artifacts were recovered from the Acropolis and structures in the Plaza Ceremonial, examples were found from every sector, suggesting that burning affected the entire civic-ceremonial center.

Rather than screening, the PEX investigations employed a hand-collection recovery strategy because of the scale of operations. Although the sample was small, this is not solely the result of collection procedures since many small lithic items were recovered in the excavations.<sup>10</sup> Instead, the small number of lithic artifacts in the elite assemblage appears to be a function of limited flaked stone consump-

TABLE 10.1. *Artifacts in the Elite Assemblage*

TECHNOLOGY	GREEN OBSIDIAN		GRAY OBSIDIAN		RED OBSIDIAN		CHERT		TOTALS	
	No.	%	No.	%	No.	%	No.	%	No.	%
Core-blade	110	5.15	1,637	76.71	0	—	0	—	1,747	81.72
Bifacial	67	3.14	179	8.39	2	0.09	35	1.64	283	13.26
Expedient flake	0	—	0	—	0	—	13	0.61	13	0.61
Lapidary	0	—	15	0.70	0	—	0	—	15	0.70
Undiagnostic	6	0.28	61	2.86	0	—	9	0.42	76	3.61
TOTALS	183	8.57	1,892	88.66	2	0.09	57	2.67	2,134	100

tion coupled with good maintenance and refuse disposal in the civic-ceremonial center. During the excavations 37 percent of the artifacts recovered ( $N = 799$ ) came from on or near floor, patio, and plaza surfaces. Many other artifacts ( $N = 1,335$ ) came from a mixture of contexts, including middens, abandonment refuse (e.g., Elements 1 and 77), construction fill, and postabandonment deposits.

#### THE TECHNOLOGICAL FEATURES OF THE ELITE ASSEMBLAGE

The flaked stone artifacts in the elite assemblage were classified by the technology used to produce them. A technological approach (see chapter 3) enables archaeologists to reconstruct sequences of tool production that are useful in site and regional reconstructions of prehistoric political economy. As mentioned above, artifacts were classified as either blade, bifacial, expedient flake, or lapidary technologies and are discussed below.

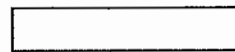
#### Prismatic Blade Artifacts

The blades recovered in the elite assemblage were manufactured using the same technology found elsewhere at the site (Hirth 2000; Hirth 2002), and Table 10.3 summarizes the technological categories recovered. Most of these artifacts (94 percent) were made of gray obsidian, with green obsidian represented in small amounts (6 percent). Prismatic blade segments predominate in the collection. Only one nearly complete blade was recovered, and this had a single-facet platform (Table 10.3, Figure 10.4a); the rest of the blade artifacts are segments. Proximal blade segments have pecked and ground ( $N = 165$ ), single-facet ( $N = 75$ ), and cortical platforms ( $N = 1$ ). Proximal segments with single-facet platforms have the largest average widths and thicknesses, indicating that they were removed from cores with large diameters.<sup>11</sup> The remaining blade artifacts were medial and distal segments.

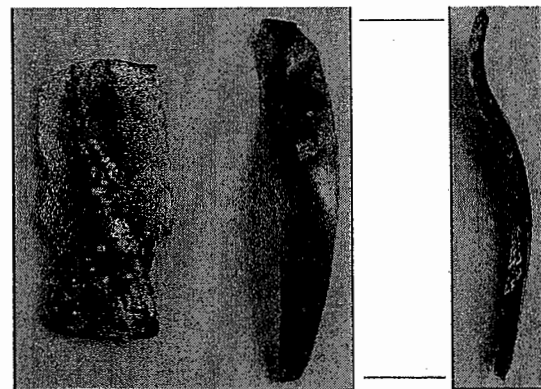
Blade artifacts were examined for use wear using a 10x hand lens. Evidence of use wear consisted of striations, demarcated zones of polish, and microchipping along blade edges. Although some edge chipping could have occurred



2 cm



1 cm



2 cm

PHOTO 10.1. Heat-damaged artifacts: fractured biface fragment (top), fractured blade segment (middle), melted blades (bottom). Photo by B. Andrews.

TABLE 10.2. *Heat-Damaged Flaked Stone Artifacts in the Elite Assemblage*

LOCATION	CORE-BLADE TECHNOLOGY	BIFACIAL TECHNOLOGY	TECHNOLOGICALLY UNDIAGNOSTIC
Acrópolis	0	3	0
Plaza Ceremonial	20	11	1
Plaza Central	2	4	0
East Ball Court	4	9	0
North Ball Court	31	27	4
Sector A	2	7	0
General civic-ceremonial	0	1	0
TOTAL	59	62	5

TABLE 10.3. *Obsidian Core-Blade Artifacts in the Elite Assemblage*

THIRD-SERIES BLADES	GRAY	GREEN	TOTAL
Complete blade, single facet	1	0	1
Proximal segments, cortical platform	1	0	1
Proximal segments, single-facet platform	75	0	75
Proximal segments, ground platform	154	11	165
Medial segments	774	56	830
Distal segments	85	7	92
Blade artifacts			
End modified (percussion sequence)	0	1	1
Hafted points	243	17	260
Eccentric blades	22	2	24
End-modified blades	21	1	22
Pointed blades	55	13	68
Misc. other blade artifacts	69	0	69
Blade artifact production by-products			
Snapped blade segments	12	0	12
Pressure notch flakes	2	0	2
Blade cores and blade-core fragments			
Prismatic core, faceted platform	1	0	1
Prismatic core, ground platform	3	0	3
Blade-core fragments	4	0	4
Percussion and bipolar rejuvenation debitage			
Faceted core-top fragments	7	0	7
Pecked and ground core-top fragments	15	0	15
Platform preparation debitage	54	2	56
Distal orientation flakes	27	0	27
Artifacts made from rejuvenation debitage	12	0	12
TOTAL	1,637	110	1,747

