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# Lithic economies and community organization at La Laguna, Tlaxcala

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LITHIC ECONOMIES AND COMMUNITY ORGANIZATION AT LA LAGUNA,  
TLAXCALA

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*Abstract*

Site wide, assemblage based lithic analyses help to elucidate community dynamics including variability in domestic economies, technological skill and decision making, exchange networks, and ritual practices. In this study we present the results of an analysis of over 36,000 lithic artifacts from the site of La Laguna, Tlaxcala. We compare Middle/Late Formative period (ca. 600-400 B.C.) and Terminal Formative period (ca. 100 B.C.-A.D. 150) deposits to examine transformations associated with urbanization and state formation during this interval. The residents of La Laguna had relatively equal and ample access to obsidian, and most production was organized independently by households. We identify blade production zones and variability in consumption patterns suggestive of different domestic, communal, and ceremonial activities. The introduction of bloodletters, elaborate large bifacial knives, and zoomorphic eccentrics to the Terminal Formative assemblage may indicate the emergence of higher statuses, new social roles, and militaristic symbolism during this period.

Lithic studies play a prominent role in reconstructions of ancient Mesoamerican domestic and ritual economies. Although analyses commonly employ data recovered from a particular site to evaluate macroregional trade and political economy models, site-based lithic assemblages are also of significant value in the analysis of intra-community dynamics (e.g. Hirth 2006). Analysis of lithic assemblages at the community level permits assessment of variability in household activities; the organization, technology, and sequencing of production; and the use of space within sites and particular structures (Carballo 2011a; Feinman et al. 2006; Haines et al. 2004; Healan 2012; Hirth and Andrews 2002; Hruby 2007; Levine and Carballo 2014; Pastrana and Domínguez 2009).

In this study we present an assemblage-based analysis of stone tool production and consumption at the site of La Laguna, Tlaxcala. We detect incremental technological diversification during the later Formative period (ca. 600 B.C.-A.D.150) with the emergence of new tool forms suggestive of new social activities. The characteristics of assemblages grouped by structures and excavation areas permit us to identify Terminal Formative period (ca. 100 B.C.-A.D. 150) blade production zones and variability in consumption patterns suggestive of various domestic, communal, and ceremonial activities. From basic subsistence tasks such as maguery processing to highly ritualized events involving the ceremonial caching of obsidian eccentrics, La Laguna's lithic assemblage is illustrative of varied facets of community organization and changes associated with urbanization and political evolution within Mexico's Central Highlands.

## **FORMATIVE LITHIC ECONOMIES IN THE CENTRAL HIGHLANDS**

From a macroregional perspective Plunket and Uruñuela (2012) define the Central Highlands as a “cultural seam” or physical interface where Formative period cultural traditions of both eastern and western Mesoamerica comingled for centuries. Concentrated centers of population emerged during the Middle Formative period and became more integrated culturally and economically during the Late (500-100 B.C.) and Terminal Formative (100 B.C.-A.D. 100) periods. The Basin of Mexico and Puebla-Tlaxcala region experienced explosive population growth in particular, and a number of competing communities constructed monumental architecture and residential districts consistent with urban or proto-urban settlement systems.

Stone tools across the Formative Central Highlands were made primarily from obsidian—which can be sourced chemically to various mines in the region—and secondarily from local and more compositionally heterogeneous microcrystalline (i.e. chert), basaltic, and felsic stones. Major obsidian sources include the Mesa Central sources northeast of Mexico City (Paredón, Tulancingo, Otumba, and the distinctive Pachuca or Sierra de Las Navajas green obsidian); Sierra Madre Oriental sources in eastern Puebla and western Veracruz (Oyameles/Zaragoza, Guadalupe Victoria, and Orizaba); and the Ucareo-Zinapécuaro source area in Michoacan (Cobean 2002) (Figure 1). There is no clear evidence for exclusive elite or state control of any obsidian source in the Central Highlands, yet changes in source utilization correlated with major political changes in certain cases (Charlton et al. 1978; Darras 2009; Hirth 2006; Pastrana and Domínguez 2009). Formative period regional obsidian trade networks have been proposed to have developed due to growing elite control associated with the rise of chiefly centers (Clark 1987), but more recent work suggests a stronger role for independent consumer demand (Hirth et al. 2013).

The trade of obsidian prismatic blades began during the Archaic period (ca. 4000 B.C.) (Macneish et al. 1967: 22; Niederberger 1976) and expanded during the Early Formative period, connecting the Central Highlands to the Gulf Coast (Cobean 2002; Hirth et al. 2013) and the Valley of Oaxaca (Parry 1987). Prismatic blade cores began to be traded extensively across the Central Highlands during the Late Formative period. Distance to obsidian sources and access to blade-producing sites were important variables influencing the form in which blade exchange took place. Processed and whole-blade trade generally preceded the widespread practice of on-site blade production (De León et al. 2009).

Social differentiation generally increased in the region during the Formative period, though its manifestations could vary from site to site (Carballo 2009, 2011b; Plunket and Uruñuela 2012; Serra Puche and Lazcano Arce 2011). The possibility of elite sponsorship of prismatic blade production and trade remains a central topic to inquiries into the emergence of social hierarchies. Key lines of evidence for evaluating this issue include the distribution of ritual or status related items (e.g. green obsidian, bloodletters, and eccentrics) and the identification of production loci within sites. The currently earliest well-documented blade workshop in the Central Highlands is associated with a Middle Formative period residence at Chalcatzingo, where production is variously interpreted as either an elite (Grove 1987) or communal (Hirth 2008) activity. A contemporaneous or only slightly later blade workshop attached to Xochitecatl's Edificio del Serpiente may be indicative of politically sponsored production within the monumental center of the site (Blanco 1998), perhaps undertaken as a form of labor tribute. Household blade production was the norm at the small Tlaxcalan villages of Tetel and Mesitas during the late Middle Formative and early Late Formative periods (De León et al. 2009). Santley (1993) argued for a shift at the Late Formative period site of Loma Torremote, in the

Basin of Mexico, whereby earlier blade production took place within densely nucleated corporate house compounds and later became increasingly associated with only one dwelling interpreted as an emerging chief's residence. As we detail in the sections to follow, the model of elite sponsorship of obsidian production does not translate well to La Laguna's lithic dataset. We see instead patterned variability consistent with the operation of several independent procurement and production networks, and associated with different activities undertaken in domestic and public spaces.

### **LA LAGUNA AND ITS EXCAVATION CONTEXTS**

The archaeological site of La Laguna is located in north central Tlaxcala, adjacent to a natural transportation corridor that connects the Basin of Mexico with the Gulf Coast to the east and the Maya region to the south (Figure 1) (Carballo and Pluckhahn 2007). Prior research at La Laguna include its documentation in regional surveys (García Cook 1981; Merino Carrión 1989; Snow 1969), initial exploratory excavations (Lesure et al. 2006), and the detailed reconstruction of its history of land use (Borejsza 2006; Borejsza et al. 2008, 2011). The Proyecto Arqueológico La Laguna (PALL) investigated domestic areas of the site and its central precinct of temple platforms, plazas, and ball court (Carballo 2007, 2009, 2012; Carballo et al. 2011, 2014). The site had an initial occupation during the late Middle and early Late Formative periods ca. 600-400 B.C., followed by a significant population contraction ca. 400-100 B.C., and finally a second major occupation during the Terminal Formative period ca. 100 B.C.-A.D. 150. During the most intensively occupied periods settlement extended over approximately one square kilometer.

Due to lower precipitation, higher elevation, and fewer lacustrine resources, northern Tlaxcala was less optimal for prehispanic subsistence than the Basin of Mexico and southern

Puebla-Tlaxcala. Along with similarly sized sites such as Guadalupe las Dalias in northeastern Puebla (García Cook and Rodríguez 1975) and Xochilténango in central Puebla (Castanzo and Sheehy 2004), La Laguna represents an intermediate tier in the regional settlement hierarchies of the later Formative period Central Highlands. Surrounded by what develop into the three largest Classic period cities—Teotihuacan to the west, Cholula to the south, and Cantona to the east—La Laguna offers a complimentary rural perspective on the processes of urbanization and state formation.

Stone tools at La Laguna were made primarily from obsidian imported from Mesa Central sources a minimum of 58 km away and secondarily from locally available sources of chert and basalt. In a sample of 50 obsidian artifacts sourced by LA-ICP-MS, 88 percent were grouped to three Mesa Central sources (Paredón= 68 percent, Pachuca= 16 percent, Otumba= 4 percent) and the remaining 12 percent was grouped to the Oyameles source area, in the Sierra Madre Oriental (Carballo 2014). We should note that the sampling strategy included preferentially selecting more ambiguous gray obsidian in order to refine our visual classifications, as well as more green obsidian than is representative of the total collection, resulting in the over representation of material from the Oyameles and Pachuca sources at the expense of the Paredón source, which visually appears to constitute over 80 percent of the assemblage.

We discuss two primary sample sets in this study: a diachronic sample includes only securely dated excavation lots (e.g. occupation floors) from the first and second occupations to ensure the greatest chronological control; a synchronic spatial sample combines securely dated second occupation (Terminal Formative period) contexts with other closely associated contexts such as construction fill, platform fill, and structural collapse. La Laguna's five zones of

excavation were designated alphabetically as areas and they span the site center to its periphery (Figure 2).

La Laguna's central core (Area G) includes Structures 12L-1, 12L-3, 12L-4, 12L-5 and the central plaza. Structure 12L-1 is the site's primary temple platform. Structure 12L-3 is an I-shaped ball court located at the northwest end of the central plaza. Structure 12L-4 is a small altar located along the central plaza's centerline shared with altar 12L-5 and mound 12L-1. Radiocarbon dates for these structures are presented in Carballo (2012: Table 1).

The eastern plaza (Area I) includes Structures 12M-1, 12M-2, and 12M-3. Structure 12M-1 is a platform with evidence of three phases of expansion interspersed with seven flooring episodes. Its original construction in the mid first millennium B.C. began as a low platform containing a cremated mortuary bundle in its center, leading us to propose that Structure 12M-1 began as a residence, perhaps corresponding to a higher-status family, and later became a temple or shrine. Structure 12M-2 and deposits underneath Structure 12M-3 are consistent with having been parts of a house and outdoor domestic space during the site's first occupation. During the Terminal Formative period Structure 12M-3 was used for both residential and communal purposes involving suprahousehold rituals and food storage, production, and consumption (Carballo et al. 2014).

