Prehispanic Obsidian Exploitation: Lithics from Cholula, Mexico

OBSIDIAN EXPLOITATION AND POLITICAL ECONOMIC DYNAMICS ON THE CLASSIC PERIOD THROUGH COLONIAL ERA CENTRAL PLATEAU: AN ANALYSIS OF A LITHIC COLLECTION FROM CHOLULA, PUEBLA, MEXICO

BY

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Abstract

In this thesis, I reevaluate current archaeological models of prehispanic Central Plateau obsidian exploitation systems through the analysis of a lithic collection dating to the Middle Classic Period through the Colonial Era from Cholula, Puebla, Mexico. Traditionally, absolute control over obsidian procurement and distribution networks in prehispanic Central Mexico has been attributed to various past states, namely those of Teotihuacán, Tula, and the (Aztec) Triple Alliance. Often in the literature these states are described as 'obsidian empires' that monopolized access to the sources and products of the major Mesoamerican obsidian source areas. And, obsidian consumption studies at sites across Mesoamerica have demonstrated the widespread distribution of central Mexican obsidian implements. However, few consumer studies of obsidian importation patterns at sites within close geographical proximity to the seats of these states, yet that existed somewhat independently of their political realms have been conducted. The ancient settlement of Cholula represents one such community. Yet, Cholula is an enigmatic site in prehispanic Central Mexican history and this thesis is meant to serve as an initial ingression into the possible significance of the Cholulan community's diachronic obsidian procurement-distribution-consumption behaviours for our understanding of Classic Period through Colonial Era Central Plateau political economic dynamics.

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While I was in the field learning about Cholula and studying the lithic collection this thesis takes as its point of entry into the issues with which it is concerned, I benefited both directly and indirectly from my friendships with Geoff, Sharisse, and their family and Josh, Erik, Kari, Byron, and Misha who made up the Brown University field crew that participated in the Summer of 1994 excavations at Cholula. Brooke Wells, my unfailing assistant in the last stretch of analysis, and Antoine Techenet, my French comrade for a good deal of the summer, deserve a great deal of thanks for pretending that lithics were fun and interesting enough for them to help me in labeling, counting, drawing, and photographing even the most minute fragments of obsidian. I hope we all get another chance to play a game of in-door volleyball to a Euro-trash soundtrack together again sometime (please let it be in Mexico).

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Table of Contents

List of Figures

List of Tables

Chapter 1

Archaeological Perspectives on Interregional Interaction in Ancient Mesoamerica

Ethnohistorical sources from early colonial Mexico are rife with references to the importance of trade, tribute, and markets to sixteenth century life in Mexico. In one of his early letters to the Emperor Charles, Cortés was moved to write of Aztec Tenochtitlán:

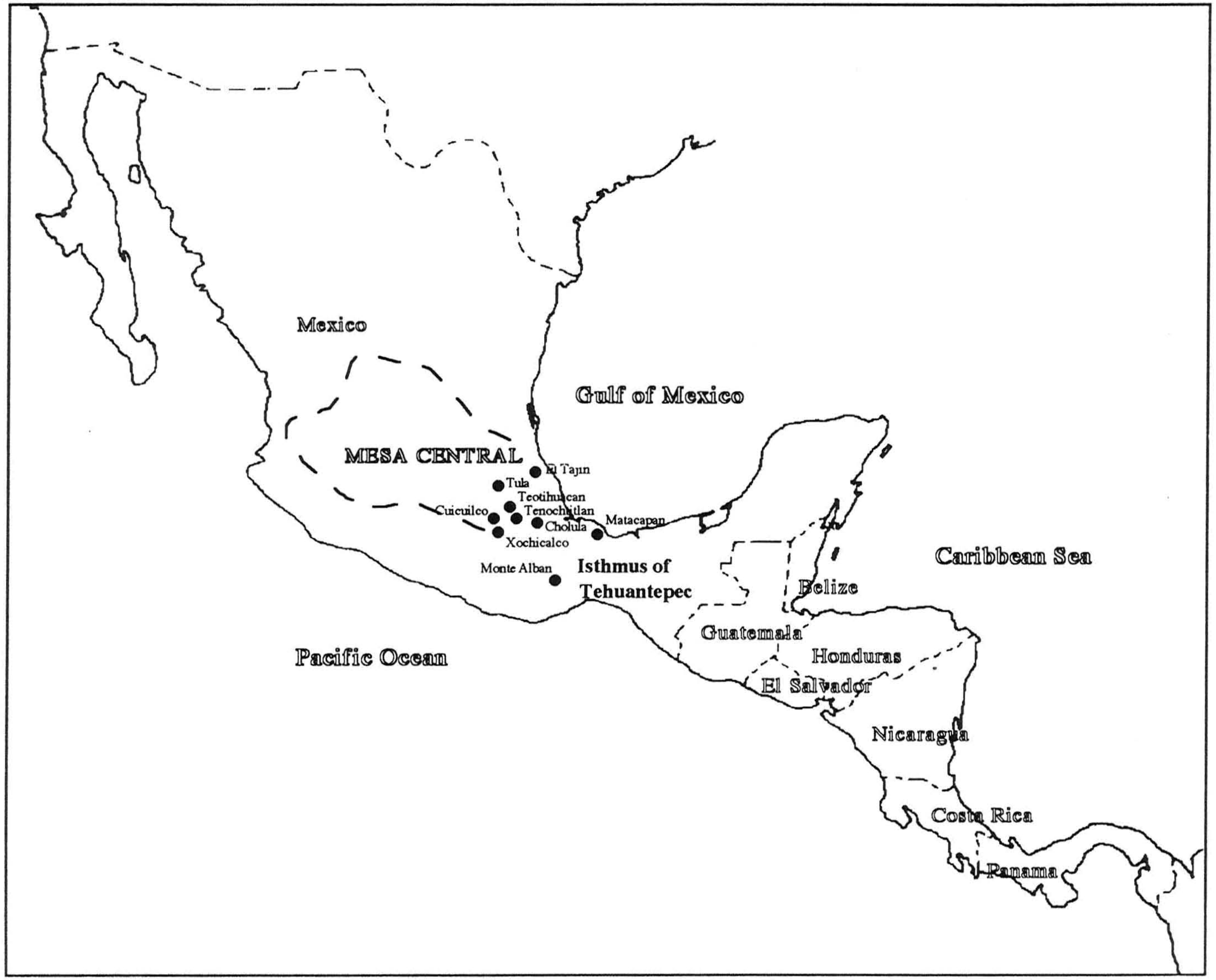
> The city has many squares where trading is done and markets are held continuously. There is also one square twice as big as that of Salamanca, with arcades all around, where more than six thousand people come each day to buy and sell, and where every kind of merchandise produced in these lands is found. (Cortés 1986:102)

Descriptions of Aztec commerce fill pages in the histories of chronicler Diego Durán (1971, 1976). Part II of the Codex Mendoza (Clark 1938; Ross 1984), a detailed pictographic presentation of Aztec conquest territory including representations of tribute items sent to the capital by the subject lands, was ordered painted for the King of Spain in the mid-sixteenth century and its tribute lists were carefully annotated by one of the Crown's officers. Friar Bernadino de Sahagún's Books IX and X relate tales of conquest era trading expeditions by Aztec *pochteca*, guild-organized professional merchants, and the marketing activities of the *tlanecuilo*, or independent traders (Sahagún 1959, 1961). For the obvious reasons, wealth in the Aztec realm, its accumulation and circulation, was of great concern for New Spain's treasure-seeking conquerors and colonialists. From an historical perspective, it seems no less obvious why material wealth and its circulation in society through trade and exchange would be of central concern to the study of Mexico's precolumbian past.

Studies of intersocietal interaction have long informed our archaeological understanding of prehispanic Mesoamerica. Indeed, the very notion of a culturally coherent entity known as 'Mesoamerica', is premised upon a deep recognition of the significance of regional interconnectedness to the development of complex society in Middle America. Writing a few years after the establishment of Mexico's first University Department of Anthropology, the term, 'Mesoamerica', was first proposed by pioneering culture-historian Paul Kirchhoff (1943) as a means of identifying certain parts of Middle America as a macroregion long inhabited by groups of interrelated and interacting peoples, forming a 'culture area'. Studies of interregional interaction continue to be a traditional and successful means of approaching an archaeological understanding of Mesoamerican political economic dynamics.

This thesis takes as its focus of study the implications of one aspect of interregional interaction, the circulation of obsidian, for our understanding of the history of political economy on Mexico's Central Plateau. The Mexican Central Plateau is a highland area of valleys surrounded by coastal mountain ranges and volcanic chains (Figure 1). The Central Plateau is bounded to the south by the Transverse Volcanic Axis, that peaks at some points at over 3800 meters, and the mountain ranges of the Sierra Madre Oriental and Sierra Madre Occidental to the east and west respectively. Basin floors range from 1400-2600 meters and have been home to some of the earliest complex societies of the New World (West 1964). The Central Plateau area includes the present

Figure 1: Major Archaeological Sites of the Mesoamerican Central Plateau



day Mexican states of Puebla, Tlaxcala, Morelos, Hidalgo, Queretaro, Mexico, and the Districto Federal and has long been recognized as one of the most vital regions of prehistory, a starting point for complex and urban societal organization (Blanton 1981; Coe 1981; Grove 1981). Sources of obsidian, one of the most widely used extractive resources in ancient Mesoamerica, are numerous, but highly localized across the landscape. The restricted natural distribution of obsidian and its ubiquity at archaeological sites throughout the Central Plateau have led many researchers to question the organizational structure of its distribution to communities across the region. In part, the theories that developed through such inquiries are based on the premises and principles of a limited number of larger theoretical paradigms.

Archaeological Perspectives on Central Plateau Exchange

If earlier work conducted under the paradigm of culture-historical archaeology, and its explanatory corollary of diffusionism, emphasized interregional exchange in ideas and ephemerally-defined cultural traits, modern archaeological approaches to the study of interregional interaction have concentrated on the objects or commodities of material exchange. With the resurgence of evolutionary thought in mid-twentieth century North American archaeology, studies of interregional interaction had become refocused on the determinative role of ecological circumstances in the development and structure of exchange systems.

Writing as early as the 1950s, William Sanders was among the first researchers to incorporate the tenets of cultural-ecology into a synthetical understanding of the processes of complex societal development in Mesoamerica's Central Plateau (Sanders 1956). Reconceived as a 'symbiotic region', the Central Plateau was envisioned as consisting of a series of ecologically diverse environmental zones whose inhabitants cooperated in mutually beneficial exchange relationships of, primarily, basic necessities. Interregional interdependence was seen as developing out of a perceived need for the equitable allocation of resources through exchange and as being a prime stimulus for the elaboration of sociopolitical complexity. Early studies of Formative Period (Figure 2) exchange networks (e.g. Coe 1965; Pires-Ferreira 1975) suggested the primarily integrative role played by regional elites in managing these consensual exchange networks. More recent analyses of the implications of this unevenness in the distribution of natural resources across the Central Plateau landscape and adjacent areas tend towards a less quixotic vision of the role of elite forces in interregional dynamics, and focus instead on how such natural imbalances in localized resource distributions may have conditioned the development of intrasocietal stratification and intersocietal hierarchization (Parsons and Price 1971; Logan and Sanders 1976; Hirth and Angulo Villaseñor 1981; Sanders and Santley 1983; Santley 1984). Maintaining an orthodox materialist line, studies of this orientation stipulate that complexity in the form of intrasocietal socioeconomic and intersocietal sociopolitical differentiation develops as an elite stratum of society comes to attain control over access to valued or essential raw material sources and/or the management of major extractive technologies, and grows to manipulate that privileged access for self-benefit (Santley 1984; Sanders and Nichols 1988).

An adoption of Wallerstein's World Systems approach (1974, 1979, 1980) towards the question of intersocietal interaction in Central Plateau prehistory has also been forwarded. As proposed by Blanton and Feinman (1984, but see

<u>Figure 2: Selected Mesoamerican Chronologies</u>

TIMELINE	Central Plateau Period	Cholula and the Puebla-Tehuacan Valley	Basin of Mexico	Teotihuacan Valley	Tula Region
1520	Colonial-Historical	Colonial-Historical	Aztec IV	Aztec IV	Tesoro
1400	Late Postclassic	Late Chollolan			
1300			Aztec III	Aztec III	Palacio
1200	Middle Postclassic	Early Chollolan	Aztec II/I	Aztec II/I	Fuego
1100					
1000	Early Postclassic	Late Tlachihualtepetl	Mazapan	Mazapan	Tollan
900					Terminal Corral
800			Coyotlatelco	Coyotlatelco	Corral
700	Epiclassic	Early Tlachihualtepetl			Prado
600		Cholula III-a	Metepec	Metepec	
500		Cholula III		Late Xolalpan	Chingu
400	Classic		Xolalpan	Early Xolalpan	
300				Late Tlamimilolpa	
200		Cholula II-a	Tlamimilolpa	Early Tlamimilolpa	Classic
100		Palo Blanco	Miccaotli	Miccaotli	
C.E./B.C.E.	Terminal Formative		Tzacualli	Tzacualli	
100			Cuicuilco	Patlachique	Terminal Formative
200		Santa Maria Totomihuacan	Ticoman III	Late Cuanalan	
300					
400	Late Formative		Ticoman II	Middle Cuanalan	Tepeji
500			Ticoman I	Early Cuanalan	
600					
700	Middle Formative		Zacatenco	Chiconautla	
800					
900	Early Formative	Las Bocas			
1000					
1100-1200					

Sources: Postclassic chronology for Cholula adapted from McCafferty In Press-b. Classic Period and Formative chronology for Cholula and the Puebla-Tehuacan Valley adapted from Price 1976:15-16, Figure 1. All else adapted from Cobean and Mastache 1989:36, Figure 5.1.

Schneider 1977), a precapitalist world economy may emerge through the establishment of control by the elites of major state systems over the distribution of the symbols of power, foreign and sumptuary goods. Due to systemic properties in elite sponsored exchange, such as the precondition of exchange linkage elaboration and maintenance as population and demand for preciosities grow, trade is seen by Blanton and Feinman to have been stimulated and pursued on a macroregional, or world system, scale. Cross-cultural research has illustrated the importance of interregional exchange to elites (Curtin 1984), but an archaeological understanding of the structural importance of elites to the development and elaboration of exchange systems is still in the early stages of development. More current theories about the role of exchange and trade in Mesoamerican society also see the development of interregional and macroregional exchange systems as based, in part and at inception, on the elaboration and maintenance of elite social identity (e.g. Ball 1983; Smith 1986; Drennan et al. 1990; Stark 1990; Spence In Press; but see also Flannery 1968 for an earlier elaboration on this theme).

Clearly, a common element among these theories of interregional interaction is the causal role attributed to elite forces in conditioning and determining the structure of those dynamics. Elites, whether scripted as raw material tyrants or cultural luminaries, are ascribed the primary role in the development, elaboration, and maintenence of complex intersocietal interaction. This is a point to which I later return.

Interregional Interaction and Obsidian

As Earle (1982:3-8) has pointed out, the interrelated aims of the archaeological study of exchange are threefold: i) to determine the origin or source of items of exchange; ii) to describe the spatial and temporal distribution of those items; and, iii) to infer the organizational structure of the exchange systems in which such items circulated. One central focus of many explorations of interregional interaction in the Central Plateau has been on the exchange of obsidian. Clearly, there are some purely practical reasons related to Earle's conceptualization of the objectives of exchange studies for this emphasis. Obsidian is among the most durable of the artifact classes comprising the material culture of ancient Mesoamerica. As well, the geological processes that give obsidian form allow for the potential of chemically proveniencing obsidian artifacts to their sources of origin. Yet, these are not the sole reasons for the 'obsidian-centrism' that seems to pervade examinations of Central Plateau interregional interaction. Obsidian artifacts are ubiquitous at Central Plateau archaeological sites, even in areas where local chert was readily available. There are then a number of culturally significant reasons specific to obsidian itself that surely contributed to the widespread use of this material among the communities of ancient Mesoamerica.

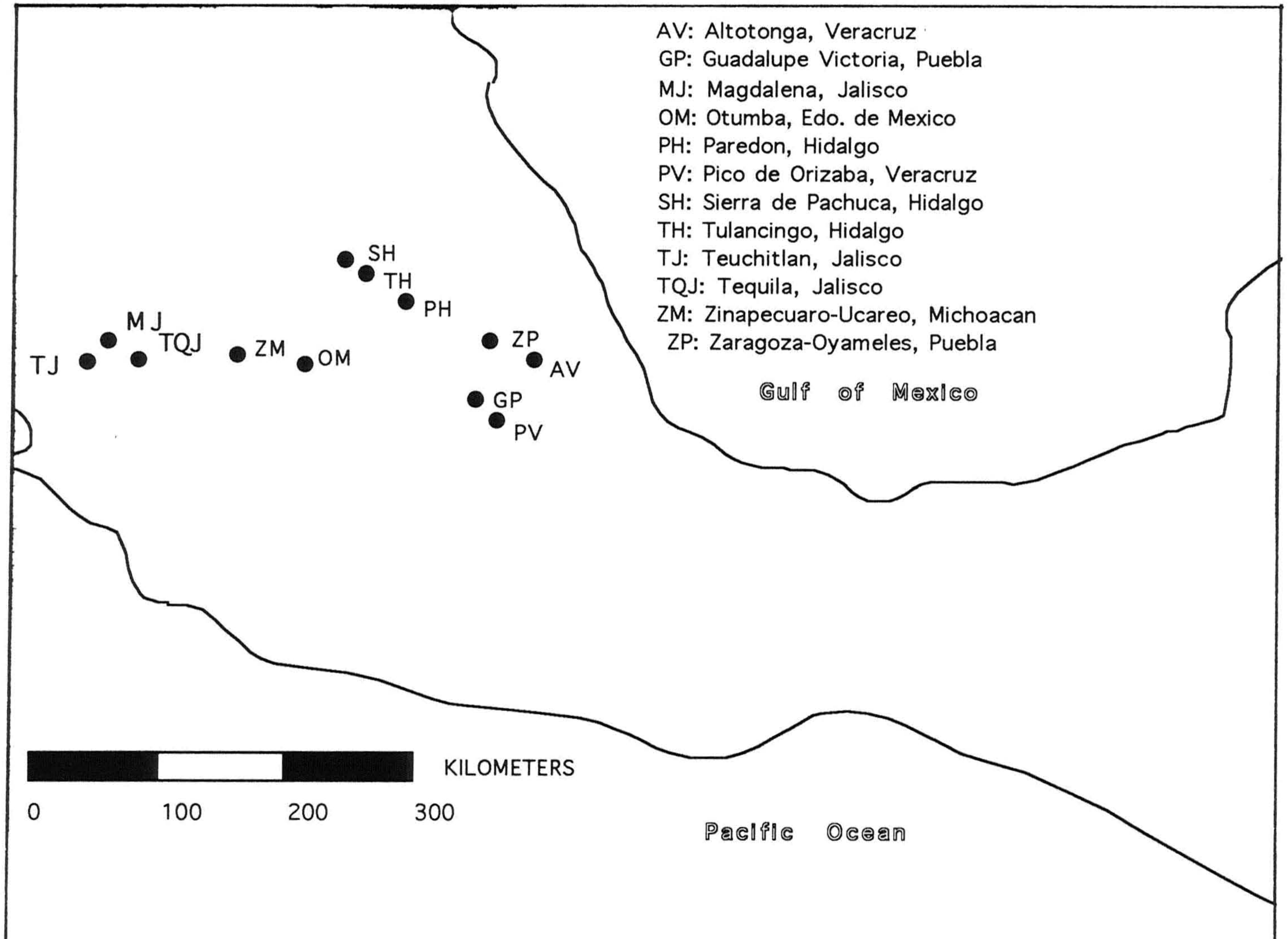
With its inherent property of conchoidal fracturing, freshly knapped obsidian retains one of the sharpest lithic edges available, insuring its usefulness and desiribility to non-metallurgical societies. Obsidian is also well suited for lithic blade technology, which is regarded as one of the most efficient lithic technologies ever developed (Sheets 1975; Clark 1987). Controlled blade manufacture produces standardized forms and results in more usable cutting edge per gram of raw material than any other lithic reduction system ever developed (Sheets and Muto 1972). Yet, exchange of obsidian destined for use as blades need not have involved finished blade implements, which are fragile and not well suited for transport in bulk. Of course, obsidian was transported in raw nodule form in ancient Mesoamerica (Zeitlin 1982; Boksenbaum et al. 1987; Stark et al. 1992; Joyce et al. 1995), but with the technological shift from a previously predominant flake technology to one of prismatic blade manufacture by the Classic Period, obsidian was more widely circulated in modified form.

As Clark (1987) has indicated, the structure of prismatic blade technology is itself intrinsically divisible into distinct reduction episodes that each result in a distinct product form. At one end of the continuum is the macrocore, a prismatic blade core form that results from the initial preforming of quarried or collected material. At the final point of the process, standardized prismatic blades are manufactured; these too may be further modified into implements such as drills and eccentrics. This property of intrinsic divisibility, characteristic to blade technology, allows for the transport and exchange of obsidian, destined ultimately for use as prismatic blades, in the form of several distinct stages of modification. Reconstruction of the form in which obsidian was exported to and imported into the communities of the Central Plateau is made possible by a third inherent property of the technology: as a subtractive process, each stage of reduction encompassed by prismatic blade technology that a mass of raw material must pass through as it is formed into blades also results in the by-production of a predictable and largely unique set of debitage types. By recognizing the stage of reduction characterized by an assemblage of debitage at an archaeological site, the form in which obsidian was exported, imported, and consumed can be determined. A final characteristic of obsidian in Mesoamerica accords it a unique role in the reconstruction of past exchange systems. Obsidian is a highly localized resource of limited natural distribution across the Central Plateau (Figure 3). Although not all the Mesoamerican sources of obsidian used in prehispanic times have yet been identified, the sources of those obsidian types which circulated in the highest volume are known and increasingly easy to distinguish both physiochemically and, in some instances, visually (Cobean et al. 1991; Stark et al. 1992). It is these last two factors that have been critical to inferring the structural organization of obsidian exploitation in the Central Plateau.

The Obsidian Industries of Teotihuacán, Tula, and the Aztec Empire

The Classic Period Valley of Mexico site of Teotihuacán has long been regarded as the locus of one of the earliest intensive obsidian industries in Mesoamerica (Spence 1967, 1981). Based on the analysis of collections amassed through extensive surveys conducted under the Teotihuacán Mapping Project (Millon et al. 1973), Spence (1967) claimed that obsidian production at Teotihuacán was an important aspect of the city-state's long-distance trade endeavors. In a later paper (1981), he also suggested that the Teotihuacán state and community retained some form of control over the main sources for the industry's raw materials: the Otumba obsidian deposits located 17 kilometers east of the city's core, and the Sierra de Pachuca obsidian source area which lies considerably further, in the state of Hidalgo some 50 kilometers northeast of Teotihuacán. Teotihuacán's obsidian industry has since been reconfigured as a central component of the city-state's economy (Sanders and Santley 1983; Santley 1984). At one point, the obsidian industry of Early-Middle Classic Period Teotihuacán was estimated to have supplied obsidian implements for over 3-6 million consumers annually (Sanders and Santley 1983:283), its export-for-profit products reaching clients as far away as the southern Maya

Figure 3: Major Central Plateau Obsidian Sources



Sources: Compiled from Cobean et al. 1991 and Stark et al. 1992.

Lowlands (Santley 1983). Furthermore, absolute control over the sources of Pachuca, Otumba, and even Zaragoza-Oyameles obsidian has been asserted to have been a mainstay of the Teotihuacán state (Santley 1989a, 1989b). More recently, the magnitude of scale attributed to Teotihuacán's obsidian manufacturing industry has come under criticism (Clark 1986a; Spence 1987); the role it may have played in the development of the Teotihuacán state has been reevaluated (Spence 1984); and, exaggerated notions about the extent of its monopoly over Classic Period Central Plateau obsidian distribution systems have been challenged (Clark 1986a; Drennan et al. 1990). Yet the image drawn earlier of a vast Classic Period monopolistic empire that shared structural parallels with the Postclassic Aztec Empire was a persuasive one.

At the Early Postclassic site of Tula in southwestern Hidalgo, survey reconnaissance projects (Diehl 1974; Matos Moctezuma 1974, 1976) recovered enormous quantities of obsidian debris and implements. Tula's obsidian craftsworkers were once estimated to have comprised over 40 percent of the Early Postclassic city's population (Diehl 1983:113) and, like Teotihuacán before it, Tula is considered by some to have been home to a major state involved in the control of obsidian exchange systems that included the administration and regulation of access to Pachuca obsidian (Parsons and Price 1971:188; Sanders and Santley 1983:282).

In its third and final incarnation, a postulated empire of obsidian has been given shape in the form of the Aztec Triple Alliance (Sanders and Santley 1983). In this one instance, however, there is substantial ethnohistorical, as well as archaeological, evidence with which to contest so narrow a conceptualization of Late Postclassic Central Plateau political economic dynamics (Berdan 1986; Smith 1990).

There are two general schools of thought on the driving force behind the obsidian exploitation systems of these precolumbian states. Most in line with the cultural-ecologist's view of the development of complex sociopolitical organization, Santley (1984, 1986, 1989a, 1989b) and his colleagues (Sanders and Santley 1983; Santley et al. 1986) have claimed that obsidian procurement, processing, and distribution were directly and monopolistically controlled by state forces as a means of accumulating wealth and capital that could then be channeled into the management and aggrandizement of their empires. Obsidian industries, as major extractive-productive systems, are seen as having been conditioned and regulated by state interests and geared towards a large-scale export sector. Thus, every aspect of past lithic exploitation systems, from direct control over the resources of raw material to the management of exchange mechanisms, is envisioned as an undertaking of politico-elite administrative forces.

A second view, that retains much in common with the World Systems theory approach to modeling precolumbian exchange systems, considers the structure and organization of long-distance obsidian distribution systems to have been mediated by regional elite interests and directed towards interregional elite conspicuous consumption (Drennan et al. 1990; Stark et al. 1992; Spence In Press). As this model is still in its developmental stages, whether obsidian procurement systems are envisioned as having been centralized or largely decentralized has not been made fully clear.

Based on his research at Tula, Healan (1993:458-450) has recently proposed a third possibility for the organization of obsidian exploitation at some points in the Central Plateau's past. In this model, low volume exchange in obsidian by elite and state forces is supplied by tribute fulfillments made by subject communities in the state's hinterland. Otherwise, obsidian procurement-processing-distribution systems are seen as having been privatized commercial ventures. Exchange among groups of commoner status is seen as integral to the development and continuation of large-scale obsidian exploitation systems.

Much theorizing about the organization of production underlying the obsidian procurement-processing-distribution systems of Teotihuacán, Tula, and the Triple Alliance is based on analyses of productive activities at the loci of lithic implement manufacturing (Spence 1967, 1981, 1984, 1985, 1986, 1987; Gonzalez Rul 1979; Healan et al. 1983; Healan 1986; Healan and Stoutamire 1989; Smith 1990). The primary form of data used to further infer the structure and scale of the distribution systems developing from those manufacturing systems has been amassed through the collection of consumer evidence from regions across Mesoamerica. A few of these studies assess intraregional patterns of obsidian circulation in relation to the hypothesized capitals of production (Spence 1985; Santley et al. 1986); others examine the importing and consuming behaviours of communities at some distances from the presumed site of the origin of the commodity in question (Moholy-Nagy et al. 1984; Santley 1989; Moholy-Nagy and Nelson 1990; Stark et al. 1992; Joyce et al. 1995). There are, however, fewer studies of obsidian exploitation patterns at communities within close range of the capitals of these past states, yet that existed largely independently of their control (for an exception, see Drennan et al. 1990). Obsidian exploitation patterns at communities of this nature may well provide an alternative view of obsidian procurement and consumption strategies that are not governed by the principles of either imperialistic or elite control underlying models of Teotihuacán-, Tula-, and Triple Alliance-dominated obsidian exploitation systems. In this thesis, I examine diachronic evidence for obsidian exploitation at one such site, Cholula.

Cholula and a History of Political Economy on the Central Plateau

Cholula lies in the Puebla-Tlaxcala Valley of the central Mexican highlands at approximately 2200 meters above sea level and is nestled among the twin volcanoes Popocatepetl and Ixtaccihuatl to the west, and Malinche to its north (Reyes 1970:9-10). With evidence for its initial settlement in the Middle Formative and its present-day status as one of the Puebla-Tlaxcala region's major urban centers, Cholula may well be the New World's longest continuously inhabited city (McCafferty 1992:1). With its Great Pyramid demonstrating a vast indigenous commitment to the center's early precolumbian development, its civic-ceremonial core home to eclectic polychrome frescoes and murals that imply contact with many areas of past artistic innovation in Mesoamerica, and its location in an area of highly irrigable land rich in clay sources, ancient Cholula must surely have had great drawing power in its day. Yet, the position of Cholula in ancient Mesoamerican political economic dynamics is enigmatic. Few New World archaeologists seem comfortable proclaiming anything terribly conclusive about the past of Cholula. In synthetical analyses of the site of Cholula (Messmacher 1967; Marquina 1970a), generally, Cholula's Valley of Mexico neighbour, Teotihuacán, is presented as an ideal model of precolumbian Central Mexican urban society against which the forms of Cholula's Classic Period organization and material culture are compared (Noguera 1954; Marquina 1970b). And, as two of the earlier archaeological investigators of the site make quite clear in their assessment of Classic Period Cholulan ceramic traditions, in this instance, Cholula was perceived as having fallen short: "In all, the Classic complex at Cholula is a rather darkly lugubrious and impoverished version of Teotihuacán, in which the lacks are not made up for by any noticeably vital local traditions" (Dumond and Müller 1972:1209). In fact, Müller for one held the belief so strongly, perhaps unconsciously, that Cholula was but a pale reflection of Teotihuacán that she defined Cholula's ceramic chronology almost exclusively in terms of Valley of Mexico history (Müller 1970, 1978) and with no regard for independent events at Cholula (Lind et al. n.d.:5; McCafferty 1992:234-235).

Relations between Cholula and wider sociopolitical dynamics become no clearer regarding the center's Epiclassic Period. It has been contended by some that Cholula was abandoned at the end of the Classic Period (Dumond and Müller 1972; Marquina 1975). Yet others see the Epiclassic Period at Cholula as one of the city's most vital moments (Diehl 1989:14; Mastache and Cobean 1989:55). Cholula's relationship to Tula, while the Toltec city was at its height of influence in the Early Postclassic, is unclear. Ethnohistorical sources recount a major Middle Postclassic take-over of Cholula by Tolteca-Chichimeca emigrants from a conflict-torn Tula. Cholula's direct interactions with Aztec forces are better documented. The sixteenth century chronicler Fray Diego Durán records one of the highest losses for any Aztec army as having occurred in a battle against Cholulteca forces (Durán 1967:448, cited in Davies 1987:184). And, largely through ethnohistorical sources, Cholula is known to have maintained its political independence from the Triple Alliance state (Paddock 1987:44-45).

That, in its earlier Classic and Early Postclassic Period history, the achievements and significance of Cholula have come to be eclipsed by the near-absolute importance attributed to the states of Teotihuacán and Tula in Central Plateau political economic dynamics has led one frustrated researcher to proclaim: "*Es como si existiera algún oculto deseo de negar la importancia que tuvo Cholula en el panorama mesoamericano*". (Paddock 1987:21). Recent excavations conducted by the Puebla regional Center of Mexico's Instituto Nacional de Antropología e Historia of a Middle Classic household situated near ancient Cholula's civic-ceremonial core and an Epiclassic patio on a northeast platform of Cholula's Great Pyramid may have inaugurated a process geared to reclaim Cholula's past. The lithic assemblages from these two excavations and one more site from within the zone of ancient settlement at Cholula are analyzed in this thesis.

Research Objectives

This thesis is structured around the analysis of a collection of lithic artifacts from sites in and near Cholula's precolumbian core. The collection is formed by assemblages that date to the Classic, Epiclassic, and Postclassic periods and the Colonial Era. In part, this analysis was conducted to better understand the internal history of Cholula itself. It was hoped that the reconstruction of lithic reduction behaviours over time might provide insight into the organization of this one aspect of Cholula's past economy. Precolumbian and early colonial intrasite lithic procurement strategies and consumption behaviours, as represented through the distribution of different types of obsidian, chert, and chalcedony, might then also be assessed diachronically.

Technological analyses, allowing for an assessment of the form in which obsidian reached Cholula through time, were pursued to better account for Cholula's diachronic participation in wider lithic procurement-distribution systems. In this manner, the analysis of a collection of lithic materials that spans the Middle Classic through the Colonial periods, from a site that was largely outside the subject territories of the Central Plateau's major state systems, yet within their geographical domain, can provide a significant basis from which to evaluate the various models forwarded to account for the role of obsidian procurement-processing-distribution-consumption systems in interregional political economics on the Central Plateau.

Ultimately, this thesis asks: what can the nature of a number of lithic assemblages spanning the Classic through Colonial periods tell us of the relationship between the community of Cholula and wider political economic dynamics? As we have seen, an integration of the history of obsidian exploitation at Cholula within a broader history of the Central Plateau might better engender a more thorough understanding of the sociopolitical dynamics that gave Classic Period through Colonial Period Central Mexico form, a form borne through the dynamic interaction of interregional polities. Thus, this thesis is meant to serve as one possible foray into an exploration of the political economy of the Classic Period through Colonial era Central Plateau.

Thesis Organization

This thesis consists of five chapters and two appendices. In Chapter 2, I present a review of the various theories and models forwarded to account for the evolution and developmental processes of the obsidian production-distribution systems of the states of Teotihuacán, Tula, and the Triple Alliance.

Direct evidence for exploitation systems at the major Central Plateau obsidian sources is examined. This research is contextualized within a framework of wider sociocultural and sociopolitical developments in the Central Plateau over the Late Formative through Colonial periods. Evidence for the structure of obsidian exploitation systems in the Central Plateau from consumer contexts is then presented from a diachronic perspective. The organizational structures attributed to the obsidian procurement-processing-distribution systems of the aforementioned states are assessed in light of these data.

Chapter 3 provides a historical look at archaeological research conducted to date at the site of Cholula. A brief overview of the precolumbian and early colonial history of the city of Cholula is then presented. The final section of Chapter 3 consists of a discussion of the excavations from which the lithic collection analyzed in this thesis is derived. Some issues concerning the identification of behaviourally meaningful contexts for the subassemblages that comprise the collection and the level of analytical comparability among them are broached.

In Chapter 4, a model of prismatic blade-core technology is presented. The structure of the model of lithic reduction employed for analysis in the study of the lithic collection from Cholula is introduced. Commodity models for determining the form in which obsidian for prismatic blade-core technology entered consumer sites in the Central Plateau's past are reviewed. A second related discussion concerns the expected variability among the compositions of the various lithic subassemblages. Finally, the questions this study poses for evaluation are summarized within the context of the foregoing discussions.

In Chapter 5, I present my analysis of the lithic collection. Diachronic lithic distribution patterns witnessed in the collection are described and assessed. A technological analysis is presented as a means of assessing the form in which obsidian reached Cholula through time. Other subsidiary technological analyses, concerned with the internal structure of lithic reduction at Classic Period through Colonial era Cholula are discussed. Trends in patterns of utilization of the lithic materials within the collection as a means of clarifying the depositional contexts of the lithic subassemblages are considered. Finally, a consideration of intrasite obsidian distribution patterns is undertaken in an attempt to assess the organizational structure of lithic reduction at Cholula through time.

Chapter 6 consists of concluding statements concerning the nature of lithic exploitation at Cholula through time and the implications of these patterns for a diachronic understanding of Central Plateau obsidian exploitation systems and political economic dynamics.

Appendix 1 is the complete dataset upon which the analyses described in Chapter 5 are based. Appendix 2 provides comprehensive definitions of the technical terms employed in the analysis of the lithic collection from Cholula.

Chapter 2

The Obsidian Industries of Teotihuacán, Tula and the Triple Alliance and Obsidian Exploitation Patterns in the Central Plateau: Models and Evidence

Having considered the various theoretical interpretations attributed to the role of obsidian exploitation, production, exchange, and consumption within the question of complex society interaction, here I shift the focus to the one component that is seen by many researchers as having been critical to the elaboration of that process on the Central Plateau: the Teotihuacán obsidian industry. Patterns of obsidian exploitation discerned through decades of survey and excavation at the Valley of Mexico site of Teotihuacán have allowed researchers to propose the existence of a massive industry centered at the capital of this once powerful state concerned with the procurement, processing, and circulation of certain types of obsidian, and to develop models to explain its origins and its effects. The impact of such models on our understanding of Mesoamerican political-economic systems has been far-reaching and has come to condition the archaeological assessment of the structure of the later Central Plateau polities of Tula and of the Triple Alliance.

Models of Teotihuacán's Obsidian Industry: A Total System?

Through long-term intensive survey projects, settlement population history and resource exploitation patterns continue to be extremely well-documented for the Basin of Mexico (Brumfiel 1976; Sanders et al. 1979; Sanders 1986; Storey 1992). Sedentary hamlets and villages were first settled in the region in Early Formative times (Sanders et al. 1979:97). Sociopolitical complexity, as evident in heightened intra- and inter-site differentiation, increased until by the Late Formative a distinct settlement hierarchy of regional centers developed. The region's population at this time is estimated to have reached 90,000 persons (Sanders et al. 1979:97). In the Late Formative, a supraregional center, Cuicuilco, emerged. Cuicuilco served as a centralized administrative community and is proposed to have had tight control over Basin of Mexico obsidian exploitation, production, and distribution systems until its Terminal Formative-Early Classic Period abandonment (Charlton 1984). Cuicuilco's eventual catastrophic destruction by the eruption of the volcano Xitli is believed to have occurred sometime later, at c. 400 C.E. (Cordova F. de A. et al. 1994). Elsewhere in the Basin of Mexico, within the Valley of Teotihuacán, demographic levels and population nucleation continued to develop at the site of Teotihuacán (Sanders et al. 1979:107). During the Late Formative, Teotihuacán superseded Cuicuilco as the dominant polity of the region. In its Patlachique phase (150 B.C.E.-1 C.E.), Teotihuacán is believed to have covered 6-8 km^2 and to have housed a population of around 20,000-40,000 individuals (Sanders et al. 1979:101). At the height of its powers, Teotihuacán's direct politico-economic domain has been described as encompassing an area of 25, 000 km^2 within the Basin of Mexico and adjacent areas including the Tula region, southern Hidalgo, northern Tlaxcala, eastern Morelos and some parts of the Valley of Toluca (Millon 1988: 113-114). Within the Central Plateau, Teotihuacán is believed to have had direct economic and, possibly, political links to Veracruz, the Tehuacán Valley, and Tepeapulco and Tulancingo through its "Teotihuacán Corridors", or routes of implied mutual access (Garcia Cook 1981). Teotihuacán's 'sphere of influence' was even more widely drawn, reaching parts of northern Mexico and the Maya lowlands (Santley 1983; Millon 1988).