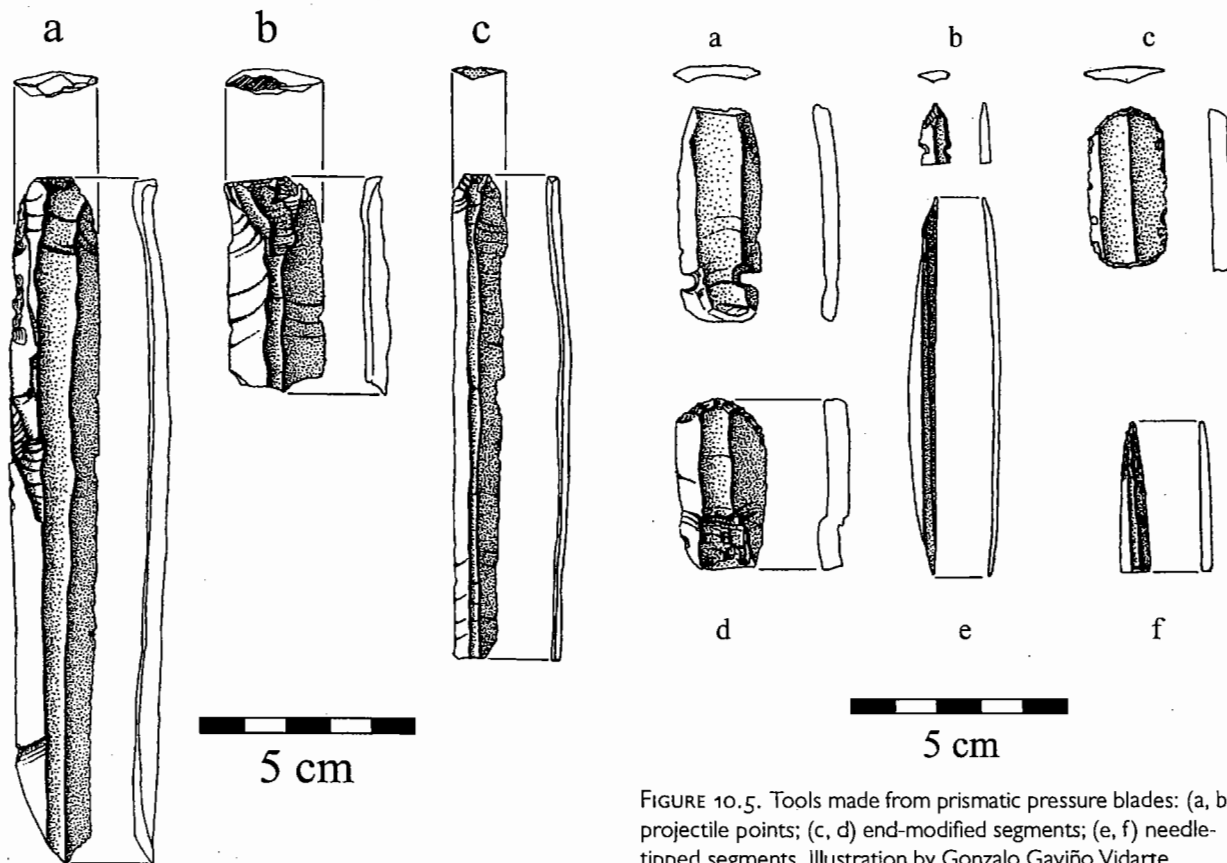


FIGURE 10.4. Prismatic blades from the civic-ceremonial site core: (a) segment with single-facet platform; (b) segment with cortical platform; (c) segment with pecked and ground platform. Illustration by Gonzalo Gaviño Vidarte.

FIGURE 10.5. Tools made from prismatic pressure blades: (a, b) projectile points; (c, d) end-modified segments; (e, f) needle-tipped segments. Illustration by Gonzalo Gaviño Vidarte.

during the excavations, the striations and polish were certainly the result of prehistoric activities (Photo 10.2). Fully 42 percent of blade segments ( $N = 707$ ) have visible use wear at 10x magnification.

Artifacts manufactured from blade segments were shaped into specialized implements such as hafted points ( $N = 260$ ), eccentric blades ( $N = 24$ ), end-modified blades ( $N = 22$ ), and lanceolate blades ( $N = 68$ ) (Figure 10.5). Pointed and diagonal-tipped segments were classified as miscellaneous forms ( $N = 69$ ). A few by-products from blade artifact production also were found consisting of snapped blade fragments ( $N = 12$ ) and notch flakes ( $N = 2$ ). One end-modified segment of a green Pachuca percussion blade was also recovered.

The remaining blade artifacts were blade cores, blade-core fragments, and debitage related to platform rejuvenation (Table 10.3, Figure 10.6a-f, i). One complete prismatic core with a single-facet platform was recovered that was the only core with this type of platform found at Xochicalco. The remaining complete cores were small, exhausted cores with pecked and ground platforms ( $N = 3$ ).

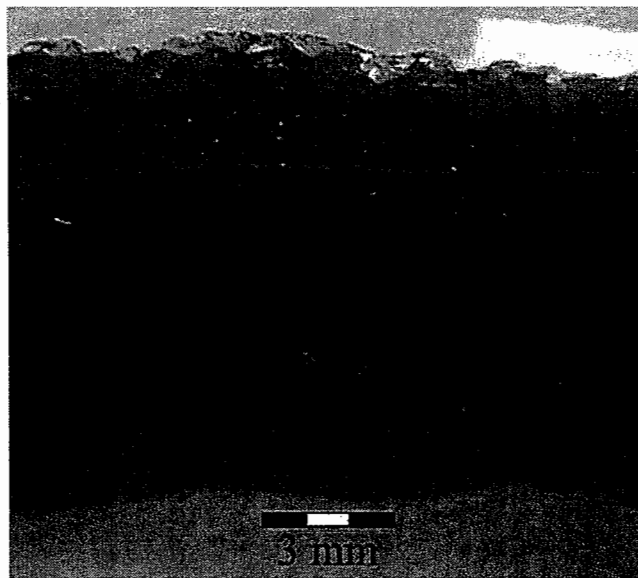


PHOTO 10.2. Magnified photo of a blade segment with use wear. Note chipping and light polished zone apparent along upper edge. Photo by B. Andrews.