Area K consists of Structure 13M-1, one of the site's three temple platforms similar in size to Structure 12L-1. Structure 13M-1 lacks its final occupation floor due to its highly elevated position at the site and subsequent erosion over the centuries, but excavations uncovered its penultimate floor, which dates to the Terminal Formative period.

Area H is a Terminal Formative period elite residential compound containing the residential platforms of Structures 14M-1, and 14M-2, and a likely kitchen and storage facility

designated Structure 14M-3. Area F is located in the northeastern periphery of the site and includes both Formative period occupation levels, with the later common residence designated Structure 15M-1 (Carballo 2009).

## **ANALYTICAL METHODS**

The full PALL lithic collection (n= 36,546) was analyzed using a technological framework that mixes elements of those developed by Clark and Bryant (1997) and Hirth and Flenniken (2006). As noted by Odell (2000), technological approaches to lithic analysis have the advantage of creating more objective and independently verifiable means of discriminating the variables involved with lithic acquisition, production, and consumption. Technological analyses are useful in discerning types and scales of lithic industries, knapper skill level, the local or non-local origins of tools, and other activities involving lithic distribution and consumption.

Bags of lithic artifacts grouped by excavation lots were first separated by material type and then classified based on technology. Other salient attributes such as proportions of cortex and visible use-wear were also recorded. Specific technological categories were grouped together into broader categories that represent specific industries: blades, unifaces, bifaces, bipolar, and items of likely ritual use (i.e. needles or “bloodletters” and eccentrics). The following analyses compare these general categories diachronically between the first and second occupations and spatially across La Laguna during the second occupation only. We refer to the first occupation as the Middle/Late Formative period assemblage and the second occupation as the Terminal Formative period assemblage.

The terminology used in this article follows conventions for Mesoamerican literature (e.g. Clark and Bryant 1997; Hirth 2006). Bipolar flaking refers to the smashing of small

irregular pieces or spent blade cores on anvils to recover flat flakes and angular chunks (Figure 3). Blades are defined as sequential pressure removals, often called prismatic blades yet also including triangular detachments from cores that were occasionally worked on all sides but often only on about 60-75 percent (Figure 4 and Figure 5). Knappers performed specific strikes or maneuvers to maintain functional blade cores and compensate for errors in the blade making process (Figure 6). The most common form of core maintenance was platform rejuvenation, which entails the lateral removal of a core's platform and the simultaneous production of a new platform on the core designed to maintain a proper platform-to-core-face angle (Figure 7). Platform isolation elements, also called ribbon flakes, created with pressure tools helped to maintain a core's platform by keeping the edge flush with the face of the core (Figure 6g). A distal blade core correction refers to a lateral strike on a core's distal end in order to rejuvenate a core from the negative effects of overshot blades (Figure 6f).

The two most common types of errors were overshot blades and hinge fractures on cores. Overshot blades, also called plunging blades, were distal sections that continued beyond their intended point of termination and removed part of the distal end of the core (Figure 6h and 6i). Hinges on cores were removed in different ways. A lateral rejuvenation refers to a flake designed to remove a hinge that has dorsal surfaces perpendicular to its own line of force visible on its ventral surface (Figure 6a and 6d). A proximal rejuvenation refers to a flake or blade with evidence of a hinge fracture on its dorsal surface removed by percussion from a prismatic core (Figure 6c). A medial rejuvenation flake is produced when a pressure tool is placed directly on a hinge—making the hinge a platform—and used to remove the remainder of the intended blade, which produces a new bulb of pressure on the flake. A direct rejuvenation technique refers to hinge removal by pecking and abrading. Distal rejuvenation can be a one or two-step process

where a flake or blade is driven from the distal end of the core designed to intersect and remove a hinge (Figure 6e).

### **DIACHRONIC VARIABILITY**

La Laguna's Middle/Late Formative period (600-400 B.C.) assemblage contains gray (89.9 percent) and green (1 percent) obsidian, chert (8.5 percent), and basalt (0.6 percent) (Table 1). Gray obsidian is prevalent in general debitage categories and it was used to make blades, unifacial scrapers, bipolar tools, and bifaces. The extremely scarce green obsidian is primarily present in the form of finished blades. Chert is common in general debitage yet low in blade production-related categories. Complete chert tools include blades and unifacial scrapers. Basalt was worked exclusively to produce unifacial scrapers, evidenced in finished trapezoidal tools and edge-preparation flakes. Expedient bipolar tools, dart points, and other bifacial tools appear to have been very minor industries during the first occupation. The Middle/Late Formative assemblage also lacks distinguishable tool types used in ritual activities such as bloodletters and eccentrics. Overall, the assemblage is technologically diverse and exhibits high counts of blade production debitage and finished blades. Compared to the Terminal Formative assemblage, the Middle/Late Formative assemblage contains slightly higher proportions of crested blades, percussion blades, and early series pressure blades relative to late series pressure blades, while the Terminal Formative assemblage has a slightly higher proportion of late series pressure blades (Figure 4 and Figure 8).

The Middle/Late Formative late series blade proximal-distal ratio is 1.5:1, and the late series medial-distal ratio is 2.7:1. Combining these ratios with primary and secondary production evidence, the presence of whole blades, and the presence of cores, the Middle/Late Formative

assemblage fits an expected model for local on-site blade production (De León et al. 2009). Blade production is also suggested by the ratio of late series blades to blade production debitage, which is 1.7:1 for the Middle/Late Formative assemblage.

La Laguna's Terminal Formative period assemblage, representing the second occupation, also contains gray (76.8 percent) and green (4.1 percent) obsidian, chert (9.4 percent), and basalt (9.7 percent), though in different proportions from the early occupation (Table 1). Gray obsidian is prevalent in general and blade production debitage categories and it was used to manufacture blades, unifacial tools and scrapers, bifacial implements such as dart points, bipolar tools, and bloodletters and knives used in ritual activities. Green obsidian is scarce in general debitage and in blade production debitage categories and it is primarily present in the form of finished products. During the Terminal Formative period green obsidian was also used for unifacial scrapers and dart points. The higher percentage of green obsidian is mostly the result of increased complete blade importing of Pachuca source material, and these blades may have been manufactured at the quarry or at an intermediate site. Chert is most common in general debitage categories, but compared to the Middle/Late Formative assemblage it was used less for blades and more for unifacial scrapers, along with basalt, during the Terminal Formative. Overall, the Terminal Formative assemblage is slightly more diverse technologically than the Middle/Late Formative assemblage with the addition of ritual-related lithic implements (i.e. bloodletters and eccentrics); a slight increase in the types of unifacial tools; and a slight increase in the quantity of bipolar tools. The entire technological range of blade-production debitage is observable, but there are slight decreases in the percentages of blades and blade debitage in the Terminal Formative assemblage. However, these decreases are exaggerated by the way in which the data were aggregated, since we exclude excavation lots from construction fill, in order to maintain

chronological control, and such contexts are where production debris and exhausted blades were often disposed. Late series pressure blades are more prominent than percussion and early series pressure blades. Bifacial tools remained a relatively minor industry during Terminal Formative occupation as they were during the Middle/Late Formative occupation.

The Terminal Formative late series blade segment proximal-distal ratio is 1.4:1, and the late series segment medial-distal ratio is 3.6:1. Combining these ratios with primary and secondary production evidence, the presence of whole blades, and the presence of cores the Terminal Formative assemblage fits the expected model for local on-site blade production with the caveat that green obsidian was imported as whole blades. The error rate for overshoot plunging blade occurrence is lower in the Terminal Formative assemblage (34 percent) compared to the Middle/Late Formative assemblage (52 percent). Improved knapper skill associated with more efficient blade removal techniques may explain why the ratio of late series blades to blade-production debitage increases to 3.8:1 in the Terminal Formative assemblage.

### **SYNCHRONIC VARIABILITY AND USAGE**

The PALL dataset speaks best to the production and use of stone tools during the Terminal Formative occupation at La Laguna because this later occupation resulted in more accessible, superficial deposits that can be more confidently associated with structures. The lithic assemblages from a variety of structures enable us to identify production zones, areas of use and consumption, and locations of ritual activity. Table 2 presents the assemblage of each structure divided into the categories of blade production, blade consumption, ritual use, unifacial/bifacial production and consumption, bipolar production and consumption, and general debitage. Table 3 displays the density (piece per m<sup>3</sup> of excavated sediment) for each technological category.

### *Production Zones*

Blade production densities and raw counts (Table 4) indicate a primary blade production zone in the eastern plaza associated particularly with Structure 12M-3. Debris from this production zone may have also been included in construction and platform fill at the nearby temple mounds (Structures 12M-1 and 13M-1). Structure 12M-3 has the most bladecore fragments, core preparation and maintenance flakes, platform isolation elements, platform rejuvenations, and overshot blades of any structure at La Laguna (Table 4). Structure 12M-2 has the most specialized correction flakes designed to compensate for errors in the blade-making process. The lithic production activities within the eastern plaza were therefore diverse, with intensive blade production and lower scales of bipolar and bifacial tool production. The presence of a gray obsidian bloodletter fragment with pressure retouch along one edge at Structure 12M-2 (Figure 3) may indicate that the eastern plaza was an area at which the production of tools used in rituals primarily elsewhere across the site was undertaken (we will return to this point). Large green obsidian macrocore fragments were found exclusively at Structure 12M-3.

Secondary blade production zones are suggested at the elite residence in Area H (Structures 14M-1, 14M-2, and 14M-3) and at the commoner residence in Area F (Structure 15M-1). The quantities of blade-production debris from Areas F and H are quite similar with a few small differences. Area F contains fewer cores but slightly more platform rejuvenations and over twice the core preparation flakes as Area H, which has over twice the platform isolation elements and specialized correction flakes as Area F. The implications are that the inhabitants of Area F undertook more initial core preparation work than the inhabitants of Area H. Inhabitants of both areas had access to some green obsidian, and the elite household has only a marginally higher density than the commoner household. Sufficient blade production evidence exists at both

areas to suggest that each household produced its own stone tools, however production may have been linked between households (e.g. Feinman et al. 2002). Another notable feature of stone tool production at Areas H and F is a larger focus on the production of bipolar tools compared to the eastern plaza. Structures 14M-1 and 15M-1 have the highest counts and percentages of bipolar tools in their assemblages by a large margin (Table 2). Structures 14M-1 and 15M-1 also have slightly higher counts and percentages of unifacial and bifacial production debris and finished tools compared to the rest of the site. Overall, the assemblages suggest decentralized, domestic production with one example of centralized, communal production focused primarily on blades.