Working in conjunction with the Teotihuacán Mapping Project (Millon et al. 1973), Michael Spence has written most extensively on the structure and developmental history of Teotihuacán's obsidian industry (Spence 1967, 1981, 1982, 1984, 1986, 1987; Spence et al. 1984). It is during the Patlachique phase that the earliest evidence for workshop-based obsidian production is found (Spence 1981:781). The nine manufacturing loci dating to this time that have been reported yielded evidence of an equitable distribution of the various types of obsidian used as raw material for both prismatic blade and biface production, leading Spence to suggest that these workshops were likely to have been organized as corporate work groups engaged in cooperative resource procurement strategies. According to this view, access to obsidian from the Otumba source area would have been conducted by the local groups, whereas Pachuca obsidian was only indirectly obtained through exchanges between Teotihuacán's obsidian-producing populace and groups indigenous to the Cerro de las Navajas area (Charlton and Spence 1982:55-56). Spence has also noted that these workshops were situated on what would have been the outskirts of the Patlachique phase city of Teotihuacán and were not associated with any public architecture, signifying to him that these workshops operated beyond the sphere of state control (Spence et al. 1984; Spence 1986). In Spence's estimation, the obsidian industry was incidental, not critical, to the emergence of state level society at Teotihuacán; nor was the state essential to the inception of the industry. These early, autonomous corporate workshop groups formed the antecedent to what would develop into a tradition: the functioning of craftworking industries independent of state intervention in some important aspects (Spence 1981:782-785).

Spence has demonstrated that by Tzacualli times (1-150 C.E.), these local, corporate group-based procurement and production systems, which continued to largely bypass state involvement, were well established. The industry itself was certainly growing and diversifying as several different forms of workshops, known as 'local', regional', and 'precinct' workshops, that differed in the type of implement produced, size of occupation, volume of output, and proximity to state administrative structures were established (Spence 1981:781). While state involvement in most, if not all, aspects of the industry had continued to be minimal, at some point within the Miccaotli (150-200 C.E.) or Tlamimilolpa phase (200-400 C.E.), Teotihuacán administrators may have taken over the previously independent system of Pachuca obsidian procurement (Spence 1981:,777-780; Spence et al. 1984:103). It has been suggested elsewhere (Sanders 1977:98-99; Charlton 1978:1234) that at this time the Teotihuacán state actually absorbed both the Otumba and the Pachuca source areas into its domain of control. And, Spence has noted that the growing demand for Pachuca obsidian at Teotihuacán's workshops may have necessitated state involvement in large-scale procurement operations and that this, coupled with a pattern of generally equitable inter-workshop distribution of Pachuca obsidian at the city, may indicate the operation of a "coordinating authority" (Spence 1981:799) for its procurement and transport (Spence 1981:799; Spence et al. 1984). According to this model, state forces probably first pooled and then redistributed Pachuca obsidian from mining activities directly overseen by the state, as may be demonstrated by the remains of storage facilities associated with civic-ceremonial structures in the city's core (Spence 1984:98-99). Spence, however, has maintained that state administrators did not directly control the production and marketing activities of the city's workshops with the exception of those undertaken by 'precinct' workshops. Spence (1981:770-774; 1986) has identified 'precinct' lithic production loci as areas where Teotihuacán residents may have worked under state auspices as a form of levy. According to Spence, these activities would have generated only a low volume of lithic implements. These products were channeled to administrative and/or elite powers for use in state sponsored projects and/or elite conscripted activities (Spence In Press).

Development of the obsidian industry continued throughout the Miccaotli to Metepec phases (150-750 C.E.), as the city came to cover 20 km^2, its population grew to 150, 000 (Spence 1984:105), and contact with the Maya area became most pronounced (Millon 1988:115-127). At least one hundred obsidian workshops can be dated to this legion period in Teotihuacán's history (Spence 1984:106). Otherwise, Teotihuacán's Middle Classic lithic producers most likely supplied obsidian implements according to local and hinterland demand as no contemporaneous workshops within the Valley of Mexico beyond Teotihuacán have been documented (Spence 1984:99, 104). Yet, the extent of the market for Teotihuacán's obsidian products is said to have reached even further, incorporating "...a major part of central Mexico [that] probably included the Valley of Mexico itself, at least parts of Morelos...and Tlaxcala, Puebla, and Oaxaca" (Spence 1987:437). These patterns persisted until some time after the process of state decline at Teotihuacán had begun.

By the Epiclassic, Teotihuacán's extended state procurement system for Pachuca obsidian may have collapsed, but the city's industry in obsidian implement production was not entirely dissolved. According to Rattray's (1987) analyses of the Metepec Hacienda, a mound group situated at the eastern end of the city's East-West Avenue, a high volume of San Marcos projectile points and bifacial implements and blanks was manufactured by Teotihuacanos for both local and external consumption. However, the focus on the reduction of Pachuca obsidian that had characterized previous lithic production was replaced by a reliance on grey obsidians from various sources, notably that of Otumba. This on-going exploitation of the Otumba source area, continuing in the wake of the Teotihuacán state's decline, may have been facilitated by the entrenched nature of the established independent network of procurement for Otumba obsidian established early in the city's history (Spence 1981:784). Conversely, the cessation of intensive exploitation of the Pachuca source area has been attributed to the absence of a major polity within that vicinity, the diminished scale of Coyotlatelco regional polities and their hinterlands, and the likelihood of increasingly strained interregional relations in the absence of a unifying state power (Charlton and Spence 1982:66). Generally, obsidian procurement-production-distribution systems of this time have been characterized as ones whereby the smaller, developing regional polities of the time focused on the exploitation of only single local source areas, and through exchange, may have provided those societies without direct access to obsidian with their raw and/or processed materials (Charlton and Spence 1982:65-66).

Thus, according to Spence's analyses, during the early years of settlement at Teotihuacán, one cooperative procurement and marketing unit engaged in the production of a wide range of products including prismatic cores and blades and bifacial implements. By the Tzacualli phase, several similarly organized, independent workshop groups had formed. And, it is during this vital period in Teotihuacán's history, when a state-imposed Valley of Teotihuacán-wide population resettlement program was instituted and the area encompassed by the city nearly tripled that of the earlier Patlachique phase territory (Spence 1984:100), that some evidence for state involvement can be found in the form of precinct workshops associated with public civic structures. This pattern of development has led Spence to conclude that by Middle Horizon times, Teotihuacán's obsidian exploitation system was an "administered industry" (1987:242). However, the state functioned in a benevolent, rather than internally coercive, manner, suppressing competition, and allowing for market expansion through the state's own separate political expansion, without directly securing complete control over all aspects of the industry (Spence 1981:785). Those aspects over which the state did exercise control were most likely associated with the procurement of raw material from the Pachuca source area and long-distance, low volume exchange while local obsidian processing and marketing remained relatively autonomous from state involvement (Spence 1981:785). As Spence has claimed, "The Teotihuacán state protected and encouraged the obsidian industry, but did not attempt to dominate all aspects of it" (1981:785). Still, it is worth noting that integral to Spence's argument concerning the state as facilitating the growth and maintenance of the obsidian industry is the notion that it suppressed competition in obsidian exploitation by prohibiting foreign access to some sources of high quality raw material and preventing the flow of unprocessed materials from the Otumba and Pachuca source areas to communities outside of Teotihuacán or Teotihuacán-related settlements (1987:442).

Santley's interpretation of Teotihuacán's position in the Classic Period Central Plateau political economy, is less circumspect: "From the beginning of the Christian era to the eighth century A.D., Teotihuacán was unquestionably the dominant economic, political, and religious force in Central Mexico" (1983:69). Through a series of papers detailing, primarily, evidence for Teotihuacán contact with polities throughout Mesoamerica, Santley and his colleagues (Santley 1983, 1984, 1989a, 1989b; Santley and Sanders 1983; Santley et al. 1986), have outlined quite a different interpretation of the structure and developmental history of Teotihuacán's obsidian industry. As the capital of a dendritically organized "vast commercial empire" (Santley 1983:69), Teotihuacán's program of economic imperialism was begun as early as the Terminal Formative once the state restricted access to the Otumba obsidian deposits. As envisioned by Santley, this monopolistic system was even further entrenched with the absorption at a later date of the Pachuca source area (1983:108). In Santley's model, control over raw material sources and a restricted export commodity allowed Teotihuacán an opportunity to accumulate the resource base necessary to finance commercial ventures abroad (1989b). These commercial ventures in exchange were central to Teotihuacán's growth and its survival according to Santley. As the only major site in the Basin of Mexico situated in an area susceptible to periodical droughts (Sanders et al. 1979), Teotihuacán administrators were forced to diversify economic return to the capital. This they accomplished by overseeing not only specialized obsidian production and export at Teotihuacán, but also by achieving a managerial role in the bulk trafficking of obsidian from other sources and by practicing discriminatory pricing policies to suppress external competition (Santley 1984:67-73, 1980). Santley (1983:111) has also suggested that the emergence of rivals to Teotihuacán's export monopoly ultimately contributed to the state's downfall.

Thus, Santley goes to great lengths to document evidence for a Teotihuacán presence at Tikal (1983:99-103), Monte Alban (1983:103-107), and on the South Gulf Coast (Santley 1989a), and to identify enclaves of Teotihuacanos serving as state agents and managerial forces in these distant communities located near localized resources. Millon (1988) has looked more critically at these wider consumer patterns and in many instances has found the evidence ambiguous and inadequate for purposes of attempting to distinguish between cases of a state imposed and regulated circulation of obsidian rather than those involving the circulation of obsidian through diplomatic or entrepreneurial ventures. Spence's (In Press) reevaluation of the evidence for consumption of Pachuca obsidian in the Maya area also demonstrates that exchange in Teotihuacán-related obsidian products was largely limited to a social role, as a means of demonstrating affiliation between Teotihuacán elites and the upper stratum of more distant communities, and would have had few purely economical implications for either Teotihuacán itself or the recipient societies. Still, Santley maintains that these endeavors were pursued by Teotihuacán's administration to ensure the return of economic gain to the city as a form of accumulated capital that might be either recycled back into the city administrators' major construction efforts or be stockpiled and stored as energy to be tapped in times of agricultural scarcity (Santley 1989a, 1989b).

John Clark (1986a) was the first researcher to publicly contest the fundamental theoretical underpinnings and question the reliability of the evidence marshaled in support of the two aforementioned models of Teotihuacán's obsidian industry. In his estimation, the archaeological identification of workshops at Teotihuacán had never been rigorous enough and likely obsidian consuming contexts were too often mistaken for production loci. Tenuous workshop identifications, Spence's inflated population estimates for participation by Teotihuacanos in the obsidian industry (1979), and Santley's derived faulty estimates of workshop output volume (1984), he argued, also inhibited a fair assessment of the scale of the industry. In Clark's interpretation of the evidence, he found, "There is no compelling reason for supposing that Teotihuacán's obsidian workshops were producing for an outside market" (1986a:37). Instead, Clark maintained that the patterns of production, distribution, and consumption of obsidian recorded within Teotihuacán and throughout Classic Period Mesoamerica could be most parsimoniously explained by identifying Teotihuacán residents themselves as consumers, on both small-scale domestic use and industrial use levels, of the products of Teotihuacán's lithic producers. Spence's evidence of the centralized administrative pooling of Pachuca obsidian and its ultimate equitable distribution to all types of workshops within Teotihuacán, for instance, might reflect administrative concerns with local demand rather than demonstrating conclusively that the state oriented the industry to long-distance exchange. Rather, Clark has argued, most of Teotihuacán's obsidian workers maintained a high degree of autonomy from the state except perhaps in the production of sumptuary goods for foreign elite exchange. He has contested Santley's argument that the Teotihuacán presence in greater Mesoamerica signifies the operation of envoys of a vast state-sponsored commercial and monopolistic empire. Instead, Clark argued that Teotihuacán influence, especially in elite contexts, could be most easily understood as a reflection of the ideological significance of class endogamy and survival among Classic Period elites. Directly refuting Santley's model, Clark stipulated that long-distance trade originating at Teotihuacán was small-scale and elite oriented. Spence's most recent interpretation of long-distance Classic Period trade in Pachuca obsidian (In Press) is more in line with this thinking.

Another recent model developed to explain Teotihuacán's obsidian industry and its role in macroregional political economics has been proposed by Drennan et al. (1990) and is based on the results of their research in the Tehuacán Valley (Drennan and Novack 1984; Drennan et al. 1990). Drennan et al. examine the different expectations anticipated at consumer sites as accorded by Santley's model and by Clark's model and assess the utility of each one for interpreting the results of their own research on patterns of obsidian consumption in their Tehuacán Valley collections. The authors state that according to Santley's model, at consumer sites which lie at some distance from a Teotihuacán whose monopolistic obsidian export industry was a wholly capital gain venture, one would expect a clear and observable shift in obsidian resource exploitation from a Formative period reliance on nearby sources to a greater Classic Period dependence on those sources presumed to be in the hands of Teotihuacán administrators by that time. Conversely, if long-distance export was simply a component of Teotihuacán's elite foreign relations sector, as Clark argued, then evidence for such exchange, in this case in the form of Pachuca or Otumba obsidian, would be largely isolated to elite consumer contexts and little impact on Classic Period procurement strategies in comparison with those dating to the Formative Period would be witnessed to have been effected.

In fact, neither set of expectations was fully borne out by their analysis of obsidian materials from three Late Formative-Middle Classic sites in the Tehuacán Valley. Instead, they found evidence for the existence in the Middle

Classic of at least two separate, but not mutually exclusive, lithic procurement-distribution systems. While one centered on the exploitation of Teotihuacán-related sources, a contemporaneous system based on the continued exploitation of long-used local sources continued to operate; yet consumers of the materials of both these systems were derived from all ranks of society. Drennan and his colleagues concluded that while the pooling and redistribution of valued goods such as fine matrix obsidian by local community administrators was probably conducted throughout Mesoamerica, the efforts of Teotihuacán's administration specifically were focused on the production of goods on a small scale to be exchanged for prestige items of exotic materials or style. In their comparison of the Tehuacán Valley data with obsidian distribution patterns from other regions of Mesoamerica, the authors argued that from the consumer perspective Teotihuacán's exchange system represents an expenditure of human resources that could not have been returned in any real sense; instead of allowing the city to accumulate capital, the exchange system employed, focused as it was on garnering rare and exotic prestige items to satisfy local elite demand, most likely incurred a debit for the city in terms of human energy over the long term. In a recent theoretical exploration of the various premises and implications of the Santley, Spence, and Clark models of the connection between Teotihuacán's obsidian industry and wider political-economic dynamics within Mesoamerica, Stark (1990) has also concurred that Teotihuacán's obsidian export sector functioned on a small scale to satisfy a pan-Mesoamerican elite demand for prestige items.

The implications of the interpretation of the Teotihuacán state as having exercised control over aspects of its craft economy, to whatever degree, have been consequential for an understanding of the political-economic dynamics of the Central Plateau's history after Teotihuacán's general decline. The often stated, otherwise implied, claim that the Teotihuacán state also controlled access to the source of raw materials for the obsidian industry has led a number of researchers to assume that in the absence of an all-encompassing state system, the Pachuca obsidian source was only moderately exploited. There also exists a prevailing notion that without a unifying polity on the scale of Teotihuacán within the Central Plateau, obsidian procurement and circulation systems generally devolve and are replaced by small-scale, restricted ones (Charlton and Spence 1982). These assumptions may have led several individuals to single out the next best candidate for control of the Pachuca source area and its products: the Early Postclassic state of the Toltec.

Tula and the Toltecs: Inheritors of a Tradition?

There has existed for some time in the literature a persistent assumption that the state administrators of Tula eventually assumed the role once played by Teotihuacán in the procurement, processing, and distribution of Pachuca and other types of obsidian among Central Plateau communities (Parsons and Price 1971:188, Spence and Parsons 1972:29, Diehl 1974:193-194; Charlton 1978:1235; Charlton and Spence 1982:67; Sanders and Santley 1983:282). As Charlton and Spence have stated: "The existence of a major state system provided the context within which aspects of Teotihuacán's procurement, production, and distribution systems were revived and reorganized" (1982:67). One major aspect of that system was presumed to be control over access to raw material sources; thus, the obsidian source areas of Pachuca and of Zinapécuaro-Ucareo are also thought by some to have been absorbed by the

Toltec state (Spence and Parsons 1972:29; Diehl 1981:290). Tula's own Postclassic Period obsidian industry is less comprehensively understood than that of Classic Period Teotihuacán, but ongoing surveys and excavations at the site have begun to amass a good deal of relevant information.

The small center of Tula Chico was initially settled by local populations that themselves may have been originally formed by Formative Period northern immigrants and Early Classic Teotihuacanos migrants (Healan et al. 1989:239-243). Access to the Pachuca source area was not coincident with the initial Coyotlatelco/Prado-Corral (700-900 C.E.) settlement of Tula at Tula Chico, a mound/plaza complex located 1.5 kilometers northeast of Tula Grande (Tula proper) as artifacts of Zinapécuaro obsidian are common only at occupations relating to this time (Healan et al. 1989:244, 248). There is no evidence for anything other than minimal obsidian processing within this settlement as debitage is extremely rare (Healan et al. 1989:248). Terminal Corral (900-950 C.E.) workshop areas, primarily involved in the production of prismatic blades, were settled along the fringes of Tula and at least one was occupied by craftworkers using locally foreign Mazapa sphere ceramics (Healan et al. 1983). However, between the Terminal Corral (900-950 C.E.) and Tollan (950-1150/1200 C.E.) phases, as Tula Grande came to be established and its civic-ceremonial core elaborated, the city's major obsidian workshop zone was fully incorporated into the city and only a Tollan sphere ceramic complex is evident within its vicinity, further implying the sociocultural incorporation of the lithic working community into the Tula polity (Healan et al. 1989:249). Access to Pachuca obsidian was increasing; it constituted 80% of the obsidian processed within this zone (Healan 1986). Further technological analyses have demonstrated that Pachuca obsidian was imported to the site in the form of percussion macrocores (Healan and Stoutamire 1989:211). Apparently, the manufacture of trilobal and crescent eccentrics was one of the industry's subspecializations (Healan 1989:281; 1986).

By the Tollan phase, Tula covered 13 km^2 and had an estimated population of 60,000 people (Healan et al. 1989:245) supported by a stable agricultural base and possibly including a significant export-oriented craftworking sector that included intensive blade-core reduction (Healan et al. 1983; Healan 1986). Healan et al. (1983) and Healan and Stoutamire (1989) have demonstrated that the primary output object of Tula's lithic workers was the prismatic blade, rather than a core form. According to Santley et al. (1986:127-129), this allowed for tighter control by the Toltec state over its hinterland by restricting the circulation of high quality obsidian to trade in labour intensive and non-recyclable blades. The principal American investigators of the site are, however, more reluctant than their colleagues in assigning either causality to Tula's obsidian industry for the city's growth or in attributing direct control over the Pachuca source area to its administrators (Healan et al. 1989:249). It is apparent though that Tula served as a central force in Early Postclassic Mesoamerican political-economic dynamics (Davies 1977; 1980; Sanders and Webster 1988:539). Its domain of control included the northern Basin of Mexico (while Cholula may have controlled the southern half, Sanders et al. 1979:130) and the Toluca Valley in the southwest (Sanders and Santley 1983), but its sphere of interaction was much more broadly drawn and involved on-going contact with the southern Gulf Coast, parts of the southern Maya lowlands, and possibly even the Mixteca Alta (Diehl 1983). A great deal of this interaction may well have been carried out by Tula's merchants and traders, whose activities are commemorated in the art of the city (Kristan-Graham 1993).

The extent to which these far-reaching interregional relationships influenced the obsidian procurement, production, and distribution systems in operation at the time has not yet been made fully clear. Recently, Healan (1993:452-453) has demonstrated that the scale of the output produced by Tula Grande's blade manufacturing workshops was actually rather small and that their products were probably destined for local and hinterland consumption rather than long-distance commercial or state mediated trade. To explain evidence for a Tula-sponsored trade in Pachuca obsidian with areas as far away as the Maya lowlands, Healan (1993) has suggested that the Toltec state may have been organized as a tributary hegemony, collecting tribute and taxes in the form of prismatic blades from otherwise independent intensive lithic producer communities established nearer to the actual sources of obsidian. Convincing archaeological evidence to support Healan's contention of the existence of such Early Postclassic intensive blade manufacturing communities within the obsidian zones has not yet been offered.

The Triple Alliance: A Tradition Continued?

The circumstances leading to and resulting in the eventual Toltec abandonment of Tula Grande are not yet clear. Ethnohistorical documents detail a climate of internal political unrest and the development of an irreconcilable cleavage between ruling groups that provoked a dispersion of the city's original populace, as well as telling of destructive invasions by a new set of northern immigrants (Davies 1977:346-414). There is some archaeological evidence for ceremonial destruction of certain monumental structures within the city's core by fire, for looting, and for general societal decay (Healan et al. 1989:247). But, clear evidence for a major Aztec Period reoccupation of Tula dates to the beginning of Tula's Palacio phase (1350-1520 C.E.) or the Basin of Mexico's Aztec III phase (1350-1400 C.E.) (Healan et al. 1989:247), slightly after the founding of Tenochtitlán and of Tlatelolco.

Much as the Aztecs themselves considered their heritage as intricately tied to the Toltec past (Davies 1987), it has been suggested that certain aspects of the Toltec state system served as precedents for the structure of Aztec political-economic organization, specifically direct control over major obsidian sources (Sanders and Santley 1983). In actuality, the structure of Central Plateau obsidian procurement, production, and distribution systems of the Late Postclassic Period may have been substantially different from those of the era of either Teotihuacán or of Tula. The Late Aztec period has been characterized as a time in which pre-Aztec economic systems continued to operate and coexist with the new forms of sociopl oitical and economic control the Aztec exerted over many of the small previously autonomous kingdoms of earlier Postclassic central Mexico (Brumfiel 1986:245-255). While in some areas military conquest was pursued and the Aztecs implemented policies of control over local economic resources and foreign trade, in many instances local and regional sociopolitical and economic systems were left intact (Berdan 1986:282-283). Hassig (1985) has described the structure of the Aztec Empire as hegemonic in that it largely refrained from directly intervening in local level processes, save for its implementation of a wide-ranging tribute system.

Thus, the Late Aztec Period (1350-1521 C.E.), during which time the Triple Alliance, a conquest coalition joining the forces of Tenochtitlán, Texcoco, and Tlacopan, was established, witnessed a coexistence of both centralized and regional systems for obsidian procurement and distribution. Increased residential occupation at major source areas was concomitant with a reintensification of exploitation at areas such as Pachuca and Otumba (Charlton and Spence 1982:71). These systems of exploitation, of the Pachuca source area for instance, are thought to have not been directly overseen by the Aztec state; rather, individual or corporate group specialization in obsidian exploitation conditioned the structure of local and regional obsidian marketing. In his assessment of the archaeological data available to evaluate the organization of exchange in Late Postclassic Mesoamerica, Smith (1990) consistently demonstrated the operation of exchange systems beyond the realm and independent of the Triple Alliance's conquest empire. The common occurrence of Aztec sphere ceramics and Pachuca obsidian in Late Postclassic commoner and elite contexts across Mesoamerica and within sites known ethnohistorically to have successfully resisted Aztec imperialism suggests to Smith (1990:163-165) that most Late Postclassic exchange was conducted independently of Aztec state forces and in a free-market forum. In more subtle ways, the structure of the Aztec state may have mediated the wider circulation of obsidian to an extent, as an effect of tribute levies placed on towns local to the major obsidian source areas (Spence 1985:114), but its impact on local and regional markets within the Central Plateau could be characterized as indirect (Berdan 1986:283). Late Postclassic lithic workshops operated at major urban Aztec areas like Tlatelolco (Gonzalez Rul 1979), but also within rural Teotihuacán Valley areas (Spence 1985) and separate Late Postclassic Basin of Mexico state systems (Charlton et al. 1993:158-160), existing largely beyond the exigencies of Aztec 'imperial control'.

In the early Colonial Era, there is some archaeological evidence for the persistence of lithic technologies among, especially, rural populations (Cressey 1974). Sixteenth century ethnohistorical documents provide a wealth of information pertaining to the manufacture of lithic implements (Clark 1989b), their use in warfare (Taube 1991), and their role in the early colonial market and tribute economy (Isaac 1986). Local, regional, and interregional trade in obsidian and obsidian implements were as integral to both imperial and secular economies in the Late Postclassic as they had been in the centuries previous to Aztec rule. With the fall of Tenochtitlán in 1521, certain of these lithic traditions continued. At Cholula, for instance, an obsidian industry flourished as it may have in precontact times (Diehl 1983:164), with both local and interregional production-distribution components. Writing in the later sixteenth century, Durán (1971:129, quoted in Berdan 1986:281) stated: "Today the natives of Cholula continue their trade and commerce with different merchandise, trading through the most remote and distant parts of the land,...all along those coasts and mines, with their loads of peddlers' trinkets, just as they did in ancient times." Thus, Cholula can be seen as one of many Central Plateau centers that maintained some degree of economic independence from both Aztec and Colonial forces alike.

The foregoing section was meant to serve as a review of the various theories developed to account for the structural organization of obsidian exploitation systems on the Central Plateau through time. The focus thus far has been on how such models are developed from the perspective of research conducted at those sites, Teotihuacán, Tula, and certain Aztec cities, that are proposed to have been the capitals of control over various aspects of obsidian exploitation systems. As Torrence (1986:48) has demonstrated, control over valuable resources and trade in products from them in the form of direct prevention of access to the raw material sources of these commodities, is critical to the establishment of a monopoly over such resources. Material and archaeologically resilient correlates of direct control, however, are not always evident in all instances of restriction to access at raw material sources (Torrence 1986:84-85). Yet, as so many of the theories forwarded to explain the formation of such masterdom posit the notion of direct control over raw material sources as a starting point for the subsequent elaboration of monopolistic obsidian exploitation systems, it should serve us well to examine whether or not there is evidence at these major Central Plateau obsidian sources to substantiate such claims.

Recent Research at Major Central Plateau Obsidian Source Areas

Obsidian, the raw material most suited to blade manufacture because of its internal homogeneity, is a naturally occurring volcanic glass of a highly localized natural distribution in the New World. In Mesoamerica, it is presently known to have formed and to have been mined in any great volume at only two broad regions of past volcanic activity in areas of highland Guatemala, Honduras, and El Salvador and of Mexico (Cobean et al. 1991:69). Masses of obsidian for lithic reduction would have been available to ancient Mesoamericans in three forms - subsurface veins, outcropping layers and water borne nodules or cobbles.

The following discussion of recent research at Central Plateau obsidian source areas is not meant to be preclusionary; while I have chosen to describe in most detail research conducted at those obsidian sources of the Central Plateau that most likely supplied Cholula's stoneworkers with their base materials, this selection process is near equally reflective of the spotty state of research at Mesoamerican obsidian sources in general. Although the study of lithic implement production, distribution, and consumption systems has been a concern in archaeological studies of past economic relationships for well over several decades, there is a distinct bias in Mesoamerican studies of this nature towards a more comprehensive examination of the structure of these systems from the producer/consumer perspective rather than that of the original procurement situation (e.g. Spence 1981; Pires-Ferreira 1975; Boksenbaum et al. 1987).

In a recent survey and neutron-activation trace-element analysis of lithic artifacts from a number of Mesoamerican sites, Cobean et al. (1991) identify twenty-five isolable chemical signatures and thus demonstrate the prehispanic exploitation of at least that many distinct obsidian sources of the Mesoamerican landscape. Of these twenty-five obsidian source deposits, a number of Mexican ones were identified as having been more intensively exploited and their raw materials having been circulated more widely and consistently over time. These major obsidian sources of Mexico include Sierra de Pachuca, Otumba, Tulancingo, El Paredón, Zinapécuaro-Ucareo, Pico de Orizaba, Guadalupe Victoria, La Joya, Teuchitlán, Zaragoza-Oyameles, and Altotonga.

Perhaps the most familiar and widely reported of the central Mexican obsidians is the translucent green Pachuca material of the Sierra de Pachuca source area; the attractiveness and high quality of Pachuca obsidian is still recognized today by modern flintknappers and souvenir-seeking tourists alike (Clark 1978). In their examinations of the Pachuca source area, Charlton and Spence (1982:11-29, 21-27) report that obsidian deposits occur as both subsurface flows and in nodule form along streambeds. They and López Aguilar et al. (1989:194) concur that evidence for the exploitation of these deposits is found in the form of both deep mine shafts and more shallow quarry pits that date to Late Postclassic/Late Aztec times. In their survey of the Pachuca area, Charlton and Spence were able to identify and examine a number of localities where evidence for resource exploitation could be found. One such area of focused research, that of the Cruz del Milagro locality, bore evidence of mining operations so extensive and formally organized spatially (Spence and Parsons 1972), that the authors concluded their exploitation to have been undertaken through at least large-scale cooperative participation networks if not a state organized mechanism (Charlton and Spence 1982:24). López Aguilar et al. (1989) also inferred a level of marked organizational complexity at the Pachuca mines where they believe they can identify obsidian processing activity zonation. Obsidian processing at the Cruz del Milagro quarries was focused on macrocore production, although unifacial scrapers and bifacial blanks were also manufactured in lesser quantities. Within the Cruz del Milagro locality, two other smaller-scale obsidian reduction areas have been reported. One, known as Workshop 15, was dated by the authors to the Middle-Late Formative Period by an examination of artifact morphologies (Spence and Parsons 1972:17), a method of relative dating not well developed for lithic assemblages in Central Mexico. At a second manufacturing zone, named Workshop 21, some Middle Horizon and Aztec sherds were found (Spence and Parsons 1972:21). Otherwise, throughout the Cruz del Milagro locality, only Aztec-era sherds were recovered. From this scant evidence, Charlton and Spence (1982:26-27) conclude that while exploitation of this zone of the Pachuca source area began in the Middle

Formative Period and continued through the Classic "...presumably under the direct control of Teotihuacán" (1982:26), the period of its most extensive exploitation occurred in the Postclassic Period under Aztec rule. Within the Barranca de Iztala locality of the Pachuca source area, Charlton and Spence (1982:27-28) identified at least three lithic processing areas. Based again on artifact morphology, one such area was dated to the Formative Period; a second multicomponent zone was deemed to have been occupied in the Middle and Late Formative, Classic, and Late Postclassic periods; and, a third area was believed to have been utilized in the Classic and Early Aztec periods.

Another recent study of the Sierra de Pachuca obsidian source (López Aguilar et al. 1989), does not present any information concerning evidence for a Teotihuacán presence in the area; the only securely dated artifacts that have yet been discussed in the literature are Aztec period ceramic sherds, although Spence et al. (1984:98) mention the "recent discovery by Terrance Stocker of a Teotihuacán sherd in an Aztec obsidian waste heap in the Navajas source region" which, "indicates their [Teotihuacanos] presence there". However, Spence et al. (1984:98) still concede that no Teotihuacán period mining has yet been identified in the area. Apparently, Cruz Antillon (1989:63, cited in Healan 1993:454) has reported the retrieval of some Tula-related sherds in association with small-scale mines within the Pachuca source area.

Pachuca obsidian has been described as encompassing a "golden green" (Clark 1978:44; Santley 1984:51) and "bottle green" (Clark 1978:44; Clark and Lee 1984:242) range of appearance; López Aguilar et al. (1989:194) also mention the existence, although rare, of grey and black obsidian in the area. Green Pachuca obsidian is quite distinct and easily identifiable.

A second source area also closely associated with the Teotihuacán state is Otumba, which lies some 20 kilometers east of the ancient city's core (Cobean et al. 1991:75). Located in the Valley of Teotihuacán and associated with Cerro Soltepec and nearby streambeds (particularly Barranca de los Estes, see Charlton 1978), the Otumba source area has been subject to ongoing research (Charlton 1978), but very few recent reports have been published (López Aguilar and Calleja 1989). One reported survey of some localities in the area conducted by Charlton and Spence (1982:39-50), found evidence of both shallow pits and mines in and around which biface production debris and Late Aztec ceramics were found. In his notes concerning an informal visit to the source area, Clark (1979) also reports that most of the lithic artifacts within the vicinity are associated with biface production.

Otumba obsidian is said to vary from transparent grey, grainy/streaked, opaque grey, meca (López Aguilar and Calleja 1989) to a "clear, fine grey" (Charlton 1978:1236, note 33). It has also been described as "milky grey" and ranging from "nearly transparent to virtually opaque" (García Chávez et al. 1990:227), as grey-black and black (Charlton and Spence 1982:40), and as a grainy and opaque banded grey (Clark 1978). Healan and Stoutamire (1989:211) maintain that Otumba obsidian can be distinguished from other grey obsidian types due to its distinctive brown hue or cast.

The Tulancingo obsidian source of Hidalgo, located a mere twenty kilometers east of the core of the Sierra de Pachuca source, generated a green-hued opaque black or grey obsidian, commonly referred to as Pizzarín obsidian (Charlton and Spence 1982; Spence 1984:94), that is further distinguishable from green Pachuca obsidian by its coarseness and unsuitability for prismatic blade production (Fraunfelter 1972; Spence 1984:94; Cobean et al. 1991:74).

Huapalcalco, a major Late Formative-Late Classic Period site in the Tulancingo Valley replete with obsidian workshops, is located on the northern edge of the Tulancingo obsidian source area and is believed to have controlled its exploitation upon the decline of Teotihuacán (Charlton and Spence 1982:34).

The El Paredón obsidian deposit is a locality within the Tecocomulco source area of Hidalgo (Charlton et al. 1978; Charlton and Spence 1982:35) which figured substantially in the postulated joint control by Teotihuacán of the Pachuca, Otumba, and related source deposits and whose materials were circulated widely (Charlton 1984). Paredón obsidian is described as 'a fine and clear gray' (Charlton 1984:42).

Through recent research at the obsidian source area of Zinapécuaro-Ucareo (referred to by Healan as 'Ucareo-Zinapécuaro') in Michoacán, Healan (n.d.) has identified three chemically related, but distinct obsidian flow systems that are now known as Zinapécuaro, Ucareo, and Cruz Negra. While Healan has identified quarries at the Zinapécuaro source area, he contends that obsidian of this type was used only locally. The history of exploitation of the Cruz Negra source is even less clearly understood, as no lithic artifacts, processing debitage or debris have yet been recovered from within its immediate vicinity. In Healan's estimation, of the three source deposits, the most extensively utilized was Ucareo where both open shallow pits and trench quarries and mounds of debìtage from blade-core production can be observed. Intensive exploitation of the Zinapécuaro-Ucareo source area has been dated to the Late Classic-Epiclassic (Healan 1993:454). Healan has also reported that there are several Epiclassic Period settlements in the Ucareo area within which workshop deposits are frequent. Healan views the history of obsidian exploitation at Ucareo as being of a long duration with intermittent periods of centralized organization of raw material extraction and, possibly, initial processing.

Raw materials and products from La Joya, Jalisco were also widely circulated in the Early Postclassic, although exploitation of this Tequila Volcano source deposit can be traced to the Middle Classic (Weigand and Spence 1989). Weigand and Spence have observed that, especially in the Postclassic, the prismatic blade producers of nearby Postclassic Las Cuevas-Atitlán relied on the mining and quarrying of one particular flow of the nearby La Joya source for raw material that was fashioned into implements to be traded widely. The extent of the circulation of these implements through inter-regional trade is believed to be reflected in the high volume and variety of foreign, imported goods at the site itself. The raw material of Teuchitlán, Jalisco, another west Mexican obsidian source, was exploited extensively by stone tool producers from the nearby Classic period site of Guachimontón, one of prehispanic west Mexico's most complex settlements (Weigand and Spence 1982; Cobean et al. 1991:75).

Pico de Orizaba and Guadalupe Victoria are separate flow deposits of obsidian related to the Orizaba volcano which borders two of central Mexico's modern states; the former flow lies in Veracruz, while the latter is claimed by Puebla. Guadalupe Victoria obsidian occurs as cobbles in barrancas and streambeds around the base of the volcano (Cobean et al. 1991:72). Although no mine shafts or heavy accumulations of lithic debitage have been found in the vicinity, Stocker and Cobean (1984) report that lithic debris can be found scattered throughout the area. Guadalupe Victoria obsidian is believed to have been traded widely in prehispanic times, particularly in the Formative Period (Cobean et. al 1991:73). Guadalupe Victoria obsidian has been described as cloudy grey with dark gray or black banding (Stocker and Cobean 1984), as semi-transparent (Pires-Ferreira 1975:25), and as possessing a "...cloudy grey banded color with a slightly irregular surface texture owing to tiny crystalline inclusions" (Cobean et al. 1991:85). Based on her own replicative studies, Pires-Ferreira has also claimed that Guadalupe Victoria obsidian is too brittle for blade-core technology (1975:25), although her experiments were never described in published form.

At the Pico de Orizaba source area, Stocker and Cobean (1984) conducted a series of surveys and excavations at the Valle del Ixtetal mines located near the Middle Formative and Late Postclassic site of Calcahualco where prismatic blade workshops have been found and where Pico de Orizaba obsidian is presumed to have been the primary material utilized in this lithic industry (1984:86). To date, however, only Aztec Period sherds have been found in the source area. Evidence of Aztec period mining points towards a highly organized system of exploitation that included the construction of major subterranean shafts and the stockpiling of blocks of mined raw material. Other artifacts most commonly associated with these Aztec period workings included large blade cores (macrocores), and smaller blade cores (large polyhedral cores), some formal blade-core debitage, and a high volume of angular fragments. While evidence for intensive exploitation of the source area itself is largely restricted to the Late Postclassic Period, Pico de Orizaba obsidian is considered to have been among the most widely circulated of the obsidians throughout prehispanic times (Cobean et al. 1991:72). Stocker and Cobean (1984) describe Valle del Ixtetal obsidian as translucent grey with crystalline inclusions.

The Zaragoza and Oyameles sources are geologically related and span 30 kilometers (Cobean et al. 1991:7). Located in eastern Puebla, these sources are thought to have been exploited throughout the Formative-Postclassic periods (Zeitlin 1982; Cobean et al. 1991:73). Quarrying at these sources seems to have been most intensive in the Classic and Postclassic periods has been associated with the prehispanic settlement of nearby Caltonac (Ferriz 1985). Obsidian from these sources has been described as, "...black and lustrous or light grey and dull...[or] dark grey with light streaks" (Ferriz 1985:367).