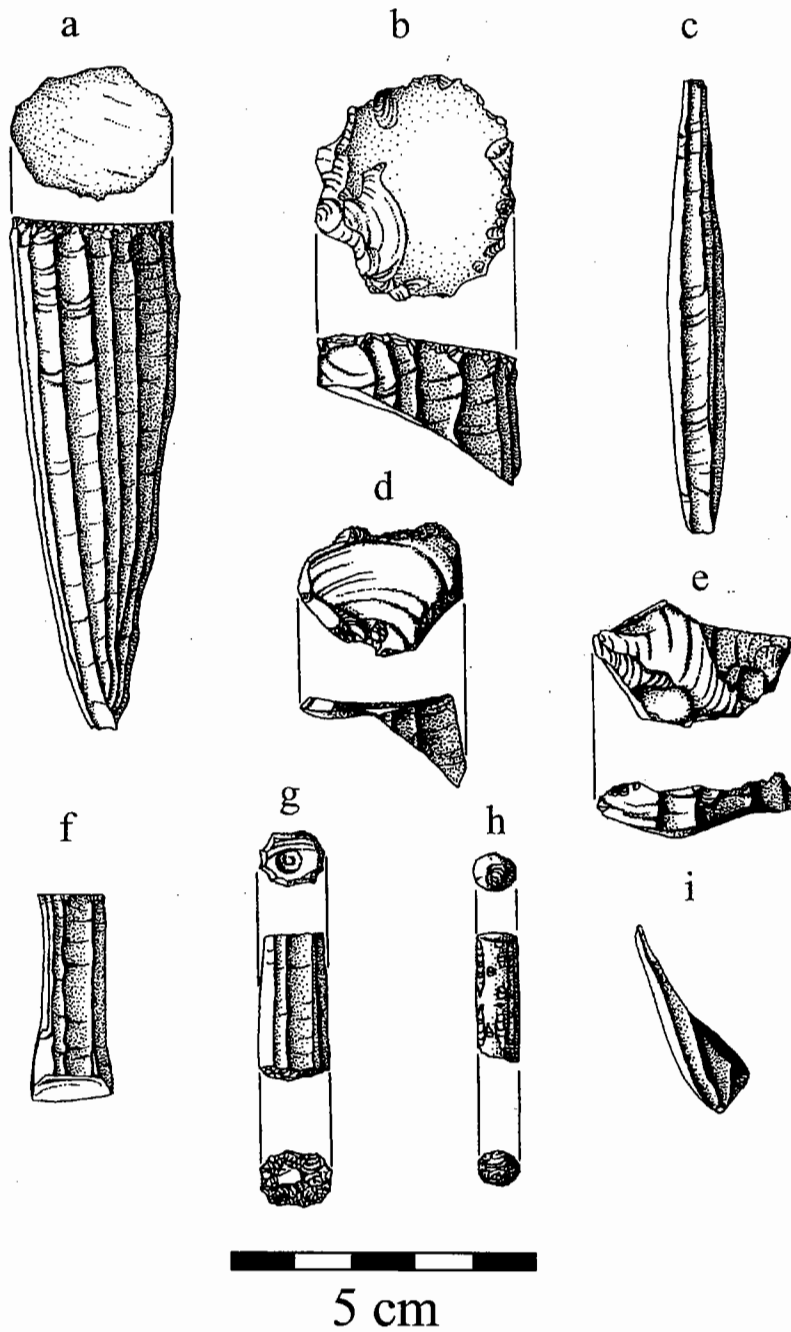


FIGURE 10.6. Core artifacts: (a) prismatic core with single-facet platform; (b) single-facet core top; (c) exhausted prismatic core with pecked and ground platform; (d, e) platform preparation flakes; (f) bipolar core top with pecked and ground platform; (g, h) unfinished beads made from prismatic core segments; (i) distal orientation flake. Illustration by Gonzalo Gaviño Vidarte.

Fragments of smashed, presumably exhausted prismatic cores ( $N = 4$ ) were also recovered. Platform rejuvenation debitage consisted of platform removal flakes from both faceted ( $N = 7$ ) and pecked and ground platforms ( $N = 15$ ), platform preparation debitage ( $N = 56$ ), and distal orientation flakes ( $N = 27$ ). Metric measurements indicate that cores with single-facet platforms had larger diameters ( $\bar{X} = 33.18$  mm,  $SD = 7.01$ ,  $N = 5$ ) than cores with pecked and ground platforms ( $\bar{X} = 12.99$  mm,  $SD = 4.27$ ,  $N =$

16). A few retouched rejuvenation artifacts were recovered ( $N = 12$ ) that were used as scraping tools.

#### Bifacial Artifacts

Most of the bifacial artifacts from the civic-ceremonial core were finished tools or implements (Table 10.4). The bifacial and unifacial artifacts are treated here as a single technological category since bifacial flaking techniques

TABLE 10.4. *Bifacial and Expedient Flake Artifacts in Obsidian and Chert in the Elite Assemblage*

BIFACIAL TECHNOLOGY	GRAY OBSIDIAN	GREEN OBSIDIAN	RED OBSIDIAN	CHERT	TOTAL
Projectile points					
Corner notched	22	1	0	2	25
Side notched	19	12	0	26	57
Flat or concave base	5	1	0	0	6
Bifacial implements					
Laurel-leaf bifaces	0	1	0	0	1
Bifaces	106	47	2	6	161
Eccentrics	19	5	0	0	24
Unifacial implements					
Eccentrics	2	0	0	0	2
Unifaces	2	0	0	1	3
Production tools and by-products					
Percussion bifacial thinning flakes	2	0	0	0	2
Pressure bifacial thinning flakes	2	0	0	0	2
TOTAL BIFACES	179	67	2	35	283
Expedient flake technology					
Flake core	0	0	0	1	1
Percussion secondary flakes	0	0	0	3	3
Early percussion interior flakes	0	0	0	7	7
Late percussion interior flakes	0	0	0	1	1
Hammerstone	0	0	0	1	1
TOTAL EXPEDIENT FLAKES	0	0	0	13	13

TABLE 10.5. *Dimensions of Complete Projectile Points in the Elite Assemblage (in mm)*

MATERIAL	LENGTH	SD	WIDTH	SD	THICKNESS	SD
Obsidian (N = 31)	68.81	24.34	33.94	7.66	8.08	1.68
Chert (N = 26)	36.69	6.69	22.88	4.47	5.86 <sup>a</sup>	1.62

<sup>a</sup>Measures of thickness were taken for only 13 of the 26 complete projectile points.

are involved in the production of unifaces. The projectile points consist of formally shaped bifacial implements that were classified as corner notched (N = 25), side notched (N = 57), and flat or concave base (N = 6) varieties according to the shape of the base (Figure 10.7). Seventy percent of corner-notched examples (Figure 10.7c, N = 18) resemble Ramec-style points produced in the Epiclassic Hacienda Metepec workshop at Teotihuacan (Nelson 2000). Overall, obsidian projectile points were twice as long as those made of chert (Table 10.5).

One impressive laurel-leaf biface was recovered that measured 188 mm long and 62 mm wide (Photo 10.3).

Other biface fragments may have been parts of either projectile points (N = 161) or bifacial eccentrics (N = 24). Except for those affected by heat damage, many of the bifacial fragments have attributes consistent with impact fractures (Alejandro Pastrana, personal communication June 2002; Kelterborn 2001:Figure 6). Two unifacial eccentrics were also recovered. One large crescent eccentric was found with a portion of one flaked face ground smooth (Photo 10.4). Only two obsidian unifaces and one chert uniface were recovered. Other biface obsidian artifacts included two percussion thinning flakes and two pressure thinning flakes.