### *Areas of Use and Consumption*

Determining how people used and consumed stone tools is just as important as identifying production areas for enhancing our overall understanding of ancient economies. Here we outline how the residents of Terminal Formative period La Laguna used stone tools in domestic, communal, and ceremonial contexts. We identify prevailing domestic, communal, and ceremonial consumption patterns (Table 5) based on the comparison of lithic assemblages grouped by structures (Tables 2 and 3).

Locations where domestic consumption patterns prevail include Area H (Structures 14M-1, 14M-2, and 14M-3) and Area F (Structure 15M-1). Domestic patterns are distinguished by moderate densities of blade production (1-4 per m<sup>3</sup>), blade consumption (from 10-45 per m<sup>3</sup>), general debitage (from 10-45 per m<sup>3</sup>), bipolar (1-3 per m<sup>3</sup>), and bifacial/unifacial production and use (1-3 per m<sup>3</sup>) (Table 3). Domestic patterns are technologically diverse and characteristic of the prevalent Mesoamerican household economic strategy of multicrafting (Hirth 2009). Domestic patterns have ample evidence for tools used in food processing (e.g. blades, notched and trimmed

blades, unifacially trimmed tools, and scrapers) and expedient bipolar tools used for utilitarian tasks. At La Laguna one of the most diagnostic tools used in food processing is the unifacial scraper. Chipped obsidian and chert scrapers were likely used to scrape maguey hearts to extract sap for pulque production, and rectangular basaltic scrapers were likely used to scrape leaves to extract fibers (Figure 9). Structure 15M-1 has the most scrapers (n= 38) and highest density of scrapers (0.9 per m<sup>3</sup>) of any structure at La Laguna. Other domestic contexts have densities of scrapers ranging from 0.2-0.6 pieces per m<sup>3</sup> (Table 6). Structure 15M-1 also has the highest densities of notched (0.3 per m<sup>3</sup>) and trimmed (2.3 per m<sup>3</sup>) blades of any structure at the site. The presence of bloodletters in Area H likely relates to the higher status of the occupants and their different ritual practices (Table 6). The proportions of materials used in domestic contexts (Table 7) generally reflect La Laguna's overall pattern: around 85 percent gray obsidian, 5 percent or less green obsidian, less than 10 percent chert, and 1 percent basalt. However, Structure 15M-1 has the largest percentage of basalt (6 percent) of any structure at the site. Basalt was used primarily for making unifacial scrapers and grinding tools for maize processing.

Communally focused activities of food production and consumption took place at Structure 12M-3 (outlined in Carballo et al. 2014). The eastern plaza as a whole is distinguished by: (1) high densities of blade production (over 3 per m<sup>3</sup>), blade consumption (over 30 per m<sup>3</sup>), and general debitage (over 20 per m<sup>3</sup>); (2) low (0-1 per m<sup>3</sup>) to moderate (1-3 per m<sup>3</sup>) densities of unifacial and bifacial production; (3) low densities of bipolar production and use (0-1 per m<sup>3</sup>); and (4) a general absence of lithics of suspected ritual use (Table 3). Activity patterns we are designating communal resulted in higher percentages of blade production and consumption and more technological diversity than activity patterns we identify as ceremonial, but lower diversity than those that are clearly the result of domestic activity patterns (Table 2). Structure 12M-2 has

the highest blade consumption density (82.9 per m<sup>3</sup>) and Structure 12M-3 also has a high density (48.1 per m<sup>3</sup>) (Table 3). The assemblage from the eastern plaza contains various types of tools used for food production, and these tools demonstrate higher knapper skill level compared to other areas of the site. For example, Structure 12M-3 has 25 scrapers and Structure 12M-2 (with an excavation volume less than one-third of Structure 12M-3) has 14 scrapers (Table 6). The densities of notched and trimmed blades for both structures are also comparable to domestic activity patterns indicating at the very least equal levels of stone tool use related to food processing. Higher amounts of complete and fragmented dart points (Table 6 and Figure 10) without evidence of burning or rapid destruction at the time of abandonment (as we see in Area H) may suggest that dart points were stored in the eastern plaza. The production of miniature dart points from late-series blades involving notching and trimming is also observable from the eastern plaza assemblage (see Figure 11). Overall, the predominant activities reflected in La Laguna's communal pattern seen in the eastern plaza were blade production and consumption. The prominent use of gray (90 percent) and green (2 percent) obsidian compared to the lower use of chert (8 percent) and basalt (less than 1 percent) reflects a technological focus on blade production in the eastern plaza because the internal structure of obsidian is more conducive than either chert or basalt to systematic pressure blade removal.

Locations with ceremonially focused activities at La Laguna include Area G (the central precinct), Structure 13M-1, and Structure 12M-1. Ceremonially focused activities are distinguished by the following characteristics in the lithic assemblage: (1) high percentages of blade consumption compared to low percentages of blade production and general debitage categories (Table 2); (2) low (0-1 per m<sup>3</sup>) to moderate (1-3 per m<sup>3</sup>) densities of blade production and unifacial/bifacial production debris and finished tools; (3) primarily low (0-10 per m<sup>3</sup>) but

occasionally moderate (due to construction fill contexts at temple platforms, 10-20 per m<sup>3</sup>) densities of general debitage; (4) low (0-1 per m<sup>3</sup>) densities of bipolar production and consumption; and (5) the presence of ritual lithic implements. Construction fill contexts for structures in close proximity to blade production and crafting zones and variability in ritual activities are factors that may create variability in blade production and consumption densities for structures within locations of ceremonial activities. For example, Structure 12L-1 is proximate to the eastern plaza production areas, lithic implements were used in rituals at this structure (we discuss the details in the following section), and it has a blade consumption density of 65.9 per m<sup>3</sup>. In contrast, Structure 12L-3 is located at the opposite end of the central precinct farther away from blade production and commercial zones, the ball game was the ceremonial focus at this structure, and it has a blade consumption density of 13.2 per m<sup>3</sup>. It is therefore important to not isolate lithic analyses alone for reconstructing community economies. Lithic assemblages in locations consistent with ceremonial activities based on other lines of evidence have the least amount of technological diversity and an overall prevalence of finished products (e.g. blades, bloodletters, eccentrics, bifaces, dart points). For example, the central precinct contained few notched blades, trimmed blades, and scrapers compared to other locations of the site where they designate food processing areas (Table 6). Another archaeological signature for ceremonial activity is a relatively high percentage of green obsidian and a low percentage of basalt compared to other consumption patterns across the site. For example, Structure 12L-1 lacks basalt and has the highest percentage of green obsidian (14 percent) followed by the nearby altar at Structure 12L-5 and the central plaza (both 8 percent) (Table 7). Yet the best line of evidence that La Laguna's dataset offers for the distinguishing of ceremonial activities and ritual economies is the distribution of finished implements used in rituals.

### *Locations of Ritual Activities*

The distribution of bloodletters (n= 20) and of large bifaces and eccentrics (n= 15) is suggestive of ritual activities involving obsidian at Structures 12L-1, 12M-1, 12M-2, 14M-1, and the central plaza. Implements we interpret as bloodletters (Figure 12) were made from obsidian in two forms: (1) fine needles with bifacial pressure retouch, and (2) fine, long, and narrow late series pressure blades. One of the purposes of bloodletting in ancient Mesoamerica was as part of rituals intended to communicate with ancestors and supernatural entities (Plunket 2002). This may explain the fact that the largest concentration of fine-blade type bloodletters was found at Structure 12M-1, which contained the cremated burial placed within the first occupation floor. In the realm of the living, bloodletting was more associated with elite domestic spaces, such as Structure 14M-1 which has the largest concentration of fine-retouch type bloodletters, and public ceremonial spaces, such as Structure 12L-1 and the central plaza which both have one fine-retouch type bloodletter.

The most dramatic example of the ritual use of lithics at La Laguna is Feature 173 from Structure 12L-1, which dates to the mid second century A.D. (Carballo 2012, 2014) (Figure 13, 14, and 15). Feature 173 is unique for currently excavated contexts at La Laguna and represents a termination offering with similarities to those found at the major pyramids of Teotihuacan (e.g. Sugiyama and López Luján 2007). This offering included pyrite mirrors, greenstone, shell, and 15 obsidian bifaces (10 green and 5 gray). More specifically the bifaces included one stemmed point with large serrations on one edge (Figure 13a); one large bipointed knife similar to those found in offerings at Teotihuacan (Figure 14b); one large biface with a rounded base and tip (14c); one very large biface with a rounded base and broken tip that was likely pointed (Figure 14a); two zoomorphic eccentrics (Figure 15); and nine serrated knives (Figure 13). The serrated

knives, zoomorphic eccentrics, and large bifaces have similar sizes and forms, suggesting that they are examples of three distinct artifact classes. The serrated knives, zoomorphic eccentrics, and large bifaces share similar lengths in three separate ranges: the serrated knives average 19.2 cm with a range of 14.9-22.2 cm; the zoomorphic eccentrics range from 22.5-29.3 cm; and the large bifaces range from 37-44 cm. The serrated knives all have four large teeth on one edge, giving them a comb shape. The bifaces exhibit varied skill levels, but all of them high, and finer examples tended to be made with green Pachuca obsidian. It is likely that the bifaces were made outside of La Laguna and imported to the site based on the absence of long bifacial thinning flakes and preforms within currently excavated contexts, generally low frequencies of bifacial reduction debitage, and the exceedingly higher knapping quality demonstrated on several of the bifaces that does not appear elsewhere on tools across the site. We propose that this sudden introduction of ceremonial eccentrics and bifacial knives to La Laguna's ritual program at the time of the site's abandonment, which included the burning of temples and elite houses, reflects increasingly militaristic symbolism in the Central Highlands associated with Teotihuacano urbanization and state expansion.

## **DISCUSSION**

La Laguna's transitional temporality in the Central Highlands during the processes of urbanization in several regions is particularly useful for examining the development of regional lithic economies and technological variability in relation to a changing social landscape. The lithic production and consumption patterns from La Laguna illustrate how activities spanning the quotidian to the spectacular—such as maguey processing, the production and exchange of finished tools, food production, ritual bloodletting, and cache offerings at temples—were

realized within this early Mexican town's domestic, communal, and ceremonial spaces. Using both diachronic and spatially variable lithic datasets permits a more comprehensive understanding of La Laguna's community organization and economies.