While obsidian from the source of Altotonga in Veracruz is known to have been circulated on the Central Plateau, especially in Formative times (Pires-Ferreira 1975; Zeitlin and Heimbuch 1978; Boksenbaum et al. 1987), neither mines nor workshops dating to the prehispanic era have yet been identified in its vicinity (Cobean et al. 1991:74). The Altotonga source area lies a mere 30 kilometers away from the Zaragoza-Oyameles source area and there is some debate over whether or not the two should be considered distinct from one another (Ferriz 1985).

Having considered the evidence for obsidian exploitation available at both producer loci and raw material sources, little can be said about the extent of obsidian exploitation beyond these areas except, of course, that it must have occurred. The most widely cited evidence used to support theories about the structure of Teotihuacán's, Tula's, and the Triple Alliance's obsidian industries is derived from sites where the consumption of implements that are presumed to have been the products of these industries has been documented. What follows is a brief review of obsidian consumption-related studies conducted in and around the Central Plateau and is meant to provide a wider perspective on the secondary processing and the consumption of obsidian.

Patterns of Classic Through Colonial Period Importation and Consumption of Obsidian on the Central Plateau

A number of studies of consumer sites for Central Plateau obsidian have been conducted and are reviewed here to provide a fuller picture of Classic through Colonial Period patterns of obsidian exploitation. Most of the following studies assume that evidence for the consumption of large polyhedral cores and finished artifacts manufactured from obsidian deposits believed to be under the control of the states of Teotihuacán, Tula, and/or the Triple Alliance, including the Pachuca, Otumba, and Zinapécuaro-Ucareo source deposits, provides self-evident, material manifestation of the operation of those states' obsidian production and distribution systems. This assumption is evaluated in a later chapter. Here I focus on more recent studies of Central Plateau obsidian consumer contexts in the Terminal Formative through Colonial eras.[1]

Late Formative-Late Classic Period Distribution-Consumption Patterns

One of the better documented lithic exploitation systems of the Central Plateau is that centered at Tepeapulco (Charlton 1978, 1984). Beginning in the Late Formative Period, local populations around Tepeapulco began an intensive and extensive effort to procure, reduce, and transport lithic implements formed from the obsidian of three major sources: Pachuca, Otumba, and Paredón. During the Middle Classic, the Tepeapulco obsidian

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[1]See Charlton and Spence 1982 for various earlier references to sourced consumer collections. For detailed studies of obsidian consumption in Formative Mesoamerica involving Valley of Mexico obsidians, refer to Pires-Ferreira 1975, Boksenbaum et al. 1987, and Elam 1993. For Western Mexico refer to Spence et al. n.d. For the Maya area please see Moholy-Nagy et. al. 1984 and Moholy-Nagy and Nelson 1990.

industry may have been subsumed by the Teotihuacán state (Spence 1984:104-105). The only known hiatus of this system occurred during the Early Postclassic as the Toltec capital of Tula reached its height of influence.

Within Middle Classic Period Basin of Mexico obsidian consumer sites, artifacts of Pachuca obsidian predominate over those of other varieties of obsidian (Tolstoy 1971; Iceland 1989). Santley et al. (1986) have visually sourced artifacts from the lithic collections of four Middle Classic rural communities in the Teotihuacán Valley. Their results indicate that while most of the obsidian used was from the Pachuca deposits (74.2% of the total collection), these communities both imported only crudely processed blocks of Pachuca obsidian and independently collected nodules of obsidian from nearby barrancas, and may even have scavenged previously quarried obsidian on occasion (Santley et al. 1986:120-122). Patterns in the comparative proportions of different categories of blade-core technology products and debitage among the lithic assemblages of these sites suggest a lack of reliance among these rural communities upon the endeavors and/or products of Teotihuacán's urban obsidian workshops, as they pursued independent procurement strategies that may have involved scavenging of previously discarded lithic implements (Santley et al. 1986:120). Santley et al. also argue for the first occurence of platform grinding in the region at these rural sites and suggest that this further indicates that access to or availability of these materials was in some way limited for rural area residents who accordingly economized those specimens they were able to acquire.

In the region of Morelos, surveys have been conducted in the Rio Amatzinac-Tenango and Rio Chalma-Amacusac valleys through larger research projects (Grove et al. 1976). Middle-Terminal Formative settlement patterns indicate increasing nucleation of populations on hilltop sites. The lithic collections of two such Late Formative sites, Cuautlita and Coatlan del Rio, have been analyzed (Hirth 1984). Of a sample of 418 obsidian specimens from these sites, the Zinapécuaro-Ucareo source in Michoacán predominates, specimens from Otumba account for 41.5%, and artifacts from the Pachuca source area amount to 1% of the sample (Hirth 1984:136-141; Table 6.1, p. 137). Technological evidence suggests that all obsidian entered the sites as either fully prepared polyhedral cores or as finished tools. Hirth takes these patterns of consumption, situated within the context of broader settlement patterns, to indicate that obsidian was most readily available to the administrative powers of large regional centers where these materials were pooled for later redistribution (Hirth 1984:140-141). According to Hirth (1984:140), importation of obsidian from distant sources was based on mutual exchange relationships between regional elites. Hirth also suggests that these communities relied on Cuicuilco for their obsidian until its decline upon which point they turned to the Teotihuacán obsidian distribution system to satisfy their already established need for high quality obsidian (1984:144-146). Hirth has not yet reported on Middle Classic consumption patterns for Morelos, but at the Late Classic site of Miahuatlán, over 80% of the obsidian was from the Pachuca and Otumba sources (Hirth 1989:78, Table 1).

In the Tehuacán Valley surveys conducted by Drennan et al. (Drennan and Novack 1984; Drennan et al. 1990), earlier analyses had indicated that participation in interregional trade with the Valley of Mexico in Formative times was pursued on an individual community basis with elites most heavily involved in structuring and carrying out these activities (Drennan and Novack 1984). After a more thorough analysis of lithic collections from three quite different types of sites in the region, more complex patterns of obsidian consumption were identified (Drennan et al. 1990). Materials from all the major Central Plateau obsidian sources were represented in the sites' lithic collections, and the authors grouped these into Teotihuacán-related ones, which included Pachuca, Otumba, and Tulancingo, and a set of Puebla/Veracruz sources which they believe were not under Teotihuacán control (1990:189-190), including Zaragoza-Oyameles, Altotonga, Guadalupe-Victoria, and Pico de Orizaba. At the Late Terminal regional supracenter of Quachilco, the distribution of obsidian from the central Mexican sources varied greatly by intrasite zone, amounting, for instance, to 40% of the sample in one yet only 1% at another. Through their technological analysis, the authors determined that while Teotihuacán-related materials were imported to Quachilco as finished blades, Puebla/Veracruz source materials entered the site as prepared cores. At the Early-Middle Classic hilltop site of Cuayucatepec, Teotihuacán-related sources comprised only 10-30% of the sample throughout the site, while most of the other specimens were derived from the Zaragoza-Oyameles source. Early-Middle Classic La Nopalera is representative of other anomalous sites in the authors' research area in that, while there was little public architecture and no indication of strategic defensive positioning, a very high frequency of true Thin Orange ceramics occurred. The pattern of obsidian distribution at La Nopalera in comparison with the Valley's other site types was equally incongruous. Here Teotihuacán-related sources dominated, and Zaragoza-Oyameles material was the second most common of the obsidian types. No cores of any obsidian type were recovered. As previously mentioned, these patterns are understood by the authors to represent the simultaneous operation of two separate long-distance obsidian distribution systems: one focused on the importation, processing and consumption of Teotihuacán-related materials, and the other exploiting Puebla/Veracruz sources. To account for the discrepancy between the assemblages of La Nopalera-type sites and those of other sites of the Valley in the frequency of Teotihuacán related source materials and debitage categories represented, the authors suggest that La Nopalera may have been one of a few Teotihuacán outposts inhabited by Teotihuacanos serving their capital as administrators overseeing trade from the Teotihuacán Valley to more distant areas such as the Valley of Oaxaca, the south Gulf Coast and the Maya lowlands. Contra Santley, however, the authors stipulate that the objective of this long-distance exchange was not capital gain, but rather that it was geared towards the acquisition of prestige goods to satisfy elite demand for items for conspicuous consumption back at the capital.

At the Middle-Late Classic site of Matacapan in the obsidian impoverished Tuxtlas, Santley (1989a) has demonstrated ongoing contact between residents of this site and communities in the central highlands as reflected in architectural styles, mortuary patterns, and artifact assemblages. At Matacapan, 90% of the Middle Classic lithic collection is comprised of Zaragoza-Oyameles obsidian reflecting a wide range of blade-core product and debitage categories, while Pachuca obsidian amounted to a mere 6% of the collection and is represented only by the products and byproducts of fully prepared pressure core reduction. In the Late Classic collection, evidence for the importation of Zaragoza obsidian in the form of percussion macrocores persists, whereas Pachuca obsidian seemingly entered the site as finished blades only and was less equitably distributed among the different segments of society (1989b). Santley has used this pattern of obsidian distribution, Matacapan's reliance on the Zaragoza-Oyameles source, to contend that this source too was dominated by the Teotihuacán state (1989a:145-146).

Elsewhere along the Gulf Coast, in the Mixtequilla region of southcentral Veracruz where the development of the Teotihuacán state is seen to have had little impact on internal sociopolitical events (Stark et al. 1992:224-225), a clear reorientation of lithic import economy from a Formative Period reliance on obsidian from the Guadalupe-Victoria and Pico de Orizaba sources to a near complete dependence on materials from the Zaragoza-Oyameles source of Puebla that continued well into the Late Classic is also evident. Citing evidence for a continued predominance of Zaragoza-Oyameles obsidian at their study sites even after the decline of Teotihuacán, Stark et al. (1992:232-234) have argued, contra Santley (1989b), that this Zaragoza-Oyameles obsidian distribution network may have operated independently of direct control by the Teotihuacán state.

From the backdirt of excavations at Cholula, 89 obsidian specimens were recovered and subjected to geochemical analysis (Hester et al 1982). This collection is believed to date to the Classic Period, although the authors of the study caution against accepting their results as in any way definitive of Classic Period obsidian consumption patterns. Fifty-four percent of the sample was comprised of specimens from Zaragoza-Oyameles, 18% of Pachuca material, 7.9% was of Guadalupe-Victoria obsidian (Hester et al. 1982) and 15% of the specimens were of Altotonga obsidian (Zeitlin 1982:269). While patterns derived from such a small and poorly temporally defined sample cannot be accepted as in any way conclusive, the complete absence of obsidian specimens manufactured from Otumba materials is interesting as the Otumba source lies closer to Cholula than does any other source area. Zeitlin (1982:269) has even proposed that the pattern of lithic procurement suggested by the geochemical analysis might indicate that Classic Period Cholula had closer political and economic links to El Tajín than it did to Teotihuacán.

How do these patterns of lithic exploitation and consumption compare to those found in areas farther afield? In a recent sampling of obsidian from the Cuicatlán Cañada, Drennan et al. (1990) found some interesting changes in Formative procurement patterns when compared with those of the Classic Period. In the Early-Middle Formative Period Cañada, patterns of obsidian consumption are diverse, but by the Terminal Formative a distinct surge in Teotihuacán-related sources is evident; this increased reliance on the central Mexican sources, however, declines in the Classic Period (Drennan et al. 1990:195). Among Valley of Oaxaca sites (Finsten 1982:204-210; Drennan et al. 1990:196), Pachuca obsidian accounts for roughly 30% of the obsidian specimens throughout the Early Classic through Postclassic periods, even after Teotihuacán's decline (Drennan et al 1990:196). A recent analysis of the lithic assemblages of four sites within Pacific Coastal Oaxaca's Lower Rio Verde region demonstrated a dramatic increase in the importation to the area of Pachuca obsidian finished prismatic blades in the Early Classic relative to the Formative Period (Joyce et al. 1995). At Early Classic sites along the Soconusco coast, Pachuca obsidian amounted to 20% of the chipped stone assemblage (Clark et al. 1989:272). Among Early Classic sites in the Maya Lowlands, up to 15% of all obsidian sampled derives from the Otumba and Pachuca source deposits while the rest is of Guatemalan origin (Drennan et al 1990:194).

Thus, from the perspective of consumer localities, rather than major production centers, the pattern of Formative-Terminal Classic obsidian distribution is not nearly as straightforward as otherwise presented. Indeed, there may have been significant challenges to Teotihuacán's presumed ' dual domination' (or 'triple', if one accepts Santley's claims of direct control by the Teotihuacán state over the Pachuca, Otumba, *and* Zaragoza-Oyameles obsidian source areas) of obsidian procurement and distribution on the Central Plateau and over certain long-distance exchange systems. There is, for instance, substantial evidence from both the Tehuacán Valley and the southern Gulf Coast that other independent obsidian exploitation systems may have coexisted with that postulated to have been controlled by Teotihuacán.

Epiclassic Period Distribution-Consumption Patterns

Sorensen et al (1989) have analyzed lithic collections from five workshop loci at Cerro Xochicalco that date to the Epiclassic Period. Xochicalco is located in western Morelos and is one of the prime independent urban centers to have emerged in the Epiclassic from a long-standing Classic Period tradition of intensive interaction between central Mexico and autonomous polities of parts of Morelos (Hirth 1984). All the workshops identified specialized in prismatic blade and blade-related artifact production and imported large polyhedral cores that were already prepared for pressure blade removal. While four of the workshops were located on platforms at a terraced residential area near the site's ceremonial core, the fifth workshop covered $2500 m^2$ and contained evidence that a part of it had once also served as a storage area for imported cores, further evidence for a centralized pooling and redistribution mechanism. While Pachuca obsidian was rare, of the samples of grey obsidian from these excavations subjected to chemical analysis, 85% of the specimens were from Zinapécuaro-Ucareo obsidian. Two percent of the sample consisted of Otumba materials and another 2% of specimens came from the Metzquititlán source. The authors concluded that Epiclassic production at Xochicalco was centered on local production for local consumption, yet involved some unspecified mechanism for access to semi-processed and raw material from sources some distance away. In a later paper, Hirth (1989) compared the differences in obsidian consumption patterns for Late Classic and Epiclassic communities in western Morelos. At the Late Classic site of Miahuatlán, over 80% of the obsidian at the site derived from Pachuca and Otumba source areas (1989:78, Table 1). As analysis of obsidian specimens from Xochicalco demonstrates, by the Epiclassic over 85% of the obsidian reaching the site was imported from the Zinapécuaro-Ucareo source in Michoacán, which is further afield than either the Pachuca or Otumba source areas. Central Mexican sources are represented by 13% of the sample: a high rate, but quite distinct from the earlier Late Classic Period pattern of consumption. According to Hirth, the Zinapécuaro-Ucareo obsidian, "...probably reached western Morelos by circuitous trade routes which bypassed the western edge of the Valley of Mexico" (1989:79), and is but one representation of an increasing polarization between the developing polity of Xochicalco and Teotihuacán (1989:79).

Prior to major settlement at Tula Grande, residents of Coyotlatelco hilltop sites within the Tula region concentrated on the exploitation of local chert, basalt, and rhyolite resources for their lithic technologies and implements of obsidian are noted as having been very rare (Mastache and Cobean 1989:56). When obsidian is found within the Coyotlatelco communities, it usually derives from Zinapécuaro-Ucareo. Mastache and Cobean suggest that these politically and economically independent hilltop settlements were founded by immigrants to the area who did not have the same ties to Teotihuacán as did the region's Classic period inhabitants when the Tula region was directly incorporated into Teotihuacán's hinterland (1989:64).

A lithic collection dating to the Epiclassic has been analyzed from Azcapotzalco, a settlement on the western shore of Lake Texcoco with a long history of habitation (García-Chávez et al. 1990). Six hundred and twelve lithic artifacts, 98.7% of them obsidian, have been excavated from Metepec-Coyotlatelco contexts at the site. Only 10.6% of the obsidian derives from the Pachuca source area, while two-thirds of the collection is comprised of Zinapécuaro-Ucareo obsidian. Otumba obsidian accounts for less than one-third of the collection. Through technological analysis of the collection materials, the authors determined that Zinapécuaro-Ucareo obsidian was imported in the form of large polyhedral cores, Otumba obsidian likely arrived as both prepared cores and finished implements, whereas Pachuca obsidian entered the site only in the form of finished implements.

There does appear to be a clear transformation in obsidian exploitation procurement and exchange systems in the Epiclassic to a much greater and wider reliance on the Michoacán source of Zinapécuaro-Ucareo. However, thus far, little work has been done to elaborate the context of this transformation. Pollard's continued research on the origins and development of the Tarascan state in central Michoacán (Pollard 1991, 1993, n.d; Pollard and Vogel 1993) may provide some information relevant for these developments. Excavations at sites in the Lake Pátzcuaro Basin have demonstrated the existence of several coexisting autonomous chiefdoms prior to the unification of a Tarascan empire in the Postclassic period (Pollard 1993). During an earlier period of complex societal developments, Michoacán's regional elites shared a common cultural tradition and participated extensively in the macroregional interaction spheres of the time. Prior to the formation of the Tarascan state, Pachuca and Zinapécuaro-Ucareo obsidian were rare at Lake Pátzcuaro settlements; instead, area inhabitants relied on local basalt and obsidian for their lithic technology (Pollard n.d.:4). At c. 700-900 C.E., obsidian mines within the Zinapécuaro-Ucareo source area expanded as must have the volume of materials extracted, processed, and circulated from it, yet a centralized, regional Michoacán authority still did not exist (Pollard n.d.:5). Zinapécuaro-Ucareo materials are much more common in post-Tarascan state contexts within the region (Pollard 1993:228-241). At Tzintzuntzan, the Late Postclassic imperial capital of the Tarascan state, lithic workshops are numerous and evidence of their past operation is dense (Pollard 1993:43-45). Tzintzuntzan's lithic specialists acquired their materials, over 70% of it consisting of Zinapécuaro-Ucareo obsidian (Pollard 1993:229), as macrocores and small nodules that they fashioned into prismatic blades, projectile points, scrapers and other implements. Thus, the Tarascan state may have had some hand in structuring and developing the movement of Zinapécuaro-Ucareo materials in the Middle or Late Postclassic Period, but the extent to which its ancestral communities were involved in the earlier mass Epiclassic exploitation of the resource area is unknown.

Postclassic Period Distribution-Consumption Patterns

The compositions of lithic assemblages from Early Postclassic Basin of Mexico sites are not commonly reported. Parsons et al. (1982, referred to in Santley et al. 1986:122) indicate that Early Postclassic Basin of Mexico sites have a much lower proportion of Pachuca obsidian than do the Basin's Late Postclassic sites. Early Aztec, or Middle Postclassic, sites in the Basin's Chalco region (Parsons et al. 1982, referred to in Charlton and Spence 1982:69) and Huexotla area (Brumfiel 1976) also seem to have had access to higher proportions of Pachuca obsidian than local Early Postclassic communities. Charlton and Spence (1982:70) argue for the absence of any centralized, regulated procurement system for the acquisition of central Mexican obsidian during the Early Postclassic; instead, they suggest that procurement may have been conducted by consumer-organized and directed expeditions to the source areas. Elsewhere (García Chávez et al. 1990:228), Middle-Late Postclassic Basin of Mexico lithic assemblages have been characterized as consisting of 65%-90% Pachuca obsidian.

Excavations and analyses of a workshop zone from Tula have also been conducted (Healan et al. 1983; Healan et al. 1986; Kerley 1989). A linear arrangement of residential compounds and associated workshops lying atop two ridges and a refuse dump in between these mounds were excavated and vast evidence for prismatic blade core reduction and blade and blade artifact production was found. These areas represent a highly specialized production zone with almost 83% of the sample comprised of Pachuca obsidian (Healan et al 1983:137). According to the authors' visual identifications, the rest of the collection consists of Zinapécuaro-Ucareo obsidian (Healan 1986:142). The reliance on Pachuca obsidian is more pronounced in the more recent deposits and Healan (1986:149) has noted that this pattern may represent a temporally defined shift in resource procurement strategies for Tula's lithic specialists. Healan (1986) and Healan et al. (1989) have since suggested that this zone was the locus of a cottage industry formed of corporate kin groups, allied to work in the domestic context, who possibly were originally immigrants from the Basin of Mexico or the Valley of Teotihuacán and were among the earliest founders of the site of Tula. The site's investigators had refrained from stipulating the degree of state involvement in this industry (Healan et al. 1989:249). But more recently, Healan (1993) has suggested that finished obsidian implements entered the Toltec state's export sector through the state's collection of tribute from subject lithic producing communities local to obsidian source areas. Tula's craftworkers, he has suggested, received their obsidian cores from these communities through commercial exchange and produced blades for consumers within Tula itself and largely free of state involvement.

Santley et al. (1986:122) have discussed the compositions of rural Early Postclassic sites around Tula. Although they do not provide a verifiable reference for their conclusions, the authors state that agricultural villages around Tula proper consumed Pachuca obsidian in proportions identical to those of Tula's lithic specialists, but stipulate that Pachuca obsidian reached these rural sites primarily in blade form rather than as cores. Apparently, rural communities around Tula depended on the center's obsidian industry for their lithic necessities.

At two small villages in western Morelos, Sorensen et al. (1989) report the excavation of two Late Postclassic workshops, both associated with civic-ceremonial architecture, suggesting to the investigators that elite forces oversaw obsidian procurement for the community. The lithic collections from both these workshops consisted of Pachuca obsidian almost exclusively. Zinapécuaro-Ucareo obsidian was also present. Technological evidence indicated to the investigators that most of the obsidian was imported in unaltered cobble form which is, as was discussed above, a pattern of obsidian importation quite different from that reported for Epiclassic western Morelos communities.

At the Late Postclassic site of Xico in the southeastern part of the Basin of Mexico, Brumfiel (1986) found that Pachuca obsidian comprised 35% of the lithic assemblage and was imported in the form of highly refined pressure cores. Otumba obsidian was most commonly used in a flake-core industry. Zinapécuaro-Ucareo, Zaragoza, and Pico de Orizaba obsidian entered the site in smaller quantities, sometimes as finished blades. Chert and basalt were also important in Xico's lithic reduction system. Brumfiel's analysis has also provided some indication that rates of both Pachuca obsidian and of blades were somewhat lower in Middle Postclassic, or Early Aztec times when local chert and Otumba obsidian were utilized much more commonly (1986:266-267, Tables 6 and 7).

Spence (1985) has reported on surveys of Middle Postclassic and Late Postclassic rural Teotihuacán Valley lithic production loci. It is thought that these workshops supplied both local and regional markets with prismatic cores, blades, and various unifacial and bifacial implements. Pachuca obsidian amounted to over 90% of the lithic assemblages of all the analyzed workshop sites; comparatively, Pachuca obsidian rarely amounted to less than 80% of non-workshop lithic deposits surveyed in the area (Spence 1985:104, Table 5). In Spence's opinion, by the later phase at least some of these materials were being obtained through a wider marketplace, but the earlier phase specialists may have employed independent procurement strategies for the acquisition of raw material (1985:113-115).

Late Postclassic Aztec obsidian workshops have been excavated at the site of Tlatelolco and comparably high percentages of Pachuca obsidian have been found (González Rul 1979); detailed information from consumer contexts is not reported.

High volume importation of Pachuca obsidian is characteristic of lithic components of several wider late Postclassic Mesoamerican economies including that of the Soconusco region in Chiapas (Clark et al. 1989), the Tehuantepec Isthmus (Zeitlin 1982) and the Mixtequilla, Veracruz region of the south-central Gulf Coast (Stark and Heller 1991:19; Stark et al. 1992; Curet et al. 1994). In southeast Mesoamerica, the importation of Pachuca obsidian occurred at a relatively low rate and is most common in elite and ritual contexts (Smith 1990:157-158).

Early Colonial Period Distribution-Consumption Patterns

Cressey (1974) has analyzed the lithic assemblages of three Colonial era rural communities in the Otumba area of the Teotihuacán Valley. She reports that Pachuca obsidian predominates, but there may have been a shift to a greater exploitation of grey (probably Otumba) material for some communities in the seventeenth century (1974:77, Tables 11-13). While prismatic blades and unretouched flakes were the most frequent artifacts at all three sites, cores were extremely rare, ranging from .54% to 2.2% of each of the lithic assemblage compositions (1974:69, Table 6). Cressey's data would indicate that the only substantial lithic reduction to have occurred at these sites was that of a simple flake-core technology (1974:68, Table 5), but this pattern may be more reflective of the author's limited technological analysis rather than of the activities pursued by the sites' inhabitants. Regardless, Cressey's research clearly demonstrates the persistence of lithic technology in the early colonial era.

Discussion

Obviously, the entire universe of Central Plateau obsidian consuming communities is not known. From the available data, some generalizations concerning Central Plateau obsidian exploitation patterns for the Classic Period through the Colonial era can be suggested. Classic Period obsidian exploitation is certainly characterized by a preponderant reliance on Pachuca materials among some Central Plateau communities. These settlements, such as Miahuatlán in western Morelos and La Nopalera in the Tehuacán Valley, imported Pachuca material in the form of heavily processed large polyhedral cores and/or even as finished implements. Other communities, particularly those within rural areas of the Teotihuacán Valley, relied on an exploitation of Pachuca obsidian for their lithic consuming activities, but largely avoided dependence on importing preprocessed materials and instead were able to access Pachuca obsidian in nodule and block form. Data from the Tehuacán Valley and from the southern Gulf Coast strongly support the possibility that Teotihuacán did not dominate all aspects of Classic Period obsidian exploitation in central Mexico. Rather, individuals in certain Central Plateau communities were able to access alternative systems of lithic procurement and processing and, in so doing, resist Teotihuacán's dominance of lithic exploitation. One possible alternative obsidian procurement-circulation system may have been based on the exploitation of the Zaragoza-Oyameles source in Puebla. Obsidian from this source was imported to Tehuacán Valley and southern Gulf Coast communities in, primarily, macrocore form, implying a further degree of independence for its consumers than that for some of the communities relying on the Pachuca obsidian distribution sphere trafficking in the distribution of fully-prepared prismatic cores and finished implements. Farther afield, Pachuca obsidian was circulated in, primarily, blade form and its consumption may have been restricted to certain socioeconomic sectors.

Even a cursory examination of evidence from Epiclassic Central Plateau settlements indicates a dramatic shift in obsidian exploitation patterns. Exploitation of Zinapécuaro-Ucareo obsidian predominates at sites within the Basin of Mexico and other areas of central Mexico where technological analyses of lithic assemblages indicate that it was imported as prepared large polyhedral cores. Intensive exploitation of this source area is known to date to the Epiclassic period, but the organizational nature for its circulation beyond that vicinity remains elusive. Pachuca obsidian is relatively uncommon at these sites and, when it occurs, may have entered only as finished prismatic blades.

By the Early Postclassic, the frequency of Pachuca obsidian at sites within the Basin of Mexico may have generally increased, but its distribution still remained quite variable on an inter-site basis. At Tula, there is abundant evidence for intensive processing of Pachuca obsidian imported as percussion macrocores (Healan and Stoutamire 1989:211) and exported to Tula's rural hinterland as, primarily, finished blades (Santley et al. 1986:122). Central Plateau exploitation of the Zinapécuaro-Ucareo source also seems to have continued, but at a much lesser degree of intensity. Throughout the later Postclassic obsidian exploitation patterns on the Central Plateau are also quite variable, but Pachuca obsidian forms a major proportion of all known assemblages. Pachuca obsidian seems to have been circulated in nodule, percussion macrocore, refined pressure core, and finished implement form at this time. Other obsidian sources continued to be exploited throughout the

Central Plateau, but long-distance trade in obsidian seems to have been dominated by materials from the Pachuca source area consisting of, mostly, finished implements. Data from lithic assemblages of the three rural Colonial communities analyzed by Cressey indicate that Pachuca obsidian continued to be exploited by Basin of Mexico communities into the historical era.

In this chapter and the one that precedes it, I have attempted to address several issues that are relevant to the study of lithic exploitation patterns at Cholula. Foremost has been the discussion of the developmental history of large-scale obsidian exploitation on the Central Plateau and the various theories that have been forwarded to account for its role in the dynamics of interregional interaction among complex societies. This provides a context within which to assess lithic procurement strategies, processing systems and consumption behaviours evident at Cholula, as is done in a later chapter.

Secondly, I have provided information pertaining to general trends in lithic consumption on the Central Plateau through time. As is indicated by a diachronic examination of the available obsidian consumption data, a substantial challenge to models of state-dominated, Central Plateau-wide obsidian exploitation, whether headed by Teotihuacanos, Toltecs, or the Aztecs, has begun to amass. This too will serve as a backdrop against which diachronic patterns of lithic consumption at Cholula might be evaluated.

Chapter 3

Cholula: Past and Present

Ethnohistorical sources recording observations of early post-conquest Cholula by conquistadors and clergymen alike are numerous. Historians of sixteenth and seventeenth century Cholula may count Motolinía, Rojas, Sahagún and even Cortés himself among those whose writings have served as sources for a richness of detail seldom as possible in early contact reconstructions. Cholula even had its own John Lloyd Stephens in the traveler-adventurer A.F. Bandelier who once wrote, "A confusion has always existed, in regard to the past of Mexico, between the known and the conjectured (Bandelier [1884], 1976:90). Too often in the course of examining accounts of Cholula's past, one is reminded of Bandelier's observation. The mythico-historical tales of ethnic invasions and migrations told by ethnohistoric documents, are frequently alluded, even referred to in conventional reconstructions of Cholula's Postclassic period. Traditionally, scholars of ancient Cholula have chosen to rely to a great extent on these ethnohistorical writings to provide accounts of the city's past as archaeological research at Cholula itself has been largely restricted to the area immediate to the Great Pyramid and only infrequently are the results of these investigations made accessible to a wider public. The brief review of archaeological research conducted at the site of Cholula which follows is then necessarily selective and reflects, in part, the unevenness of published material from such investigations.

A Brief History of Research at the Archaeological Site of Cholula

Truly disciplined archaeological research at Cholula was first undertaken in the 1930's by the local Puebla branch of Mexico's Instituto Nacional de Antropología e Historia. Under the direction of Ignacio Marquina, roughly 8,000 meters of interconnected tunnels (Marquina 1970b:33) were dug through the Great Pyramid in the hope of understanding its obviously vast construction history (Marquina 1951; later synthesized in Marquina 1970a). Other stratigraphic excavations conducted on the northeast platform of the pyramid and around its base enabled Marquina's then assistant, Eduardo Noguera, to create a ceramic sequence for Cholula's ceramic traditions based on affinities among ceramics from his excavations as compared to those known from other sites in the Basin of Mexico region for which ceramic chronologies had been established (Noguera 1954). In the mid-1960's, the INAH once again inaugurated a program of intensive research at Cholula. Under the direction first of Miguel Messmacher and later of Marquina, the investigations conducted by Proyecto Cholula were concentrated on the south and western faces of the Great Pyramid. These operations exposed and partly reconstructed two major elite residential patios and the monumental architectural complex most closely associated with the pyramid, known as the Patio of the Altars. Having undergone at least six separate episodes of construction over its history, this central patio consists of numerous structures and a variety of grand, carved monuments whose meanings are still not fully understood. The results of these early projects at Cholula's civic-ceremonial core were collected in the few publications dedicated to the archaeology of the precolumbian city of Cholula (Marquina 1970b; see also Noguera 1954, Messmacher 1967, and Müller 1978).

In the following decade, a number of salvage surveys and excavations were begun on a site some two kilometers east of the ceremonial core of Cholula, on the grounds of the Universidad de las Americas, Puebla campus where such research had become necessary to accommodate the school's expansion. In 1968-69, the ambitious Man and Land Project was initiated by Joseph Mountjoy and David Peterson (1973) with the assistance of a team of UDLA student-researchers. Working from within a culture-ecology framework, the stated goal of the Man and Land project was to study utilization of the surrounding natural resources by the area's precolumbian population. With its survey of a 66 hectare area and problem-driven excavations, the Man and Land Project recovered information concerning the earliest habitation in the Cholula vicinity yet brought to light. Archaeologists associated with this project were also responsible for conducting one of the earliest 'household archaeology' investigations in central Mexico through their examinations of the UA-1 residential compounds, a Postclassic residential complex which obviously lay at some distance from the civic-ceremonial and elite core of Postclassic Cholula proper (Wolfman 1968). It is also worth noting that these excavations of the UA-1 compounds were later reanalyzed from a decidedly anti-materialist theoretical approach (McCafferty 1992). Having profitably studied human resource exploitation and subsistence in the low-lying valley zone, Mountjoy and his team of UDLA students turned their study towards an exploration of a hill-top site, Cerro Zapotecas. This 240 meter high hill lies some 3 kilometers west of the Great Pyramid and is clearly visible from the city's core. As is discussed in the next section on interpretations of Cholula's

Classic Period, Mountjoy's (1987) interpretations of this general survey and subsequent selective excavation of only parts of Cerro Zapotecas have contributed to a rather traditional view that Cholula was abandoned in the later Classic Period. A 1977 UDLA reconnaissance undertaken with the aim of delineating the ancient city's populated perimeters estimated the Classic period city to have been inhabited by upwards of 100, 000 Cholutecas (Peterson 1987). Other smaller-scale UDLA research projects are discussed in McCafferty (1992:51-77) and Lind et al. (n.d.). Noyola-Cherpitel (1993) also provides a useful review of household archaeology research in the Puebla region.

Throughout the last two decades, the regional branch of the INAH has continued to conduct small-scale salvage excavations in and around the modern city of Cholula as the expanding urbanism of the area continues to encroach upon sites of past cultural significance. While several such investigations have been undertaken, subsequent publication of their results in widely available form is rather limited. Two notable exceptions are Suarez Cruz's monographs on burial excavations recently released by the INAH (1985; 1989); one describes the interment in Cholula's civic-ceremonial center of a possible Maya merchant and the other reports on the mass burial of a Postclassic nobleman and fifty members of his court. In addition to on-going salvage operations, recent excavations have focused on the Patio of the Carved Skulls, an Epiclassic occupation on the northeast side of Cholula's Great Pyramid (McCafferty and Suárez C. n.d.), that is described in detail in a later section of this chapter.

Before an attempt to outline the history of human habitation in and around Cholula can be made, the centrality of the construction history of Cholula's Great Pyramid to much archaeological interpretation of the site's general historical development must be recognized. As the focus of much of the earlier research at the site, the chronology of Cholula's Great Pyramid has in many ways come to partially determine the general interpretation of the rest of the site's history. Marquina, long *the* authority on the site, first presented a comprehensive account of his reconstruction of the pyramid's history in 1951. In his account (Marquina 1970b), the structure underwent five phases of growth, beginning as early as c. 200 B.C.E., and was abandoned in the later Classic Period. Much of Marquina's interpretation of the Great Pyramid's construction history was dependent on a ceramic chronology (Müller 1970) that more recently has been found to be seriously flawed (Lind et al. n.d.; McCafferty In press-b). In his reformulation of the Great Pyramid's history, McCafferty (In press-a) has synthesized the architectural information collected by Marquina with a revised Postclassic ceramic chronology that accredits a much longer history to Cholula's polychrome tradition than was once suggested by Müller (1970; 1978) that is based on radiometric seriation, and contends that rebuilding at the Great Pyramid continued without the postulated Late Classic-Early Postclassic hiatus. With McCafferty's revisions, the construction of the Great Pyramid involved a continuous investment of labor by the ancient Cholultecas in four major successive construction stages with numerous intermittent modification episodes beginning in Terminal Formative-Early Classic times and continuing until the structure reached its ultimate form in the Postclassic.

McCafferty and McCafferty (n.d.) have recently attempted to discern the ideological meaning and cosmological significance of the Great Pyramid and indicated how such underlying principles might differ from those guiding the design and construction of the massive, monumental pyramid structures at the site of Teotihuacán. McCafferty's revised ceramic chronology (In Press-a, In Press-b) and McCafferty and McCafferty's (n.d.) recent interpretations of the cosmological significance of the Great Pyramid are crucial to a thorough understanding of the historical development of Cholula. These analyses demonstrate that construction at the Great Pyramid was continuous throughout the Classic-Postclassic transition and only temporarily abated between stages, thus creating a substantial basis to begin to confirm what others (e.g. Sanders 1989:214-215; Millon 1992:134-135) have long suspected about traditional interpretations of Cholula's past; namely, that the city was neither completely absorbed by Teotihuacán in the Classic nor abandoned at the end of this period. Such research has contributed to the emergent idea that, indeed, the community of Cholula had its own distinct developmental history.

Cholula's Past: A Brief Overview

Early evidence for human occupation in the Tlaxcala-Puebla region can be found at the nineteen sites predating 1600 B.C.E. thus far recorded in the region (Garcia Cook 1981; Porter Weaver 1993:40). At a time when the latter day site of Cholula's core was itself submerged by a shallow lake (Peterson 1987:97), sedentary, ceramic producing communities had begun to inhabit sites throughout the dry areas of the vicinity. The Man and Land excavations on the UDLA campus (Mountjoy and Peterson 1973) revealed that by the Middle Formative (Peterson 1987:97; Mountjoy 1987:119), small, semi-permanent groups had begun to occupy the shores of the then disappearing lake (Mountjoy and Peterson 1973). The results of these investigations also indicated that by 700 B.C.E., a number of minor villages, including Acatepec and Coronango, had begun to form within the vicinity of Cholula (Peterson 1987:120); these communities may well have practiced irrigation agriculture (Garcia Cook 1981). There is also some evidence for drainage/irrigation agriculture in the area in the Late Formative (Mountjoy 1987:120). In terms of general settlement patterns, growth continued throughout the Middle and Late Formative so that by 300 B.C.E., 275 sites had been founded and significant concentrations of population had formed in towns with planned civic-ceremonial architecture (Garcia Cook 1981). At this time some human use of Cerro Zapotecas for ritual purposes is evident (Mountjoy 1987:121). Also in the Late Formative, construction of the Edificio Rojo, an area immediately northeast of Cholula's later Great Pyramid, was begun (Noguera 1954:199-203; McCafferty and McCafferty n.d.:4). By the later Terminal Formative, the area's population was concentrated at Cholula proper and the constellation of earlier smaller villages ceased to be inhabited. It is also in the Terminal Formative that the building of the Great Pyramid was begun.