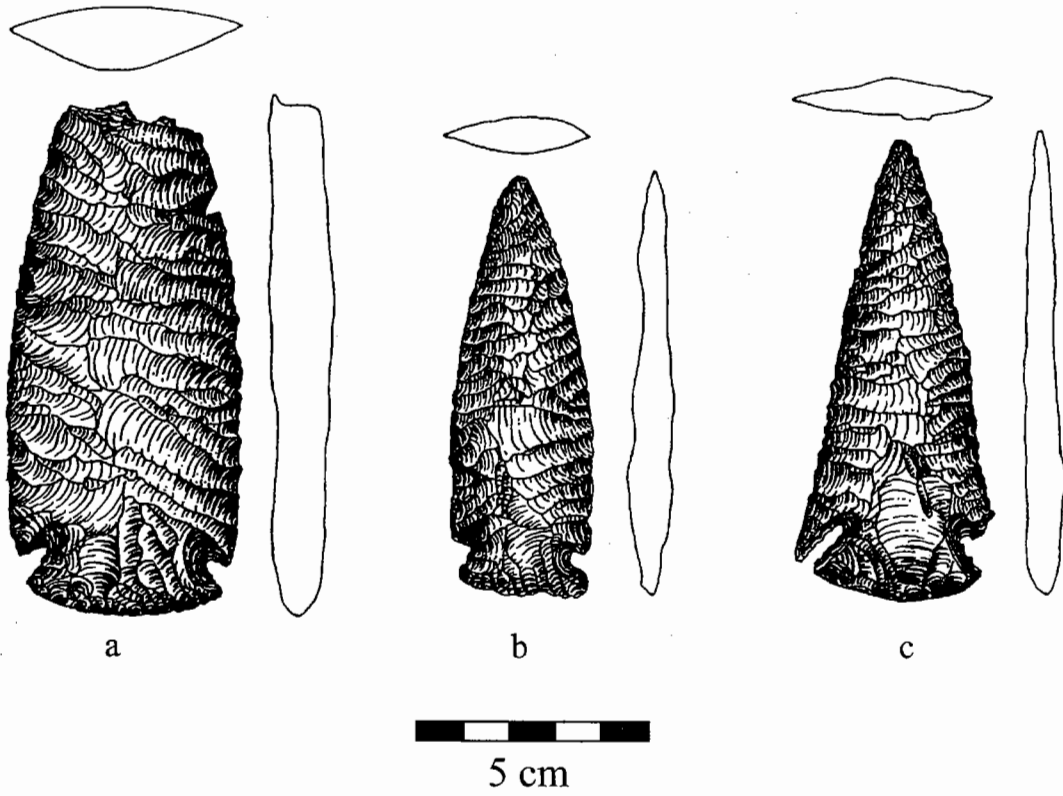


FIGURE 10.7. Bifacial projectile points: (a, c) corner notched; (b) side notched. Illustration by Gonzalo Gaviño Vidarte.



PHOTO 10.3. A large laurel-leaf biface. Photo by B. Andrews.



PHOTO 10.4. A large crescent-shaped bifacial eccentric altered with lapidary grinding. Photo by B. Andrews.

Many of the bifacial artifacts still have remnant detachment scars, indicating that they were made from large flake blanks. A detachment scar is the ventral surface of a flake that may remain visible if not completely removed by subsequent flaking. Twenty-one percent of the obsidian bifaces ( $N = 44$ ) and 42 percent of the chert bifaces ( $N = 20$ ) have visible remnant detachment scars. Furthermore, three bifacial artifacts, including the laurel-leaf biface (Photo 10.3), were made from tablets, or *lajas*, of raw material like those described for the Late Postclassic period in the Valley of Mexico (Pastrana and Hirth 2003). Evidence of *laja* reduction consists of the incomplete removal of the *laja* cortical surface on one or both faces.

#### Expedient Flake Artifacts

Thirteen artifacts were identified in the elite assemblage that reflect an expedient flake technology in chert (Table 10.4). These artifacts included one core, three decortication flakes, seven early interior flakes, and one late interior flake.<sup>12</sup> A small, well-battered chert hammerstone was also identified.

#### Lapidary Artifacts

The elite assemblage contains 15 obsidian lapidary artifacts (Table 10.6). Most of these were partially finished cylindrical beads that were fashioned from exhausted prismatic cores (Figure 10.6g, h). The other lapidary artifacts include a small polished projectile point, which may have been made from a pressure blade segment, and three polished half-spheres. The average diameter of the cylindrical beads is 12.05 mm ( $SD = 2.90$ ) and 13.3 mm ( $SD = 0.68$ ) for the half-spheres. Based on diameter, it appears that the half-spheres were also fashioned from segments of exhausted prismatic blade cores.

#### THE SPATIAL PATTERNING OF CIVIC-CEREMONIAL STONE TOOL CONSUMPTION

The flaked stone artifacts from the civic-ceremonial center are unique in two respects. First, they represent an assemblage of implements used in the elite core of Gobernador phase Xochicalco. As such, they indicate a mixture of elite domestic, ritual, and civic activities not found elsewhere in the Xochicalco state. Second, they reflect the type and quantity of flaked stone tools used and consumed in ritual and elite activities.

Although we realize that functional classifications are problematic in flaked stone tool analysis (Hester and Heizer 1972; Kidder 1947; Sheets 2003), artifact frequencies and their spatial patterning are the foundation for most archaeological interpretation. The spatial distribution of stone tools is examined here for information about

TABLE 10.6. *Obsidian Lapidary Artifacts in the Elite Assemblage*

LAPIDARY TECHNOLOGY	GRAY OBSIDIAN
Beads in production	11
Half-spheres	3
Hafted points	1
TOTAL	15

state-sponsored activities carried out within the civic-ceremonial center. Flaked stone tools are multipurpose implements, and it is difficult to assign *specific* ritual or administrative functions to them on the basis of form. Nevertheless, Binford (1962) illustrated years ago that artifact classes may contain useful information for identifying behavior. Accordingly, we have made some initial observations about tool function and the distribution of activities within Xochicalco's civic-ceremonial core. Ethnohistoric sources are used to support inferences of tool function that enhance the reliability of functional interpretations (Clark 1989e:318–319). Our strongest inferences of tool function are those where the ethnohistorically informed interpretations are consistent with inferences of architectural function based on archaeological data. In this way archaeology and ethnohistory complement one another.

Several things stand out about the elite assemblage that are congruent with the activities we know were associated with the Xochicalco state. The first is the high frequency of weaponry recovered from the civic-ceremonial center. Xochicalco was the capital of a military conquest state, and like other expansionistic city-states during the Postclassic period (Clark 1989e:note 1; Pastrana 1994a, 1998; Pastrana and Hirth 2003), it needed a large quantity of flaked stone tools to supply itself with weapons. Although flaked stone armaments such as bifacial projectile points have other functions (e.g., hunting or domestic activities), they are used here as a possible measure of military activity and martial tool consumption within the civic-ceremonial center.