Lithic production contexts at La Laguna do not exhibit evidence of having been primarily elite sponsored. Bloodletters and large bifaces and eccentrics are the only artifact types with a restricted distribution at the site, appearing mainly at temples and an elite residence. For other lithic products, obsidian sources and tool types were not restricted to certain areas or households. During the Terminal Formative period changes in lithic economies at La Laguna reflect a greater underlying current of regional economic interaction and integration that may also be seen at contemporaneous Tetimpa. Terminal Formative period households at both sites exhibit more diversified obsidian provisioning patterns; households at Tetimpa began to use more Paredón and Pachuca rather than Otumba obsidian (Plunket et al. 2005), and households at La Laguna began to use imported green Pachuca obsidian mostly as finished late series pressure blades.

Starting with its initial occupation during the Middle to Late Formative period, tool production at La Laguna was primarily organized and conducted independently by households. The absence of specialized implements used during rituals, the presence of substantial evidence for local blade production, and a lower frequency of more distant green obsidian in La Laguna's Middle/Late Formative period assemblage suggests that households provisioned themselves independently.

The Terminal Formative assemblage from La Laguna shows more efficient local blade production and an increase in the importation of green Pachuca obsidian, particularly in the form of complete blades. The shift away from expedient bipolar tools to blade technologies and basalt unifacial scrapers represents a greater formalization of tools used in food processing. The new

additions of bloodletters, elaborately chipped bifacial knives, and zoomorphic eccentrics may indicate the emergence of higher statuses, new social roles, and symbolism linked to growing participation in the economic and cultural network connected to the urban nodes surrounding the site in three directions. It is important to note that amidst these social developments all of La Laguna's residents had access to ample quantities of obsidian, including the valued green variety.

We identify the most intensive blade production at the center of the site in the eastern plaza, between the three major temple mounds. This area appears to have served a mix of domestic supra-household functions, the latter based on several lines of evidence: the presence of modest architecture inconsistent with elite dwelling in a very central part of the site; an abundance of food preparation and storage artifacts and features; and the presence of effigy vessels depicting deities suggestive of ritual activities (Carballo et al. 2014). Large obsidian macroblades and macroflakes found in the eastern plaza may indicate it was the first point of entrance for macrocores that were initially shaped elsewhere.

While marketplaces or areas of general commercial activity are usually thought to have taken place in and around formalized central plazas, La Laguna's central production zone was the less bounded eastern plaza, located behind the primary temple and central plaza. In contrast, the central plaza contains the lowest density of artifacts at the site, indicating that it was kept clean for use primarily in formalized ceremonial activities (Carballo et al. 2014). The martially themed knives and eccentrics from Feature 173 evoke contemporary and subsequent forms and styles found in ritual offerings at the major monuments of Teotihuacan.

Results of our analysis of over 36,000 lithic artifacts and debitage from La Laguna suggest variation in production and consumption patterns for this early town in the Central

Highlands. The introduction of new lithic technologies, subtle changes to existing lithic technologies, and spatial variability in the production and use of stone tools during the Terminal Formative period, in particular, indicate new ritual and ceremonial activities and increasingly formalized methods of food production and processing.

## RESUMEN

Análisis líticos basados en conjuntos completos de sitios permiten la consideración de dinámicas comunitarias como variabilidad en economías domésticas, competencia y decisiones tecnológicas, redes de intercambio y prácticas rituales. En este estudio se presentan los resultados de un análisis de más de 36.000 artefactos líticos del sitio de La Laguna, Tlaxcala, ubicado en el Altiplano Central mexicano. Comparamos depósitos del periodo Formativo Medio/Tardío (ca. 600-400 a.C.) y el periodo Formativo Terminal (ca. 100 a.C. - 150 d.C.) con el fin de examinar las transformaciones asociadas a la urbanización y la formación del Estado durante este intervalo. Los habitantes del sitio tuvieron relativamente parejo su acceso a amplias cantidades de obsidiana, y la talla se organizó por mayor parte de forma independiente por unidades domésticas. Identificamos zonas de producción de las navajillas prismáticas y registramos variabilidad en los patrones de consumo cuales sugieren distintas actividades domésticas, comunitarias y ceremoniales. La introducción de implementos para el auto-sacrificio, cuchillos bifaciales de mayor tamaño y excéntricos zoomorfas a la asamblea Formativo Terminal puede indicar la aparición de los estatus sociales elevados, nuevos roles sociales y el surgimiento de simbolismo bélica durante este período.

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## TABLES

Table 1. Middle/Late Formative (600-400 B.C.) and Terminal Formative (100 B.C.-A.D. 150)  
stone tool assemblages.

Technology	Middle/Late Formative					Terminal Formative				
	Gray	Green	Chert	Basalt	Total	Gray	Green	Chert	Basalt	Total
<b>General Debitage</b>	586	5	193	12	796	570	15	170	180	935
<b>(% of Assemblage)</b>	(25.6)	(19.2)	(89.8)	(80)	(31.3)	(39.6)	(19.5)	(96)	(99.4)	(50)
Cobble/Pebble	--	--	3	1	4	--	--	1	1	2
Chunk	--	--	3	--	3	--	--	3	--	3
Shatter	59	3	25	--	87	52	--	36	19	107
Flake Core	1	--	5	--	6	75	2	3	19	99
Flake Fragment	69	--	2	--	71	293	7	54	98	452
Natural Platform	253	2	48	6	309	--	--	--	--	--
Single Facet Platform	56	--	69	4	129	50	2	59	20	131
Multiple Facet Platform	39	--	10	1	50	49	1	5	2	57
Block	1	--	2	--	3	--	--	--	--	--
Edge Flake	61	--	14	--	75	27	3	6	10	46
Alternate Flake	47	--	12	--	59	21	--	3	11	35
Bulb Removal	--	--	--	--	--	2	--	--	--	2
Undulation Flake	--	--	--	--	--	1	--	--	--	1
<b>Unifacial</b>	3	--	2	3	8	9	1	3	1	14
<b>(% of Assemblage)</b>	(0.1)	--	(1)	(20)	(0.3)	(0.6)	(1.3)	(1.7)	(0.6)	(0.7)
Unitrim	--	--	--	--	--	6	--	--	--	6
Scraper	3	--	2	3	8	3	1	3	1	8
<b>Bifacial</b>	16	--	1	--	17	9	3	--	--	12
<b>(% of Assemblage)</b>	(0.7)	--	(0.4)	--	(0.7)	(0.6)	(3.9)	--	--	(0.6)
ES Bifacial Flake	--	--	--	--	--	--	1	--	--	1
LS Bifacial Flake	--	--	--	--	--	--	1	--	--	1

BR Edge	4	--	--	--	4	3	--	--	--	3
BR Alernate	2	--	--	--	2	--	--	--	--	--
BR Late Pressure	2	--	--	--	2	1	--	--	--	1
Flake										
Bifacial Retouch	--	--	--	--	--	1	--	--	--	1
Notching Flake	5	--	--	--	5	1	--	--	--	1
Biface Fragment	--	--	1	--	1	1	--	--	--	1
Biface Complete	--	--	--	--	--	1	--	--	--	1
Point Fragment	--	--	--	--	--	--	1	--	--	1
Point Complete	3	--	--	--	3	1	--	--	--	1
<b>Ritual</b>	--	--	--	--	--	1	--	--	--	1
<b>(% of Assemblage)</b>	--	--	--	--	--	(<0.1%)	--	--	--	(<0.1%)
Bloodletter	--	--	--	--	--	1	--	--	--	1**
Eccentric	--	--	--	--	--	--	--	--	--	**
<b>Bipolar</b>	13	--	--	--	13	24	--	1	--	25
<b>(% of Assemblage)</b>	(0.6)	--	--	--	(0.5)	(1.7)	--	(0.6)	--	(1.3)
Bipolar Core	3	--	--	--	3	10	--	1	--	11
Bipolar Flake	10	--	--	--	10	14	--	--	--	14
<b>Blades</b>	1495	18	18	--	1531	759	55	2	--	816
<b>(% of Assemblage)</b>	(65.4)	(69.2)	(8.4)	--	(60.2)	(52.7)	(71.4)	(1.1)	--	(43.5)
Percussion Complete	6	--	1	--	7	3	--	--	--	3
Percussion Proximal	33	--	7	--	40	12	1	--	--	13
Percussion Medial	27	--	4	--	31	11	--	2	--	13
Percussion Distal	21	--	5	--	26	4	--	--	--	4
ES Pressure										
Complete	4	--	--	--	4	1	--	--	--	1
ES Pressure										
Proximal	113	2	--	--	115	28	--	--	--	28
ES Pressure Medial	68	1	--	--	69	34	--	--	--	34
ES Pressure Distal	72	--	--	--	72	30	--	--	--	30

LS Pressure	5	--	--	--	5	9	2	--	--	11
Complete										
LS Pressure	169	1	--	--	170	90	13	--	--	103
Proximal										
LS Pressure Medial	293	7	--	--	300	239	30	--	--	269
LS Pressure Distal	111	--	--	--	111	70	4	--	--	74
LS Snap Segment	30	1	--	--	31	24	1	--	--	25
Tongue Flake	14	1	--	--	15	2	--	--	--	2
Crested Blade	23	1	1	--	25	9	1	--	--	10
Notched Blade	1	--	--	--	1	--	--	--	--	--
Trimmed Blade	18	--	--	--	18	25	--	--	--	25
Blade Shatter	424	3	--	--	427	113	2	--	--	115
Bipolar Blade	61	1	--	--	62	43	--	--	--	43
Short Blade	2	--	--	--	2	1	--	--	--	1
Complete										
Short Blade Proximal	--	--	--	--	--	1	1	--	--	2
Short Blade Medial	--	--	--	--	--	9	--	--	--	9
Short Blade Distal	--	--	--	--	--	1	--	--	--	1
<b>Production Related</b>	173	3	1	--	177	67	3	1	--	71
<b>(% of Assemblage)</b>	(7.6)	(11.6)	(0.4)	--	(7)	(4.7)	(3.9)	(0.6)	--	(3.8)
Platform Spall	1	--	--	--	1	--	--	--	--	--
Platform	7	--	--	--	7	1	--	--	--	1
Rejuvenation										
Core Preparation	52	--	--	--	52	25	--	--	--	25
Flake										
Overshot Blade	56	1	1	--	58	24	--	1	--	25
Proximal Correction	3	--	--	--	3	--	--	--	--	--
Medial Correction	1	--	--	--	1	--	--	--	--	--
Distal Correction	3	--	--	--	3	1	--	--	--	1
Lateral Correction	8	1	--	--	9	1	1	--	--	2
Platform Correction	--	--	--	--	--	--	--	--	--	--
Platform Isolation	18	1	--	--	19	9	2	--	--	11

Bladecore Fragment	19	--	--	--	19	1	--	--	--	1
Bipolar Bladecore	4	--	--	--	4	4	--	--	--	4
Core Maintenance	1	--	--	--	1	--	--	--	--	--
Distal Bladecore	--	--	--	--	--	1	--	--	--	1
Correction										
<b>Total</b>	2286	26	215	15	2542	1439	77	177	181	1874
	(89.9%)	(1%)	(8.5%)	(0.6%)	--	(76.8%)	(4.1%)	(9.4%)	(9.7%)	--

\*\*20 bloodletters and 2 eccentrics were found associated with structures.