With the Cholulan population nucleated in their emergent center, the first major stages of the Great Pyramid were completed within the first few centuries of the Early Classic (McCafferty n.d.:16). An UDLA survey estimates that by Middle Classic times, the settlement of Cholula covered 6 km^2 and was home to a population of 30,000-60,000 (Peterson 1987:73-74), this at a time when Teotihuacán is generally believed to have been at its peak as the capital of a vast empire (Millon 1981). It is quite unfortunate that very little else about Classic Period Cholula can be said with certainty. Peterson (1987) does not offer any description of the means by which settlement and population estimates for Classic Period Cholula were ascertained by him and his crew, nor does he describe the nature of the architectural remains or artifact assemblages they used to identify Classic Period occupations. It is unfortunate that the reliability of the survey estimates must remain questionable in the absence of more contextual information. Caskey (1988) has reported on the excavation of an Early Classic burial within ancient Cholula's core that included the interment of an elite male individual. A residential structure some 3 kilometers northeast of the developing ceremonial center, known as El Transito: R-106, also dates to the Early Classic (McCafferty and Suárez C. In Press). This two room structure, which is discussed in greater detail in a later section of this chapter, underwent several floor resurfacings and may have been inhabited by two or more generations of a single family. Very little is presently understood about the relationship of Cholula to its Classic Period neighbour, Teotihuacán. Some researchers have been willing to speculate. Millon, for one, has claimed: "It [Cholula] appears to have maintained its independence throughout the period of Teotihuacán's ascendancy" (1992:134).

It is during the examination of its Epiclassic period that Cholula's culture history becomes most controversial. According to Dumond and Müller (1972), whose work has long stood as the only published direct investigation of this issue, the Great Pyramid and the Cholula core were "...largely deserted at this time, a provocative parallel to similar events at Teotihuacán..." (1972:1209). On extremely tenuous grounds, such as. "...water-laid deposits against some buildings of this phase [Cholula III-a]", and, "...some facades [that] had been dismantled [and used] in constructing drains and buttresses apparently designed to shore up major structures" (1972:1209), Dumond and Müller suggest the cause of this abandonment to have been a flood. Mountjoy's later work at Cerro Zapotecas has been used to support this notion of a dramatic Epiclassic abandonment of Cholula. On this small hill, occupation is reported to have been most dense during the Classic-Postclassic transitional phase and Cerro Zapotecas' dwellers are believed to have built temples, residential complexes and even a ballcourt (Mountjoy 1987:124). From his investigations, Mountjoy concurs with the Dumond-Müller hypothesis of Cholula's Epiclassic abandonment and states: "...Cerro Zapotecas housed either the remnants of lowland Classic society or some intrusive group instrumental in the collapse of the Classic or which settled in the area post-collapse" (1987:132). Of these possibilities, Mountjoy favours the first and conjectures that the Epiclassic residents of Cerro Zapotecas were refugees from the threat of Gulf Coast forces who, presumably, were beginning to encroach upon Cholula proper (1987:132-133), rather than escapees from the equally creative 'flood'. Such reconstructions have since been denounced as highly 'imaginative' (Sanders 1989:215) and it would seem that the general consensus among other (non-Cholula-specializing) Mesoamericanists is that such reconstructions are confusing and often misleading.

For the most part, Cholula is widely perceived as having emerged as a "major independent center" (Diehl 1989:14; see also Mustache and Cobean 1989 and Webb 1978:160-161) in the Epiclassic, as one of several regional 'capitals', including El Tajín, Xochicalco, and Cacaxtla, that exerted influence on the Central Plateau political-economy after the demise of Teotihuacán's power. Little is understood of the structure of power relations among these Epiclassic Period polities, but there is some agreement that social and cultural differences among them were retained and often emphasized (Hirth 1989). More recent excavations, such as that of the Epiclassic Patio of the Carved Skulls (McCafferty and Suárez C. In Press), that will be discussed in detail in a later section of this chapter, have begun to marshal evidence in support of

Sanders' (1989:215) contention that there were, "...no significant breaks in Cholula's functioning as a major center" during the Classic-Postclassic Period transition.

The Early Postclassic history of the Central Plateau is largely dominated by research on the Toltecs and their capital of Tula in Hidalgo. As is discussed below, the Toltecs and their cultural traditions are believed to have largely determined the course of Cholula's Postclassic history. Through mythico-historical and ethnohistorical sources Cholula's Postclassic world has been vividly described. These accounts have been very influential to the understanding of this period in Cholula's history. Through ethnohistorical and stylistic analyses, it is widely held that Epiclassic-Early Postclassic Cholula was invaded by the Gulf Coast Olmeca-Xicallanca (Davies 1977:114-120) whose presence may very well have influenced the architectural style of the final phase in construction of the Great Pyramid (McCafferty In Press-a). McCafferty (1992:641-642) also suggests that there is evidence of Gulf Coast stylistic motifs in the architecture and material culture of the Early Postclassic UA-1 Domestic Compound, although he has been cautionary in relying on the ethnohistorical sources to the excessive extent that has been common in Cholula archaeology. It is also during Early Postclassic times that the Mixteca-Puebla style, with Cholula as a likely source of original inspiration for this widespread ceramic and decorative tradition, is believed to have been developed (Nicholson 1982). An indigenous source, the Historia Tolteca-Chichimeca, records a subsequent, later Postclassic overthrow of the Olmeca-Xicallanca by the Tolteca-Chichimeca who, it is recorded, had left their capital of Tula in c. 1150 C.E. (Davies 1980:160-164). And, it is believed that it was these inheritors of the Toltec tradition who oversaw the reorientation of Cholula's major religious sphere. Under their auspices, a new massive pyramid, in honour of Quetzalcoatl, was built approximately one kilometer northwest of the Great Pyramid, in the heart of today's San Pedro Cholula, the modern town's civic-administrative and commercial district.

The pyramid the Toltec migrants are believed to have constructed was subsequently razed at the time of the Spanish conquest of the area, but the pervasive influence of its benefactors was witnessed throughout the town by sixteenth century Spaniards who proclaimed Cholula, "the city of temples" in reference to the multitude of private shrines spread across the urban landscape of Cholula (Peterson 1987:76). Yet, as probable testimony to Cholula's even more distant past, the city was also more officially known as Tollan Chollan Tlachihualtepetl, or the metropolis of the 'man-made-hill', in reference to Cholula's older venerated mound, the Great Pyramid (Peterson 1987:95). The religious mecca and powerful commercial center of Late Postclassic, or at least early colonial, Cholula covered 8-12 km^2 and is believed to have housed a population of 35,000-100,000 (Sanders 1971:29-31; Peterson 1987:71). Cholula retained a degree of independence from the next conquerors of the Central Plateau, the Aztecs, who established their empire in the fifteenth century. Cholula, much like the rest of the New World, however, was unable to resist the efforts of conquest that were to be faced next: those of the Spanish *conquistadores.*

It is unfortunate that the history of Cholula's conquest by officers of Spain must be relegated here to little more than a mere footnote. The Massacre of Cholula in October of 1591 was one of Cortés' most bloodlusty, underwritten in part by a Tlaxcalan revenge vendetta (Peterson and Green 1987; Clendinnen 1993:21). In an effort to reconstruct life in colonial Cholula and in an attempt to broach a link between ethnohistorical documents and the archaeological record, Michael Lind has conducted a number of pioneering examinations of Cholula's documentary colonial legacy. His analysis of the Obverse of the Codex of Cholula (Lind In Press-a), an indigenous illustration mapping the Puebla-Tlaxcala region executed between 1549 and 1586 that includes Nahuatl glosses of place names and other information, demonstrates how topographical landmarks were used by colonial era Cholultecas to delineate territorial boundaries among the many autonomous polities coexisting in the area. Cholula is shown as a primate center surrounded by secondary, tertiary and other subject communities that comprise a kingdom encompassing 800 km^2 (Lind In Press-a:98). Plunket's Valley of Atlixco survey (1990) has begun to establish the archaeological expression of such political borders by demonstrating a distinct disjuncture in the frequency of Aztec ceramics at the border between Cholula and its southern neighbour, Aztec-influenced Huaquechula. The sixteenth century center of Cholula is itself illustrated on the back, or reverse, of the codex. The *Mercado* (Great Market) figures prominently as would befit a city famed for its jewelry and polychrome pottery craftworkers (Rojas 1927:159). Six districts, each with its own church/temple, barrios, and public buildings, are outlined in the pictorial representation of the city. In his analysis of historic documents (e.g. Rojas 1927; Torquemada 1975; Las Casas 1974), Lind (In Press-b) found corroboration for this pattern of six districts of local administrators that worked in councils in cooperation with, and occasionally in subjugation to, a powerful religious sector. A strict division of responsibilities and privileges among these two elite sectors was adhered to, with the kingly ruler of Cholula and secular administrators and leaders forming a council of nobles focused on regulating matters of domestic concern, while the city's priests oversaw the numerous concerns of foreign interests and affairs. Kings from polities throughout the region are known to have traveled to Cholula to consult with its priests as a means of rulership legitimation (Lind In Press-b). Lind's analysis demonstrates there to have been a high degree of articulation between the two sectors of rule in colonial Cholula; a structure of governance, as Lind point out (In Press-b), unique to Cholula as a leading sacred center.

Recent Excavations and the Lithic Collection from Cholula

The lithic material analyzed in this thesis was collected from a series of excavations undertaken in and around the ancient core of Cholula by the Puebla Regional Center of Mexico's Instituto Nacional de Antropolgía e Historia under the direction of Arqlgo. Sergio Suárez Cruz, state archaeologist for Cholula. In large part, these excavations were conducted in cooperation with a team of researchers from Brown University of Rhode Island, U.S.A. led by Dr. Geoffrey McCafferty over the summer months of 1993 and 1994[2] .

Although absolute dates have not yet been assigned to all of these excavations, a number of carbon samples from two of the operations, the Transito (R-106) site and the Proyecto Cholula 94 (Patio of the Carved Skulls), discussed in detail below, have been analyzed. The majority of excavated deposits have been assigned a relative date by McCafferty based on independent ceramic seriation, where possible, and through comparison with well-established ceramic chronologies for the Valley of Mexico in instances,

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[2] The following three papers pertaining to these excavations have been prepared and submitted for publication: McCafferty In Press-a, In Press-b; and, McCafferty and Suárez C. In Press.

such as the Classic-Epiclassic periods, for which an independent and reliable chronology for Cholula ceramics has not yet been fully formed. There have been several early studies of Cholula's ceramic chronology (e.g. Noguera 1954; Müller 1978; Mountjoy and Peterson 1973), each based on data from separate excavation projects and each employing its own typological system. These typologies have been criticized for their terminological anarchy (McCafferty 1992:230-237) and one (Müller 1978) has been singled out as remarkably misleading in structure (Lind et al. n.d.). More recent ceramic studies focusing on Cholula's Postclassic ceramic assemblage (Lind et al. n.d.; McCafferty 1992) are loosely based on the Type-Variety system of ceramic typology (Smith, Willey, and Gifford 1960). While minor disagreement over terminological aspects persists, seriation of Cholula's Postclassic ceramic assemblage is developing well (McCafferty In Press-b).

The site designated as Transito (R-106) (Figure 4), investigated in the Spring and Summer of 1993 as a salvage operation, is the product of a highly complex formation history. The site consisted of one multi-room domestic structure or compound and several intrusive middens. A burial cache of Classic Period pottery associated with a stucco floor and two reasonably intact adobe walls were initially exposed by Arqlgo. Suárez Cruz and his crew. Through an analysis of artifacts embedded in an adobe layer overlying the exposed floor, including ceramic vessels and figurines, the structure was dated by McCafferty to the Middle Classic Period, or in Teotihuacán chronological phraseology as contemporary with the Late Tlamimilolpa to Late Xolalpan phases (c. 350-550 C.E.). The dating of this structure to the Middle Classic corresponds well with the information reported on securely dated Classic Period domestic structures within the Valley of Puebla, as multiple room rather than single zone abodes are more common in the Classic than in Formative times (Noyola Cherpitel 1993:26).

As part of the excavation strategy at the Transito (R-106) site, stratigraphic units were excavated through the visible stucco floor in the two main areas where postdepositional disturbance seemed to have been least extensive. Subfloor contexts in one of these units, Unit 2-1 in the more southerly room, included Middle Classic and mixed Classic Period ceramics (n=90 rim sherds) and artifact deposits (including 34 lithic specimens). The analysis of a carbon sample from just above the floor of this context derived a date of 460 ±61 C.E. (calibrated with a 1-sigma error, as are all the following radiocarbon dates). Unit 5-1, dug in the northernmost area of the northerly room, exposed a stone crypt burial which contained Classic Period pottery of the Tepontla Burnished Grey type and a small olla with nubbin supports as part of the associated mortuary offering. There is also some evidence for a later secondary interment in the original crypt grave that has been radiocarbon dated to 522 ±35 C.E.[3]. Unit 5-2, also situated in the northerly room, has been radiocarbon dated to 371 ±67 C.E. Unit 5-1, a subfloor excavation, contained 116 rim sherds and 19 lithic specimens among other artifacts. Unit 5-2 yielded 98 rim sherds and 25 lithic items.

To further complicate the interpretation of this structure, a Middle Postclassic midden in *Cala* (trenchcut) 3 and two intrusive middens dating to

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[3] Please note that I was unable to gain access to the lithic artifacts associated with any of the burial contexts excavated by Suárez C. and McCafferty for analysis.

the Colonial Era in *Calas* 7 and 10[4] , were discovered and dated by ceramic typological analysis. *Cala* 3 yielded 517 ceramic rim sherds and 47 chipped lithic artifacts.

An interesting deposit in *Cala* 10 South was excavated from along the external side of the west wall of the structure. This deposit, which has been radiocarbon dated to 411 $\pm$49 C.E., was composed nearly entirely of obsidian implements and debitage. Also included in this deposit were four ceramic figurines and one decorated ceramic sherd. A mammalian longbone, possibly of deer, that may have served as a soft percussion tool and one round basalt stone that bears evidence of its use as a polishing or grinding implement and/or hammerstone were also found. With a ratio of 100:1 for a comparison of its frequency of chipped lithic artifacts to ceramic sherds, this deposit is unique in composition. As the plan illustrates, this deposit is located up against an external wall of the house structure. My preliminary interpretation of the context and depositional circumstances of this deposit was that it had formed through the refuse disposal behaviours of a member or members of the associated household who were engaged in part-time or small-scale lithic specialization. It was unclear upon initial observation whether the products of this part-time labour were meant to be used in activities performed by members of the associated household, or circulated more widely. As is discussed

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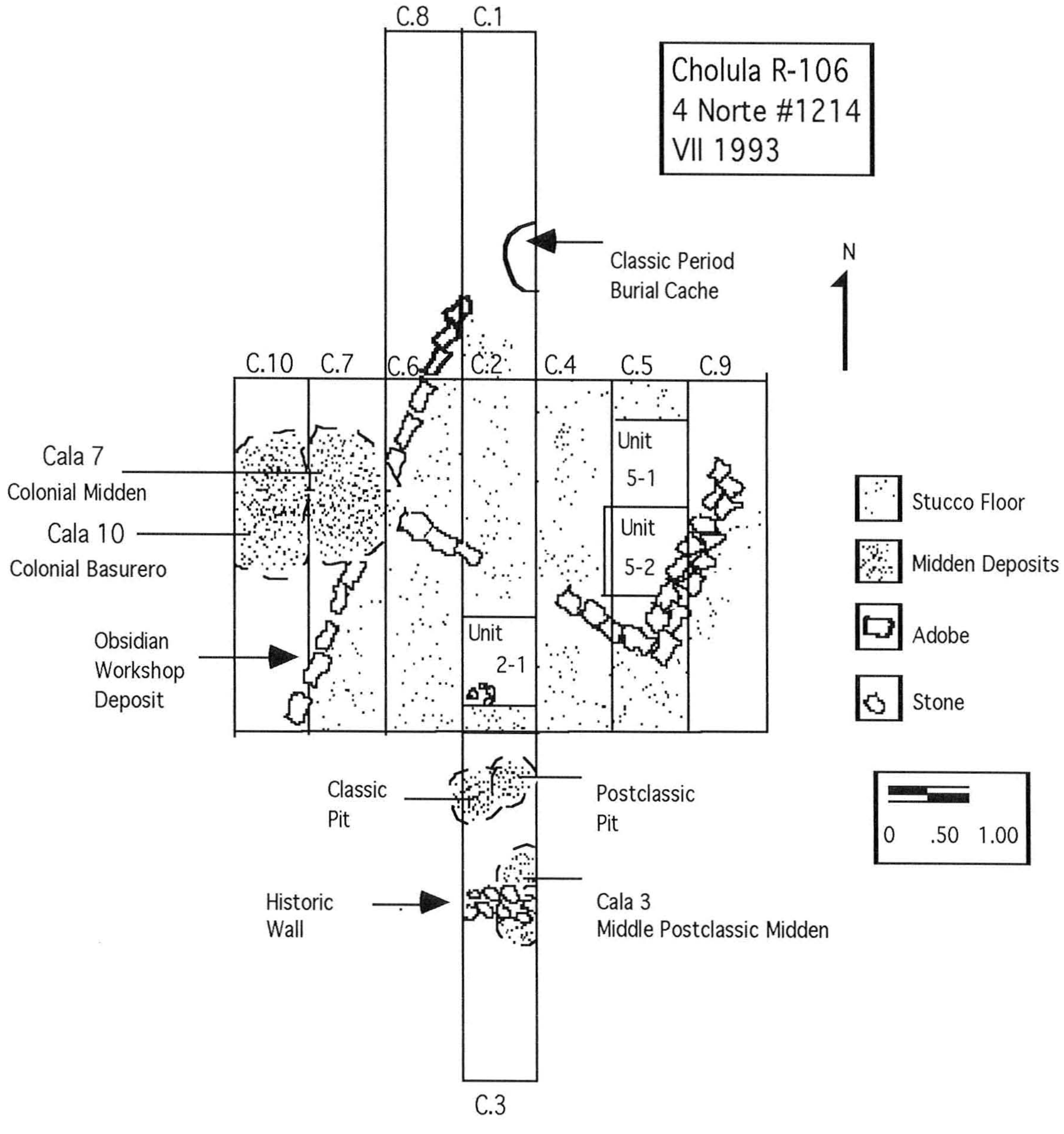
[4] In more recent interpretations of the Transito (R-106) structure's formation history (McCafferty, personal communication, September 1995), these two Colonial Era features have been recognized as contiguous deposits of one larger midden feature. The lithic specimens derived from this feature are separated for the remainder of this thesis into two subassemblages to reflect the methodological reality of their original collection. It should be kept in mind, however, that these two subassemblages are in fact from a single feature.

in a later chapter of this thesis, differences in the compositions of the Unit 10 South subassemblage and that of the house structure itself indicate a rather complex answer to this question. The secondary deposition of the lithic deposit is suggested by its zonation in a restricted accumulation against a wall and the general lack of microdebris[5], which has been considered a good indication of in-situ craftworking (Shafer and Hester 1986:160; Parry 1987; Turner 1992:94). This absence of obsidian microchips is particularly significant as Unit 10 South was the only excavation deposit that was carefully screened.

The radiocarbon dates thus far obtained for the use of this structure would indicate an initial occupation between 350-450 C.E. and suggest a final use of the structure at 500-550 C.E. (McCafferty, personal communication May 1995), a pattern of use concordant with McCafferty's ceramic seriation. The Early-Middle Postclassic and Colonial middens, clearly intrusive from their depositional contexts as no regard to habitational zone boundaries within the structure had been adhered to, are suggestive of the 'urban sprawl' for which Cholula was known in its later history. According to the radiocarbon dates, the Unit 10 South lithic deposit discussed above, relates to the earlier, initial occupation of the house site.

[5] Microdebitage measures between one and three millimeters (Clark 1986b:22; Hayden and Cannon 1983:156).

Figure 4: Plan of the Transito (R-106) Excavation



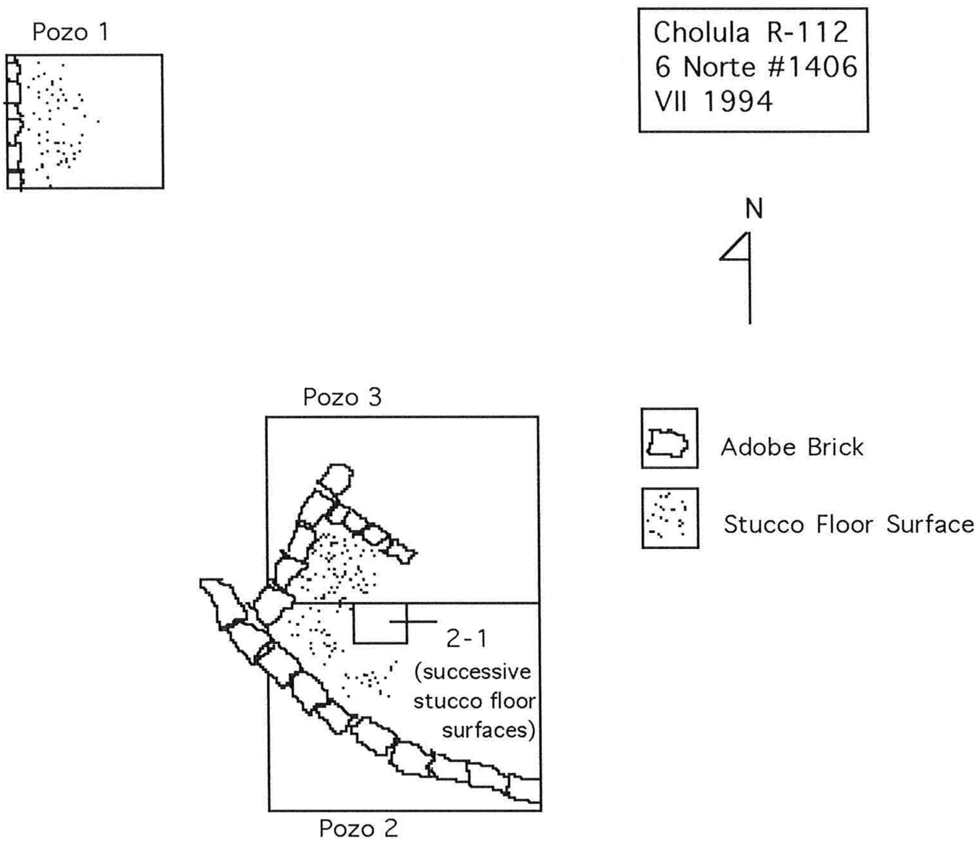
While certain similarities exist between the Transito (R-106) Classic Period ceramic assemblage and known Tlamimilolpa-Xolalpan phases assemblages from Teotihuacán, McCafferty and Suárez C.'s analysis (In Press) has also revealed several distinct differences between material culture patterns associated with the house and those from contemporaneous domestic contexts at Teotihuacán. While Thin Orange pottery, a Teotihuacán-sphere diagnostic, constituted 10% of the ceramic types derived from subfloor Classic contexts, 30% of the collection was comprised of a previously unknown 'plain tannish orange type', assigned the name Acozoc Tan/Orange (McCafferty and Suárez C. In Press:10). Moreover, the floreros, candelarios, and incensarios typical of Teotihuacán domestic ritual life were absent from the material culture of the Cholula residence, while the elaborateness of the burial tombs excavated at Transito (R-106) contrasts substantially with the stark mortuary practices of Early Classic Teotihuacanos (Ibid.:12-13). The geographical orientation of the Early Classic structure, at 24° east of north, conformed to that of the Great Pyramid, rather than to the grid layout system known from Teotihuacán (Ibid.:12). Thus, if this one context is any indication, substantial and potentially critical differences existed between Classic Period Cholula and Teotihuacán.

In the summer of 1994, the crew from Brown joined the on-going Proyecto Cholula 1994 excavations and consolidation of the Patio of the Carved Skulls, an elite residential or civic-ceremonial compound built on a platform roughly midway up the Great Pyramid's northeast slope that was first explored in the 1930's by Noguera (1937). The area McCafferty and his crew excavated in 1994 extended off the edges of the previously exposed patio opening, within which stands the Altar of the Carved Skulls - a miniature pyramidal burial altar containing the interment of a female and a male and their associated mortuary assemblages, to reveal a series of earlier reflooring episodes, architectural modifications, and a number of less elaborate burials, some intrusive. The excavators were able to establish relative dates for successive patio refloorings and constructions.

The patio has been dated to the Terminal Classic-Epiclassic Period (700-900 C.E.) on the basis of a number of ceramic correlations (McCafferty and Suárez C. n.d.; McCafferty In Press-b). For instance, no examples of Thin Orange pottery were found in excavations at this site, nor were there any polychrome ceramics. Polychromes are most common to Postclassic Period Cholula, securely dated, at the earliest, to 1000-1100 C.E., and are extremely rare in earlier contexts (McCafferty In Press-b); their presence, if manufactured at the time, could be reasonably expected within so clearly an elite zone. Some revealing stratigraphic trends have also been noted in the relative frequencies of utilitarian/serving wares diagnostic of the Classic Period and those typical of the Postclassic. Tepontla Burnished Gray, a Classic Period diagnostic, occurs at a 7% higher frequency than the Early Postclassic Cocoyotla Black on Natural in the earliest levels; Cocoyotla then gradually increases in frequency in later depositional levels, implying a continued occupation of the Patio from the Terminal Classic to the Postclassic Period and mitigates against the notion of a Late Classic Period abandonment of the Great Pyramid as postulated by Dumond and Müller (1972). Thus far, one radiocarbon sample from the patio area has been analyzed and a date of 1210-1328 C.E. has been obtained. The discrepancy between the radiocarbon date and McCafferty's ceramic analysis remains to be resolved. In all, 352 rim ceramic sherds and 101 lithic artifacts were excavated from the patio. Other artifacts included beads and spindle whorls.

That same summer of 1994, McCafferty's crew was called away from the Patio of the Carved Skulls to help in the salvage excavation of a site zoned for construction, designated as R-112 (Figure 5). Two occupation zones, one dating to the Classic and the other to the Early-Middle Postclassic, were found. Mechanical clearing had exposed a stucco floor above which were mixed Postclassic ceramics. A 4x8 meter unit, Unit 2, was established to explore the extent of this feature. Unit 2-1 was a stratigraphic pit that dropped through the exposed floor of Unit 2 and crosscut at least five distinct stratigraphically layered floors replete with Early-Middle Postclassic (Early Tlachihualtepetl-Late Tlachihualtepetl phase) ceramics and artifacts. Unit 1 was set up as a 2x2 meter unit in the northern portion of the site and revealed a well-defined floor and adobe wall with Classic Period artifacts in association. Radiometric dating techniques have not been employed and the functions of the structures are not yet understood.

Figure 5: Schematic Plan of the R-112 Excavation



Discussion

In all, over 1000 lithic artifacts were excavated in the course of these recent investigations and 584 specimens could be assigned to the well-defined and dateable contexts discussed above. Each specimen was assigned and labeled in ink with an individual Artifact Name that included the code for the Centro's archaeological operation, R-106, PC 94, or R-112, a unit specific number (based on the numbered bag within which each artifact was collected), and an individual consecutive number. Preliminary sorting of the materials was done on the basis of maintaining distinctions between both archaeological operations and artifact assemblage dates. The collection of 584 lithic artifacts was further sorted into more behaviourally meaningful subassemblages according to their depositional contexts. That is, specimens associated with midden deposits were separated from those derived from special circumstance depositional contexts (such as burials or pure lithic deposits), while those from well-dated but ill-defined depositional contexts were interpreted as construction fill or scatter. The collection analyzed in this thesis is composed of assemblages that span four broad temporal periods of Mesoamerican history, the Classic Period, the Epiclassic Period, the Postclassic Period, and the Colonial Era and some of the subassemblages of these assemblages could be dated to more finely defined temporal phases, such as the Early Classic and the Early Postclassic.

As the subassemblages of chipped lithic artifacts from the various aforementioned excavation zones and contexts form a cumulative collection for analysis, some issues concerning the level of comparability among them should be discussed. Foremost among these concerns are the differences in the depositional contexts of the lithic subassemblages. As has been discussed, some of the subassemblages were excavated from clearer behavioural contexts, such as middens and house floors. Another subassemblage, that comprised of materials from R-106: Unit 10 South, was collected from a defined area adjacent to the external wall of a structure. The majority of the subassemblages, however, derive from much less interpretively meaningful contexts that can only be described as construction fill. A related issue is the differences in excavation strategy employed for the investigations of the three main loci of research. A traditional horizontal excavation method was used to explore both the R-106 structure and the Epiclassic patio, subsequently allowing for a better analytical assessment of the contexts of the lithic artifacts in relation to the boundaries of the features. Due to time constraints, however, excavations at the R-112 structure could not delineate clearly the parameters of the feature itself, and the lithic artifacts can only be securely identified as in association with sequential reflooring episodes in the structure's history of use.

A third matter to be addressed pertains to the different past functional statuses of these structures. It is not clear whether or not domestic-residential occupation occurred within the zone excavated on the Patio of the Carved Skulls. It remains possible that the structures there may have served as loci of administrative or ceremonial activities. The R-106 structure was clearly a domestic residence occupied by at least two successive generations of individuals. The past function of the R-112 structure is less certain. While a similar range of utilitarian artifacts types have been found at both of these features, there is some evidence for craft-specialization and access to higher status goods at R-106 that was not evident at R-112. A concern over this potential difference in the socioeconomic position of the occupants of R-106 and R-112 for the subsequent interpretation of obsidian exploitation patterns evident within each of the excavation loci also extends to the PC 94: Patio feature. The location of this patio at the center of Cholula and the degree of energy that seems to have been expended in its maintenance over time, contrast sharply with both the location and nature of the other two features. Thus, variation in the distributional patterns of obsidian types and artifact forms among the three excavation loci may be expected to reflect socioeconomic differences among their former occupants. These concerns will be addressed further in Chapter 5 of this thesis.

The preponderance of lithic artifacts in this collection were the products and byproducts of prismatic blade technology. The manufacture and consumption of obsidian prismatic blade forms was clearly the central component of Cholula's obsidian exploitation system throughout its history of Classic Period through Colonial era occupation. In the following chapter, I present a model of prismatic blade-core technology that will serve to guide subsequent analyses of the lithic collection from Cholula conducted in this thesis.

Chapter 4

Prismatic Blade Technology, Commodity Models, and Consumption Contexts at Cholula

Reflecting upon some of the harder questions facing individuals who have chosen to explore the past from its mere remains, the paleontologist, Larry Martin, has been quoted as eloquently stating, "Behavior is the first thing to go when you're dead" (quoted in Monastersky 1990:41). As a subtractive, reductive technology, lithic reduction defies such simplistic rationalization to a degree. By its very nature, lithic reduction is processual, in the strictest sense of the word, and produces both scars on worked material and classes of debitage that are diagnostic of a limited and often largely understood set of sequential behaviours (Collins 1975; Young and Bonnichsen 1984). Replicative studies of lithic production systems are critical to the archaeological understanding of the means of manufacture of final products, as well as the waste the manufacture of such implements generates.

In this chapter, I develop a model of prismatic blade production based on such replicative studies against which the actual composition of the assemblages analyzed in the following chapter (Chapter 5) are assessed. In the lithic collection analyzed in this thesis, there is an almost complete absence of evidence for bifacial production and only a slight indication of an expedient flake technology, yet a preponderance of artifacts related to prismatic blade production. Thus, for the purposes of my subsequent analysis, I offer a review of the general process of prismatic blade manufacture. This section is followed by a discussion of the various indices used by Mesoamerican archaeologists to infer the form in which obsidian has been imported into their study communities, an aspect of lithic analysis, as we have seen in Chapter 2 of this thesis, critical to the assessment of wider diachronic obsidian exploitation patterns. The general model of blade-core technology and the hypothetical expectations of the various consumer assemblages are presented here as they are subsequently applied in Chapter 5 to assess the form in which obsidian entered Cholula through time. In a final section of this chapter, I summarize the questions this study will focus upon for exploration.

A Model of Prismatic Blade Core Reduction

The earliest accounts of Mesoamerican obsidian blade technology are provided by sixteenth century chroniclers' observations of Aztec knapping. In a number of articles, Clark (1982; 1989b) has meticulously compiled and presented those references scattered throughout the journals and official communications of, for example, Fray Juan de Torquemada (1975) and Francisco Hernández (1959), and the available ethnohistorical information concerning the Aztec's mode of manufacture and means of utilization of prismatic blades. Although Crabtree (1968) was the first experimental researcher to propose a feasible technique for the manufacture of prismatic blades, he has since been criticized for having overridden the authority of the relevant information recorded in ethnohistorical accounts (Sheets 1977:143-144; Clark 1982). Over a decade after Crabtree's influential study was first published, Clark proposed a more faithful reading of the available ethnohistorical sources, and through subsequent experimentation, proposed a method for the manufacture of Mesoamerican-style obsidian prismatic blades that conforms more closely to the ethnohistorical descriptions and has since been widely accepted. Ultimately, while the observations of early colonialists provide a wealth of data concerning the Aztec blade specialists' methods and uses of obsidian, it was left to experimental archaeologists to attempt to understand and reconstruct the entire production trajectory for this technology.

The system of lithic analysis employed here relies mainly on the work of such researchers and takes as its overarching principle a conceptualization of lithic implement production, distribution, and consumption that focuses upon a use cycle concept (Driskell 1986; Shott 1989) for all the materials comprising the analyzed assemblages. The raw material of the production systems employed at Cholula is seen as having undergone a long series of transformations in the reduction process, an understanding of which allows for a more thorough comprehension of the structure of the resulting assemblages. Employing the concept of a use life for each lithic specimen emphasizes the recyclable nature of lithic implements and challenges some basic precepts of traditional archaeological lithic typological classification. Specimens that are analytically classified by us today as 'debitage' may have served other use-related purposes for their prehistoric manufacturers; alternatively they may have been scavenged by later inhabitants of the same or some nearby community for use in contexts for which these artifacts were not originally designed. Similarly, certain classes of implements, such as prismatic blades, may have been modified into more distinct formal tools, such as drills or projectile points, or even into forms related to an entirely different, non-utilitarian category altogether, as in the case of eccentrics.

The model of prismatic blade production presented here is derived and generalized. It is meant to be a simplified, normative model against which the structure and composition of the actual lithic assemblages analyzed within this thesis may be compared. Due to the nature of the composition of excavated assemblages from the contexts at Cholula, the model incorporates certain assumptions, as follows. First, the ultimate end towards which Cholula's lithic manufacturing trajectory is aimed is the production of prismatic blades; this does not preclude the subsequent recycling of certain products and byproducts of this system into unifacial and bifacial tools; it only states that such systems are ancillary to the main goal. A second assumption is that the one stage of reduction not particularly useful for my purposes is that of the mining and processing of vein or block raw material. Although such processes as the mining of material from subterranean deposits and initial decortication of that mass (see Santley 1986:105-107) are certainly stages through which Cholula material might have passed, evidence for such procedures is almost entirely absent from the site collection. It is largely with the product of such quarry obsidian working, the preform percussion macrocore, that the story of knapping at Cholula begins. The following reconstruction is based on a compilation of details from the research of a number of archaeologists who have undertaken both experimental replicative studies of blade-core technology and analyses of Mesoamerican lithic collections (including the research of Clark 1982, 1988, and 1989b; Healan et al. 1983; Santley et al. 1986; Healan and Stoutamire 1989).

The macrocore is a large cylindrical roughout of a polyhedral core with rather flattened proximal and distal ends that represents the first stage product of the reduction of a mass of raw material in the subsequent manufacture of a prismatic blade core. The prototypical macrocore bears wide, irregular, roughly parallel vertical flake scars around its surface diameter and usually lacks surface cortical material. At this stage in its transformation to a large polyhedral or pressure core, the proximal end of the macrocore is modified to serve most efficiently as the platform for a series of percussion blade removals. With the removal of these macroblades and crested ridge blades, themselves triangular in cross-section and largely irregular in form, a series of increasingly parallel vertical scars is created and a series of ridges that guide subsequent blade removal is formed around the core face. At this, the large polyhedral core stage in the raw material's transformation, the knapper may choose to either continue to straighten out the core face vertical ridges until a desired effect is achieved or s/he may decide to begin to remove the first series of pressure blades from the core. The first such blades to be detached, known as initial series blades, will be asymmetrical and will not extend the full length of the core's longitudinal axis. As the core comes to take on an increasingly polyhedral formal appearance and as the vertical ridges running longitudinally around its diameter become increasingly parallel and standardized, the pressure blades being forced off also begin to appear increasingly standardized. The original mass of obsidian is now a refined prismatic core and prismatic blades may become its primary products. By applying a pressure retouch technique, a number of these resultant prismatic blades may be further modified, as they were at Cholula, into distinct implement forms such as eccentrics and perforators. Eventually, however, all good things must come to an end and the core itself will become exhausted, assuming the familiar bullet shape whose physical structure rather strictly prohibits the removal of any further blades. In the normative model, the exhausted core would be discarded and the knapper might proceed to the next reduction project.

The preceding model is necessarily highly derived and meant to represent the best of possible worlds, where all is orderly and proceeds as ideally expected. In truth, there are several other possibilities our hypothetical knapper might encounter. For instance, s/he may haphazardly apply an excessive amount of force while pushing off a prismatic blade from the core, thereby effectively detaching the entire distal end of the core along with the attached blade. Such errors in production limit the knapper in terms of the next move. The techniques used by the knapper to recover from such mistakes are also important to a reconstruction of the use history of the core and may provide a good deal of information concerning, potentially, the skill of the knapper or the relative availability of raw material. Likewise, a core that cannot be recovered for further blade removal may itself be modified to become a useful implement, such as a scraper. The experimentally observed occurrence of such 'mishaps' and the identification of the resulting material effects, both as scars on a core and as diagnostic debitage within archaeological assemblages, assure us that the hypothetical model is simply that and that it is the real world processes that come to structure any particular assemblage of lithics. The collection analyzed in the following chapter is replete with evidence of just such events, of manufacturing errors, debitage recycling, and core rejuvenation episodes. Below I have outlined the various stages or 'action sets' (Clark 1988), referred to herein as 'Reduction Sequences', and specified their corresponding products and by-products, that comprise the model of blade-core technology employed for analysis of the lithic collection from Cholula. For a complete description and enumeration of each of the technological categories introduced below and included in the technological analysis discussed in Chapter 5, please refer to Appendix 2.

The model of blade technology used in my analyses is composed of seven Reduction Sequences as follows:

Reduction Sequence 1: Primary Reduction of a Block or Nodule of Obsidian

The expected debitage associated with such primary reduction includes large primary decortication flakes, ridge blades, crested ridge blades, and platform creation flakes (Santley et al. 1986:107). Evidence for this initial stage of obsidian reduction is usually restricted to mine and quarry locations (Santley et al. 1986:107). The resultant form of this primary reduction process is the macrocore. Clark (1988); Clark and Lee (1984:255) place macroflakes at this stage. In the collection from Cholula, the existence of only one crested ridge blade provides possible evidence for this Reduction Sequence.