Second, we know that the upper ceremonial zone of Cerro Xochicalco was the site's primary ritual and religious precinct. As such, the elite assemblage should reflect ritual activity in the frequency and distribution of symbolically meaningful lithic goods like eccentric blades and paraphernalia used in ritual sacrifice. Third, and finally, the Acropolis and other structures in the civic-ceremonial center were the residences of the ruling elite. While domestic assemblages can be quite varied, we look at the distribution of those artifacts in terms of what they indicate about flaked stone procurement and consumption within elite contexts.

TABLE 10.7. *Functional Classification of Flaked Stone Artifacts in the Elite Assemblage*

ARTIFACT TYPE	TOTAL	PERCENT
Military implements		
Pressure blade hafted points	260	12.2
Bifacial projectile points	88	4.1
Bifacial tools	162	7.6
Subtotal	510	23.9
Ceremonial implements		
Pressure blade tools	92	4.3
Bifacial eccentrics	26	1.2
Lapidary artifacts	15	.7
Subtotal	133	6.2
Domestic implements		
Blade segments	1,164	54.5
Formal tools	110	5.2
Subtotal	1,274	59.7
Production related artifacts <sup>a</sup>		
Prismatic blade	128	6.0
Bifacial and flake technologies	4	.2
Expedient flake <sup>b</sup>	13	.6
Undiagnostic	72	3.4
Subtotal	217	10.2
TOTAL	2,134	100.0

<sup>a</sup>The 11 lapidary beads in production are included with the ceremonial artifacts. The artifacts produced from rejuvenation debitage are included with the domestic artifacts.

<sup>b</sup>This undiagnostic total differs from that in Table 10.1 because it does not include four worked flakes classified in this table as domestic artifacts.

#### Weaponry and the Evidence for Military Activity

One striking aspect of this flaked stone tool assemblage was the large number of weapons recovered from the civic-ceremonial center in comparison to other areas of the site. Artifacts classified as weaponry include hafted points made from pressure blades (Table 10.3) and the greater array of bifacial projectile points, laurel-leaf bifaces, unhafted bifaces, and biface fragments (Table 10.4). These items together constitute nearly one-quarter (24 percent) of the flaked stone tools recovered from the upper elite-controlled zone of the site (Table 10.7).

This contrasts sharply with information on the frequency of weaponry in domestic and workshop locales at Xochicalco. Bifaces and blade projectile points constitute only 5 percent of the lithic inventory recovered in surface collections from 70 Gobernador phase domestic residenc-

es and precinct areas sampled by the Xochicalco Mapping Project (Hirth, Grant Hirth, and Pauer 2000). The flaked stone tool remains discussed in chapter 9 indicate that these artifacts represent only 2.8 percent of obsidian artifacts and 1.4 percent of the total lithic assemblage recovered from excavated domestic contexts at Xochicalco (see Table 9.9).<sup>13</sup> Finally, these lithic categories occur in very low numbers in Xochicalco workshops, constituting less than 1 percent (0.19 percent) of lithic assemblages from these contexts.<sup>14</sup> Although the number of weapons from these two areas is about the same, the sample from the lithic workshops was about 170 times larger than it was for the civic-ceremonial sample. Statistics are not needed to confirm that this difference is significant.

We believe that the majority of the bifacial projectile points and other bifacial artifacts recovered within the civic-ceremonial center represent weaponry. Some of the hafted projectile points certainly could have been used for hunting, just as some of the bifaces could have been used for normal domestic activities, but given the context, it is likely that weaponry was their primary use.<sup>15</sup> Obsidian projectile points and biface fragments probably were used as spear points or atlatl darts, while the smaller chert projectile points (Table 10.5) probably were atlatl darts. The hafted points made from pressure blades pose a special problem because their size range suggests they were used for both atlatl darts and arrow points. This is an interesting issue because archaeologists disagree widely on when they think the bow and arrow was introduced into Mesoamerica. Hassig (1992) has suggested the bow and arrow was not introduced until the Postclassic period, but others argue for its introduction during the Classic period (Linné 1934) or earlier, during the Middle Formative period (Tolstoy 1971). Whenever the bow and arrow was introduced, it was in active use at Xochicalco.

The spatial distribution of these materials is also interesting. Well over 50 percent of the weapons recovered from the civic-ceremonial center come from two areas, the Acrópolis (28 percent) and the Plaza Central (27 percent) (Table 10.8). We know that Epiclassic societies had warrior sodalities similar in function to the Aztec knight societies (Hirth 1989b; Hirth 2000). Furthermore, they supported elite authority and probably assembled periodically within the Plaza Central in public displays of state power. This could account for the high concentrations of weaponry both here and in the Acrópolis.

Centralized storage of weaponry is reported ethnohistorically, and the available evidence suggests that the Plaza Central may have had this function. First, weapons constitute nearly 85 percent of the flaked stone remains recovered in the Plaza Central (Table 10.8). Second, in addition to having a large number of weapons, nearly 60 percent of them ( $N = 94$ ) were recovered from Structure X3-5 in the southeast corner of the plaza. Weapons were the only flaked stone artifacts found in this building, so

TABLE 10.8. *Distribution of Flaked Stone Weaponry in Xochicalco's Civic-Ceremonial Zone*

LOCATION	NUMBER COMPLETE	PERCENT COMPLETE	TOTAL ARTIFACTS	PERCENT	PERCENT OF SECTOR
Sector A	10	38	26	5	13
Acrópolis	92	65	142	28	48
Plaza Ceremonial	34	52	66	13	13
North Ball Court Complex	31	33	93	18	15
East Ball Court Complex	14	40	35	7	38
Plaza Central	112	81	139	27	84
General provenience	6	66	9	2	31
TOTAL	299	56	510	100	—

TABLE 10.9. *Distribution of Ceremonial Flaked Stone and Lapidary Artifacts in the Civic-Ceremonial Center*

LOCATION	TOTAL	PERCENT	PERCENT OF SECTOR ASSEMBLAGE
Sector A	21	16	10
Acrópolis	27	20	9
Plaza Ceremonial	36	27	7
North Ball Court Complex	23	17	4
East Ball Court Complex	10	8	11
Plaza Central	14	11	9
General provenience	2	1	18
TOTAL	133	100	—

it probably functioned as the site's *tlacochealco*, or armory. Its architectural twin, Structure X<sub>3-4</sub>, located in the southwest corner of the plaza, also contained weaponry ( $N = 13$ ), representing 8 percent of the flaked stone artifacts recovered in the Plaza Central. Ethnohistoric sources indicate that armories were located in or near public plazas like we find here (Hassig 1988; Motolinía 1950), and Structures X<sub>3-4</sub> and X<sub>3-5</sub> were conveniently located to provision warrior regiments meeting or assembling in the city's main public plaza. It is possible that weapons also were stored in the Acrópolis, since a high percentage of complete projectile points was noted for this area (65 percent,  $N = 92$ ).<sup>16</sup>

Finally, the high concentration of weaponry in the civic-ceremonial center may also reflect the catastrophic conditions under which the site was destroyed. All the evidence points to a violent overthrow and conquest of Xochicalco at the end of the Gobernador phase. The distribution of weaponry throughout the site core may reflect the final conflict within the city's innermost defensive perimeter (Hirth 1984b:Figure 5, 2000). Equally significant is that a high proportion of the weapons are broken (41 percent), and many have impact fractures indicative of use in combat. The recovery of a large number of unbroken

weapons in Structure X<sub>3-5</sub> ( $N = 90$ ) in the Plaza Central is somewhat surprising if the city was conquered, sacked, and burned at the end of the Gobernador phase. These weapons, however, may have been unhafted at the time of the assault and therefore remained unused in the city's *tlacochealco*.