Table 2. Terminal Formative (100 B.C.-A.D. 150) stone tool technological counts and assemblage percentages organized by structures.

Structure	Blade Production	Blade Consumption	Ritual	Unifacial/ Bifacial	Bipolar	General Debitage
12L-1	19 (2%)	697 (73%)	16 (2%)	7 (1%)	--	213 (22%)
12L-3	58 (3%)	1331 (71%)	--	22 (1%)	1 (1%)	462 (24%)
12L-4	2 (8%)	21 (80%)	--	1 (4%)	--	2 (8%)
12L-5	6 (1%)	251 (71%)	--	4 (1%)	2 (1%)	90 (26%)
12M-1	233 (5%)	2693* (65%)	--	40 (1%)	8 (1%)	1168 (28%)
12M-2	162 (5%)	1961 (62%)	1 (1%)	43 (1%)	14 (1%)	970 (30%)
12M-3	429 (6%)	4332 (61%)	--	56 (1%)	20 (1%)	2263 (31%)
13M-1	208 (4%)	3334 (63%)	--	56 (1%)	5 (1%)	1671 (31%)
14M-1	165 (4%)	1934 (46%)	8 (1%)	105 (2%)	173 (4%)	1855 (43%)
14M-2	4 (2%)	101 (43%)	--	7 (3%)	7 (3%)	116 (49%)
14M-3	15 (2%)	291 (49%)	--	16 (3%)	24 (4%)	251 (42%)
15M-1	168 (4%)	1848 (44%)	--	83 (2%)	122 (3%)	1976 (47%)
Plaza	32 (3%)	666 (60%)	1 (<1%)	23 (2%)	--	377 (34%)

\*includes 14 possible bloodletters

Table 3. Terminal Formative (100 B.C.-A.D. 150) stone tool densities (piece per m<sup>3</sup>) organized by structure and technological category.

Structure	Blade Production	Blade Consumption	Ritual	Unifacial/ Bifacial	Bipolar	General Debitage
12L-1	1.8	65.9	1.5	0.7	0	20.1
12L-3	0.6	13.2	0	0.2	0	4.6
12L-4	0.4	4.3	0	0.2	0	0.4
12L-5	1.6	68.0	0	1.1	0.5	24.4
12M-1	4.4	50.6	0.3	0.8	0.2	22
12M-2	6.9	82.9	0.1	1.8	0.6	41
12M-3	4.8	48.1	0	0.6	0.2	25.1
13M-1	2.3	37.4	0	0.6	0.1	18.7
14M-1	1.5	17.3	0.1	0.9	1.6	16.6
14M-2	0.6	14.5	0	1	1	16.7
14M-3	0.6	11.7	0	0.6	1	10.1
15M-1	3.8	42.1	0	1.9	2.8	45
Plaza	1.7	34.2	0.1	1.2	0	19.4

Table 4. Terminal Formative (100 B.C.-A.D. 150) blade production evidence organized by structure.

Structure	Core Frag	Core Prep.	Core Maint.	Platform Isolation	Platform Rejuv.	Platform Spall	Over shot	Correction Flakes	Total	Density (p/m <sup>3</sup> )	Assemblage (%)
12L-1	1	4	--	13	1	--	--	--	19	1.8	2%
12L-3	8	6	--	34	3	--	6	1	58	0.57	3%
12L-4	1	1	--	--	--	--	--	--	2	0.41	8%
12L-5	--	1	--	4	--	--	1	--	6	1.63	1%
12M-1	29	53	--	109	9	1	25	7	233	4.38	5%
12M-2	20	11	3	81	9	--	10	28	162	6.85	5%
12M-3	38	124	--	178	35	2	36	16	429	4.77	6%
13M-1	31	45	--	98	11	2	16	5	208	2.33	4%
14M-1	16	37	8	62	9	1	17	15	165	1.48	4%
14M-2	--	1	--	--	2	--	1	--	4	0.58	2%
14M-3	1	--	1	4	1	--	5	3	15	0.6	2%
15M-1	12	83	2	27	18	--	17	9	168	3.83	4%
Plaza	5	6	--	20	--	--	1	--	32	1.65	3%

Table 5. Archaeological signatures for domestic, communal, and ceremonial consumption patterns based on Terminal Formative (100 B.C.-A.D. 150) lithic assemblages. Densities are measured in pieces per m<sup>3</sup>.

<b>Archaeological Signature</b>	<b>Domestic</b>	<b>Communal</b>	<b>Ceremonial</b>
Technological Diversity	Highest	High	Lowest
Material Diversity	Higher Basalt	Higher Gray	Higher Green Obsidian
	Higher Chert	Obsidian	Lower Basalt
Blade Production Density	Moderate	High	Low to Moderate
	(1-4)	(over 3)	(0-3)
Blade Consumption Density	Moderate	High	Moderate to High
	(10-45)	(over 30)	(10- 65)
Unifacial/Bifacial Density	Moderate	Low to Moderate	Low to Moderate
	(1-3)	(0-3)	(0-3)
Bipolar Density	Moderate	Low	Low
	(1-3)	(0-1)	(0-1)
General Debitage Density	Moderate	High	Low to Moderate
	(10-45)	(over 20)	(0-20)
Food Processing Tools	Yes	Yes	No
Ritual Lithics	Yes	No	Yes

Table 6. Terminal Formative (100 B.C.-A.D. 150) finished tool counts and densities (piece per m<sup>3</sup>) organized by structure.

Structure	LS Blades	Notched	Trimmed	Scrapers	Points	Bifaces	Bloodletters	Eccentrics
12L-1	93 (8.8)	--	2 (0.2)	--	5 (0.5)	13 (1.2)	1 (0.1)	2 (0.2)
12L-3	137 (1.4)	2 (< 0.1)	10 (0.1)	6 (<0.1)	3 (<0.1)	--	--	--
12L-4	2 (0.4)	--	--	1 (0.2)	--	--	--	--
12L-5	36 (9.8)	--	2 (0.5)	--	2 (0.5)	--	--	--
12M-1	324 (6.1)	7 (0.1)	22 (0.4)	14 (0.3)	11 (0.2)	1 (< 0.1)	14 (0.3)	--
12M-2	171 (7.2)	2 (0.1)	47 (2)	14 (0.6)	3 (0.1)	2 (0.1)	1 (< 0.1)	--
12M-3	513 (5.8)	13 (0.1)	32 (0.4)	25 (0.3)	17 (0.2)	3 (< 0.1)	--	--
13M-1	342 (3.8)	2 (< 0.1)	19 (0.2)	19 (0.2)	17 (0.2)	1 (< 0.1)	--	--
14M-1	296 (2.6)	9 (0.1)	34 (0.3)	23 (0.2)	11 (0.1)	3 (< 0.1)	3 (< 0.1)	--
14M-2	13 (1.9)	--	9 (1.3)	1 (0.1)	2 (0.3)	--	--	--
14M-3	50 (2)	3 (0.1)	9 (0.4)	1 (< 0.1)	3 (0.1)	--	--	--
15M-1	260 (5.9)	11 (0.3)	100 (2.3)	38 (0.9)	7 (0.2)	4 (0.1)	--	--
Plaza	68 (3.5)	--	5 (0.3)	1 (0.1)	6 (0.3)	2 (0.1)	1 (0.1)	--

Late series pressure (LS) blades include complete and proximal fragments.

Both points and bifaces include complete and fragmented artifacts.

Table 7. Terminal Formative (100 B.C.-A.D. 150) material percentages for assemblages organized by structure.

Structure	Gray	Green	Chert	Basalt
12L-1	76	14	10	0
12L-3	90	1	8	1
12L-4	85	4	11	0
12L-5	82	8	10	0
12M-1	89	3	7	1
12M-2	92	0.5	7	0.5
12M-3	89	3	8	<1
13M-1	89	1	9	1
14M-1	85	5	9	1
14M-2	80	1	19	0
14M-3	85	5	10	<1
15M-1	84	2	8	6
Plaza	83	8	8	2

## FIGURES

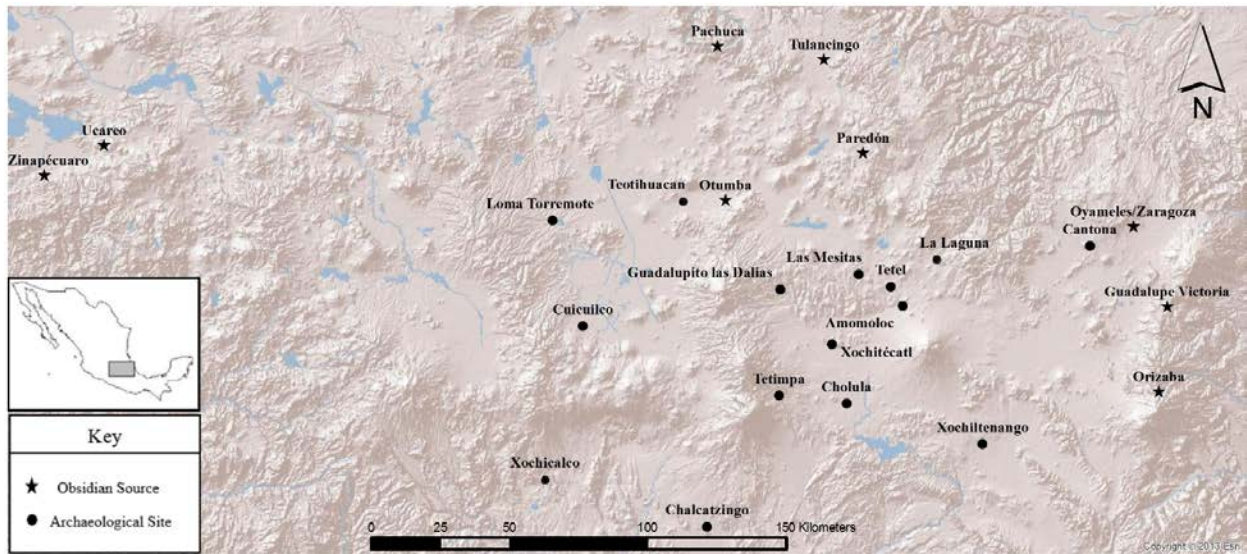


Figure 1. Central Mexican Highlands with archaeological sites and obsidian sources mentioned in the text.