Reduction Sequence 2: Reduction of a Percussion Macrocore

The debitage associated with the reduction of an obsidian macrocore includes a number of percussion debris categories such as macroflakes and macroblades that possibly retain some amount of cortical material on their dorsal aspects, platform faceting flakes (Santley et al. 1986:108, but see Clark 1988: 15), and small percussion blades (Clark and Lee 1984:255; Clark 1988:15). The resultant form of this reduction is the pressure (Santley et al. 1986:109) or large polyhedral core (Clark 1988:15). In my terminology and analysis, decortication flakes, percussion macroflakes, percussion macroblades, and pressure macroblades are included as evidence for the occurrence of this Reduction Sequence.

Reduction Sequence 3: Reduction of a Pressure Core or Large Polyhedral Core

With the switch in manufacturing technique from primarily percussion to pressure flaking, initial or 'first-series' blades are produced (Clark 1988:15). The production of irregular pressure blades which are not true prismatic blades is also common to this reduction stage (Santley et al. 1986:109). The resultant product is a prismatic core. In the Cholula collection, evidence for this Reduction Sequence includes the existence of initial series blades and irregular pressure blades.

Reduction Sequences 4a and 4b: Reduction of a Prismatic Core

Prismatic blades with increasingly regular and standardized characteristics are produced. These implements (4a) are referred to as prismatic pressure blades. Triangular pressure blades and irregular prismatic blades with multiple dorsal ridges (4a) may also be removed as the core diametre decreases (Santley et al. 1986:111). Core recovery and rejuvenation techniques may also take place in some instances (4b). These behaviours also produce diagnostic debitage including transverse core modification flakes, platform preparation flakes, internal platform preparation flakes, core sections, core tablets, and core segments (4b). Exhausted and abandoned cores have also been assigned to this Reduction Sequence. In the collection of lithics excavated from Cholula, evidence for the execution of Reduction Sequence 4a comes in the form of triangular pressure blades, prismatic pressure blades, irregular prismatic pressure blades, and chiconautla/amantla pressure blades. Evidence for Reduction Sequence 4b consists of specimens that result as by-products of Reduction Sequence 4a and include blade cores, blade core segments, blade core sections, blade core thinning sections, transverse core modification flakes, plunging blades, internal platform preparation flakes, and one overhang removal flake.

Reduction Sequences 5a and 5b: Specialized Manufacture of Blade Tools

Prismatic blades may be further modified into a number of varied forms including eccentrics, drills, and projectile points through pressure flaking (5a). These implements are taken as evidence for the occurrence of Reduction Sequence 5a. Evidence for their in situ manufacture (5b) includes rejects and, possibly, pressure microflakes (also known as 'bending flakes' in Cotterell and Kamminga 1992: 133). In my terminology, products of 5a activity are referred to as modified prismatic blades and their associated debitage as pressure retouch microflakes.

Analysis of the Cholula collection demonstrated that while the majority of lithic specimens were related to a blade-core technology, there were a number of specimens related to other forms of technology. Two further typological categories were created to accommodate an analysis of these artifacts:

Flake Core, General Flake, Biface, and Uniface System: Artifact classes

included in this aspect of the lithic reduction system found in the

Cholula collection are flake cores, general flakes, bifacial points, and unifacial scrapers on macroblades.

Unidentifiable/Angular Fragments: This is a bit of a kitchen sink category. It includes specimens identified as angular fragments, which might be related to the earlier stages of prismatic core reduction, and a few uninterpretable artifacts. Although number of the artifacts assigned to this category may be related to the early stages of blade-core reduction, but I have been unable to find published illustrations of comparative examples adequate to assess this possibility.

<u>Import Commodity Models</u>

As Clark (1987) has observed, the structure of prismatic blade-core technology is itself intrinsically divisible. It is composed of action-sets - that modify a mass of raw material into a macrocore, that is then reduced into a pressure core, and subsequently refined into a prismatic core - that are integral and essential to achieving the ultimate goal of the technology: the consistent manufacture of prismatic blades. Obsidian was circulated among Central Plateau communities in all of these stages of reduction. Following Clark (1988), in this analysis obsidian artifacts that are recovered from occupation sites laying outside of the immediate environment of a source area are conceived of as constituent elements of a commodity form. As was noted in Chapter 2, in Mesoamerica obsidian was circulated, exported and imported, in a variety of forms such as macrocores, large polyhedral cores, finished blades and other labour intensive artifacts. As has also been discussed, the archaeologist's ability to reconstruct the form in which certain types of obsidian reached the consumer communities s/he investigates has also been used to provide some indication of the structure and mechanisms of wider obsidian exploitation systems. The primary product believed to have been formally manufactured and exported from the major central Mexican obsidian sources is the percussion macrocore; this general assumption, based as it is on the remains left behind from such inferred activities, cannot preclude the possible occurrence of episodes of less formal exploitation of the sources during which raw material may have been either collected or mined, but not reduced further before its export. Large polyhedral cores and blade implements are believed to be the main product of Teotihuacán's workshops. At Tula, prismatic blades and, possibly, composite blade tools, are now thought to be the major product of lithic craftworkers (Healan 1993). The Aztec traded obsidian in a variety of core and implement forms (Smith 1990). It is then central to the consideration of obsidian distribution systems in the Mesoamerican past to develop a means by which to assess the form in which obsidian entered the consumer site under study. Central Plateau archaeologists have approached this problem in different ways.

In their comparison of the composition of lithic assemblages at Middle Classic rural sites in the Teotihuacán Valley and those of Early Postclassic rural Toltec villages, Santley and his associates (Santley et al. 1986) conclude that there was a significant difference in the form of commodity import used at these two types of communities based on the representation of relative frequencies of certain debitage categories. The occurrence of percussion macroflakes, macroblades, and crested-ridge blades, in unspecified proportional quantity, at Middle Classic Teotihuacán Valley sites is taken as an indication that the villagers received blocks or nodules of obsidian that had not yet been processed at Teotihuacán's workshops (Ibid.:120), while the absence of such artifacts at rural Toltec sites is understood as signifying that those communities received primarily finished blades and artifacts from urban Tula (Ibid.:120-121). Yet, no quantification of the compositions of either of these assemblage types is presented. Instead, the authors offer only a 'presence/absence' index of the various technological categories.

Healan and his associates (Kerley 1989; Healan et al. 1983; Healan 1986; Healan and Stoutamire 1989) were able to recognize that the main imported obsidian product worked by Tula's Postclassic blademakers was the percussion macrocore as evident in the presence of certain categories of debitage and the absence of others. Unlike Santley and his colleagues, however, these researchers do consistently present the relative frequencies of the various artifact categories represented in their collections, thus providing some means of later comparison with other lithic assemblages. They do not, however, use this quantification in any comparatively meaningful way, but instead rely on a presence/absence index to substantiate their conclusions.

John Clark has been most systematic in quantifying his materials to substantiate his arguments. In his study of the lithic collection from La Libertad in Chiapas, Clark (1988) presented the statistical results of his many replicative studies to demonstrate the similarity in composition between his experimentally derived assemblage of products and by-products from the reduction of macrocores to that of the lithic assemblages excavated from La Libertad. Through his discussion of numerous blade-core manufacturing experiments, Clark offers a comprehensive account of the material expectations in terms of the frequencies and ratios of percussion-generated artifacts relative to pressure-generated artifacts for the reduction of, (a) a nodule of raw material, (b) a percussion macrocore, and (c) a large polyhedral core. The resultant patterns of macrodebitage as charted by Clark (1988:213-214, Tables 152- 155) are reprinted in my Table 1. The derived frequencies and ratios of percussion artifacts relative to pressure artifacts are meant to serve as a guide, rather than as absolute criteria, for differentiating among lithic assemblages formed through the on site reduction of the various core types. For my purposes, I have had to make some modifications to Clark's expectations in order to assess the composition of the lithic assemblages from Cholula. These adaptations are discussed in Chapter 5.

Table 1: From: Clark's Tables 152-155 (1988:212-214) illustrating expected frequencies and ratios of percussion generated products relative to pressure generated products resulting from the separate reduction of Nodules, Macrocores, and Large Polyhedral Cores. Please note: these are Clark's 'Adjusted Artifact Counts'.

Product Type	Artifact Type	Nodule	Sub-Total %	Macrocore	Sub-Total %	Large Polyhedral Core	Sub-Total %
Percussion Products	Decortication Flake	30		-		-	
	Macroflake	45		25		2	
	Macroblade	112	51.3	72	40.4	-	4.6
	Small Percussion Blade	112		68		8	
	Flake	181		111		31	
	Flake Shatter	255		117		1	
Pressure Products	Prismatic Blade	628		528		806	
	Stunted Blade	24		24		24	
	Exhausted Core	5		4		6	
	Core Fragment	1	48.7	1	59.6	1	95.4
	Plunging Blade	11		7		16	
	Core Rejuvenation Flake	18		14		16	
	Core Shatter	11		-		-	
	Core Tablet	-		-		-	
	TOTAL	1433	100.0	971	100.0	912	100.0
Ratio of Percussion Products to Pressure Products			1:1		2:3		1:19

On the Comparability of the Collection's Assemblages: Identifying Producers, Identifying Consumers

The above archaeological indices for inferring the form in which obsidian reached a site of study are based primarily on research on assemblages excavated from contexts that were first determined to have been manufacturing loci (including, obviously, Clark's experimentally derived assemblages). While it is not my intention to delve too deeply into the on-going debate among Mesoamerican archaeologists concerning the identification of craft 'workshops' (see Shafer and Hester 1983, 1986; Mallory 1986; Clark 1986; Moholy-Nagy 1990; Costin 1991; Healan 1992; Hester and Shafer 1992; Moholy-Nagy 1992), I have attempted to be critical in my identification of the behavioural contexts of the various lithic subassemblages analyzed in this thesis. As I have discussed in my introduction to the excavations from which the subassemblages were collected, certain contextual circumstances permitted a tentative identification of one such subassemblage as having been formed through household-related lithic reduction and prismatic blade production. The means for confirming this identification are further refined in Chapter 5 of this thesis through technological analysis. For the time being, it should suffice to say that while the formation of this one subassemblage may well have been the result of either in-situ or nearby lithic reduction behaviour, the remainder of the subassemblages derive from rather different depositional contexts.

Some of the subassemblages, for instance, were associated with archaeologically identifiable midden deposits that included other forms of domestic refuse. These lithic subassemblages then could possibly have taken form through multiple disposal episodes and have been contributed to by more than one occupational unit. These materials are certainly in at least secondary depositional contexts and the composition of these lithic subassemblages may reflect the consumption behaviours of non-lithic reduction specialists. Moreover, while the Classic, Postclassic, and Colonial period lithic subassemblages are associated with modest structures located some distance from ancient Cholula's civic-ceremonial core, the lithic assemblage dated to the Epiclassic Period derives from a zone of only possible residential occupation that lies at the very heart of what was Classic-Epiclassic Cholula's civic-ceremonial center. The Epiclassic Period assemblage was once part of the construction fill used to maintain and modify the Patio of the Carved Skulls. Whether its composition can be presumed to reflect the obsidian consuming behaviours of elites is unclear. If, as seems likely, the Patio site itself was not residentially occupied nor the locus of some large-scale lithic production activities, the assemblage may well have been formed from consumed materials originally derived from less elite contexts. In my analysis of the lithic collection, I have tried to remain aware of these depositional uncertainties and their implications for interpreting intrasite diachronic patterns of obsidian exploitation at Cholula.

Questions Posed for Analysis

I have attempted in previous chapters to provide some indication of the general questions a study of lithic assemblages from a variety of depositional contexts and temporal periods at the site of Cholula might serve to address. Below, I elaborate on the goals and objectives of this thesis within the context of the foregoing discussions.

This study will follow several axes of investigation. One of these could be considered purely technological. I hope to understand whether or not substantial lithic reduction occurred at Cholula and to determine the orientation of that reduction over time. Evidence for subspecialization will be sought so that the composition of the material remains of such manufacturing behaviour can be compared to the model of prismatic blade-core technology outlined above, and any anomalies in terms of technological classes isolated. Patterns in implement and debitage recycling will also be assessed. The tracking of trends in core and blade platform morphology and treatment is also an aspect of the technological analysis as these general developmental trends are recognized as meaningful to the evolution of Mesoamerican prismatic blade technology.

On another plane, I hope to address certain issues of archaeological formation processes, such as the identification of workshops and other depositional circumstances. The organization of obsidian exploitation at Cholula will also be addressed through an analysis of intrasite distributions of obsidian types and reduction behaviours. The implications of the patterns derived from this analysis for our understanding of the diahronic organization of Central Plateau obsidian distribution networks will then be explored.

A final dimension of this thesis concerns an evaluation of the aforementioned models of obsidian exploitation on the Central Plateau in light of obsidian exploitation patterns evident in the Cholula collection. To best address the issue of the Central Plateau's political economy through time, I plan to assess patterns in lithic type utilization and procurement. I will concentrate specifically on the form or stage of reduction in which lithic materials reached Cholula's inhabitants through time.

Chapter 5

Analysis: Rationales. Methodologies, and Results

In this chapter I present the methodologies and results of my analysis of the collection of lithics from Cholula. I explored 3 main axes of investigation including, i) obsidian source exploitation patterns; ii) operative lithic technological systems; and, iii) lithic implement consumption and utilization patterns. In the second section of this chapter, I describe the rationale, methodology, and findings of this tripartite analysis. Explanation of the results of these analyses is then integrated into the chapter's final discussion section, where Cholula's patterns of obsidian exploitation over time are contextualized and assessed within broader diachronic Central Plateau obsidian exploitation patterns. To begin, though, I present an introduction to the structure of my database which is appendixed (Appendix 1) and the variables employed in my analysis. Complete descriptions and explanations of these variables and their categories are provided in Appendix 2 of this thesis.

Preliminary Classification and the Structure of the Database

The structure of the database in this study is a testament to the divisionary nature of classification. The database encompasses numerous variables; most of these are conceptually independent, but others are mutually embedded in one another, as is discussed below. Italicized terms refer to names of variables.

The collection of chipped lithics from Cholula examined in this thesis encompasses a wide span of time. Each lithic assemblages could be dated to one of four broad *Temporal Periods* , the Classic, Epiclassic, Postclassic, or Colonial, by McCafferty as based on ceramic associations. McCafferty was also able to assign some lithic subassemblages to more well-defined *Temporal Phases* within the broader *Temporal Periods*, including the Middle Classic, the Middle Postclassic, and the Early-Middle Postclassic, when the associated ceramic assemblages themselves could be better defined. As has been discussed in Chapter 3, the lithic collection derives from the excavations of four separate features, The Transito (R-106) Middle Classic domestic structure that also contained Postclassic and Colonial middens, the PC 94 Epiclassic Patio, and the R-112: Classic and Postclassic Structures. Thus, the temporally defined assemblages can be further differentiated by their various depositional circumstances. According to a third variable of the dataset, termed *Excavation Context*, the lithic collection has been divided into subassemblages that have been appropriately named to represent both the temporal phase or period to which they have been dated and the circumstances of deposition in which they were found. The *Excavation Context* subassemblages are: R106: Middle Classic House Construction Fill, R106: Middle Classic House Workshop Deposit, R106: Classic House Construction Fill and Floor Contact, R112: Classic Structure Floor Contact, PC 94: Epiclassic Patio Construction Fill, R106: Middle Postclassic Midden Deposit, R112: Early-Middle Postclassic Structure Construction Fill, R112: Postclassic Structure Construction Fill, R106: Colonial Midden, R106: Colonial Basurero.

The *Raw Material* of each specimen is recorded in the database. Only three raw materials were noted for the chipped stone of Cholula; these are

Obsidian, Chert, and Chalcedony. Obsidian is a highly homogeneous and brittle natural glass that is formed through the rapid cooling of siliceous volcanic lava (Cotterell and Kamminga 1990:128). Chert and chalcedony are cryptocrystalline silicates which vary widely in quality and fracturing properties (Whittaker 1994:70-71).

The categories of the database variable, *Lithic Visual Type* , are used to designate differences in the appearance of the lithic specimens based on non-technological qualities, including colour, degree of translucency, and presence and nature of matrix inclusions where existent. These categories are as follows: Green, Opaque Black, Cloudy Grey, Translucent Brown-Grey, Translucent Blue-Grey, Clear White Grey, Clear White-Grey Striated, Transparent Grey Striated, Translucent Brown-Grey with Black Particulates, Translucent Grey Striated, Opaque Grey ("Slate") with Black Particulates, Translucent Black and Grey Banded, Transparent Grey with Black Particulates, White (Chert/Chalcedony), Red-Brown (Chert/Chalcedony), Light Brown (Chert/Chalcedony), Pink-White (Chert/Chalcedony). As much of the variation signified by the *Lithic Visual Type* categories is generally ignored by most researchers, the variable of *Lithic Type Designation* was created to represent a set of more inclusive visual appearance categories that correspond to descriptions of source-specific obsidian types in the literature. These source-specific descriptions are usually based on assessments of colour and degree of translucency, but otherwise ignore matrix inclusions. In the *Lithic Type Designation* variable, Chert and Chalcedony specimens are lumped together and simply referred to as Chert/Chalcedony as the low rate of these materials made subdistinctions unnecessary. The *Lithic Type Designation* categories for obsidian are as follows: Green, Opaque Black, Cloudy Grey, Translucent Brown-

Grey, Translucent Blue-Grey, Other Transparent/Translucent Grey, and Chert/Chalcedony. Complete descriptions of both the *Lithic Visual Type* and *Lithic Type Designation* categories are included in Appendix 2.

Each specimen was also assigned to a *Technological Class* category based on the recognition of certain diagnostic criteria that are specific to each technological class and are defined in Appendix 2. The following is a list of the technological classes included in the lithic collection: Flake Core, General Flake, Blade Core, Blade Core Segment, Blade Core Section, Secondary Decortication Flake, Crested Ridge Blade, Percussion Macroflake, Percussion Macroblade, Pressure Macroblade, Initial Series Blade, Irregular Pressure Blade, Triangular Pressure Blade, Prismatic Pressure Blade, Irregular Prismatic Pressure Blade, Modified Prismatic Blade, Chiconautla/Amantla, Blade Core Thinning Section, Internal Platform Preparation Flake, Transverse Core Modification Flake, Plunging Blade, Pressure Retouch Microflake, Overhang Removal Flake, Bifacial Point, Unifacial Scraper, Unifacial Scraper on a Macroblade, Angular Fragments/Unidentifiable. Again, a complete index of these technological classes and a description of the methods used to take specimen measurements have been appendixed (Appendix 2).

The *Condition* of each specimen was noted as Intact, Proximal, Medial, or Distal to signify the nature of segmentation of each of the lithic artifacts. A number of categories were established for the description of the *Platform Condition* of each Proximal specimen. Platform surfaces were recorded as Ground (coded as 'g' in the database), Scratched (coded as 's' in the database), Ground and Scratched (coded as 'g, s' in the database), Edge/Rim Abraded (coded as 'edge grind'), or as lacking in these modifications (not stated in the database). Blade specimen shoulders were recorded and described as Rounded (coded as 'r' in the database), Squared (coded as 's' in the database), or as exhibiting a combination of the two (coded as 'r-s' in the database) (after Rovner 1989). Similarly, Single-Faceting (coded as 's-f' in the database) or Multi-Faceting (coded as 'm-f' in the database) of the platform surface was also recorded. Metrics, including *Weight (g)*, *Length (cm)*, and *Width (cm)*, were taken and recorded for each specimen. *Platform Width (cm)* was recorded for some proximal blade specimens and *Diameter (cm)* was also measured for Blade Cores and Blade Core Segments. The variable of *Reduction Sequence* includes nine categories, to one of which each lithic artifact has been assigned. The first seven of these Reduction Sequences, coded as One, Two, Three, Four-A, Four-B, Five-A, and Five-B in the database, refer to the five stage model of Prismatic Blade Production discussed in Chapter 4. Two residual categories, Flake Core, General Flake, Biface, and Uniface and Unidentifiable/Angular Fragments, were established for those artifacts that were not the products or byproducts of prismatic blade production. Please note though, that two specimens of debitage related to prismatic blade production (DATABASE #323 and 536) which are macroblades that were modified into unifacial scrapers have been included in the Flake Core, General Flake, Biface, Uniface *Reduction Sequence* as these artifacts may have been imported to the site in the form of scrapers since no other technological evidence for scraper production was found in the lithic collection.

Microscopic use-wear analysis was also performed. The resultant variable of *Utilization* includes several categories; each lithic artifact was assigned to one of the following: Present, Absent, Lightly Utilized, Tip Absent (for projectile points only), Present and Notched, Absent and Notched, Present and Knapped, Absent and Knapped. These categories are described in Appendix 2.

A final section, *Descriptive Notes*, was added to the database. In this I provide some descriptions of cores and artifacts with unique formal characteristics and morphologies. These descriptions are not standardized, but are included for any possible future inter-analysis comparison.

Obsidian Source Exploitation Patterns

Rationale

An assessment of diachronic obsidian exploitation patterns at Cholula was performed in an attempt to determine the degree of involvement by inhabitants of Classic through Colonial Period Cholula in the various obsidian exchange networks known to have existed in ancient Mesoamerica. With a focus on exploring political-economic relations between Cholula and the polities of Teotihuacán, Tula, and the Triple Alliance which are said to have controlled access to obsidian from, especially, the Pachuca source area, special attention was paid to the changing frequency of Pachuca obsidian over time.

Method of Investigation

Each lithic specimen was assigned to an obsidian, chert, or chalcedony *Lithic Visual Type* based on observable differences in the following criteria: raw material, colour, degree of translucency, presence and type of banding, presence and type of inclusions. The integrity of these visually distinct divisions was tested through the performance of a series of 'blind' tests with crew member volunteers. These tests were conducted on a very informal basis whereby, at different times, three volunteers were each given an assemblage of obsidian specimens and asked to create subdivisions based on colour, degree of translucency, and any other visual distinctions they could note. Refinements were made on the basis of the results of such tests until the most popularly parsimonious distinctions (i.e. those recognized by the majority of the participants) could be confirmed. Ultimately, 13 obsidian visual type groups and 4 chert/chalcedony visual type groups were defined. These are named above. These visually distinct obsidian and chert/chalcedony type categories were collapsed for analytical purposes into the seven aforementioned *Lithic Type Designation* classes to correspond to previously identified source-specific obsidian types as discussed below.

Many lithic researchers in Mesoamerican archaeology have cautioned against an uncritical reliance on visually derived distinctions among obsidian specimens for the reconstruction and interpretation of obsidian source exploitation and lithic procurement strategies (e.g. Boksenbaum et al. 1987). Generally speaking, those analysts that greet such attempts with cynicism can afford to be critical, as they usually have access to the resources necessary for trace-element geochemical analysis. In actuality, however, even in those cases where such tests are possible, only a fraction of the recovered specimens are subjected to chemical analysis whereas the bulk of the lithic collection is still sorted based on visual distinctions. In other words, many researchers utilize visual distinctions for first level classification; they then choose a sample of specimens from their defined groups and test the validity of their distinctions through trace element analysis (e.g. Brumfiel 1986; Boksenbaum et al 1987; García-Chávez 1990; Stark et al. 1992). For other researchers, such as myself, practicality dictates throughout the entirety of the investigation and the possibility of conducting a trace-element analysis of the materials is but a hope for the future. For the time being, I have instead attempted a careful reading of descriptions provided in the literature of a few source-specific obsidian types; the best potential correspondences found are coded in this analysis as *Lithic Type Designation* groups. Thus, while I certainly cannot contend that in this study the visually distinct *Lithic Type Designation* groups correspond with absolute fidelity to actual source deposits, a few educated guesses concerning such correspondences will be hazarded.

The obsidian specimens identified as green are fine, translucent, and range in hue from clear to golden. These specimens may be associated fairly confidently with the Pachuca source deposits in southern Hidalgo as obsidian from the only other sources bearing green obsidian, deposits in the Tulancingo-Pizzarín source area and an as yet unidentified area in west Mexico, are either visually distinguishable from Pachuca obsidian and/or not known to have been circulated either often or widely in prehispanic times (Charlton and Spence 1982:29-35; Spence, personal communication, May 1995). Glassy opaque black obsidian, which is the second most frequent obsidian type in the collection from Cholula, has been recorded in the literature as deriving from a limited number of source deposits. In her study of Late Postclassic obsidian procurement and production systems in the southeastern Basin of Mexico site of Xico, Brumfiel (1986:251) initially divided her grey obsidian artifacts on the basis of variations in "shade" and degree of opaqueness. These assignments were then cross verified by neutron activation analysis. Brumfiel found a high correspondence in geochemical composition between her specimens of opaque black obsidian and known specimens from the Zaragoza-Oyameles source deposit in Puebla and the Zinapécuaro-Ucareo sources in Michoacán. García-Chávez et al. (1990:231) contend that opaque black obsidian can be reasonably assigned to the Zaragoza source area of Puebla. Stark et al. (1992:229) also found a high correspondence between visually identified glassy opaque black obsidian and a Zaragoza-Oyameles provenience through trace element analysis. Healan and Stoutamire (1989:211) have also reported that opaque black obsidian artifacts within the collection from Tula can be provenienced to the Zinapécuaro-Ucareo source. In the lithic collection under examination here, a uniform cloudy grey is the third most common obsidian type. Brumfiel (1986) also analyzed similar specimens (identified as 'smokey grey' in her terminology) and found these to derive from the Zaragoza and Pico de Orizaba source deposits in Puebla (1986:253). In their surveys of the Basin of Mexico, Boksenbaum et al. found cloudy or "fuzzy" grey" (1987:67) obsidian specimens to resemble most closely in chemical composition materials from, principally, the Zinapécuaro-Ucareo source area; but, some specimens were also found to derive from Altotonga and Otumba. García-Chávez et al. (1990:228) were able to consistently provenience cloudy grey obsidian to the Zinapécuaro-Ucareo source as were Healan and Stoutamire (1989:211). Various other transparent and translucent grey obsidian types have been most frequently identified in the literature as deriving from the Otumba and El Chayal source areas (Boksenbaum et al. 1987:67; Clark and Lee 1984).

Accordingly, I tentatively suggest a Zinapécuaro-Ucareo or Zaragoza-Oyameles provenience for the glassy opaque black obsidian in the Cholula collection. Cloudy grey obsidian also may be associated with the Zinapécuaro-Ucareo, Zaragoza-Oyameles or another Pueblan source. The *Lithic Type Designation* category of Other Transparent/Translucent Grey obsidian is used in this analysis as a residual category of lithic artifacts that are not presumed to correspond to any specific obsidian source. It is, of course, my hope that these distinctions may hold in the future, once trace element analysis is conducted on these materials. For the majority of further analyses, however, the clear and reliable distinction between green obsidian and all the grey and black obsidian types may serve as the least controversial and most informative one to maintain in interpretive arguments. As well, in even a cautious assessment of the origins of opaque black obsidian, it seems fair to say that it does not derive from any of the postulated Teotihuacán/Tula/Triple Alliance-related sources. It is more likely associated with the Zinapécuaro-Ucareo or possibly the Zaragoza-Oyameles source area. The non-Teotihuacán/Tula/Triple Alliance-related origin of cloudy grey obsidian is less clear, but it does not resemble any Otumba derived grey obsidian material described in the literature or that I, for one, have observed.

Results

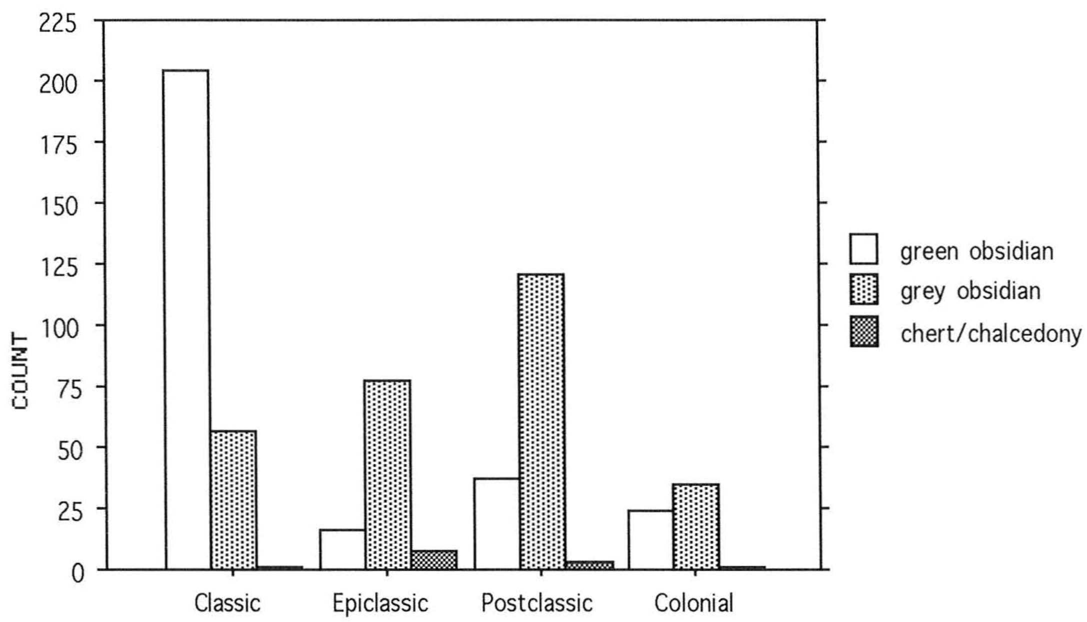
Green obsidian was the most common type of obsidian (and, indeed, lithic material) for all the lithic assemblages across time, comprising 48.6% by count (n=284) and 49.7% by weight (400.2 grams) of the total lithic sample (Figure 6; Table 2). The various grey obsidian types amounted to 49.7% (n=290) of the collection, while the chert and chalcedony artifacts account for only 1.7% (n=10) of the lithic artifacts. The total weight in grams of grey obsidian is 499.1 grams which is 52.3% of the total lithic artifact weight; the chert and chalcedony specimens amounted to 55.8 grams or 5.8% of the collection by weight.

As Figure 6 and Table 2 demonstrate, the relative frequency of green obsidian in relation to the various grey obsidian types and chert/chalcedony specimens is quite variable through time. In the Classic Period assemblage, green obsidian accounts for 77.9% (n=204) of the sample, grey obsidian constitutes 21.8% (n=57) of the sample, and chert and chalcedony specimens account for a lowly .4% (n=1). In the Epiclassic assemblage, green obsidian occurred at the remarkably lower rate of 15.8% (n=16), grey obsidians accounted for 76.2% (n=77) of the sample, and chert/chalcedony constituted 7.9% (n=8) of the sample, the highest rate for chert/chalcedony of any time period. In the Postclassic Period assemblages, green obsidian still constituted a rather small percentage of the sample at 23% (n=37) while the frequency of grey obsidian remained high at 75.1% (n=121) of the sample; chert/chalcedony account for 1.9% (n=3) of the Postclassic Period assemblage. In the assemblage dating to the Colonial Period, grey obsidians still predominated at 58.3% (n=35) of the sample, but the rate of green obsidian was once again on the rise reaching 40% (n=24); chert and chalcedony comprised 1.7% (n=1) of the Colonial Period assemblage.

Table 2: Distribution of Lithic Types Across Temporal Periods

Lithic Type	Classic Period (with R106: Middle Classic House Workshop Deposit)		Classic Period (without R106: Middle Classic House Workshop Deposit)		Epiclassic Period		Postclassic Period		Colonial Period	
	n	%	n	%	n	%	n	%	n	%
Green	204	77.9	106	65.4	19	18.8	37	22.9	24	40.0
Grey	57	21.7	55	33.9	77	76.2	121	75.2	35	58.3
Chert/Chalcedony	1	0.4	1	0.6	5	4.9	3	1.9	1	1.7
Total	262	100.0	162	100.0	101	100.0	161	100.0	60	100.0

Figure 6: Bar Chart Illustrating the Distribution of Lithic Types Across Temporal Periods



Inferential Statistical testing, in the form of Chi-Squares and Phi Coefficients, was performed as a means of testing the statistical significance of this variation in obsidian type distribution through time. The rates of green obsidian in relation to grey obsidian were tracked through the four broad

Temporal Period assemblages. A Chi-Squared value of 164.5 was determined; a value which, at 3 degrees of freedom, is significant at the 0.001 level and demonstrates significant deviation from the expectations of a random distribution (Table 3). The greatest deviation from such expectations is in the Classic Period assemblage where residual values equal +/-74.9. By contrast, the residual values for the Colonial Period assemblage are +/-5.2, suggesting that this assemblage most closely resembles the expectations of a randomly distributed population. Residual values for the Epiclassic Period assemblage were +/-28.5 with green obsidian greatly underrepresented, and those for the Postclassic assemblage were +/-41.2. These residual values indicate a dramatic decline in the distribution of green obsidian between the Classic Period assemblage and that of the Epiclassic Period. This interpretation is supported by a Chi-Squared test comparing the rates of green and grey obsidian in the Classic Period assemblage and in the Epiclassic Period. The derived value is 102.1, significant at the .001 level of significance or higher where v=1 (Table 4). As well, the residual value for green obsidian drops from +41.0 in the Classic Period to -41.0 in the Epiclassic, while the reverse is true for the residual values of grey obsidian. This trend in the decline of green obsidian continues in the Postclassic Period assemblages and is only reversed somewhat in the Colonial Period. Grey obsidian, by contrast, experiences a steady increase in its distributional rate over time.

Table 3: Chi Square for Distribution of Green Vs. Grey Obsidian Over Time[6]

	Classic Period	Epiclassic Period	Postclassic Period	Colonial Period	
Green	204 (129.1)	19 (47.5)	37 (78.2)	24 (29.2)	284
Grey	57 (131.9)	77 (48.5)	121 (79.8)	35 (29.8)	290
	261	96	158	59	n=574

[6] (n) = expected frequency.

Table 4: Chi Square for Distribution of Green Vs. Grey Obsidian in the Classic and Epiclassic Periods[7]

	Classic Period	Epiclassic Period	
Green	204 (163)	19 (60)	223
Grey	57 (98)	77 (36)	134
	261	96	n=357

The phi-squared coefficient for the comparison of the rates of green and grey obsidian through the Classic to Colonial periods is 0.29. The Phi Coefficient for the comparison of green obsidian relative to grey obsidian in the Classic Period with that for the Epiclassic Period is 0.28. In both cases, the possibility that variation in assemblage sample sizes has only a minimal effect on the significance of differences in green versus grey obsidian might be indicated.

The second most common obsidian type for the collection was a uniform and lustrous opaque black (Table 5). Artifacts of this type of obsidian comprise 18.5% of the lithic collection by count and 15.9% by weight. Although the relative frequency of artifacts of this opaque black obsidian varies through time, it is greatest in the Epiclassic and Postclassic assemblages. Conversely, it is least common among the Classic Period subassemblages in which it ranges from being entirely absent, as in R112: Classic Structure Floor Contact, to 11% of the R106: Classic House Construction Fill and Floor Contact subassemblage sample (Table 6). The third most frequent type of obsidian in the lithic collection, is a cloudy grey variety (please refer to Table 5). Artifacts of this obsidian type account for 11.6% of the total lithic sample by count and 11.4%

7 (n) = expected frequency.

by weight. It is common throughout the various Excavation Context subassemblages and absent only from the R106: Middle Classic House Workshop Deposit and the R106: Colonial Basurero subassemblages (Table 6).

TABLE 5: Distribution of Lithic Designation Types Across Temporal Periods

Lithic Type	Classic Period		Epiclassic Period		Postclassic Period		Colonial Period	
	n	%	n	%	n	%	n	%
green	204	77.9	19	18.8	37	23.0	24	40.0
opaque black	6	2.3	37	36.6	53	32.9	12	20.0
cloudy grey	19	7.2	16	15.8	26	16.1	7	11.7
translucent brown-grey	3	1.1	19	18.8	0	0.0	1	1.7
translucent blue-grey	1	0.4	1	0.99	26	16.1	0	0.0
other translucent/transparent greys	28	10.7	4	4.0	16	9.9	15	25.0
chert/chalcedony	1	0.4	5	4.9	3	1.9	1	1.7
Total	262	100.0	101	100.0	161	100.0	60	100.0

TABLE 6: Lithic Designation Types Across Excavation Contexts

Lithic Designation Type	R106: Middle Classic House Construction Fill		R106: Middle Classic House Workshop Deposit	
	n	%	n	%
green	81	62.8	98	98.0
opaque black	3	2.3	1	1.0
cloudy grey	17	13.2	0	0.0
translucent brown-grey	3	2.3	0	0.0
translucent blue-grey	0	0.0	0	0.0
other transparent/translucent greys	24	18.6	1	1.0
chert/chalcedony	1	0.8	0	0.0
Total	129	100.0	100	100.0
Lithic Type				
green	81	62.8	98	98.0
grey	47	36.4	2	2.0
chert/chalcedony	1	0.8	0	0.0

Lithic Designation Type	R106: Classic House Construction Fill and Floor Contact		R112: Classic Structure Floor Contact		PC 94: Epiclassic Patio Construction Fill	
	n	%	n	%	n	%
green	12	66.7	13	86.7	19	18.8
opaque black	2	11.1	0	0.0	37	36.6
cloudy grey	1	5.6	1	6.7	16	15.8
translucent brown-grey	0	0.0	0	0.0	19	18.8
translucent blue-grey	0	0.0	1	6.7	1	1.0
other transparent/translucent greys	3	16.7	0	0.0	4	4.0
chert/chalcedony	0	0.0	0	0.0	5	4.9
Total	18	100.0	15	100.0	101	100.0
Lithic Type						
green	12	66.7	13	86.7	19	18.8
grey	6	33.3	2	13.3	77	76.2
chert/chalcedony	0	0.0	0	0.0	5	4.9

Table 6 Continued

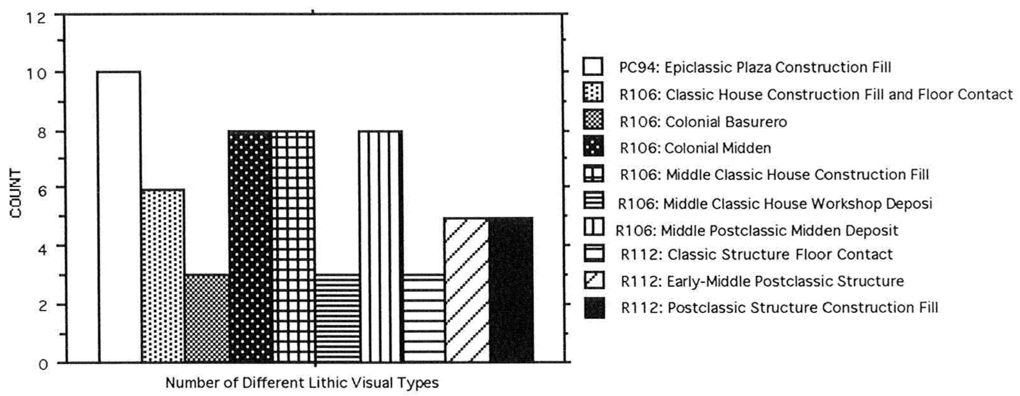
Lithic Designation Type	R106:Middle Postclassic Midden Deposit		R112: Early-Middle Postclassic Structure	
	n	%	n	%
green	12	25.5	3	12.0
opaque black	15	31.9	11	44.0
cloudy grey	5	10.6	5	20.0
translucent brown-grey	0	0.0	0	0.0
translucent blue-grey	0	0.0	5	20.0
other transparent/translucent greys	12	25.5	1	4.0
chert/chalcedony	3	6.4	0	0.0
Total	47	100.0	25	100.0
Lithic Type				
green	12	25.5	3	12.0
grey	32	68.1	22	88.0
chert/chalcedony	3	6.4	0	0.0

Lithic Designation Type	R112: Postclassic Structure Construction Fill		R106: Colonial Midden		R106: Colonial Basurero	
	n	%	n	%	n	%
green	22	24.7	14	35.9	10	47.6
opaque black	27	30.3	8	20.5	4	19.1
cloudy grey	16	18.0	7	17.9	0	0.0
translucent brown-grey	0	0.0	1	2.6	0	0.0
translucent blue-grey	21	23.6	0	0.0	0	0.0
other transparent/translucent greys	3	3.4	8	20.5	7	33.3
chert/chalcedony	0	0.0	1	2.6	0	0.0
Total	89	100.0	39	100.0	21	100.0
Lithic Type						
green	22	24.7	14	35.9	10	47.6
grey	67	75.3	24	61.5	11	52.4
chert/chalcedony	0	0.0	1	2.6	0	0.0

The other obsidian types were less well-represented in the total lithic collection. Translucent blue-grey and translucent brown-grey obsidian are the fourth and fifth most common types in the collection respectively. At its highest rate, in the Epiclassic assemblage, translucent brown-grey is the second most frequently represented obsidian type, following the opaque black obsidian type. Translucent blue-grey is most common to the Postclassic Period assemblages. Tables 5 and 6 illustrate the distribution of the various *Lithic Type Designations* through time and within individual excavation contexts.