#### Ceremonial Assemblages and Ritual Activity

Artifacts used in public rituals were socially and ideologically charged with power (Helms 1993). They played special roles in validating, maintaining, and manipulating elite status and state power (Brumfiel 1987; Brumfiel and Earle 1987; Clark and Parry 1990; Helms 1993; Inomata 2001). Although they represent only 6 percent of the total assemblage (Tables 10.7, 10.9), several artifact categories in the elite assemblage probably had important social and ceremonial functions. These include small lanceolate and eccentric artifacts made from obsidian pressure blades, as well as large bifacial and unifacial eccentrics. Lapidary beads are also included in this category because of their use in marking social status (Otis Charlton 1993).

Lanceolate blades may have had many uses, but they are frequently interpreted as lancets used in Mesoamerican

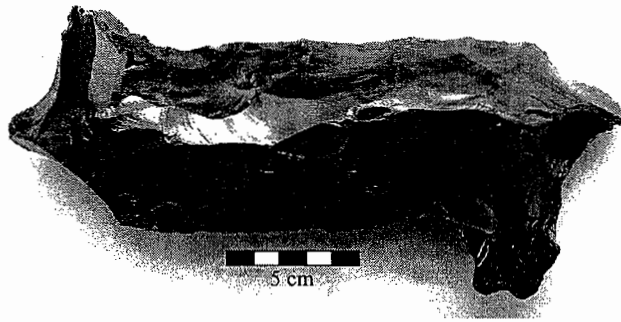


PHOTO 10.5. A large bifacial eccentric from structure X1-2. Photo by B. Andrews.

bloodletting rituals (Clark 1980; Flannery 1976; Parry 1983; Sugiyama 1995). Besides the contexts where these blades were recovered, such interpretations are supported by ethnohistoric sources that describe this practice in Mesoamerica (Clark 1989e:314; Durán 1971:263; López de Cogolludo 1954; Motolinía 1950; Nuttall 1903; Tozzer 1941:113–114).<sup>17</sup> Lanceolate blades are often pictured in bloodletting rituals in Mexican and Maya codices, as well as on Maya monuments and polychrome vessels (Clark 1989e:314). It is likely that lanceolate blades were used in a similar fashion at Xochicalco, where personal bloodletting would be compatible with the more explicit evidence for god nourishment and blood sacrifice found at the site (Hirth 1989b; 2000). What is particularly interesting is that although lanceolate blades were widely scattered across the civic-ceremonial center, 32 percent ( $N = 22$ ) were recovered from the Plaza Ceremonial, where blood sacrifice imagery is strong and autosacrifice involving bloodletting almost certainly was practiced (Hirth 1989b).

Less controversial is the view that eccentric artifacts manufactured from obsidian pressure blades, or as large individual bifaces, represent ceremonial artifacts. The ritual significance of eccentric artifacts is supported by their unique morphology and their presence in burials and cache deposits throughout Mesoamerica (Gamio 1966; Moholy-Nagy 1989; Parry 2002b; Stocker and Spence 1973; Winter 1989). Michael Spence (1996) has suggested that eccentrics made from obsidian pressure blades functioned as ornamental elements sewn on clothing. Pressure blade eccentrics were evenly distributed throughout the civic-ceremonial center, as might be expected for items worn on apparel.

The elite assemblage contains twenty-six large bifacial and unifacial eccentrics (Table 10.4), with shapes similar to large eccentrics found in ritual contexts at Teotihuacan (Cabrera Castro and Sugiyama 1999; Parry 2001a, 2002b; Sarabia 1996; Sugiyama and Cabrera 1999). Most of these were broken and randomly distributed across the site core. Ten eccentrics were found together in a ritual context in the temple atop the Great Pyramid (Structure

X2-1). Seven of these appear to have formed a stylized Tlálóc face (Palavicini Beltrán and Garza Tarazona in press). Two others are large crescent eccentrics that were ground smooth on one surface (Photo 10.4). The tenth one was a fragment from an eccentric similar to those forming the abstract Tlálóc face. It is likely that these artifacts were used in public rituals conducted atop the Great Pyramid (Structure X2-1). The largest eccentric found at Xochicalco had an abstract form and was recovered in Structure X1-2 in the Plaza Ceremonial (Photo 10.5).

Beads, ear spools, and lip plugs are widely accepted as social markers of rank in Mesoamerica (Caso 1969; Otis Charlton 1993) and likewise had social and symbolic significance at Xochicalco. Not surprisingly, nearly half of these lapidary artifacts were recovered from the Acrópolis complex, where elites resided. These artifacts include the three half-spheres, the small polished projectile points, and three of the partially finished obsidian beads.

#### The Elite Domestic Assemblage

Most (60 percent) of the flaked stone tools recovered from the civic-ceremonial center were prismatic blade segments and blade tools. Although prismatic blades had martial and ceremonial functions, they were the principal cutting tools used in non-elite domestic contexts (see chapter 9). As discussed in chapter 7, obsidian prismatic blades and other products were available to the city's inhabitants in Xochicalco's central marketplace (Hirth 1998b). Since there is little evidence that flaked stone tools were produced within the civic-ceremonial center (see below), it is likely that the elite acquired the majority of their stone tools from Xochicalco craftsmen either in the marketplace or as *tequitl* tribute.

Obsidian blades and blade tools were consumed within the civic-ceremonial core. Use wear reflecting tool consumption was found on 42 percent of blade segments, which is high given the low level of magnification used to examine working edges. Miscellaneous other simple, unembellished tools were also recovered (unifaces, modified flakes) that are typically associated with domestic contexts.