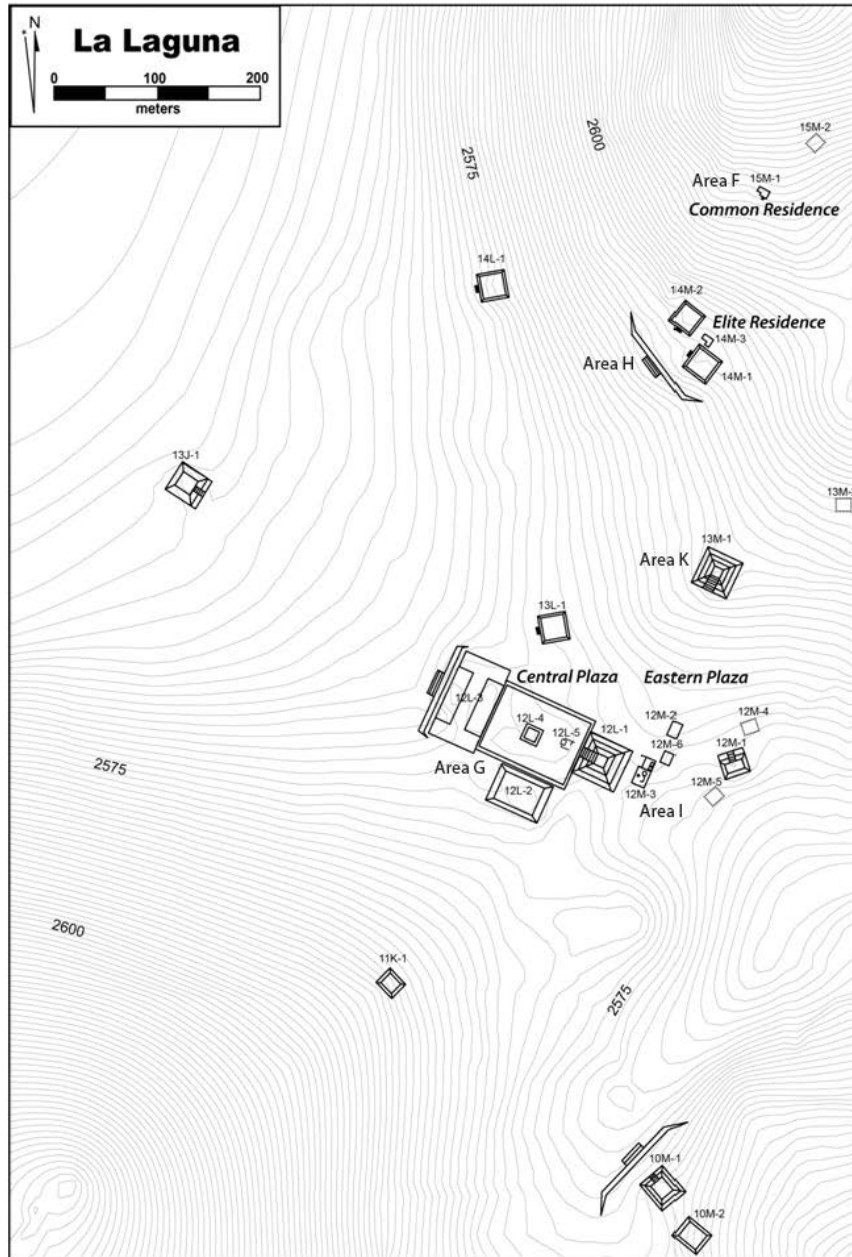


Figure 2. Map of La Laguna showing the locations of excavated areas and structures discussed in the text.

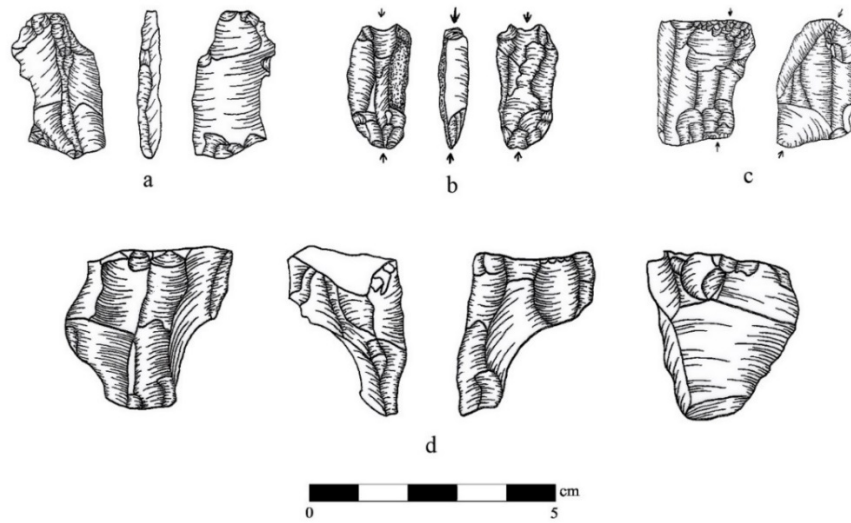


Figure 3. Examples of (a-b) bipolar blades and (c-d) bipolar blade cores from Terminal Formative contexts.

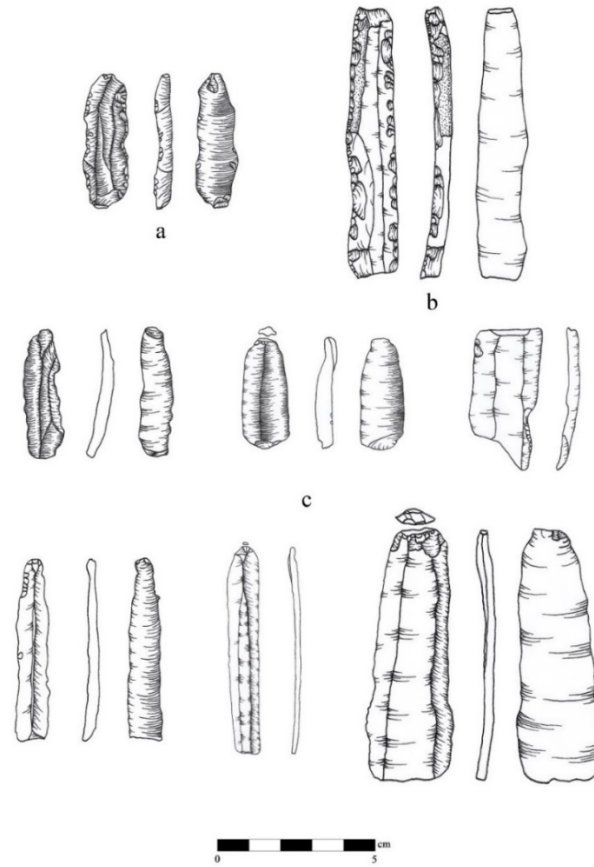


Figure 4. Finished blade products from Terminal Formative contexts including (a) an early series pressure blade with usewear, (b) an early series pressure blade with retouch and cortex, (c) six late series pressure blades.

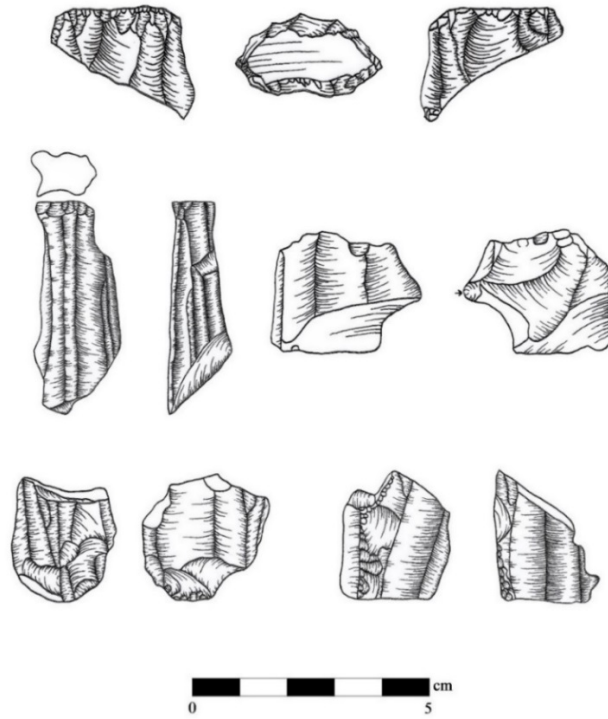


Figure 5. Blade core fragments from Terminal Formative contexts.