A tabulation of the range of *Lithic Visual Types* represented per temporally defined *Excavation Context* serves as a further index of potential differential source exploitation over time (Figure 7). The range for Classic Period subassemblages was from three to eight different lithic types; the R106: Middle Classic House Workshop Deposit and the R112: Classic Structure Floor Contact subassemblages contained the fewest different types of obsidian, while the R106: Middle Classic House Construction Fill subassemblage contained the most numerous obsidian and chert/chalcedony types (8) of any assemblages dated to the Classic Period. The Epiclassic Period assemblage has the highest range of different lithic types (10). The Postclassic range is from five, as in the R112: Early-Middle Postclassic Structure Construction Fill subassemblage and the R112: Postclassic Structure Construction Fill subassemblage, to eight, as is evident in the R106: Middle Postclassic Structure Construction Fill subassemblage. The R106: Colonial Basurero subassemblage contains merely three different obsidian types, while eight lithic types are represented in the R106: Colonial Midden subassemblage. This diversity is clearly not simply a function of sample size. Referring to Table 6, one can see that while the difference in the total number of artifacts in the R106: Middle Classic House Workshop Deposit subassemblage compared to that for the R106: Middle Classic Construction Fill subassemblage is sleight, as noted above the difference in the range of different lithic types represented in each is significantly high. Similarly, while a number of the subassemblages have total artifact counts higher than or equal to that for the PC 94: Epiclassic Patio Construction Fill assemblage, it is within this Epiclassic assemblage that variation in *Lithic Visual Types* represented is highest.

Figure 7: Bar Chart Illustrating a Tabulation of Number of Lithic Visual Types Represented in Excavation Context Subassemblages



If any of the obsidian type-source correlations speculated upon earlier can be considered accurate, some interesting patterns in the exploitation of obsidian at Cholula emerge. Importation of Pachuca obsidian dominated Classic Period Cholula lithic exploitation. With a near complete cessation of Pachuca obsidian consumption at Epiclassic Cholula, Zaragoza-Oyameles or Zinapécuaro-Ucareo was imported in its highest volume. Zinapécuaro-Ucareo and various Pueblan sources continued to be tapped for lithic material in Cholula's Postclassic Period. In the Colonial era, once again Pachuca obsidian entered Cholula's lithic consumption systems at a high rate. Yet, it is critical to a more meaningful assessment of these patterns that the form(s) in which the different obsidian types reached Cholula through time be determined.

Technological Analysis of Obsidian Importation Patterns at Cholula

Rationale

A technological analysis of the chipped lithic materials was performed for three main purposes: (1) to determine if any extensive on-site processing of lithic materials occurred through time at Cholula; (2) to assess the orientation of that(those) reduction system(s) should it(they) be evident; and, (3) to assess variation through time in the form(s) or stage(s) of reduction in which lithic material entered the community. Ultimately, these analyses are meant to serve as a means, in tandem with the above analysis of diachronic obsidian exploitation patterns, of determining whether or not the proposed monopoly over the distribution of Pachuca obsidian by Teotihuacán in the Classic and Tula in the Early Postclassic structured the nature of procurement of this lithic type by Cholula's inhabitants. Similarly, tracking both the rate at and the form in which other lithic materials, notably opaque black and cloudy grey obsidian, were most commonly imported to Cholula, might allow for an assessment of Cholula's wider obsidian procurement, production, and consumption strategies.

Method of Investigation

The products of five broad lithic technological systems were evident in the collection from Cholula. These systems included a General Flake System, a Biface Tool System, a Uniface (Scraper) Tool System, a Prismatic Blade-Core Industry, and a Modified Prismatic Blade Sub-Industry. The Prismatic Blade-Core Reduction system is referred to here as an industry because there is substantial evidence for its operation as an on site manufacturing industry at

Cholula, whereas, the collection does not contain any debitage diagnostic of biface or uniface tool reduction, excluding, of course, some evidence for both the unifacial and bifacial modification of prismatic blades. As Table 7 demonstrates, these first three technological systems account for only a fraction of the specimens in the collection from Cholula (1.9%). Although some unifacial scrapers and bifaces were recovered, their low frequency and a lack of diagnostic debitage associated with their production may suggest that their manufacture did not occur on site at Cholula with any great frequency. However, in the absence of a systematic survey of the Cholula vicinity, this cannot be known for certain. By the sheer amount of finished prismatic blades and associated debitage (95.2%), it is likely that prismatic blades were the primary focus of lithic reduction and of lithic consumption at Cholula throughout the later Classic through Colonial era. Furthermore, the subsequent specialized modification of prismatic blades into distinct forms such as eccentrics and drills, is evident, for instance, in their frequency in the R106: Middle Classic Workshop Excavation Context as was discussed in Chapter 3. Thus, the specialized manufacture of blade tools was also a focus of lithic reduction at some locales in Cholula at certain moments of the community's history.

To reiterate, with reference to the five stage model of prismatic blade-core technology as reconstructed through experimental replication by Clark (1982), Clark and Lee (1984), and Santley et al. (1986), those lithic materials diagnostic of the Prismatic Blade-Core Industry were divided into the appropriate stages and categories as follows: i) Reduction Sequence 1: Crested Ridge Blade; ii) Reduction Sequence 2: Secondary Decortication Flake, Percussion Macroflake, Percussion Macroblade, Pressure Macroblade; iii)

Reduction Sequence 3: Initial Series Blade and Irregular Pressure Blade; iv) Reduction Sequence 4a: Triangular Pressure Blade, Prismatic Pressure Blade, Irregular Prismatic Pressure Blade, and Chiconautla/Amantla Pressure Blade; v) Reduction Sequence 4b: Blade Core, Blade Core Segment, Blade Core Section, Blade Core Thinning Section, Transverse Core Modification Flake, Plunging Blade, Internal Platform Preparation Flake, and Overhang Removal Flake; vi) Reduction Sequence 5a: Modified Prismatic Blade; vii) Reduction Sequence 5b: Pressure Retouch Microflake. General Flake, Biface, and Uniface Reduction have been grouped together in this technological analysis and are referred to in the relevant Tables as "FC, GF, BF, and UF". A second residual category, that of "Unidentifiable/Angular Fragments", was established to account for those specimens that could not be identified as belonging to any of the technological subsystems or reduction sequences. The compositions of the subassemblages and the assemblages from Cholula collection are assessed in the terms of the commodity importation models discussed in Chapter 4 of this thesis.

Results

Across all the Temporal Periods, Reduction Sequence 4(a+b) predominates and accounts for 80.1% (n=468) of all *Reduction Sequences* for the collection (Table 7). Over 48% of Reduction Sequence 4(a+b) is comprised of green obsidian specimens (n=228). The remainder of Reduction Sequence 4(a+b) reduction consists of grey obsidian specimens (n=240) (Table 8). Green obsidian is most representative of Reduction Sequence 4 (a+b) in the Classic Period assemblage (refer to Table 9), but this may well be most likely due to the sheer number of green obsidian artifacts relative to grey obsidian artifacts dating to this *Temporal Period*. Green obsidian is least representative of

Reduction Sequence 4(a+b) in the Epiclassic Period assemblage, but again, this is probably a function of sample distribution.

Table 7: Reduction Sequences Across Collection

Reduction Sequence	Count (n)	Frequency (%)
1	1	.2
2	20	3.4
3	47	8.0
4a	414	70.9
4b	54	9.2
5a	14	2.4
5b	6	1.0
General Flake, Biface and Uniface	11	1.9
Unidentifiable	17	2.9
TOTAL	584	100.0

Reduction Sequence 5(a+b), which amounts to 3.4% of the collection by Reduction Sequences (Table 7), is almost entirely represented by green obsidian across the collection (Table 8), except for the one instance of a grey obsidian modified prismatic blade in a Postclassic deposit. The apparent preference for green obsidian for the specialized manufacture of modified prismatic blades may be linked to its more homogenous and inclusion-free nature. Alternatively, this apparent bias towards green obsidian for such implements may be simply a function of the general predominance of green obsidian in those subassemblages in which modified blade forms were most common (compare Tables 6 and 8, for instance). The possibility that the preference for green obsidian in the manufacture of eccentrics may be related to the material's symbolic significance remains.

As illustrated in Table 9, Reduction Sequences 1-3 account for at least 9% of specimens per Temporal Period in each of the Temporal Period assemblages and a total 11.6% of all Reduction Sequences across the collection (see Table 7).

Returning to table 9, it is clear that in the Classic Period assemblage green obsidian, rather than grey, represents 100% (green n=1) of Reduction Sequence 1, 80% of Reduction Sequence 2 (green n=4), and 84.2% (green n=16) of Reduction Sequence 3. In the Epiclassic Period assemblage, 12.8% (n= 13) of the technological specimens represent Reduction Sequences 2 and 3, yet none are of green obsidian (Table 9). This pattern might be expected due to the relative paucity of green obsidian in this assemblage, yet it is still relevant to understanding the form(s) in which obsidian entered Cholula's production and consumption systems through time. Evidence for Reduction Sequence 1 is absent from the Epiclassic Period assemblage. Nor are any specimens of Reduction Sequence 1 present in the Postclassic Period assemblage wherein Reduction Sequences 2 and 3 account for 11.8% of all Reduction Sequences. In the Postclassic Period assemblage, green obsidian accounts for only 20% (n=1) of Reduction Sequence 2 and 21.4% (n=3) of Reduction Sequence 3. In the Colonial Period assemblage, green obsidian more commonly represents Reduction Sequences 2 and 3 at 33.3% (n=2) and 28.6% (n=2) respectively. Grey obsidian, however, most frequently represents Reduction Sequences 2 and 3 which comprise 18.3% of all Reduction Sequences in the Colonial Period assemblage. No specimens diagnostic of Reduction Sequence 1 are found in the Colonial Period assemblage. Thus, evidence for the occurrence of this Reduction Sequence, and only minimal at that, is restricted to the Classic Period.

Table 8: Reduction Sequences for Obsidian Types Across Collection

Lithic Designation Type	Reduction Sequence	Count (n)	Frequency (%) of Each Reduction Sequence Stage for Collection
Green n=284 f=48.6%	1	1	100.0
	2	7	35.0
	3	21	44.7
	4a	199	48.0
	4b	29	53.7
	5a	12	85.7
	5b	6	100.0
	GF, BF and UF	2	18.2
	Unidentifiable	7	41.2
Opaque Black n=108 f=18.5%	1	0	0.0
	2	5	25.0
	3	11	23.4
	4a	86	20.8
	4b	2	3.7
	5a	0	0.0
	5b	0	0.0
	GF, BF, and UF	2	18.1
	Unidentifiable	2	11.8
Cloudy Grey n=68 f=11.6%	1	0	0.0
	2	3	1.0
	3	5	10.6
	4a	50	12.1
	4b	9	16.7
	5a	0	0.0
	5b	0	0.0
	GF, BF and UF	1	9.1
	Unidentifiable	0	0.0
Other Grey n=114 f=19.5	1	0	0.0
	2	5	25.0
	3	11	23.4
	4a	81	19.6
	4b	12	22.2
	5a	2	14.3
	5b	0	0.0
	GF, BF, and UF	1	9.0
	Unidentifiable	2	11.8
Chert/Chalcedony n=10 f=1.7	1	0	0.0
	2	1	5.0
	3	0	0.0
	4a	0	0.0
	4b	0	0.0
	5a	0	0.0
	5b	0	0.0
	GF, BF, and UF	4	36.4
	Unidentifiable	5	29.4

Table 9: Broad Trends in Reduction Processes Through Time and Number and Percentage of Each Lithic Type Designation Accounting for Each Reduction Sequence Through Time

Temporal Period	Reduction Sequence	Count and Frequency Totals		Green Obsidian		Opaque Black Obsidian		Cloudy Grey Obsidian		Other Transparent/ Translucent Grey Obsidian		Chert/ Chalcedony		Total %
		n	%	n	%	n	%	n	%	n	%	n	%	100.0
Classic n=262 f=44.9%	1	1	0.4	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	100.0
	2	5	1.9	4	80.0	0	0.0	1	20.0	0	0.0	0	0.0	100.0
	3	19	7.2	16	84.2	0	0.0	0	0.0	3	15.8	0	0.0	100.0
	4a	183	69.9	147	80.3	6	3.3	12	6.5	18	9.8	0	0.0	100.0
	4b	31	11.8	18	58.0	0	0.0	6	19.3	7	22.5	0	0.0	100.0
	5a	9	3.4	8	88.9	0	0.0	0	0.0	1	11.1	0	0.0	100.0
	5b	6	2.3	6	100.0	0	0.0	0	0.0	0	0.0	0	0.0	100.0
	FC, GF, BF, UF	3	1.1	1	33.3	0	0.0	0	0.0	1	33.3	1	33.3	100.0
	UNID/ANG FRAG	5	1.9	3	60.0	0	0.0	0	0.0	2	40.0	0	0.0	100.0
Epiclassic n=101 f=17.3%	1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
	2	4	3.9	0	0.0	2	50.0	0	0.0	2	50.0	0	0.0	100.0
	3	9	8.9	0	0.0	5	55.5	1	11.1	3	33.3	0	0.0	100.0
	4a	66	65.4	10	15.1	27	40.9	14	21.2	15	22.7	0	0.0	100.0
	4b	7	6.9	3	42.9	1	14.3	1	14.3	2	28.6	0	0.0	100.0
	5a	1	0.9	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	100.0
	5b	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
	FC, GF, BF, UF	2	2.0	1	50.0	0	0.0	0	0.0	1	50.0	0	0.0	100.0
	UNID/ANG FRAG	12	11.9	4	33.3	2	16.6	0	0.0	1	8.3	5	41.6	100.0
Postclassic n=161 f=27.6%	1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
	2	5	3.1	1	20.0	0	0.0	2	40.0	1	20.0	1	20.0	100.0
	3	14	8.7	3	21.4	6	42.9	2	14.3	3	21.4	0	0.0	100.0
	4a	127	78.9	26	20.5	45	35.4	21	16.5	35	27.6	0	0.0	100.0
	4b	9	5.6	6	66.7	1	11.1	0	0.0	2	22.2	0	0.0	100.0
	5a	2	1.2	1	50.0	0	0.0	0	0.0	1	50.0	0	0.0	100.0
	5b	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
	FC, GF, BF, UF	4	2.5	0	0.0	1	25.0	1	25.0	0	0.0	2	50.0	100.0
	UNID/ANG FRAG	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Colonial n=60 f=10.3%	1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
	2	6	10.0	2	33.3	3	50.0	0	0.0	1	16.7	0	0.0	100.0
	3	5	8.3	2	40.0	0	0.0	2	40.0	1	20.0	0	0.0	100.0
	4a	38	63.3	16	42.1	8	21.0	3	7.9	11	28.9	0	0.0	100.0
	4b	7	11.7	2	28.6	0	0.0	2	28.6	3	42.9	0	0.0	100.0
	5a	2	3.3	2	100.0	0	0.0	0	0.0	0	0.0	0	0.0	100.0
	5b	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
	FC, GF, BF, UF	2	3.3	0	0.0	1	50.0	0	0.0	0	0.0	1	50.0	100.0
	UNID/ANG FRAG	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Special Context: Early Classic Workshop n=100	1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
	2	2	2.0	2	100.0	0	0.0	0	0.0	0	0.0	0	0.0	100.0
	3	8	8.0	8	100.0	0	0.0	0	0.0	0	0.0	0	0.0	100.0
	4a	63	63.0	61	96.8	1	1.6	0	0.0	1	1.6	0	0.0	100.0
	4b	11	11.0	11	100.0	0	0.0	0	0.0	0	0.0	0	0.0	100.0
	5a	7	7.0	7	100.0	0	0.0	0	0.0	0	0.0	0	0.0	100.0
	5b	6	6.0	6	100.0	0	0.0	0	0.0	0	0.0	0	0.0	100.0
	FC, GF, BF, UF	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
	UNID/ANG FRAG	3	3.0	3	100.0	0	0.0	0	0.0	0	0.0	0	0.0	100.0

Based on a presence/absence model of relative abundance of certain debitage classes, these distributional patterns suggest that the green obsidian that was being processed on site at Cholula entered the community in different stages of reduction through time. Evidence for the importation of green obsidian in forms not yet at the Prismatic Pressure Core stage is most strongly suggested for the Classic Period assemblages, and least so for the Epiclassic Period assemblage. In the Postclassic Period and Colonial Era assemblages, there is some evidence for the reduction of green obsidian in pre-Prismatic Pressure Core form, but the implied rate of its occurrence remains rather low, not nearly approaching the frequency witnessed in the Classic Period assemblage.

Yet, when the data are organized differently, a more complex and potentially more meaningful pattern of the differential exploitation of the obsidian types emerges. Tables 10, 11, 12, and 13 illustrate patterns of consumption in Cholula's blade-core technology over time for each of the four obsidian type groups independently and excluding the Reduction Sequence categories of Flake Core, General Flake, Biface, and Uniface and Unidentifiable/Angular Fragment. Table 10, 11, 12, and 13 suggest that, on the basis of a presence/absence of certain debitage classes index, all the obsidian types entered Cholula in pre-prismatic blade-core form on occasion.

Table 10: Green Obsidian Consumption in Blade-Core Technology at Cholula Over Time

	Reduction Sequence	Classic Period		Sub-Totals	Epiclassic Period		Sub-Totals	Postclassic Period		Sub-Totals	Colonial Period		Sub-Totals
Percussion Products		n	%		n	%		n	%		n	%	
	1	1	0.5		0	0.0		0	0.0		0	0.0	
	2	4	2.0	10.5%	0	0.0	0.0%	1	2.7	10.8%	2	8.3	16.6%
	3	16	8.0		0	0.0		3	8.1		2	8.3	
Pressure Products													
	4a	147	73.5		10	71.4		26	70.3		16	66.6	
	4b	18	9.0		3	21.4		6	16.2		2	8.3	
	5a	8	4.0	89.5%	1	7.1	100.0%	1	2.7	89.2%	2	8.3	83.3%
	5b	6	3.0		0	0.0		0	0.0		0	0.0	
	Total	200	100.0		14	100.0		37	100.0		24	100.0	
	Percussion Products: Pressure Products	1:8.5			0:14			1:8.2			1:5		

Table 11: Opaque Black Obsidian Consumption in Blade-Core Technology at Cholula Over Time

	Reduction Sequence	Classic Period		Sub-Totals	Epiclassic Period		Sub-Totals	Postclassic Period		Sub-Totals	Colonial Period		Sub-Totals
Percussion Products		n	%		n	%		n	%		n	%	
	1	0	0.0		0	0.0		0	0.0		0	0.0	
	2	0	0.0	0.0%	2	5.7	20.0%	0	0.0	11.5%	3	27.3	27.3%
	3	0	0.0		5	14.3		6	11.5		0	0.0	
Pressure Products													
	4a	6	100.0		27	77.1		45	86.5		8	72.7	
	4b	0	0.0		1	2.9		1	1.9		0	0.0	
	5a	0	0.0	100.0%	0	0.0	80.0%	0	0.0	88.4%	0	0.0	72.7%
	5b	0	0.0		0	0.0		0	0.0		0	0.0	
	Total	6	100.0		35	100.0		52	100.0		11	100.0	
	Percussion Products: Pressure Products	0:6			1:4			1:7.6			1:2.7		

Table 12: Cloudy Grey Obsidian Consumption in Blade-Core Technology at Cholula Over Time

	Reduction Sequence	Classic Period		Sub-Totals	Epiclassic Period		Sub-Totals	Postclassic Period		Sub-Totals	Colonial Period		Sub-Totals
Percussion Products		n	%		n	%		n	%		n	%	
	1	0	0.0		0	0.0		0	0.0		0	0.0	
	2	1	5.3	5.3%	0	0.0	6.2%	2	8.0	16.0%	0	0.0	28.6%
	3	0	0.0		1	6.2		2	8.0		2	28.6	
Pressure Products													
	4a	12	63.1		14	87.5		21	84.0		3	42.8	
	4b	6	31.6		1	6.2		0	0.0		2	28.6	
	5a	0	0.0	94.7%	0	0.0	93.7%	0	0.0	84.0%	0	0.0	71.4%
	5b	0	0.0		0	0.0		0	0.0		0	0.0	
	Total	19	100.0		16	100.0		25	100.0		7	100.0	
	Percussion Products: Pressure Products	1:18			1:15			1:5.2			1:2.5		

Table 13: Other Transparent/Translucent Obsidian Consumption in Blade-Core Technology at Cholula Over Time

	Reduction Sequence	Classic Period		Sub-Totals	Epiclassic Period		Sub-Totals	Postclassic Period		Sub-Totals	Colonial Period		Sub-Totals
Percussion Products		n	%		n	%		n	%		n	%	
	1	0	0.0		0	0.0		0	0.0		0	0.0	
	2	0	0.0	10.3%	2	9.1	22.7%	1	2.4	9.5%	1	6.2	12.4%
	3	3	10.3		3	13.6		3	7.1		1	6.2	
Pressure Products													
	4a	18	62.1		15	68.2		35	83.3		11	68.7	
	4b	7	24.1		2	9.1		2	4.8		3	18.7	
	5a	1	3.4	89.6%	0	0.0	77.3%	1	2.4	90.5%	0	0.0	87.4%
	5b	0	0.0		0	0.0		0	0.0		0	0.0	
	Total	29	100.0		22	100.0		42	100.0		16	100.0	
	Percussion Products: Pressure Products	1:8.7			1:3.4			1:9.5			1:7		

How do these patterns of obsidian importation and reduction compare to the commodity model indices presented by Clark (1988:213-214, Tables 152-156) and discussed in Chapter 4? I will remind the reader that in my application of Clark's original data (his Tables 152-154, a summary of which were presented in Table 1), some modifications have been made. I have excluded those categories that Clark was able to identify with blade-core reduction in his experiments and that I was unable to assign as confidently to this aspect of lithic reduction in my analysis of the Cholula collection. These artifact categories that Clark includes in his model of blade-core reduction as derived experimentally that I could not associate clearly with blade-core reduction in my analysis are as follows: 'flakes', 'flake shatter', 'very small flakes', and 'core shatter'. As was discussed in Chapter 4 where I introduced my model of Prismatic Blade Production, all flake and shatter materials have been assigned to the residual categories of Flake Core, General Flake, Biface, and Uniface and Unidentifiable/Angular Fragments. I should note for clarity that I have used Clark's raw counts of artifact classes (1988:213, Tables 152-154), rather than his adjusted summary percentages which were presented in Table 1 of this thesis.

Thus, the following proportions and ratios have been adapted and adjusted from Clark's data and reflect the exclusion of all flake-related materials.

With these modifications (Table 14), Clark's data demonstrate that when a nodule of raw material has been reduced, 30.3% of the resultant lithic materials should consist of artifacts related to my Reduction Sequences 1-3. If the imported object had been already preformed into a macrocore and then further reduced on site, then 22.2% of the associated artifacts should be Reduction Sequences 1-3 products. If, however, the object in question has already been preformed into a large polyhedral core before further in situ reduction occurs, then only 1.1% of the resultant debitage will be artifacts related to my Reduction Sequences 1-3. Stated otherwise (following Clark 1988:214), for the reduction of a nodule of raw material, the ratio of percussion technological artifacts to pressure products is roughly 1:2. When a macrocore has been reduced, the ratio falls at approximately 1:3. For the reduction of a large polyhedral core, the expected percussion products to pressure products ratio is 1:87.

Reduction Sequences 1-3 involving green obsidian in the Classic Period assemblage amount to 10.5% of all blade-core related Reduction Sequences and the ratio of percussion products to pressure products for green obsidian only is 1:8.5 (Table 10). Obviously, these proportions and ratios, when compared with expectations derived from Clark's data, mitigate against the possibility that unmodified green obsidian nodules were imported and reduced on site at Cholula. Yet, the derived proportion and ratio for Classic Period green obsidian are not nearly as diminutive as the experimentally-derived proportion and ratio expected for the reduction of large polyhedral cores.

In this context, it is important to note that each of Clark's sets of proportional expectations and ratios (i.e. for each of the three core forms) was derived from experiments that focused on the reduction only of one type of core form at a time. If the resultant subassemblages of his nodule, macrocore, and large polyhedral core reduction experiment sets were collapsed into a single assemblage of artifacts, the composition of artifact frequencies and the consequent expectations derived, might be rather different. For instance (Table 15), by combining the artifact frequencies of the three assemblages I derived from Clark's data (Table 14), artifacts related to my Reduction Sequences 1-3 account for 18.2% of the complete assemblage (provided those flake-related artifact classes Clark identifies as components of blade-core technology, but that are not included in my Reduction Sequences 1-5, e.g. flakes and shatter, are excluded). The ratio of percussion to pressure products is then 1:4. If one combined the proportional representation of the different artifact classes from Clark's macrocore and large polyhedral core reduction experiments only (Table 16), 10.8% of the resultant materials should be related to my Reduction Sequences 1-3 and the ratio of percussion to pressure products is approximately 1:9 (again, excluding any artifact categories that I do not include in my Reduction Sequences 1-5).

Table 14: Adapted from Clark 1988:212-213, Tables152-154. Table showing modified proportion and ratios of percussion products relative to pressure products as derived from Clark's data.

	Artifact Type	Reduction of Nodules (n=5) Artifact Count	Sub-Totals	Reduction of Macrocores (n=4) Artifact Count	Sub-Totals	Reduction of Large Polyhedral Cores (n=6) Artifact Count	Sub-Totals
Percussion Products							
	Decortication Flake	30	30.3%	0	22.2%	0	1.1%
	Macroflake	45		25		0	
	Macroblade	112		72		2	
	Small Percussion Blade	112		68		8	
Pressure Products							
	Prismatic Blade	628	69.7%	528	77.8%	806	98.9%
	Stunted Blade	24		24		24	
	Exhausted Core	5		4		6	
	Core Fragment	1		1		1	
	Plunging Blade	11		7		16	
	Core Rejuvenation	18		14		16	
	Total	986		743		879	
	Percussion Products: Pressure Products	1:2.3		1:3.5		1:86.9	

Table 15: Composition of hypothetical assemblage from combined reduction of Nodules, Macrocores and Large Polyhedral Cores as derived from Clark's data .

	Artifact Type	Count	Sub-Total
Percussion Products			
	Decortication Flake	30	18.2%
	Macroflake	70	
	Macroblade	186	
	Small Percussion Blade	188	
Pressure Products			
	Prismatic Blade	1962	81.8%
	Stunted Blade	72	
	Exhausted Core	15	
	Core Fragment	3	
	Plunging Blade	34	
	Core Rejuvenation	48	
	Total	2608	
	Ratio of Percussion Products to Pressure Products	1:4	

Table 16: Composition of hypothetical assemblage from the combined reduction of Macrocores and Large Polyhedral cores as derived from Clark's data

	Artifact Type	Count	Sub-Total
Percussion Products			
	Decortication Flake	0	10.8%
	Macroflake	25	
	Macroblade	74	
	Small Percussion Blade	76	
Pressure Products			
	Prismatic Blade	1334	89.2%
	Stunted Blade	48	
	Exhausted Core	10	
	Core Fragment	2	
	Plunging Blade	23	
	Core Rejuvenation	30	
	Total	1622	
	Ratio of Percussion Products to Pressure Products	1:9	

When compared with the proportion and ratio expectations derived from these two derived models (Tables 15 and 16), the proportion of Reduction Sequences 1-3 materials and the ratio of percussion to pressure artifacts in the Classic Period green obsidian sub-assemblage compares most favourably with the hypothesized proportion and ratio for the combined reduction of macrocores and large polyhedral cores (Table 14). It would seem then, that the green obsidian Classic period assemblage represents the material results of on site reduction of both macrocores and large polyhedral cores. The Epiclassic data are more ambiguous; there is no statistical support for the seeming decline in importation of pre-prismatic green obsidian forms for the period as suggested by Table 10. Rather, even though no green obsidian percussion artifacts (Reduction Sequences 1-3) were recovered from the Epiclassic context, there is no statistically valid reason for assuming that this indicates a complete cessation in the importation of green obsidian pre-prismatic blade cores for the Epiclassic. The Postclassic Period subassemblage of green obsidian, where the proportion of blade-core technology percussion products is 10.8% and the ratio of percussion products to pressure products is 1:8, also strongly suggests the on site reduction of both macrocores and large polyhedral cores. The composition of the Colonial Period subassemblage of green obsidian is most similar to the hypothesized composition of an assemblage resulting from the on site reduction of all the core form types, but probably includes the results of a higher rate of macrocore form reduction than in any of the earlier cases. Thus, green obsidian was being imported to Cholula, at least on occasion, in macrocore, and possibly nodule, form in Colonial and Postclassic times. Still, in the Classic Period, green obsidian entered the site in macrocore form at least on occasion.

In the Epiclassic assemblage green obsidian is extraordinarily rare and it occurs in the recovered sample only as finished blades and other artifact forms relating to the reduction of heavily pre-processed large polyhedral core forms. Yet, artifacts relating to Reduction sequences 2-3 amount to a full 14.9% of all blade-core related specimens (or reduction Sequences 1-5 artifacts) and the ratio of percussion products to pressure products is 1:7. What fills the role that was once occupied by green obsidian? As has been established, there is a clear indication that opaque black dominates the pattern of lithic consumption in the Epiclassic assemblage (see Table 5). It would appear that when Reduction Sequences 2-3 reduction did occur, opaque black obsidian and various other transparent/translucent obsidian types were more commonly involved at approximately similar rates (Tables 11 and 13, respectively). In the Epiclassic assemblage, the proportion of opaque black obsidian percussion artifacts among blade-core related artifacts is 20.0% and the ratio of opaque black obsidian percussion products to pressure products is 1:4 (Table 11). The proportion of other transparent/translucent obsidian percussion artifacts within the blade-core related Reduction Sequences is 22.7% and the ratio of percussion products to pressure products is 1:3.4 (Table 13). Thus, it seems likely that on site reduction of opaque black and other transparent/translucent grey macrocores, and possibly nodules, occurred at Epiclassic Cholula. Conversely, there is little evidence to demonstrate the importation in the Epiclassic of cloudy grey obsidian in anything other than large polyhedral core form (Table 12).

This pattern continues to characterize the Postclassic Period assemblage where the rate of Reduction Sequences 2-3 reduction remains rather high, but cannot be accounted for by green obsidian alone (Table 9). Twelve percent of all blade-core related artifacts in the Postclassic assemblage are associated with Reduction Sequences 1-3 and opaque black obsidian accounts for 31.6% of that portion. Green obsidian represents 21% of all Reduction Sequences 1-3 reduction and the remainder is accounted for by cloudy grey and other transparent/translucent obsidian types. The compositions of the Postclassic subassemblages of each of the four obsidian types (Tables 10, 11, 12, and 13, Postclassic column) most closely resemble the expected frequencies and ratios of combined macrocore and large polyhedral core reduction on site. Table 12 does suggest the possibility that cloudy grey obsidian entered Postclassic Cholula in nodule form on occasion as 16.0% cloudy grey obsidian represents Stages 2-3 reduction, while the ratio of percussion products to pressure products is 1:5.2. Thus, it seems likely that on occasion macrocores of a number of obsidian types, including green, were reduced on site, but that more commonly, large polyhedral cores and possibly even finished implements of the various obsidian types were imported to Postclassic Cholula.

In the Colonial Period assemblage, the rate of Reduction Sequence 2-3 reduction is at its highest (28.8% of all blade-core related reduction) and is as commonly represented by green obsidian as it is by the other obsidian types. The ratio of percussion to pressure products is 1:4. Within the obsidian type specific Colonial subassemblages, 27.3% of opaque black obsidian is accounted for by Reduction Sequences 1-3 reduction and the ratio of percussion products to pressure products is 1:2.7 (Table 11). For cloudy grey obsidian, the proportion accounted for by artifacts associated with Reduction Sequences 1-3 is 28.6% and the ratio of percussion products to pressure products is 1:2.5 (Table 12). By comparing these proportions and ratios with those derived from Clark's data, it would seem clear that on-site reduction of nodules of opaque black and cloudy grey obsidian occurred at Cholula in the Colonial era. Opaque black, cloudy grey, green and other transparent/translucent obsidian macrocores and large polyhedral cores were probably also imported to Colonial Cholula. It follows then that prismatic blades were also likely to have been manufactured on site.

Finally, although the frequency of green obsidian percussion artifacts is quite variable over time, throughout the temporally defined assemblages Reduction Sequence 4(a+b) continues to be well represented by green obsidian. There does not seem to have been a time when Pachuca obsidian was not brought into Cholula's lithic consumption systems. Opaque black, cloudy grey, and other transparent/translucent obsidians were also exploited by both Cholula's lithic producers and consumers throughout the Classic through Colonial Period, but may have arrived in different forms at different times.

Other Technological Analyses

Platform Treatment and Morphology

The occurrence of chronologically and behaviourally meaningful sub-trends within the general framework of the evolution of prismatic blade technology has long been recognized. In his synthetical study of lithic artifacts in central Mexico, Tolstoy (1971) was one of the first researchers to remark that pecked and ground blade platforms occurred more commonly in more recent contexts, especially those dating to the Postclassic Period. MacNeish (1967) had earlier observed this general pattern in the lithic assemblages of the Tehuacán Valley. These earlier works contributed to a general understanding that platform grinding in blade-core technology was a Postclassic phenomenon. Santley et al. (1986:123-124), however, have since contended that platform grinding developed within rural communities of the Teotihuacán Valley in the Middle Classic, when it was still quite unknown in Teotihuacán's city blade workshops. They have suggested that this implies a lack of reliance by the valley's rural settlements on the products of their state capital.

In another vein, Sheets (1978) has documented a general increase in Mesoamerican blade platform size over time, but Parry has suggested that the trend may be more related to factors governing procurement strategies (Parry 1987:39-40) rather than to a steadfast technological shift. In his collections from Dzibilchaltún and Mayapán, Rovner (1974, 1975) tracked a general trend of increasing platform size and more intensive platform grinding over time. He also found Formative Period core rim-edge trimming (nibbling) to have been common, while in the Middle Classic some surface scratching on core and blade platforms could be detected; Postclassic platforms were heavily ground with no evidence of core rim edge trimming. The analysis of the lithic collection from Cholula offers some data to contribute to the on-going discussion of these general evolutionary sub-trends in prismatic blade technology.

Variation in platform morphology of blades and blade cores through time was assessed as a means of comparing these frequencies within the Cholula collection with the wider trends referred to above. Specimens with a proximal end intact were examined and the observable condition of the platform recorded. As demonstrated in Table 17, of the 118 proximal specimens with examinable platform conditions, seven were macroblades (five of which were ground), one a crested ridge blade, one a core segment and the rest were pressure blades (including two ground platform initial series blades). Sixty-one of these platforms were ground (51.7% of platforms with observable conditions), ten were scratched (8.5%), ten exhibited rim/edge grinding and/or crushing (8.5%), two were scratched and ground (1.7%), while thirty-five (29.7%) exhibited none of these characteristics.

Table 17: Platform Treatment Across Temporal Periods

Total Examinable Blade Platforms: 118
Ground: n=61 %=51.7
Scratched: n=10 %=8.5
Ground and Scratched: n=2 %=1.7
Edge Grind/Edge Crush: n=10 %=8.5
Unabraded: n=35 %=29.7

Temporal Period	Condition	Count	Frequency	Green Obsidian Count
Classic	Ground	5	10.6	1
	Scratched	8	17.0	7
	Ground and Scratched	0	0.0	0
	Edge Grind/Edge Crush	9	19.1	9
	Unmodified	25	53.2	17
	Total	47	100.0	34
Epiclassic	Ground	17	85.0	0
	Scratched	1	5.0	0
	Ground and Scratched	1	5.0	0
	Edge Grind/Edge Crush	0	0.0	0
	Unmodified	1	5.0	1
	Total	20	100.0	1
Postclassic	Ground	27	79.4	2
	Scratched	0	0.0	0
	Ground and Scratched	1	2.9	1
	Edge Grind/Edge Crush	1	2.9	1
	Unmodified	5	14.7	1
	Total	34	100.0	3
Colonial	Ground	12	70.6	1
	Scratched	1	5.9	1
	Ground and Scratched	0	0.0	0
	Edge Grind/Edge Crush	0	0.0	0
	Unmodified	4	23.5	4
	Total	17	100.0	6
Special Context: Middle Classic Workshop Deposit	Ground	0	0.0	0
	Scratched	1	8.3	1
	Ground and Scratched	0	0.0	0
	Edge Grind/Edge Crush	7	58.3	7
	Unmodified	4	33.3	4
	Total	12	100.0	12

Some broad temporal trends suggested by these data can be isolated. The ratio of ground platforms to unabraded/untreated platforms for the Classic

Period assemblage is 1:5. The ratio for the Epiclassic Period assemblage is quite different at 17:1. In the Postclassic Period assemblage it is 5.4:1, while in the Colonial Period assemblage it is 3:1. This pattern seems to correspond well with wider Mesoamerican trends in platform abrasion as this technique is more common to prismatic blades in the post-Classic assemblages. Markings resembling scratching or abrasion on a core top or blade platform, could possibly be a remnant of post-depositional disturbance, but it has been observed and noted as a technological effect by Rovner (1974; 1975). In this collection, evidence of such platform scratching is common only in the Classic Period. Distinctive core rim or edge abrading (nibbling) is also most common in the Classic Period assemblage of the Cholula collection. It is also of interest to note that while none of the proximal specimens associated with the Middle Classic Workshop Deposit bear ground platforms, 58.3% (n=7) exhibit evidence of core rim abrading (nibbling).