The highest percentages of these remains were recovered from the Plaza Ceremonial and the North Ball Court Complex, where artifacts with possible domestic use constituted as much as 80 percent of the flaked stone tools (Table 10.10). Most of the domestic artifacts in the Plaza Ceremonial ( $N = 351$ , 84 percent) were recovered from the Temple of the Stelae (X1-4) and Structures X1-3 and X1-6. The Temple of the Stelae probably had both religious and civic functions since systems mounds of this type appear to have been important in the administrative life of the city (Hirth 1995b, 2000). Structure X1-4 would have been a good venue for entertaining visiting dignitaries given the impressive character of the

TABLE 10.10. *Distribution of Domestic Flaked Stone Artifacts in the Civic-Ceremonial Center*

LOCATION	DOMESTIC LITHICS	PERCENT	PERCENT OF SECTOR ASSEMBLAGE
Sector A	130	10	43
Acrópolis	417	33	80
Plaza Ceremonial	514	40	81
North Ball Court Complex	48	4	51
East Ball Court Complex	12	1	7
Plaza Central	153	12	77
General provenience	0	0	0
TOTAL	1,274	100	—

three stelae commemorating Xochicalco's kings that were erected nearby. Both structures XI-3 and XI-6 appear to have had residential functions and would have consumed an array of domestic materials to support the religious practitioners and/or civic administrators housed within them. Few domestic artifacts were recovered in any other structures in the Plaza Ceremonial, including the Pyramid of the Plumed Serpent (XI-1) and structures XI-2, XI-7, and XI-9 (Figure 10.3).

The North Ball Court Complex had the largest quantity of domestic remains, reflecting a diversity of activities carried out there (Table 10.10). Thirty-eight percent ( $N = 196$ ) of the domestic implements found in this sector were recovered from Terrace X2; the majority of them ( $N = 115$ ) were recovered from Patio 2, where food was prepared alongside the North Ball Court (Figure 10.3). The ball court (Structure X3-11) and sections of terrace X3 contained the majority of the domestic artifacts in this area ( $N = 318$ ). Most of these ( $N = 249$ ) were recovered from eroded, postabandonment deposits originating on terrace X2 or were from construction fill. A concentration of domestic remains ( $N = 51$ ) also was identified on terrace X2 along the base of the wall rising to the Plaza Ceremonial and may represent the postabandonment erosion of materials from Structure XI-6 above.

The low number of domestic artifacts from the Acrópolis is a function, in part, of the small amount of material analyzed from this area. From the data at hand, only a few artifacts ( $N = 31$ ) were recovered from primary floor contexts. The remaining domestic implements were found in the Meteor Drain ( $N = 35$ ) and Elements 1 and 77 ( $N = 64$ ) on Terrace 2 (Figure 10.3). Sector A had a few domestic artifacts that either were redeposited from the Meteor Drain or were deposited as midden along the west side of the Acrópolis (Hirth and Cyphers Guillén 1988:40).

Few domestic artifacts were found in either the East Ball Court Complex or the Plaza Central (Table 10.10). Most of the artifacts in the East Ball Court Complex were recovered from the patios with colonnaded galleries on terrace X2. The rest were scattered among structures

throughout the area. The Plaza Central had very few domestic artifacts reflecting its role as a public assembly area and the military function of Structures X3-4 and X3-5.

#### EVIDENCE FOR CRAFT PRODUCTION

One question of interest is where the flaked stone artifacts in the civic-ceremonial center were produced. Were they manufactured by attached specialists within this zone, or were they procured from artisans working elsewhere at the site? In general, the elite assemblage contains few production artifacts. A few are from blade production ( $N = 128$ ), followed by undiagnostic flakes, flake fragments, and shatter ( $N = 72$ ) (Table 10.7). Expedient flake production occurred infrequently and accounts for 13 percent ( $N = 9$ ) of the undiagnostic chert artifacts (Table 10.7). These items are typical by-products associated with most types of flaked stone tool production, and the four obsidian bifacial thinning flakes recovered probably were the result of periodic resharpening rather than biface production.

The small quantity of lapidary evidence recovered from the civic-ceremonial center shows evidence of production. Eleven obsidian cylindrical beads were found that were in the process of being made from exhausted blade cores, as were the three half-spheres. The recycling of blade cores into bead production is the same as that found in Xochicalco's workshops (see chapter 4) and other sites in Central Mexico (Otis Charlton 1993).

Small quantities of production debitage were found in the Acrópolis, the North Ball Court Complex, and the Plaza Ceremonial (Figure 10.2, Table 10.11). The Acrópolis had a small number of production by-products from both blade production and lapidary crafting. Most of these items were recovered from the Meteor Drain on the west side of the Acrópolis. This drain contained microdebitage from flaked stone tool production and lapidary work in a range of semiprecious materials, indicating the presence of a small workshop within the palace. Items from the drain included obsidian platform rejuvenation debitage ( $N = 7$ )



TABLE 10.11. *Distribution of Production By-Products in the Civic-Ceremonial Center*

LOCATION	CORE-BLADE	BIFACIAL	EXPEDIENT FLAKE	UNDIAGNOSTIC	LAPIDARY
Acrópolis	18	1	1	30	3
North Ball Court Complex	40	0	6	14	2
Plaza Ceremonial	38	3	4	22	4
Other	32	0	2	6	2
TOTAL	128	4	13	72 <sup>a</sup>	11

<sup>a</sup>Like Table 10.7 this undiagnostic total differs from that in Table 10.1 because it does not include four worked flakes classified as domestic artifacts.

and most of the snapped blade fragments in the collection ( $N = 10$ ). The Meteor Drain emptied into Sector A, so it is noteworthy that an additional 25 production by-products were also recovered here.<sup>18</sup> When taken together the Acrópolis and Sector A contain nearly 33 percent ( $N = 76$ ) of the production artifacts in the elite assemblage.

Production artifacts were also recovered from the North Ball Court Complex, where blade by-products and undiagnostic flakes were identified. A number of these by-products were found in Patio 1 ( $N = 11$ ), Patio 2 ( $N = 7$ ) and Patio 4 ( $N = 8$ ). Among these were the complete core with a single-facet platform (Figure 10.6a), two complete prismatic cores with pecked and ground platforms, and two partially finished obsidian beads. These data suggest ad hoc production was practiced in these patios, perhaps to supply blade implements for ritual activities. Whatever the case, most of the production by-products within this complex ( $N = 32$ ) probably are postabandonment deposits from terrace X2. A number of production by-products from the Plaza Ceremonial were found in Structures X1-3 and X1-6 (Figure 10.3). While the by-products in Structure X1-6 were distributed throughout its rooms ( $N = 15$ ), those in Structure X1-3 ( $N = 36$ ) were concentrated in Room 1b.

The evidence suggests that only isolated, ad hoc production took place in the civic-ceremonial center. The blade production artifacts recovered reflect the same rejuvenation technology that was used in the domestic workshops. These include platform removal flakes with single-facet or pecked and ground platforms, platform preparation debitage, and distal orientation flakes. As discussed in chapter 7, large platform preparation debitage probably was sold in Xochicalco's marketplace as both unshaped and reworked obsidian pieces. As such, it is possible that many of the core and core rejuvenation artifacts recovered in the elite assemblage do not reflect core processing and blade production at all. Instead, they may indicate that the Xochicalco state obtained the obsidian and other necessary flaked stone tools from craftsmen in the marketplace, through local artisan-based tequitl tribute, or from both.