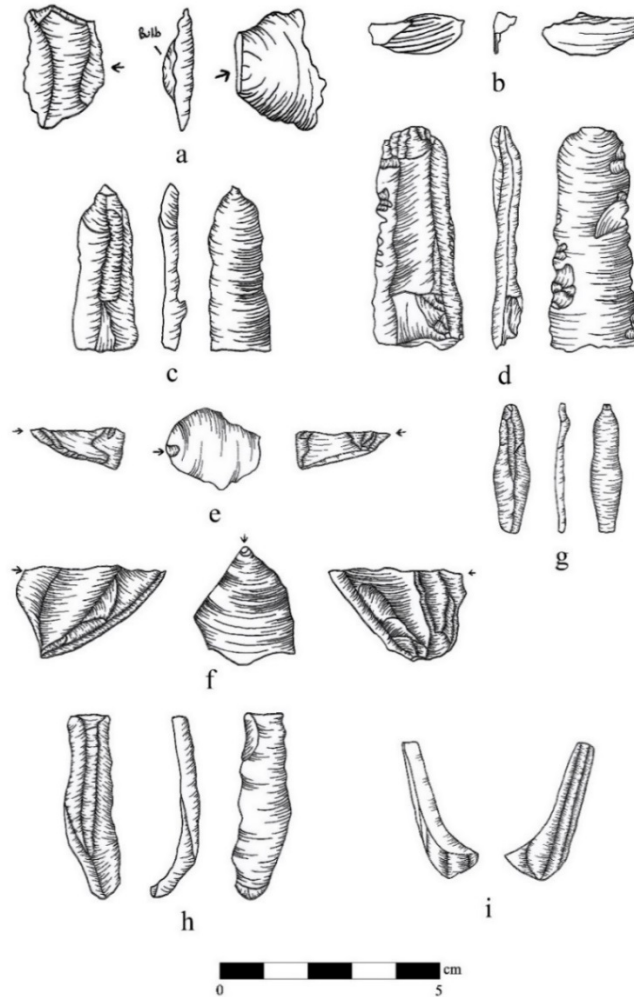


Figure 6. Evidence for local blade production from Terminal Formative contexts including (a) a lateral rejuvenation flake, (b) a tongue flake (or *languette* flake), (c) a proximal rejuvenation blade, (d) an early series pressure blade with evidence of lateral rejuvenation, (e) a distal rejuvenation flake, (f) a core distal rejuvenation flake, (g) a platform isolation element, (h-i) overshot blades.



Figure 7. Examples of platform rejuvenations from Terminal Formative contexts.

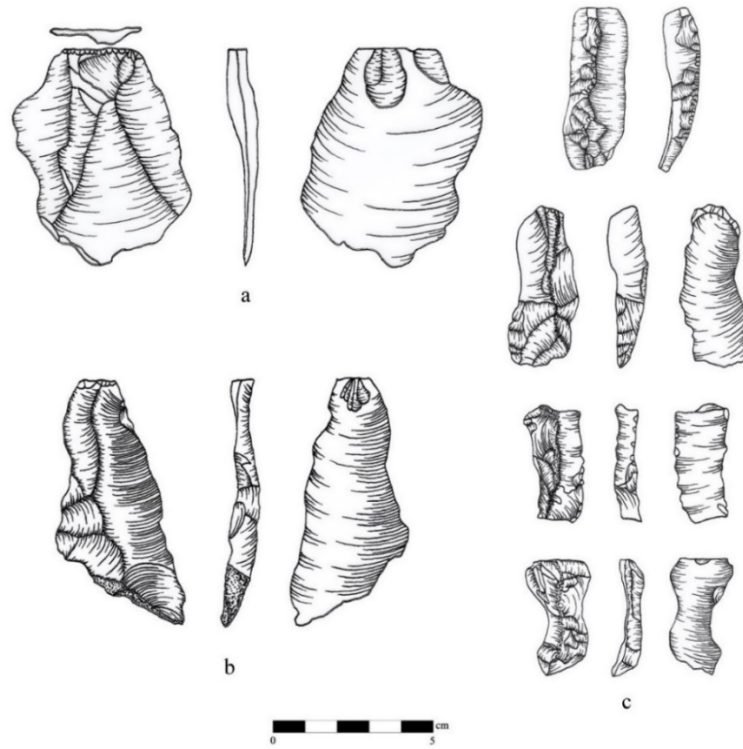


Figure 8. Evidence for local blade production from Terminal Formative contexts including (a) a core shaping macro flake, (b) a percussion blade with cortex, (c) four crested blades.

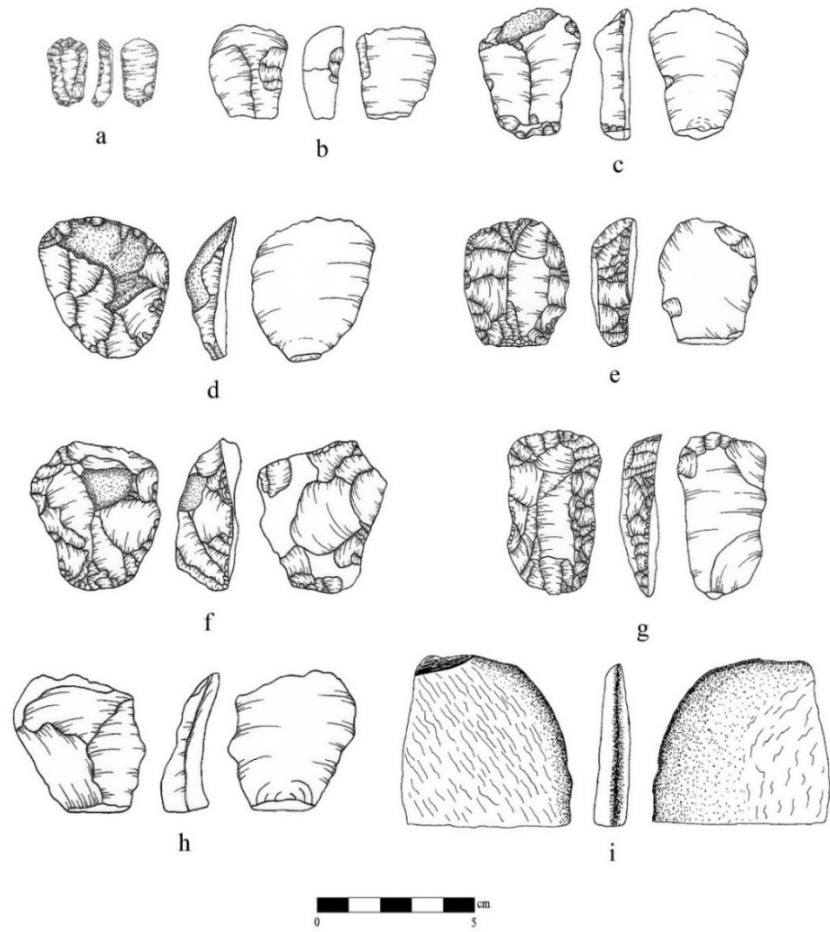


Figure 9. Examples of scrapers from Terminal Formative contexts including (a) a blade distal with retouch, (b-h) unifacial scrapers, (i) a fragment or trapezoidal scraper with ground edge.

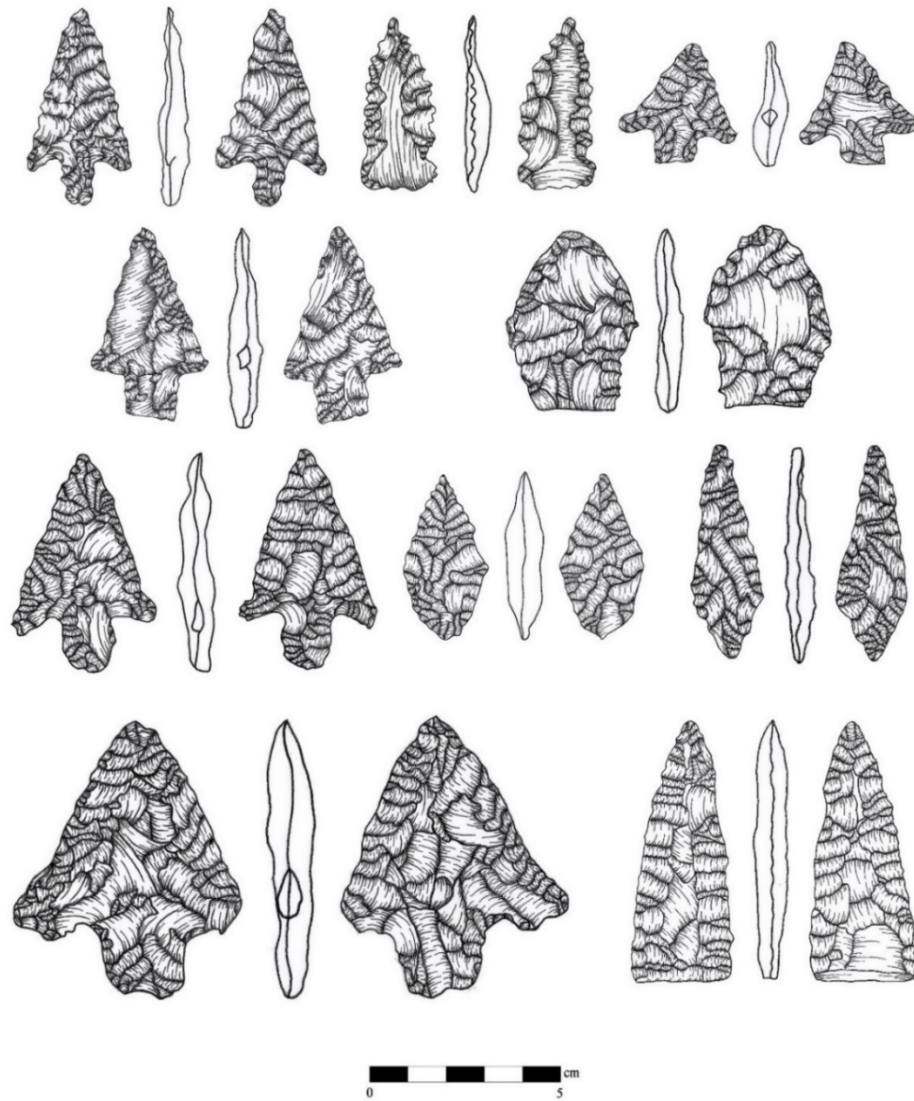


Figure 10. Dart points and bifaces from Terminal Formative contexts.