Some general trends in the width of platforms on blades are also suggested by the data. As is demonstrated in Figure 8 and Table 18, blade platforms dated to the Classic Period tend to be more narrow, measuring less than 1 millimeter, while those of later periods tend to be wider. The mean platform width for Classic Period blades is 1.1 millimeters; for Epiclassic Period blades it is 1.6 millimeters; for Postclassic blades, 1.9 millimeters; and, for Colonial blades it is 1.5 millimeters. This pattern corresponds well with wider Mesoamerican trends in prismatic blade platform width. Most probably, however, the sample size of measured blade platforms tested here is far too inadequate to truly address the issue.

Figure 8: Scattergram of Blade Platform Widths Across Temporal Periods

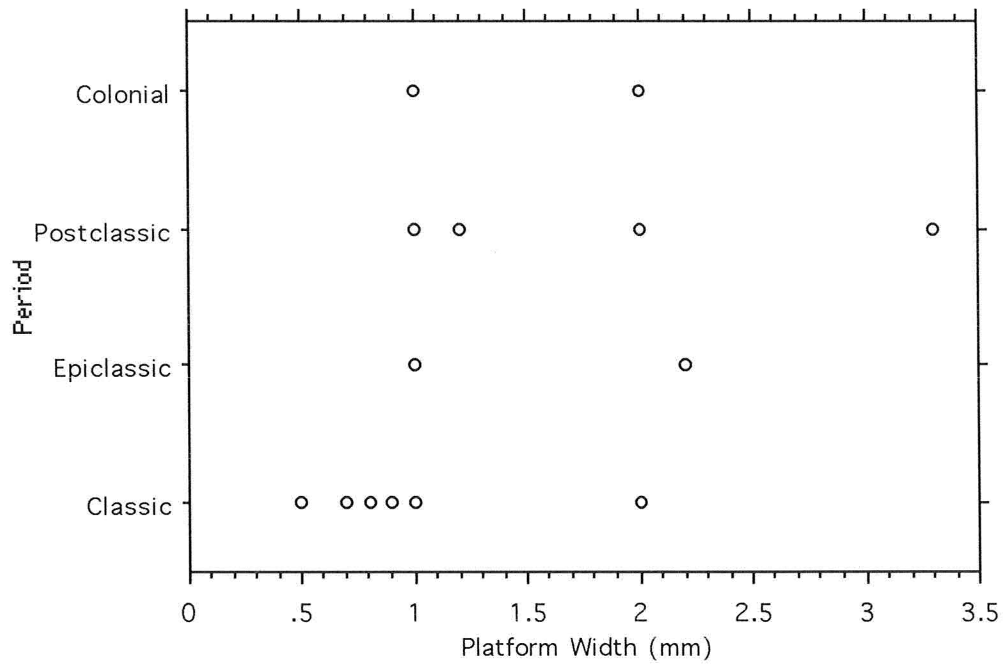


Table 18: Mean Widths of Blade Platforms Across Temporal Periods

Temporal Period	Count	Mean Width (mm)
Classic	6	1.1
Epiclassic	2	1.6
Postclassic	3	1.9
Colonial	2	1.5
Total	13	

Core Recycling and Rejuvenation

Although not strictly quantifiable, some trends in the consumption of prismatic blade cores (whatever condition obsidian first arrived in) are discernible. As Table 19 shows, many of the cores were quite severely destroyed (laterally split and/or crushed) and some were even used informally (without further modification). Also, quite a bit of core rejuvenation and recycling behaviour was indicated through the technological analysis described above; categories such as bitruncated cores, core tablets and sections, and transverse core face modification flakes (Reduction Sequence 4b) form a substantial proportion of blade-core related debitage.

Table19: Condition of Cores from Collection

Excavation Context	Lithic Type Designation	Technological Class	Condition	Utilization	Description
R112: Postclassic Structure Construction Fill	Green	blade core segment	medial	absent	Bitruncated -1 end bipolarly severed, 1 end crushed; 10 blade scars.
R112: Postclassic Structure Construction Fill	Green	blade core thinning section	intact	absent	
R106: Middle Postclassic Midden Deposit	Green	blade core segment	distal	absent	Truncated
R106: Middle Postclassic Midden Deposit	Green	blade core section	medial	absent	
R106: Middle Postclassic Midden Deposit	opaque black	blade core segment	medial	absent	Bitruncated; proximal end multi-faceted.
R106: Colonial Midden	Green	blade core	intact	absent	
R106: Colonial Midden	Green	blade core segment	distal	absent	Truncated; split laterally.
R106: Colonial Midden	Cloudy Grey	blade core thinning section	intact	lightly utilized	
R106: Middle Classic Workshop Deposit	Green	blade core segment	medial-distal	absent	Split laterally; 9 blade scars including 1 plunging blade scar; truncated, new platform preparation flakes removed and grinding on fresh core top.
R106: Middle Classic Workshop Deposit	Green	blade core segment	medial-distal	present	Split laterally; evidence of crushing; 1 plunging blade scar; cryptocrystalline impurities.
R106: Middle Classic Workshop Deposit	Green	blade core segment	medial	present	Bitruncated; grinding on distal; hinge fracture from blade driven off from distal end.
R106: Middle Classic Workshop Deposit	Green	blade core section	distal	absent	Reverse distal core.
R106: Middle Classic Workshop Deposit	Green	blade core segment	medial	absent	Bitruncated.
R106: Classic House Construction Fill	Other Transparent/Translucent Grey	blade core segment	medial-distal	absent	Split laterally along axis; evidence of crushing; 3 blade scars.
R106: Middle Classic House Const. Fill	Green	blade core segment	distal	present	Distal core tip with 2 reverse distal blades removed; grinding on edge.
R106: Middle Classic House Construction Fill	Green	blade core section	medial	present	
R106: Middle Classic House Construction Fill	Green	blade core segment	distal	present	Split laterally along axis; reverse distal core with grinding on distal end.
R106: Middle Classic House Construction Fill	Green	blade core section	medial	present	
R106: Middle Classic House Construction Fill	Green	blade core section	medial	absent	
R106: Middle Classic House Construction Fill	Other Transparent/Translucent Grey	blade core segment	proximal	absent	
R106: Middle Classic House Construction Fill	Other Transparent/Translucent Grey	blade core segment	medial-distal	absent	

Ten of the twenty-one cores exhibit evidence of rejuvenation. Evidence for core rejuvenation techniques observed on the specimens from Cholula included the truncating of cores' proximal ends, likely in an effort to create a new platform. This was probably attempted once the diametre of the core's original platform became smaller than that of the medial section, which would have otherwise impeded further blade removal. The occurrence of manufacturing errors may have also motivated Cholula's knappers to attempt truncation as a core recovery technique. In one instance of core rejuvenation by truncation, there is evidence for the previous removal of a plunging blade that would have effectively destroyed the core form. There is also evidence in the Cholula collection for the employment of another core recovery technique, the use of a core close to exhaustion as a 'reverse distal core' (Hirth and company, personal communication 1994). By flipping a nearly expended core around so that the previously distal end is used as a fresh platform, it is possible that a few more blades could be driven off. Pollard (1993:230) also mentions the inclusion of reverse distal core fragments in the lithic collection from Tarascan Tzintzuntzan. A number of the cores from Cholula bear evidence of this core reuse behaviour in the form of blade scars from distally removed blades. These core recovery behaviours seem to be restricted to Classic period contexts which might suggest a perceived relative instability in procurement strategies for Cholultecas of this time.

Several of the cores from the Classic Period assemblage bear evidence of their subsequent intentional destruction. The splitting of a core along its lateral axis and the crushing of its ends would inhibit its potential future usefulness as a core rather effectively. A few of these destroyed cores, however, bear positive evidence of use-wear. This might further suggest a certain frugality among Classic Period Cholultecas in their consumption of obsidian. The initial intentional destruction of a good proportion of cores in the Classic Period may reflect an attempt by some of Cholula's knappers to retain control of their market by limiting wider consumer access to core forms and restricting the availability of good quality obsidian within that market to finished blade implements only.

Blade cores from deposits dating to the Colonial era are much more narrow in diameter than earlier period cores and do not appear to have been fragmented to the degree that the Classic Period cores were. Rather, the cores recovered from Colonial era contexts bear a prototypical bullet-shaped form and no evidence for knapper miscalculation as was witnessed in the Classic core assemblage, such as plunging blade scars or hinge fractures, is found.

Specialized Manufacture of Modified Prismatic Blade Implements

As Table 7 shows, 2.4% of the lithic collection consisted of intentionally modified prismatic blades (see Figure 9 for some examples). Of the fourteen modified prismatic blades noted, nine (64.3%) were associated with the Classic Period assemblage (most of these were found in the R106: Middle Classic House Workshop Deposit Excavation Context), one (7.1%) with the Epiclassic period assemblage, two (14.3%) with the Postclassic Period assemblage, and two (14.3%) with the Colonial Period assemblage. These modified pressure blades were highly variable morphologically. Of the nine Classic Period assemblage modified prismatic blades, four were notched into crescent or spokeshave forms, two were side notched near a lateral blade end, and three were unifacially knapped into drill/perforator implements. In the Epiclassic Period assemblage, one blade was unifacially pressure flaked into a form resembling a thumbnail scraper. The Postclassic Period and Colonial Period assemblages also contained examples of the side notched form.

Figure 9: Examples of Modified Pressure Blades

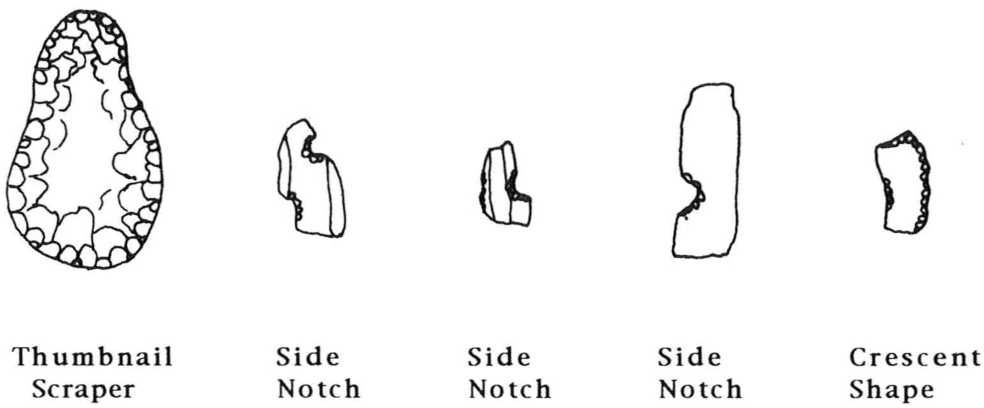
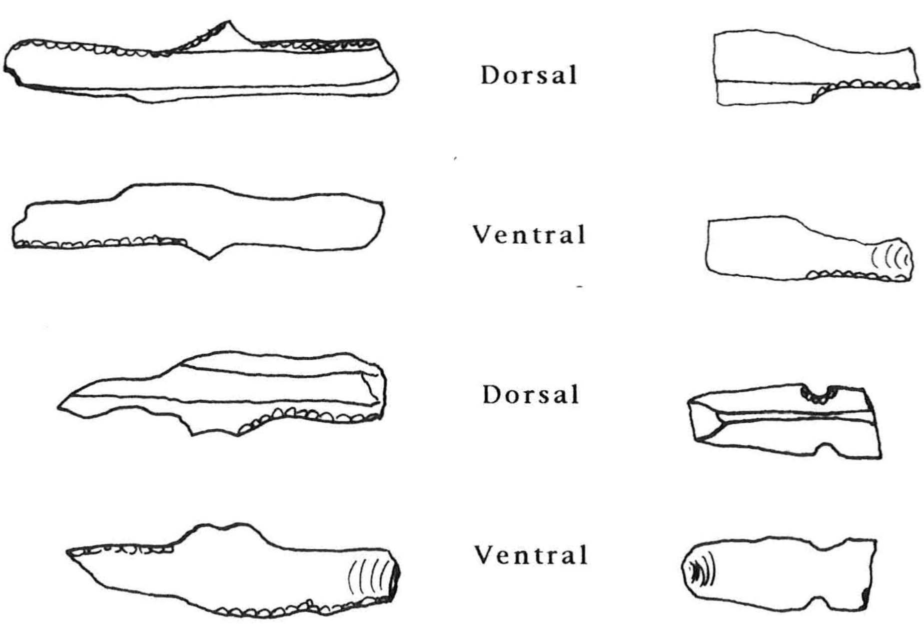


Figure 10: Examples of Chiconautla/Amantla Pressure Blades



Six additional blades have truly unique morphologies (see Figure 10 for some examples). These artifacts have been labeled as 'Chiconautla/Amantla' blades in the database to reflect their resemblance to similar forms analyzed by Tolstoy (1971). According to Tolstoy (1971:274-275) and Spence (personal communication, 1995), blades take on these forms through intensive use and, possibly, from being hafted into wood or bone handles (Keeley 1982). Healan (1993) has reported that blades with the 'Amantla' use-wear pattern are quite common at Tula. He has also suggested that this form of patterned edge damage accrues through use in bidirectional hafting (1993:451, Figure 2). It is certainly of interest to note the persistence of this observably distinct blade form through time at Cholula as it suggests the significance of the use of composite tools to blade-core technology.

<u>Use-Wear Analysis of Intrasite Obsidian Consumption Patterns</u>

Rationale

Evidence for use-wear was determined largely on a presence/absence basis. The emphasis in the examination of use wear patterns in this study was not on function. Instead, use wear analysis was pursued in order to address questions concerning the depositional nature of several of the subassemblages, and by extension, to assess patterns of the organization of lithic consumption at Cholula. Assessment of utilization of all technological categories was conducted as a means of determining whether or not specimens of the technological class termed 'irregular pressure blade' were treated as debitage rather than as formal implements by their manufacturers and/or their consumers.

Method of Investigation

Following Odell (1981; 1990), a low magnification approach to the discernment of edge damage patterns on the lithic artifacts was followed. All lithic specimens were examined under a stereoscopic microscope with a range of 10x to 25x magnification. An incandescent lighting source was used. While no control test was used to differentiate scarring from post-depositional surface modification from that incurred through use, certain criteria were established in order to mitigate against the confusion of these two factors. For a specimen to qualify as used, clear and patterned evidence of use-wear scarring that resembled either written descriptions or photographs of experimental use-wear specimens in collections presented by Parry (1987) and/or Clark (1988) had to be recognizable. Edge damage attributes, rather than evidence for polishing, were concentrated on in this determination (Tringham et al. 1974). Following Parry (1987), all usable edges of each specimen were examined. The establishment of an edge as utilized was done in a very conservative manner and those specimens not bearing clear evidence of use were ascribed to a non-utilized category.

Results

Perhaps the most interesting results of the use wear analysis are provided by the distribution of utilized forms across technological categories. According to Table 20, the frequency of utilization for debitage, for instance, ranges from 66.7% in the Colonial Period assemblage where it is most common, to 29.4% in the Postclassic Period assemblage where it is least so. Thus, even materials not originally destined to be tools were used, probably expediently, by Cholula's inhabitants at a relatively high rate.

Another technologically and behaviourally informative pattern emerged through the analysis of use wear. In the deposit designated as a lithic workshop, R106: Middle Classic House Workshop Deposit, 40% of prismatic blades were utilized (Table 21), while only 22.7% of debitage specimens (Table 20) and 25% of irregular pressure blades were used (Table 22). The average proportional frequency for the utilization of irregular pressure blades in other Excavation Contexts subassemblages containing them equals, on average, 90.6% (Table 22). This discrepancy might seem to indicate a number of possibilities. First of all, the relatively low rate at which irregular pressure blades were used by the individual(s) associated with the R106: Middle Classic House Workshop Deposit suggests that 'proper' blade tools were more easily accessible to them than to their contemporaries. In fact, even the household with which the knapper(s) was(were) associated exhibited a much higher rate of irregular pressure blade use than any of the other Excavation Contexts. This might suggest that while individuals more familiar with the mechanics of blade-core technology recognized irregular pressure blades as debitage, others treated this blade form as they might any other more refined specimen.

Table 20: Utilization of Debitage Across Excavation Contexts

Utilization	R106: Middle Classic House Construction Fill		R106: Middle Classic House WS Deposit		R106: Classic House Construction Fill		R112: Classic Structure Floor Contact	
	n	%	n	%	n	%	n	%
Present	9	36.0	5	22.7	1	33.3	1	100.0
Absent	16	64.0	17	77.3	1	33.3	0	0.0
Other	0	0.0	0	0.0	1	33.3	0	0.0
Total	26	100.0	22	100.0	3	100.0	1	100.0

Utlization	PC 94: Epiclassic Patio Construction Fill		R106: Middle Postclassic Midden		R112: Postclassic Structure Construction Fill		R106: Colonial Midden		R106: Colonial Basurero	
	n	%	n	%	n	%	n	%	n	%
Present	10	41.7	5	41.7	0	0.0	3	27.3	3	75.0
Absent	13	54.2	7	58.3	5	83.3	3	27.3	0	0.0
Other	1	4.1	0	0.0	1	16.6	5	45.4	1	25.0
Total	24	100.0	12	100.0	6	100.0	11	100.0	4	100.0

Table 21: Utilization of Blades Across Excavation Contexts

Utilization	R106: Middles Classic House Construction Fill		R106: Middle Classic House Workshop Deposit		R106: Classic House Construction Fill		R112: Classic Structure Floor Contact		PC 94: Epiclassic Patio Construction Fill	
	n	%	n	%	n	%	n	%	n	%
Present	65	68.4	24	40.0	8	66.7	8	61.5	36	55.4
Absent	22	23.2	12	20.0	0	0.0	4	30.8	15	23.1
Other	8	8.4	24	40.0	4	33.3	1	7.7	14	21.5
Total	95	100.0	60	100.0	12	100.0	13	100.0	65	100.0

Utlization	R106: Middle Postclassic Midden		R112: Early - Middle Postclassic Structure		R112: Postclassic Structure Construction Fill		R106: Colonial Midden		R106: Colonial Basurero	
	n	%	n	%	n	%	n	%	n	%
Present	20	62.5	18	78.3	59	81.9	11	45.8	11	91.7
Absent	4	12.5	3	13.0	11	15.3	0	0.0	0	0.0
Other	32	57.1	2	8.7	2	2.7	13	54.2	1	8.3
Total	56	100.0	23	100.0	72	100.0	24	100.0	1	100.0

Table 22: Utilization of Irregular Pressure Blades Across Excavation Contexts

Utilization	R106: Middle Classic House Construction Fill		R106: Middle Classic House WS Deposit		R106: Classic House Construction Fill		R112: Classic Structure Floor Contact		PC 94: Epiclassic Patio Construction Fill	
	n	%	n	%	n	%	n	%	n	%
Present	4	80.0	2	25.0	2	66.7	1	100.0	7	77.8
Absent	1	20.0	4	50.0	0	0.0	0	0.0	1	11.1
Other	0	0.0	2	25.0	1	33.3	0	0.0	1	11.1
Total	5	100.0	8	100.0	3	100.0	1	100.0	9	100.0

Utlization	R112: Early - Middle Postclassic Structure		R112: Postclassic Structure Construction Fill		R106: Colonial Midden		R106: Colonial Basurero	
	n	%	n	%	n	%	n	%
Present	2	100.0	11	100.0	3	100.0	1	100.0
Absent	0	0.0	0	0.0	0	0.0	0	0.0
Other	0	0.0	0	0.0	0	0.0	0	0.0
Total	2	100.0	11	100.0	3	100.0	1	100.0

It is also worth noting that those subassemblages identified as midden deposits prior to this analysis generally contained the highest proportion of utilized lithic specimens. The pattern of lithic consumption, then, supports the interpretation of these excavation contexts as deposits of trash.

The technological subanalyses described above provide a good deal of information relevant to an understanding of the internal structure of Cholula's lithic reduction systems. I turn to these matters in the final chapter of this thesis through a discussion of the organization of lithic exploitation at Cholula through time.

Intrasite Obsidian Procurement-Distribution-Consumption Patterns

In their landmark study of household economies in the Formative Oaxaca Valley, Winter and Pires-Ferreira (1976) introduced the notion that organizational mechanisms for the exchange of lithic items for household consumption activities might be inferred by tracking the distribution of those artifacts through intrasite, interhousehold comparison. They suggested that variation in the number of different sources represented in the compositions of households' lithic assemblages, implying access to different sources, might indicate the operation of individual household lithic procurement strategies based on reciprocal trading partnerships with individuals in the lithic source areas. Conversely, an equitable distribution of different lithic types across the households of a community were suggested to signify the repercussions in access to lithic materials of local elite control over trading networks, pooling, and redistribution mechanisms. Spence and his colleagues (1984) have since used evidence of a random distribution of four trace-element identified strains of Pachuca obsidian across Teotihuacán's workshops to suggest a centralized pooling and redistribution system organized by the state for imported Pachuca obsidian at the city.

The lithic collection from Cholula includes a much smaller number of subassemblages than were used by either Winter and Pires-Ferreira or Spence. Nor are most of the Cholula collection subassemblages from secure domestic contexts. Only three of the subassemblages, R106: Middle Classic House Construction Fill, R106: Classic House Construction Fill, and the R106: Middle Classic House Workshop Deposit, were found in good association with a residential structure. Perhaps a comparison of the range of different lithic visual types represented within the Middle Classic Workshop Deposit subassemblage and the contemporaneous subassemblage associated with the Middle Classic house could partially inform an understanding of the mechanisms by which lithic materials were imported to and circulated within Middle Classic Cholula.

Referring back to Figure 7, a rather counterintuitive pattern of lithic type distribution can be observed. While the 'workshop' subassemblage contained only three different types of obsidian, the residential subassemblage included a total of eight different lithic types. Why would the range of accessed obsidian types be so much wider for household consumption than it was for household production? As the Excavation Context tag of the R106: Middle Classic House Construction Fill subassemblage indicates, it is unclear that the patterns of lithic exploitation represented by that subassemblage actually reflect the consumer behaviours of the R106 house residents. Recently, Flannery and Marcus (1994:25-37) have provided an insightful criticism of the tradition in Mesoamerican household archaeology of attempting to infer social-behavioural information from construction fill. They caution that construction fill is comprised of materials that may accumulate from activities (and temporal phases) that bear no relationship to the structure, or analytical unit of household, within which they have become incorporated.

Yet, lithic reduction probably did occur on or near the site of the R106 house and its byproducts were left within the household's extended occupational zone. The R106: Middle Classic House Workshop Deposit was coterminous with the house's west wall, which runs the length of both of the structure's rooms, and the radiocarbon date derived from its context (411 +/-49 C.E.) can be interpreted as contemporary with either of those two rooms from which radiocarbon dates have been obtained (of 460 +/-61 for the south room and 371 +/-67 for the north room). This mitigates against the possibility that the lithic materials of the 'Workshop Deposit' were dumped by an individual external to the household itself as the structure was occupied when the materials were deposited. Since lithic reduction likely took place on site at R106, its waste may have been incorporated into various remodeling episodes that may have taken place over time. The discrepancy in obsidian type representation between the two subassemblages may reflect the effects of long-term occupation at the house, but short-term occupational specialization in lithic reduction by member(s) of the household over its multi-generational history. If, however, the composition of the R106: Middle Classic House Construction Fill subassemblage accurately reflects the consuming behaviours of its occupants, information relevant to the organization of lithic reduction and distribution at Cholula emerges. Spence (1987:430) has provided one of the more archaeologically useful definitions of a workshop: "...a site in which the occupants were producing items for distribution beyond their immediate social group". Using this definition as a guide, the R106: Middle Classic Workshop Deposit may represent the material results of production for extra-household consumption, yet it is still odd that the household members would choose to not focus their consumption behaviours on that one procurement-processing system. Instead, I would suggest that the composition of the R106: Middle Classic Workshop Deposit reflects a moment in the history of the household's occupation, whereas the composition of its construction fill probably represents longer term processes.

Better evidence for variation in the intrasite distribution of lithic materials at Cholula might be found through a comparison of the compositions of the R106: Classic House Construction Fill and Floor Contact and the R112: Classic Structure Construction Fill and Floor Contact subassemblages. A total of six different lithic types were included in the R106:House subassemblage, whereas only three different types were in the R112:Structure subassemblage. There do not seem to be any other significant discrepancies between the two subassemblages in terms the rates of utilized artifacts or debitage classes. Could the difference in variability be taken as an accurate reflection of intrasite obsidian procurement and distribution behaviours? On first consideration, the question seems difficult to answer as the function of the R112:Structure remains undetermined. Yet, no matter what the function(s) of the structures, their occupants/makers had to access sources of trash for their construction. These refuse deposits, whose materials became incorporated into the construction fill of the R106:House and the R112:Structure, were produced by some social unit(s) of the Classic Period. Thus, unless we were to presume that Cholula's builders were selective about the types of obsidian they incorporated into their construction fill, the differences in composition of the construction fill subassemblages, could still reflect a wider pattern of variation in access to obsidian types for Classic Period Cholula.

Similarly, a comparison of the compositions of two subassemblages dating to the Postclassic Period, that of R106: Middle Postclassic Midden Deposit and the R112: Early-Middle Postclassic Structure Construction Fill, demonstrates a continued variability in access to different lithic types for Cholula's households. As Figure 8 shows, the producers of the Postclassic midden had access to eight different lithic sources, whereas the producers of the Postclassic construction fill waste had access to only five.

Interpretively clearer evidence for the organization of lithic reduction-consumption at Cholula is found through the depositional circumstances of the two midden deposits included in the collection. The lithic subassemblages of the R106: Middle Postclassic Midden Deposit and the R106: Colonial Midden-Basurero co-occurred with great amounts of typical household waste, including ceramic sherds and faunal remains. In her survey of ethnoarchaeological studies of craftworking behaviours, Moholy-Nagy (1990:273) has observed that, "In preindustrial societies the world over, workshops for the production of finished artifacts of all kinds of materials usually are located at or near the craftperson's home". The mixing of debris from lithic reduction with other categories of household refuse within the middens of Cholula suggests a similar spatial organization of lithic craftworking as is witnessed ethnographically. This, in turn, might imply that lithic reduction was pursued as an integral component of the household economies of some of Cholula's past social units, rather than as a spatially and socioeconomically discrete specialized industry. This inference is further supported by patterns of utilized artifact and debitage distributions across the Excavation Context subassemblages (Tables 18-20 and Table 21). All the subassemblages contained some lithic reduction debitage and utilized lithic specimens suggesting a general conflation of lithic manufacturing behaviours and lithic consuming behaviour, or, at least, the co-discard of refuse from these activities.

It is difficult to approach an assessment of differential access to, specifically, Pachuca obsidian as meditated by socioeconomic status at Cholula for a number of reasons. The only possible case of an elite-administrative occupation is that of the Epiclassic patio, where the rate of Pachuca obsidian is low and most likely conditioned by sociopolitical factors operating beyond Cholula, as exploitation of this source decreased for most parts of the Epiclassic Central Plateau. Two contemporaneous subassemblages that might be compared, R106: Classic House Construction Fill and Floor Contact and R112: Classic Structure Floor Contact, derive from two separate structures with, quite possibly, different past functions. If, for the time being, we assume that the R112 structure was a domestic residence in the Classic Period, then its occupants did have a greater incidence of access to Pachuca obsidian. With reference to Table 4, 66.7% of the R106:House subassemblage is green obsidian, while in the subassemblage from the R112:'House', green obsidian amounts to 86.7% of lithic material. If green (Pachuca) obsidian is a marker of differential socioeconomic status, this pattern seems odd in light of McCafferty and Suárez C.'s (In Press) analysis of the material culture from the R106:House burials that indicated its inhabitants to have been relatively well off, whereas McCafferty's preliminary analysis of the R112:'House' (McCafferty, personal communication, August 1994) did not find evidence of access to high status goods. Even if the R112 structure was not a functional household, the discrepancy between the two contemporaneous structures of R106 and R112 in levels of green obsidian suggests a degree of variation in the intrasite distribution of green obsidian during the Classic Period. This possibility is still somewhat questionable as both subassemblages are formed from construction fill and so may not reflect the consumption behaviours of the household unit. They may, however, still reflect those of someone else, i.e. whoever dumped the materials upon which the builders of these two structures drew for their construction fill. In the final chapter of this thesis, I assess the significance of this possibility for the organization of lithic procurement-distribution-consumption systems at Cholula.

Table 23: Composition of Excavation Context Subassemblages

R106: Middle Classic House Construction Fill

Reduction Sequence	Total	Green	Opaque Black	Cloudy Grey	Other Grey
	n	n	n	n	n
1	0	0	0	0	0
2	2	2	0	0	0
3	7	5	0	0	2
4a	95	65	3	12	15
4b	18	7	0	5	6
5a	2	1	0	0	1
5b	0	0	0	0	0
Total	124	80	3	17	24

R106: Middle Classic House Workshop Deposit

Reduction Sequence	Total	Green	Opaque Black	Other Grey
	n	n	n	n
1	0	0	0	0
2	2	2	0	0
3	10	8	0	0
4a	61	61	1	1
4b	11	11	0	0
5a	7	7	0	0
5b	6	6	0	0
Total	97	95	1	1

Table 23 Continued

R106: Classic House Construction Fill and Floor Contact

Reduction Sequence	Total	Green	Opaque Black	Cloudy Grey	Other Grey
	n	n	n	n	n
1	1	1	0	0	0
2	0	0	0	0	0
3	2	2	0	0	0
4a	10	7	1	1	1
4b	1	0	0	0	1
5a	0	0	0	0	0
5b	0	0	0	0	0
Total	14	10	1	1	2

R112: Classic Structure Floor Contact

Reduction Sequence	Total	Green	Cloudy Grey	Other Grey
	n	n	n	n
1	0	0	0	0
2	0	0	0	0
3	1	1	0	0
4a	13	12	0	1
4b	1	0	1	0
5a	0	0	0	0
5b	0	0	0	0
Total	15	13	1	1

PC94: Epiclassic Patio Construction Fill

Reduction Sequence	Total	Green	Opaque Black	Cloudy Grey	Other Grey
	n	n	n	n	n
1	0	0	0	0	0
2	4	0	2	0	2
3	9	0	5	1	3
4a	66	10	27	14	15
4b	7	3	1	1	2
5a	1	1	0	0	0
5b	0	0	0	0	0
Total	87	14	35	16	22

Table 23 Continued

R106: Middle Postclassic Midden Deposit

Reduction Sequence	Total	Green	Opaque Black	Cloudy Grey	Other Grey
	n	n	n	n	n
1	0	0	0	0	0
2	2	0	0	1	1
3	1	0	0	1	0
4a	32	9	13	2	8
4b	5	2	1	0	2
5a	2	1	0	0	1
5b	0	0	0	0	0
Total	42	12	14	4	12

R112: Early-Middle Postclassic Structure Construction Fill

Reduction Sequence	Total	Green	Opaque Black	Cloudy Grey	Other Grey
	n	n	n	n	n
1	0	0	0	0	0
2	0	0	0	0	0
3	2	0	1	0	1
4a	23	3	10	5	5
4b	0	0	0	0	0
5a	0	0	0	0	0
5b	0	0	0	0	0
Total	25	3	11	5	6

R112: Postclassic Structure Construction Fill

Reduction Sequence	Total	Green	Opaque Black	Cloudy Grey	Other Grey
	n	n	n	n	n
1	0	0	0	0	0
2	2	1	0	1	0
3	11	3	5	1	2
4a	72	14	22	14	22
4b	4	4	0	0	0
5a	0	0	0	0	0
5b	0	0	0	0	0
Total	89	22	27	16	24

Table 23 Continued

R106: Colonial Midden

Reduction Sequence	Total	Green	Opaque Black	Cloudy Grey	Other Grey
	n	n	n	n	n
1	0	0	0	0	0
2	5	2	2	0	1
3	3	1	0	2	0
4a	24	9	5	3	7
4b	5	2	0	2	1
5a	0	0	0	0	0
5b	0	0	0	0	0
Total	37	14	7	7	9

R106: Colonial Basurero

Reduction Sequence	Total	Green	Opaque Black	Other Grey
	n	n	n	n
1	0	0	0	0
2	1	0	1	0
3	2	1	0	1
4a	14	7	3	4
4b	2	0	0	2
5a	2	2	0	0
5b	0	0	0	0
Total	21	10	4	7

Obsidian Procurement at Cholula

From the complexity of patterning that is revealed through a source exploitation and technological analysis of the Cholula collection, several general trends are discernible and can be addressed. If the source-specific identifications of the primary obsidian types exploited by Cholula through time are reasonably accurate, the diachronic pattern of obsidian exploitation at Cholula parallels in several ways that known for the wider Central Plateau. As we have seen in Chapter 2, green obsidian from the Pachuca source is quite common among lithic consuming Classic period communities in the Basin of Mexico, parts of Morelos, communities in the Tehuacán Valley, and communities even farther afield from the Central Plateau. At Cholula, green (Pachuca) obsidian dominates the Middle Classic and Mixed Classic Period subassemblages at a rate in excess of at least 60%. And, in some Excavation Contexts, green (Pachuca) obsidian amounts to over 85% of the sample, a rate of frequency not duplicated in assemblages post-dating the Classic Period. By the Epiclassic Period at Cholula, however, this focus on the exploitation of green (Pachuca) obsidian seems to have waned. The majority of obsidian processed and consumed on site, opaque black obsidian, may derive from either nearby sources in Puebla, or from the Zinapécuaro-Ucareo source in Michoacán. This Epiclassic shift in source exploitation focus away from Pachuca and towards, especially, Zaragoza-Oyameles or Zinapécuaro-Ucareo obsidian, has been witnessed at other Central Plateau communities such as Xochicalco and Azcapotzalco. Yet, at Cholula, it is within the Epiclassic assemblage that the widest diversity in consumption of different types of obsidian and of chert/chalcedony is apparent, suggesting that Cholula's Epiclassic community both was capable of drawing on a number of resources and perceived a need to pursue such a diversified strategy of resource procurement. As at other Early-Middle Postclassic sites on the Central Plateau, green (Pachuca) obsidian is more common at Cholula in the Early-Middle Postclassic than it had been in the preceding period, but it is still not nearly as frequent as it once was in the Classic period assemblage. Opaque black obsidian, from either a Pueblan or the Zinapécuaro-Ucareo source, continued to be the most widely and frequently exploited of the obsidian types. The rate of green (Pachuca) obsidian increased again in the Colonial era, but other obsidian types continued to be processed and consumed at relatively high frequencies. This Colonial pattern fits well with the little that is known of obsidian exploitation at other Central Plateau communities of Late Postclassic and early Colonial times. In summary, the diachronic patterning of different obsidian type distributions at Cholula generally corresponds rather well with trends known from other Central Plateau communities.

The critical dissimilarity between the expected and the revealed, however, lies in the apparent differences in the forms in which the various obsidian types were imported to Cholula through time as compared to diachronic obsidian importation patterns for other Central Plateau communities. Technological analysis and comparison of the assemblages from Cholula with experimentally-derived import commodity models have demonstrated that in the Classic Period, green (Pachuca) obsidian entered the site, at times, in macrocore form. It may also have been imported as large polyhedral cores, but it is less likely that green (Pachuca) obsidian was imported as finished implements on any great scale in the Classic Period since the rate of on-site reduction of green (Pachuca) obsidian at Classic Cholula is substantial. The low volume of green (Pachuca) obsidian in the Epiclassic subassemblage, however, makes it difficult to assess the pattern of its importation to Epiclassic Cholula. Conversely, the importation of opaque black (Zaragoza-Oyameles or Zinapécuaro-Ucareo) large polyhedral cores and cloudy grey (Zaragoza-Oyameles or Zinapécuaro-Ucareo) macrocores and their subsequent on-site reduction at Epiclassic Cholula is quite evident. In the Early-Middle Postclassic, green (Pachuca) macrocores may have been imported to Cholula, but the singular focus on green (Pachuca) obsidian exploitation that was followed by Cholula's Classic Period community had not persisted and macrocores, large polyhedral cores, and quite possibly finished implements of a variety of obsidian types were brought to the site. In accordance with what sixteenth century historians have recorded, the Colonial Era subassemblage data attest to the possibility that Colonial Cholula was home to an active market in the trade of obsidian, among other items, in which nodules and macrocores of a number of different obsidian types, including green (Pachuca), were imported for further reduction and/or probable market circulation.

A study of the history of obsidian exploitation at Middle Classic through Colonial Cholula results in some substantial challenges to theories concerned with state control over obsidian procurement, processing, and circulation systems. In the final chapter of this thesis, I re-evaluate some of the assumptions inherent to these theories in light of the evidence from Cholula.

Chapter 6

Summary and Concluding Statements

This thesis has explored the available evidence for obsidian procurement-distribution-consumption systems in Classic through Colonial Mesoamerica with a focus on those originating in the Central Plateau. I have attempted to use the investigation of a collection of lithic materials from Cholula that spans these centuries as a means of approaching a critical analysis of the models that currently guide research on Central Plateau political economic dynamics. In so doing, data have been collected that allow for a more thorough understanding of the internal organization of lithic procurement, processing, and consumption at Cholula than was known before. In this chapter, I discuss the significance of these results for not only an understanding of lithic exploitation at Cholula, but as well for the challenges these patterns present to some aspects of the models forwarded to account for the role of Teotihuacán, Tula, and the Triple Alliance in the distribution of obsidian across the Mesoamerican landscape.