Finally, it could be argued that the limited evidence for flaked stone tool production in the ceremonial center

was a result of the hand-collection recovery strategy used during excavation. We disagree. Fifteen percent of the artifacts collected have maximum dimensions measuring 2 cm or less. Our experience working with material from the five obsidian workshops at Xochicalco (see chapters 6 and 7) suggests that general patterns of flaked stone production should be evident from material of this size. We conclude that flaked stone tool production was, at best, a small-scale and very limited activity in Xochicalco's civic-ceremonial center during the Gobernador phase.

#### PATTERNS OF STONE TOOL CONSUMPTION IN XOCHICALCO'S CIVIC-CEREMONIAL CORE

This chapter has examined the flaked stone tools recovered from Xochicalco's civic-ceremonial core and what they indicate about production and consumption patterns of the site elite. Technological analyses revealed a pattern consistent with what is known about Gobernador phase activity at Xochicalco. Fully 97 percent of the assemblage consists of obsidian. It is dominated by prismatic blade segments, blade-derived tools, and bifacial artifacts that reflect a mixture of domestic, military, and civic-ceremonial activities. The assemblage also contains a few expedient flakes ( $N = 13$ ), lapidary ( $N = 15$ ), and undiagnostic ( $N = 76$ ) artifacts (see Table 10.1).

This assemblage contains a large number of implements used as weapons and a few ceremonial artifacts. The high percentage and concentration of weaponry in the site core (24 percent, Table 10.7) is consistent with the view that warfare was a central component of the Xochicalco state. The Epiclassic was a period of political competition, and weapons were essential for imperial expansion and the control of conquered territories. Among the weaponry are pressure blade projectile points, the smallest of which were used to tip arrows. Most weapons were found in the Plaza Central and the Acrópolis, where they were stored and where warriors participated in public ceremonies that supported the state. Especially significant is the concentration of weaponry in Structure X3-4 in the Plaza Central that we believe functioned as a *tlacochcalco*, or site armory. Finally, the dispersion of broken weapons through-

out the civic-ceremonial center reflects the violent conflict that accompanied the destruction and abandonment of the site at the end of the Gobernador phase.

Ceremonial artifacts constitute only 6 percent of the assemblage ( $N = 133$ ; Table 10.7). These artifacts include small blade eccentrics, lapidary beads, lanceolate blades, and a few large elaborate bifacial eccentrics. Ornamental implements like beads and small eccentrics are expected in an elite assemblage because they reinforced social status. Lanceolate blades probably reflect autosacrifice, and they occur in greatest frequency within the Plaza Ceremonial, where individual ritual bloodletting may have been practiced together with human sacrifice in the main temple (Hirth 1989b). The large bifacial eccentrics recovered from the top of the Great Pyramid (Structure X2-1) also were used in public ritual.

The low number of ceremonial artifacts in the assemblage is interesting given the ritual importance and prominence of ceremonial structures in Xochicalco's core. What this means is difficult to interpret because we lack comparative information about the occurrence of elite ceremonial artifacts from other sites in Central Mexico.<sup>19</sup> Moreover, the functional assignments used here are somewhat problematic since they are *etic* interpretations of tool meaning and are based on analogy with ethnohistoric sources (Hirth 2000:8). It is possible that given the central importance of warfare at Xochicalco, the flaked stone items with the greatest ideological significance were weapons like the large bifacial projectile points.

The importance of this assemblage is that it permits evaluation of elite political economy from the perspective of resource consumption (Hirth 1996:209). The composition of the assemblage suggests limited elite control over the production of stone tools within the civic-ceremonial center. The area contains only limited evidence for infrequent, ad hoc production of pressure blades, lapidary beads, and expedient percussion flakes. There is no evidence for direct elite control over raw material acquisition.

The data suggest that state demand for flaked stone tools was met through provisioning with finished products rather than raw materials (Table 10.7). The data also indicate that most blade tools probably were obtained from craftsmen who lived and worked in Xochicalco's domestic workshops. This inference is supported by the technological similarity between blades in the elite assemblage and the products manufactured in domestic workshops. The question to be answered is, how did elites acquire their flaked stone tools?

Research has established that products made in Xochicalco workshops were distributed through a central marketplace (Hirth 1998b; see chapter 7). Comparison of blade tools in the elite assemblage to those in domestic residences from excavated (see chapter 9) and surface con-

texts (Hirth, Grant Hirth, and Pauer 2000) reveals similar distributions. These similarities suggest elites acquired most of their blade tools from the same sources used by non-elite households. Procurement through the marketplace would have been an efficient provisioning strategy requiring little elite investment other than maintaining an attractive social environment for market exchange.

Although elite demands could have been met by the market, political economies often employ a mix of strategies for expropriating resources (Hirth 1996:206). It is likely, therefore, that tequitl tribute was an important provisioning mechanism supplying elites with flaked stone tools. One important aspect of this assemblage is the high percentage of weaponry, 51 percent of which were projectile points manufactured from prismatic pressure blades ( $N = 260$ , Table 10.7). Blade projectile points were produced in local workshops (see chapters 3 and 6), and it is possible that Xochicalco craftsmen supplied the state with these items as tequitl tribute. A preoccupation with war certainly generated a large demand for weaponry, and obsidian blades were an important tribute item during the Late Postclassic to supply weapons for the Aztec army (Clark 1989e:308).

The absence of evidence for biface production suggests that bifacial weapons and ceremonial eccentrics were imported as finished products (Hirth 2000; Hirth, Grant Hirth, and Pauer 2000). Furthermore, source analysis indicates that most bifaces were made of Otumba and Zacualtipan obsidian (Michael Glascock, personal communication March 2003). These bifaces probably moved through a different system from the one supplying obsidian cores from Michoacan. Although this system remains poorly understood, it is reasonable to suspect that once bifaces entered the city, they also were distributed in the central marketplace.

The 2,134 flaked stone artifacts analyzed here provide valuable insights into elite consumption patterns during the Gobernador phase. This notwithstanding, the size of the assemblage seems relatively small for a site of Xochicalco's civic-ceremonial stature. With an estimated population of 925 to 1,336 people (Hirth 2000) in the central elite core, this comes to little more than two implements per person. While this may not represent *all* the tools used in the civic-ceremonial center, this collection does seem modest for an elite assemblage. Whatever the reason, it is clear that the elite were not involved in stone tool production during the Gobernador phase. Instead, they were content to tap the system at the end of the production process by acquiring their tools through tequitl tribute and/or in the market. This strategy was sufficient to provision the elite with their flaked stone tools at little direct cost to the state.