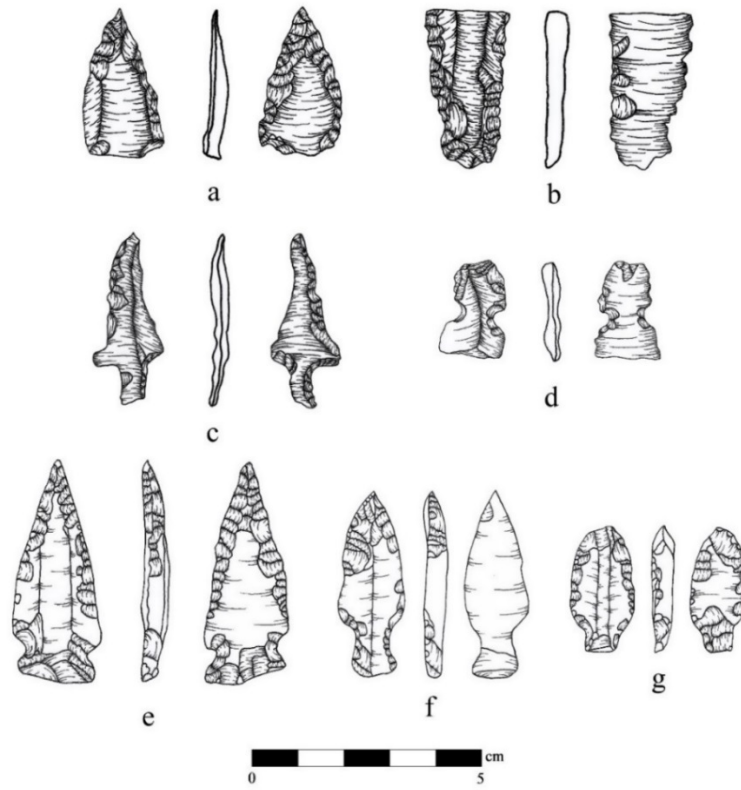


Figure 11. Terminal Formative (a-b) trimmed blades, (c-d) notched blades, (e-g) blades worked into miniature points.

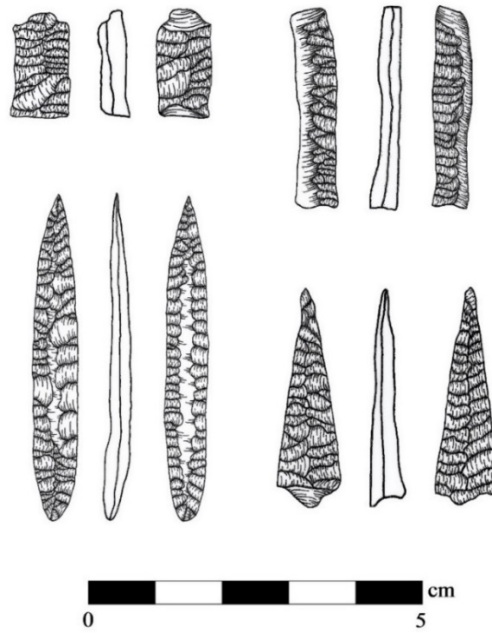


Figure 12. Fine needles, or bloodletters, with bifacial pressure retouch from Terminal Formative contexts.

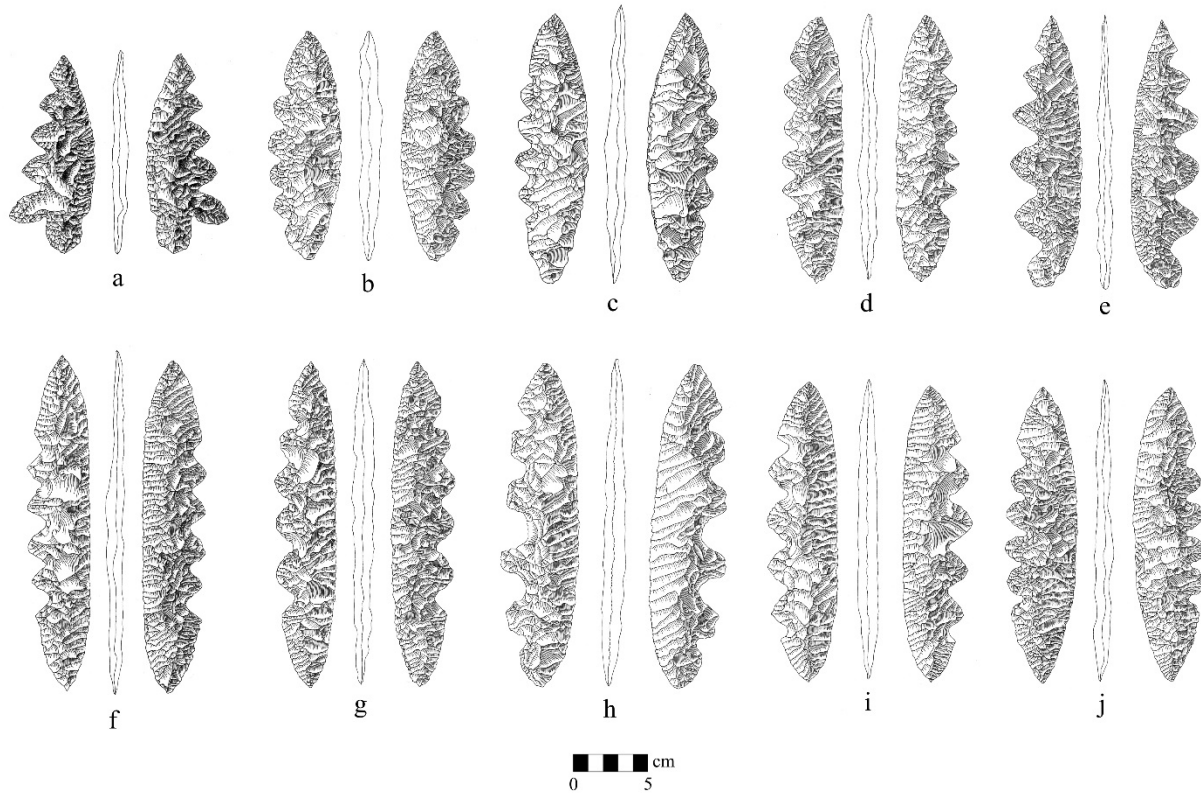


Figure 13. The (a) serrated point and (b-j) nine serrated knives from Feature 173 at Structure 12L-1.

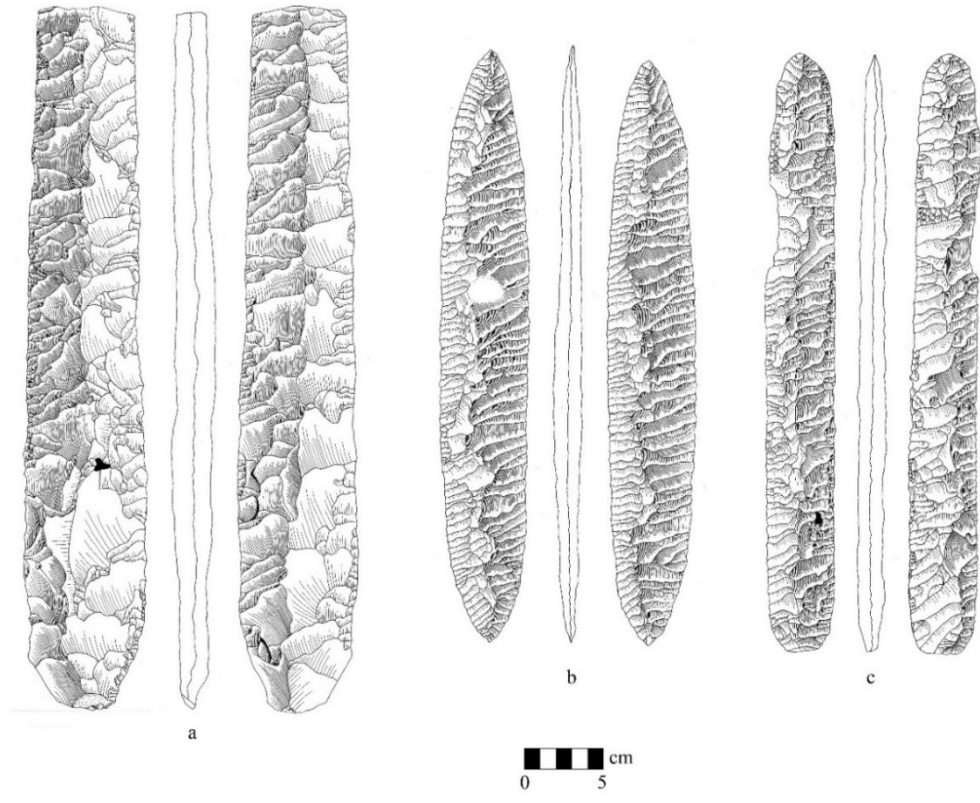


Figure 14. The (a and c) large bifaces and (b) bipointed knife from Feature 173 at Structure 12L-

1.

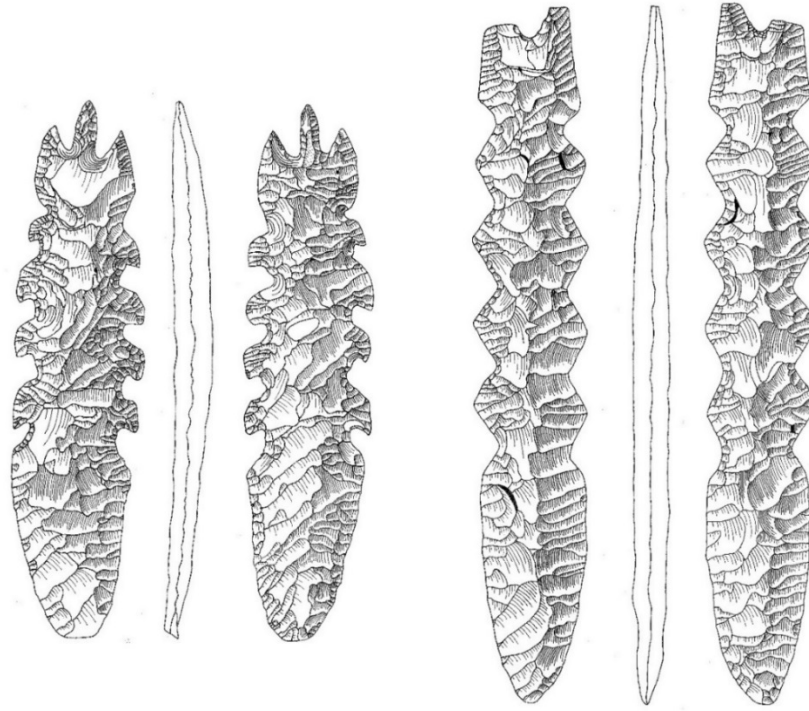


Figure 15. Zoomorphic eccentrics from Feature 173 at Structure 12L-1.