Cholula's Lithic Reduction System

Clearly, lithic consumption was a significant component of Cholula's economy throughout its precolumbian and early colonial history. One measure of this is the relative proportion of chipped lithic artifacts as compared to rim sherds (after Drennan 1976; Spencer 1982), that is known for some of the assemblages. The Classic Period deposits from Transito (R-106) contained 476 rim sherds and 147 chipped lithic artifacts. This represents a high ratio of almost 1:3 for chipped lithic artifacts compared to rim sherds. Similarly, the Proyecto Cholula 1994 Epiclassic Patio excavations collected 352 rim sherds and 101 chipped lithic artifacts, amounting to a ratio of 1:3.5. Lithic reduction also figured prominently, as has been demonstrated by the technological analysis of the collection of lithics from Cholula in Chapter 5. Information pertaining to the organizational structure of Cholula's lithic reduction system is somewhat more ambiguous, but certain patterns have emerged that allow for a tentative reconstruction of that sector of Cholula's past economy.

First, the degree of variation in access to the different obsidian types, illustrated by a comparison of the compositions of contemporaneous subassemblages from the Classic Period and from the Colonial Era, mitigates against the possibility that all lithic materials were imported to Cholula and redistributed by some centralized mechanism at these times. Instead, the pattern of variation among contemporaneous subassemblages suggests the operation at Cholula of multiple, contemporaneous obsidian procurement-distribution systems. Whether the social unit mediating this procurement strategy was the household remains unclear, as only one such domestic context was excavated. What does seem apparent, however, is the improbability that lithic procurement and/or distribution was an undertaking of a centralized administration, whether in the form of a state or a cohesive elite stratum of Cholula society. Rather, Cholula's lithic implement producers seem to have had a range of possibilities for accessing their raw materials.

Due to the fragmented and exhausted nature of the core forms excavated from Cholula, it is most likely that the primary product of Cholula's lithic implement manufacturers throughout the history of obsidian reduction at the site, was the prismatic blade rather than a core form. Although some degree of subspecialization, in the form of blade modification to produce eccentrics, was undertaken by at least one Middle Classic group of knappers, it may have been but a minimal aspect in the long-term history of lithic production at Cholula. More commonly, the reduction of core forms into prismatic blades was the primary focus of chipped stone tool production at Cholula from the Middle Classic Period onwards. Although the full range of lithic exploitation strategies followed by Cholula's past inhabitants cannot be known from this one collection alone, the data do permit a tentative and general characterization of lithic procurement through time at Cholula.

In the Middle Classic, green (Pachuca) obsidian was the most abundant lithic type, accounting for almost 63% of all lithic materials in the Transito (R-106) House that could be dated to that time and 98% of the lithic workshop deposit associated with that house. The technological analysis presented in the preceding chapter has shown that green (Pachuca) obsidian entered Classic Period Cholula's lithic reduction system in the form of macrocores, large polyhedral cores, and even as raw nodules on occasion. Thus, Cholula's obsidian knappers were able to access a system of green (Pachuca) obsidian distribution that bypassed the workshops of Teotihuacán where the focus was on the manufacture of refined pressure cores and finished blades of Pachuca obsidian. Taking the R106: Middle Classic Workshop Deposit subassemblage as an example, when Cholula's Classic Period knappers did import Pachuca cores, these materials seem to have passed through several cycles of use, from reduction, storage, and recycling, to their ultimate discard or, on occasion, intentional destruction.

If, for the moment, the Transito (R-106) lithic workshop deposit can be taken as representative of the social units of blade-core reduction at Cholula, then some tentative estimates of the scale of production at these individual loci can be attempted. Sheets and Muto (1972) and Clark (1982) have demonstrated through experimental replication that an average size core can be reduced into 100-150 prismatic blades. Further, Clark (1986a:36) has estimated that a five person household in precolumbian times consumed ten to twenty blades annually. There were four blade core segments that are definitely not conjoinable in the workshop deposit. Thus, at least 400 to upwards of 600 prismatic blades could have been produced from these cores. At a rate of twenty blades per year, a family of five would have consumed the products of these cores in twenty to thirty years. Assuming that the Transito (R-106) Middle Classic household was a five member unit and consumed blades at a normative rate, this estimate suggests that its lithic manufacturing members were producing for an outside market. Contextual evidence for the storing of the Transito (R-106) workshop deposit materials and technological evidence for the recycling of these materials, however, suggests a curatorial strategy that could indicate an intrahousehold processing-consumption system. The data remain ambiguous.

Only rarely did green (Pachuca) obsidian enter Epiclassic Cholula. Rather, Cholula's lithic reducers and consumers were drawing upon the widest range of lithic materials that they ever had or ever would again. Even the rate of chert and chalcedony exploitation had increased. From the composition of the assemblage excavated from the Epiclassic patio, the Classic Period reliance on green (Pachuca) obsidian had been replaced by a strategy of maximizing diversity in obsidian type importation, and by implication, variation in access to different obsidian distribution systems. Nodules, macrocores, and large polyhedral cores of opaque black (Zaragoza-Oyameles or Zinapécuaro-Ucareo) and other transparent/translucent obsidian types (unspecified sources) and large polyhedral cores of cloudy grey (Zaragoza-Oyameles or Zinapécuaro-Ucareo) material were imported for reduction into consumable blades. The possibility remains that this one Epiclassic assemblage is representationally biased as it is associated with a politico-elite context whose residents or most frequent attendants may have had wider access to different exchange systems based on socioeconomic privilege than a more common household may have had. But, if the patio was a non-residential area, it is even less likely that it would have been the locus of lithic reduction. The high rate of debitage in this assemblage suggests that the construction fill used for the patio was derived from contemporaneous waste heaps accumulated elsewhere that reflect the procurement, processing, and consumption behaviours of a segment of Cholula society not necessarily directly represented at the patio itself. The composition of the Proyecto Cholula 1994 Epiclassic Patio subassemblage still implies the continued simultaneous operation of several source-specific procurement systems loosely organized for the importation of lithic materials to Cholula.

In the Postclassic, variation in access to obsidian types continued as was demonstrated by a comparison of the compositions of the Transito (R-106): Middle Postclassic Midden Deposit and the R-112: Early-Middle Postclassic Structure. Macrocores and large polyhedral cores of green (Pachuca) obsidian were imported to Cholula. Other obsidian types, such as opaque black (Zaragoza-Oyameles or Zinapécuaro-Ucareo) and various transparent/translucent greys (unspecified sources) were most often brought to Cholula in large polyhedral core form. There is also a possibility that cloudy grey (Zaragoza-Oyameles or Zinapécuaro-Ucareo) obsidian was imported into Cholula in raw nodule form. Apparently, lithic procurement-reduction were still organized on an individual household basis, as is evident from the mixing of lithic debris with other household artifact types in the midden and construction fill dating to this time.

This pattern of organization continued into the Colonial Period wherein deposits of lithic artifacts co-occur with other forms of domestic waste and spatially discrete lithic subassemblages contain differential ranges of lithic types. There is strong evidence in the Colonial Era assemblage for the on- site reduction of opaque black (Zaragoza-Oyameles or Zinapécuaro-Ucareo) and cloudy grey (Zaragoza-Oyameles or Zinapécuaro-Ucareo) nodules and macrocores, and green (Pachuca) and other transparent/translucent (unspecified sources) macrocores and large polyhedral cores. Generally, the blade-core reduction systems of the Colonial Era seem more economical and efficient, as the cores recovered from the contexts dating to this period exhibit the prototypical bullet-shaped form of the exhausted prismatic blade core. They are not fragmented, nor do they bear any evidence of knapping errors. In accordance with the ethnohistorical documents, blade-core reduction at Colonial Cholula appears to have been undertaken by specialists, but this does not preclude the possibility that individual, non-lithic-specialist households continued to manufacture lithic implements on their own accord and in response to household economic need.

Cholula's Diachronic Participation in Obsidian Procurement-Distribution Systems

One thing made clear by the analysis of variation in obsidian types across the collection from Cholula is the extent to which the Cholula community participated in a number of lithic procurement systems throughout the settlement's history. Some generalizations concerning this involvement can be made. In the earlier Classic Period, green (Pachuca) obsidian figured prominently. Yet, it was imported in a stage of reduction not coeval with the products of Teotihuacán's workshops. Instead, Cholula's lithic manufacturers had access to green (Pachuca) obsidian in less modified form. In fact, by importing nodules and macrocores of green (Pachuca) obsidian on occasion, Cholula's knappers had access to cores in even earlier stages of reduction than those imported to the workshops of Teotihuacán, since Clark (1986a:69) has demonstrated that Pachuca obsidian entered the Teotihuacán lithic reduction system in large polyhedral core form. As was discussed in Chapter 2 of this thesis, this pattern of importing green (Pachuca) obsidian in less modified form was a common strategy of Middle Classic Period rural Teotihuacán Valley communities (Santley et al. 1986). At other settlements, such as Miahuatlán in western Morelos (Hirth 1989), La Nopalera in the Tehuacán Valley (Drennan et al. 1990), and at Matacapan (Santley 1989) Pachuca obsidian dominated the lithic assemblages, but was imported in large polyhedral blade core and finished implement form. At other sites still, such as Quachilco and Cuayucatepec in the Tehuacán Valley (Drennan et al. 1990) and in the La Mixtequilla (Stark et al. 1992), Pachuca obsidian occurred at a low rate and was imported as finished blades only. Instead, these latter sites relied on a procurement system focused on the importation of Zaragoza-Oyameles obsidian. Cholula, then, appears to be the only known site outside of the Teotihuacán Valley that imported green (Pachuca) obsidian in relatively unmodified form in the Classic Period. Thus, while Cholula's Classic Period lithic procurement-processing-consumption system did not participate to any great extent in the Zaragoza-Oyameles distribution system that figured prominently at sites in the Tehuacán Valley and in Veracruz, it developed an independent system for access to the materials of the more distant Pachuca source area.

Paralleling a Central Plateau-wide shift in obsidian procurement-distribution patterns, Cholula's Epiclassic lithic assemblage is largely devoid of green (Pachuca) obsidian. As is common at Epiclassic sites in the Central Plateau, such as Xochicalco (Sorensen et al. 1989; Hirth 1989) and Azcapotzalco (García-Chávez et al. 1990), opaque black and cloudy grey obsidian, quite possibly from Zinapécuaro-Ucareo or Zaragoza-Oyameles, predominate in the Epiclassic Cholula assemblage. At Azcapotzalco, Zinapécuaro-Ucareo obsidian arrived in large polyhedral core form. It was imported into western Morelos in raw and/or semi-processed form. Evidence for the importation of opaque black and cloudy grey obsidian to Cholula in less refined form, as nodules and macrocores, as well as large polyhedral blade cores, is strong. Apparently, access to sources of grey obsidian types was more direct for inhabitants of Epiclassic Cholula than it was for members of some contemporaneous Central Plateau settlements. Moreover, Cholula's independent lithic procurers-producers called upon wider networks for lithic materials, as the composition of Cholula's Epiclassic assemblage is much more broadly based than that of contemporaneous Xochicalco in which only four different sources were represented (Sorensen et al. 1989) or in that of Azcapotzalco wherein artifacts could be provenienced to only three sources (García Chávez et al. 1990:228).

In the Postclassic Period, green (Pachuca) obsidian was imported to Cholula in macrocore and large polyhedral blade core form. Yet, all other obsidian types, with the possible exception of cloudy grey (Zinapécuaro-Ucareo or Zaragoza-Oyameles) obsidian, entered the site in large polyhedral core form. There are very few analyzed assemblages with which to compare this pattern of importation and processing of obsidian, as few obsidian consumption studies have been conducted at Early-Middle Postclassic Central Plateau communities, with the exception of Tula. The composition of Cholula's Postclassic assemblage is similar to those known from the Basin of Mexico (Brumfiel 1976; Parsons et al. 1982; Spence 1985) in that green (Pachuca) obsidian is again more frequent than it had been in the previous Epiclassic Period assemblage and was imported in semi-processed form.

Cholula's Colonial Era community imported a wide range of materials, often in raw or semi-processed form. Although few Colonial Era assemblages have been analyzed, Smith (1990:163-165) has characterized Late Postclassic-Early Colonial Central Plateau obsidian procurement-distribution systems as commercially based. In his Book X (1961:85), Sahagún provides a description of independent itinerant obsidian sellers who moved around central Mexico plying their wares:

> The obsidian seller is one who, [with] a staff with a crosspiece,...forces off obsidian blades, he breaks off flakes. He sells obsidian, obsidian razors, blades, single-edged knives, double-edged knives, unworked obsidian, scraping stones, V-shaped [pieces]. He sells white obsidian, clear blue obsidian, yellow obsidian, tawny obsidian, obsidian chips.

Obsidian specialists such as those described by Sahagún surely frequented the great market of early sixteenth century Cholula, bringing with them a variety of obsidian types in all stages of modification and leaving behind the waste their processing activities generated. The lithic data from colonial contexts at Cholula support this interpretation.

Approached as a bounded universe of data, the patterns in lithic procurement-processing-distribution-consumption revealed through this thesis' analysis persuasively suggest a less centralized and more commercial basis of organization for obsidian exploitation on the Central Plateau than is afforded by some aspects of the models currently governing our understanding of these dynamics. Below, I turn to a discussion of the implications of these patterns for previous approaches to assessing the role of obsidian industries in the political economy of the precolumbian Central Plateau.

Implications for an Understanding of Central Plateau Political Economy

What is the possible significance of these diachronic patterns in Cholula's lithic procurement-processing-consumption systems? Certainly they call into question a number of the premises of some of the models currently forwarded to account for lithic procurement, production and distribution on the Central Plateau. For instance, patterns revealed in the importation of Pachuca obsidian to Cholula make it plausible to suggest that the Teotihuacán state may not have had the absolute control over materials from the Pachuca source that has been postulated. Other communities may have been capable of dealing directly with the source area's inhabitants in relationships of exchange that may have been commercially based. Nor were Tula or the Triple

Alliance "obsidian empires". At the times of their reigns, the community of Cholula, for one, was still able to access obsidian in relatively unmodified form from a variety of sources.

Furthermore, elite forces may not have been in complete control of the procurement and distribution of materials from source areas. Rather, the data from Cholula suggest that individual commoner households took a more active role in systems of lithic procurement and distribution than has been previously implied. Patterns of lithic exploitation at Cholula over time more generally support the model proposed by Healan (1993) for the organization of obsidian exploitation at Tula whereby certain states retained special relationships with particular lithic source areas, possibly in the form of subject tribute requirements, to satisfy their desire and demand for obsidian implements for interregional elite interaction and shows of display, whereas privatized commercial obsidian export was pursued by societies near the source areas on a largely decentralized, or at least non-state regulated, basis.

Ultimately, however, as the ambiguity of some of the data from an analysis of Cholula's lithic collection demonstrates, the structural organization of obsidian exploitation systems is not the sole question to which an exploration of political economic dynamics must attend. Narrowly drawn conceptualizations of the workings of political economy present biased visions of the importance of, for instance, one class of artifact, for processes that develop over millennia and across vast landscapes. Yet these approaches have their convenience. They allow the researcher to isolate one element for exploration and to extrapolate from this the structure of interregional interaction, as has been done in this thesis. The danger with such approaches is that they must focus on '*dramatis personae*' (Landau 1991), specific and circumscribed social actors to account for these processes, and that too often elite forces are the most archaeologically accessible of the possibilities. In sum, the attribution of control over obsidian procurement-processing-distribution networks to sequential state systems or elite sectors may be more an artifact of the rhetorical narrative structure endemic to (pre)historical storytelling than it is to the real processes of political economy.

Future Directions

The next obvious step in understanding the history of lithic exploitation at Cholula would be to conduct a geochemical analysis of a range of lithic materials from a range of temporal contexts at the site. Although the source-specific - obsidian type correlations based on descriptions of source-specific lithic types in the literature employed in this thesis indicate some potentially unique strategies in lithic procurement, until the materials have been subjected to a well-planned trace-element analysis, the full range and exact nature of these systems remain largely unknown. In the larger perspective, however, it would serve Central Plateau researchers well to attempt to synthesize what is understood about visually identifiable source-specific Mesoamerican obsidian types, to both characterize the typical appearance of these materials and specify the range of variation specimens from each source may exhibit, as physiochemical analyses remain costly and still are usually applied to only a minute fraction of the lithic assemblages that are studied.

A second natural progression from this research would be to collect more information on household based lithic processing-consumption economics for Cholula through time. This would, of course, require the locating and excavation of archaeologically identifiable households: a programme which the present state of archaeological research at Cholula, however, may not permit. In a final irony, the archaeological site of Cholula has not been subject to the same policies of protection and conservation as has, for instance, its Valley of Mexico neighbour, Teotihuacán. Rather, modern urban development continues to encroach upon the ancient core of the site and across its past hinterland. These processes themselves cannot be stopped, but the damage incurred could be abated if more researchers become interested in Cholula, and, particularly, its position and role in the political economic dynamics of the precolumbian Central Plateau. I can only hope that this modest analysis of a collection of lithics from Cholula may contribute in some way to a renewal of future interest in Cholula's precolumbian past.

Beyond Cholula, it is my hope that this thesis has pointed to some other potentially clarifying, perhaps even critical, directions for those of us interested in the study of the Central Plateau's precolumbian political economy. As our models for understanding the organizational structures of obsidian distribution diversify and grow more concerned with the potential of commercially based obsidian industries at sources, actual archaeological surveys directed at looking for and documenting such communities become essential. While a limited number of such investigations have been undertaken (e.g. Ferriz 1985), under a guiding paradigm that dictates the search for examples of material culture associated with the major state systems to the exclusion of other possibilities, the potential for recovering data relevant to other models is limited.

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Appendix 1

The Dataset

Case Number	Artifact Number	Temporal Period	Temporal Phase	Excavation Context
1	PC 94:41-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
2	PC 94:30-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
3	PC 94:41-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
4	PC 94:53-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
5	PC 94:35-6	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
6	PC 94:35-4	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
7	PC 94:40-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
8	PC 94:42-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
9	PC 94:27-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
10	PC 94:60-8	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
11	PC 94:16-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
12	PC 94:53-7	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
13	PC 94:33-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
14	PC 94:58-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
15	PC 94:64-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
16	PC 94:38-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
17	PC 94:36-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
18	PC 94:60.4	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
19	PC 94:60-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
20	PC 94:47-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
21	PC 94:49-4	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
22	PC 94:35-7	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
23	PC 94:44-5	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
24	PC 94:63-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
25	PC 94:44-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
26	PC 94:54-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
27	PC 94:37-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
28	PC 94:14-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
29	PC 94:34-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
30	PC 94:62-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
31	PC 94:30-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
32	PC 94:63-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
33	PC 94:60-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
34	PC 94:10-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
35	PC 94:19-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
36	PC 94:19-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
37	PC 94:10-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
38	PC 94:51-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
39	PC 94:34-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
40	PC 94:44-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
41	PC 94:63-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
42	PC 94:35-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
43	PC 94:02-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
44	PC 94:35-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
45	PC 94:31-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
46	PC 94:44-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
47	PC 94:35-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
48	PC 94:19-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
49	PC 94:26-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
50	PC 94:47-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
51	PC 94:53-5	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
52	PC 94:53-4	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
53	PC 94:53-6	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill

Case Number	Artifact Number	Temporal Period	Temporal Phase	Excavation Context
54	PC 94:44-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
55	PC 94:07-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
56	PC 94:47-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
57	PC 94:33-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
58	PC 94:43-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
59	PC 94:44-6	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
60	PC 94:63-4	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
61	PC 94:63-5	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
62	PC 94:15-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
63	PC 94:38-4	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
64	PC 94:60-6	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
65	PC 94:49-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
66	PC 94:53-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
67	PC 94:05-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
68	PC 94:07-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
69	PC 94:07-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
70	PC 94:15-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
71	PC 94:59-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
72	PC 94:38-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
73	PC 94:48-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
74	PC 94:43-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
75	PC 94:59-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
76	PC 94:63-7	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
77	PC 94:63-6	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
78	PC 94:50-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
79	PC 94:60-7	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
80	PC 94:58-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
81	PC 94:08-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
82	PC 94:32-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
83	PC 94:37-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
84	PC 94:26-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
85	PC 94:14-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
86	PC 94:35-5	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
87	PC 94:49-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
88	PC 94:28-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
89	PC 94:38-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
90	PC 94:02-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
91	PC 94:46-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
92	PC 94:05-1	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
93	PC 94:31-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
94	PC 94:53-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
95	PC 94:49-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
96	PC 94:43-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
97	PC 94:37-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
98	PC 94:44-4	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
99	PC 94:60-5	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
100	PC 94:26-3	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
101	PC 94:60-2	Epiclassic	Epiclassic	PC 94:Epiclassic Patio Construction Fill
102	R112:02-16	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
103	R112:01-5	Classic	Mixed Classic	R112:Classic Structure Floor Contact
104	R112:01-4	Classic	Mixed Classic	R112:Classic Structure Floor Contact
105	R112:08-8	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
106	R112:02-8	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
107	R112:02-63	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
108	R112:02-59	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
109	R112:02-26	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
110	R112:02-20	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
111	R112:02-43	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
112	R112:02-21	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill

Case Number	Artifact Number	Temporal Period	Temporal Phase	Excavation Context
113	R112:02-55	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
114	R112:09-1	Classic	Mixed Classic	R112:Classic Structure Floor Contact
115	R112:02-3	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
116	R112:01-6	Classic	Mixed Classic	R112:Classic Structure Floor Contact
117	R112:10-1	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
118	R112:10-5	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
119	R112:09-3	Classic	Mixed Classic	R112:Classic Structure Floor Contact
120	R112:02-44	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
121	R112:02-50	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
122	R112:01-3	Classic	Mixed Classic	R112:Classic Structure Floor Contact
123	R112:01-7	Classic	Mixed Classic	R112:Classic Structure Floor Contact
124	R112:02-23	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
125	R112:02-9	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
126	R112:02-36	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
127	R112:04-6	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
128	R112:01-2	Classic	Mixed Classic	R112:Classic Structure Floor Contact
129	R112:09-2	Classic	Mixed Classic	R112:Classic Structure Floor Contact
130	R112:09-19	Classic	Mixed Classic	R112:Classic Structure Floor Contact
131	R112:02-15	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
132	R112:08-5	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
133	R112:16-1	Classic	Mixed Classic	R112:Classic Structure Floor Contact
134	R112:15-1	Classic	Mixed Classic	R112:Classic Structure Floor Contact
135	R112:02-48	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
136	R112:08-3	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
137	R112:13-1	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
138	R112:15-2	Classic	Mixed Classic	R112:Classic Structure Floor Contact
139	R112:02-20	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
140	R112:02-8	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
141	R112:02-12	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
142	R112:02-5	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
143	R112:02-34	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
144	R112:03-1	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
145	R112:02-6	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
146	R112:02-13	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
147	R112:02-42	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
148	R112:12-1	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
149	R112:02-33	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
150	R112:02-39	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
151	R112:13-2	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
152	R112:13-7	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
153	R112:13-6	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
154	R112:08-16	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
155	R112:02-54	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
156	R112:04-10	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
157	R112:13-5	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
158	R112:02-40	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
159	R112:12-2	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
160	R112:13-4	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
161	R112:04-7	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
162	R112:02-58	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
163	R112:02-56	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
164	R112:02-61	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill

Case Number	Artifact Number	Temporal Period	Temporal Phase	Excavation Context
165	R112:14-1	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
166	R112:14-4	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
167	R112:08-12	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
168	R112:08-11	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
169	R112:08-9	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
170	R112:02-11	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
171	R112:07-1	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
172	R112:02-22	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
173	R112:14-5	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
174	R112:02-30	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
175	R112:02-14	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
176	R112:02-7	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
177	R112:02-29	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
178	R112:14-2	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
179	R112:02-28	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
180	R112:10-3	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
181	R112:02-18	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
182	R112:02-46	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
183	R112:10-2	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
184	R112:13-5	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
185	R112:02-37	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
186	R112:03-2	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
187	R112:02-47	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
188	R112:04-4	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
189	R112:07-2	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
190	R112:02-52	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
191	R112:02-57	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
192	R112:02-24	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
193	R112:02-51	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
194	R112:02-49	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
195	R112:02-34	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
196	R112:02-29	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
197	R112:02-7	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
198	R112:08-2	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
199	R112:09-4	Classic	Mixed Classic	R112:Classic Structure Floor Contact
200	R112:02-25	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
201	R112:02-35	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
202	R112:02-2	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
203	R112:02-27	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
204	R112:04-2	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
205	R112:02-38	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
206	R112:13-3	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
207	R112:04-5	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
208	R112:02-53	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
209	R112:08-6	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
210	R112:08-10	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
211	R112:08-7	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
212	R112:02-45	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
213	R112:02-60	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
214	R112:02-64	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
215	R112:13-8	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill

Case Number	Artifact Number	Temporal Period	Temporal Phase	Excavation Context
216	R112:14-6	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
217	R112:15-3	Classic	Mixed Classic	R112:Classic Structure Floor Contact
218	R112:04-9	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
219	R112:13-9	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
220	R112:02-62	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
221	R112:04-3	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
222	R112:08-1	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
223	R112:10-4	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
224	R112:04-8	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
225	R112:02-4	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
226	R112:02-55	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
227	R112:14-3	Postclassic	Early-Middle Postclassic	R112:Early-Middle Postclassic Structure Construction Fill
228	R112:08-4	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
229	R112:02-32	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
230	R112:02-17	Postclassic	Mixed Postclassic	R112:Postclassic Structure Construction Fill
231	R106:117a	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
232	R106:117G-2	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
233	R106:113-5	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
234	R106:129G-1	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
235	R106:113-10	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
236	R106:113-4	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
237	R106:117b	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
238	R106:111-2	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
239	R106:117I-2	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
240	R106:117L	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
241	R106:129	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
242	R106:117c	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
243	R106:113-11	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
244	R106:113Ka	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
245	R106:129H	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
246	R106:113Kb	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
247	R106:117d	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
248	R106:117e	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
249	R106:117f	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
250	R106:113-6	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
251	R106:129G-2	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
252	R106:117G-3	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
253	R106:113-9	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
254	R106:117g	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
255	R106:117H-1	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
256	R106:113-3	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
257	R106:117G-1	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
258	R106:117I-1	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
259	R106:117h	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
260	R106:117i	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
261	R106:117j	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
262	R106:117k	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
263	R106:113K-1	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
264	R106:113K3	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
265	R106:113K-2	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
266	R106:113-2	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
267	R106:113-8	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
268	R106:113J-1	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
269	R106:111-1	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
270	R106:113-7	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
271	R106:111C	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
272	R106:113-1	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit

Case Number	Artifact Number	Temporal Period	Temporal Phase	Excavation Context
273	R106:117l	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
274	R106:117G-4	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
275	R106:129I	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
276	R106:117m	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
277	R106:113J-2	Postclassic	Middle Postclassic	R106:Middle Postclassic Midden Deposit
278	R106:159-1	Colonial	Colonial	R106:Colonial Basurero
279	R106:159-14	Colonial	Colonial	R106:Colonial Basurero
280	R106:159-15	Colonial	Colonial	R106:Colonial Basurero
281	R106:159-5	Colonial	Colonial	R106:Colonial Basurero
282	R106:159-9	Colonial	Colonial	R106:Colonial Basurero
283	R106:159-11	Colonial	Colonial	R106:Colonial Basurero
284	R106:159-18	Colonial	Colonial	R106:Colonial Basurero
285	R106:159-12	Colonial	Colonial	R106:Colonial Basurero
286	R106:159-16	Colonial	Colonial	R106:Colonial Basurero
287	R106:159-13	Colonial	Colonial	R106:Colonial Basurero
288	R106:161C-4	Colonial	Colonial	R106:Colonial Midden
289	R106:160-2	Colonial	Colonial	R106:Colonial Midden
290	R106:162-3	Colonial	Colonial	R106:Colonial Midden
291	R106:164-2	Colonial	Colonial	R106:Colonial Midden
292	R106:180B	Colonial	Colonial	R106:Colonial Midden
293	R106:180A	Colonial	Colonial	R106:Colonial Midden
294	R106:179A-2	Colonial	Colonial	R106:Colonial Midden
295	R106:180A-10	Colonial	Colonial	R106:Colonial Midden
296	R106:180A-9	Colonial	Colonial	R106:Colonial Midden
297	R106:179A-3	Colonial	Colonial	R106:Colonial Midden
298	R106:180A-4	Colonial	Colonial	R106:Colonial Midden
299	R106:180A-11	Colonial	Colonial	R106:Colonial Midden
300	R106:179A-5	Colonial	Colonial	R106:Colonial Midden
301	R106:179A	Colonial	Colonial	R106:Colonial Midden
302	R106:159-6	Colonial	Colonial	R106:Colonial Basurero
303	R106:159-4	Colonial	Colonial	R106:Colonial Basurero
304	R106:159-19	Colonial	Colonial	R106:Colonial Basurero
305	R106:159-2	Colonial	Colonial	R106:Colonial Basurero
306	R106:159-10	Colonial	Colonial	R106:Colonial Basurero
307	R106:159-17	Colonial	Colonial	R106:Colonial Basurero
308	R106:159-3	Colonial	Colonial	R106:Colonial Basurero
309	R106:159-8	Colonial	Colonial	R106:Colonial Basurero
310	R106:159-20	Colonial	Colonial	R106:Colonial Basurero
311	R106:159-7	Colonial	Colonial	R106:Colonial Basurero
312	R106:159-21	Colonial	Colonial	R106:Colonial Basurero
313	R106:161C-1	Colonial	Colonial	R106:Colonial Midden
314	R106:162-4	Colonial	Colonial	R106:Colonial Midden
315	R106:164-3	Colonial	Colonial	R106:Colonial Midden
316	R106:161C-2	Colonial	Colonial	R106:Colonial Midden
317	R106:164-1	Colonial	Colonial	R106:Colonial Midden
318	R106:162-1	Colonial	Colonial	R106:Colonial Midden
319	R106:162-2	Colonial	Colonial	R106:Colonial Midden
320	R106:160-1	Colonial	Colonial	R106:Colonial Midden
321	R106:164-4	Colonial	Colonial	R106:Colonial Midden
322	R106:161C-3	Colonial	Colonial	R106:Colonial Midden
323	R106:179-4	Colonial	Colonial	R106:Colonial Midden
324	R106:180A-7	Colonial	Colonial	R106:Colonial Midden
325	R106:179-3	Colonial	Colonial	R106:Colonial Midden
326	R106:179-1	Colonial	Colonial	R106:Colonial Midden
327	R106:180A-8	Colonial	Colonial	R106:Colonial Midden
328	R106:180A-3	Colonial	Colonial	R106:Colonial Midden
329	R106:180A-2	Colonial	Colonial	R106:Colonial Midden
330	R106:180B-1	Colonial	Colonial	R106:Colonial Midden
331	R106:179-2	Colonial	Colonial	R106:Colonial Midden
332	R106:180A-6	Colonial	Colonial	R106:Colonial Midden
333	R106:179A-1	Colonial	Colonial	R106:Colonial Midden

Case Number	Artifact Number	Temporal Period	Temporal Phase	Excavation Context
334	R106:180A-5	Colonial	Colonial	R106:Colonial Midden
335	R106:179A-4	Colonial	Colonial	R106:Colonial Midden
336	R106:180A-1	Colonial	Colonial	R106:Colonial Midden
337	R106:180C	Colonial	Colonial	R106:Colonial Midden
338	R106:189-1	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
339	R106:189-2	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
340	R106:189-3	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
341	R106:189-10	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
342	R106:189-7	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
343	R106:189-35	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
344	R106:189-40	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
345	R106:189-23	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
346	R106:189-19	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
347	R106:189-58	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
348	R106:189-21	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
349	R106:189-64	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
350	R106:189-12	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
351	R106:189-11	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
352	R106:189-13	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
353	R106:189-24	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
354	R106:189-17	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
355	R106:189-25	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
356	R106:189-9	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
357	R106:189-15	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
358	R106:189-22	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
359	R106:189-39	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
360	R106:189-27	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
361	R106:189-18	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
362	R106:189-37	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
363	R106:189-36	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
364	R106:189-41	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
365	R106:189-34	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
366	R106:189-33	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
367	R106:189-42	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
368	R106:189-38	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
369	R106:189-16	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
370	R106:189-32	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
371	R106:189-55	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
372	R106:189-30	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
373	R106:189-20	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
374	R106:189-28	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
375	R106:189-53	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
376	R106:189-48	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
377	R106:189-26	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
378	R106:189-29	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
379	R106:189-47	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
380	R106:189-44	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
381	R106:189-46	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
382	R106:189-8	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
383	R106:189-57	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
384	R106:189-50	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
385	R106:189-61	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
386	R106:189-56	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
387	R106:189-67	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
388	R106:189-68	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
389	R106:189-69	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
390	R106:189-70	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
391	R106:189-71	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
392	R106:189-72	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
393	R106:189-73	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
394	R106:189-74	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit

Case Number	Artifact Number	Temporal Period	Temporal Phase	Excavation Context
395	R106:189-75	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
396	R106:189-65	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
397	R106:189-43	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
398	R106:189-14	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
399	R106:189-54	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
400	R106:189-62	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
401	R106:189-66	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
402	R106:189-60	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
403	R106:189-63	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
404	R106:189-31	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
405	R106:189-A	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
406	R106:189-B	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
407	R106:189-C	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
408	R106:189-D	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
409	R106:189-6	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
410	R106:189-4	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
411	R106:189-5	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
412	R106:189-64	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
413	R106:189-52	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
414	R106:189-51	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
415	R106:189-45	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
416	R106:189-59	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
417	R106:189-49	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
418	R106:189-76	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
419	R106:189-77	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
420	R106:189-78	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
421	R106:189-79	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
422	R106:189-80	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
423	R106:189-81	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
424	R106:189-82	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
425	R106:189-83	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
426	R106:189-84	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
427	R106:189-85	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
428	R106:188-1	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
429	R106:191-1	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
430	R106:190B-1	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
431	R106:190B-3	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
432	R106:191-2	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
433	R106:191-3	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
434	R106:190B-2	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
435	R106:188-3	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
436	R106:191-4	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
437	R106:188-2	Classic	Middle Classic	R106:Middle Classic House Workshop Deposit
438	R106: 72-F	Classic	Mixed Classic	R106:Classic House Construction Fill
439	R106:72E-1	Classic	Mixed Classic	R106:Classic House Construction Fill
440	R106:71B-1	Classic	Mixed Classic	R106:Classic House Construction Fill
441	R106:71B-2	Classic	Mixed Classic	R106:Classic House Construction Fill
442	R106:114-1	Classic	Mixed Classic	R106:Classic House Construction Fill
443	R106: 73B-1	Classic	Mixed Classic	R106:Classic House Construction Fill
444	R106:73B-2	Classic	Mixed Classic	R106:Classic House Construction Fill
445	R106:116-1	Classic	Mixed Classic	R106:Classic House Construction Fill
446	R106:72E-2	Classic	Mixed Classic	R106:Classic House Construction Fill
447	R106:108-1	Classic	Mixed Classic	R106:Classic House Construction Fill
448	R106:48B-2	Classic	Mixed Classic	R106:Classic House Construction Fill
449	R106:49-5	Classic	Mixed Classic	R106:Classic House Floor Contact
450	R106:49-3	Classic	Mixed Classic	R106:Classic House Floor Contact
451	R106:49-4	Classic	Mixed Classic	R106:Classic House Floor Contact
452	R106:49-1	Classic	Mixed Classic	R106:Classic House Floor Contact
453	R106:48B-1	Classic	Mixed Classic	R106:Classic House Construction Fill
454	R106:49-2	Classic	Mixed Classic	R106:Classic House Floor Contact
455	R106:48B-3	Classic	Mixed Classic	R106:Classic House Construction Fill

Case Number	Artifact Number	Temporal Period	Temporal Phase	Excavation Context
456	R106:54C	Classic	Middle Classic	R106:Middle Classic House Construction Fill
457	R106:31D	Classic	Middle Classic	R106:Middle Classic House Construction Fill
458	R106:24F-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
459	R106:37-4	Classic	Middle Classic	R106:Middle Classic House Construction Fill
460	R106:10F-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
461	R106:32A-	Classic	Middle Classic	R106:Middle Classic House Construction Fill
462	R106:51C	Classic	Middle Classic	R106:Middle Classic House Construction Fill
463	R106:20D-4	Classic	Middle Classic	R106:Middle Classic House Construction Fill
464	R106:08C-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
465	R106:54A-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
466	R106:16B	Classic	Middle Classic	R106:Middle Classic House Construction Fill
467	R106:23B-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
468	R106:18-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
469	R106:54A-4	Classic	Middle Classic	R106:Middle Classic House Construction Fill
470	R106:56-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
471	R106:23B-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
472	R106:23B-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
473	R106:28B-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
474	R106:53A-5	Classic	Middle Classic	R106:Middle Classic House Construction Fill
475	R106:20D-6	Classic	Middle Classic	R106:Middle Classic House Construction Fill
476	R106:57B-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
477	R106:56A-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
478	R106:56A-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
479	R106:33-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
480	R106:55A-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
481	R106:33-4	Classic	Middle Classic	R106:Middle Classic House Construction Fill
482	R106:55A-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
483	R106:23C-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
484	R106:65-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
485	R106:33-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
486	R106:22A-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
487	R106:33-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
488	R106:38C	Classic	Middle Classic	R106:Middle Classic House Construction Fill
489	R106:53A-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
490	R106:55A-4	Classic	Middle Classic	R106:Middle Classic House Construction Fill
491	R106:55A-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
492	R106:28B-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
493	R106:23B-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
494	R06:17A-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
495	R106:31D-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
496	R106:23B-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
497	R106:56A-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
498	R106:10-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
499	R106:22A-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
500	R106:56-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
501	R106:09A-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
502	R106:33-8	Classic	Middle Classic	R106:Middle Classic House Construction Fill
503	R106:20D-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
504	R106:20D-8	Classic	Middle Classic	R106:Middle Classic House Construction Fill
505	R106:20D-7	Classic	Middle Classic	R106:Middle Classic House Construction Fill
506	R106:24F-5	Classic	Middle Classic	R106:Middle Classic House Construction Fill
507	R106:17A-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
508	R106:18-4	Classic	Middle Classic	R106:Middle Classic House Construction Fill
509	R106:10-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
510	R106:34-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
511	R106:18-6	Classic	Middle Classic	R106:Middle Classic House Construction Fill
512	R106:55A-7	Classic	Middle Classic	R106:Middle Classic House Construction Fill
513	R106:58A-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
514	R106:31D-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
515	R106:53A-4	Classic	Middle Classic	R106:Middle Classic House Construction Fill
516	R106:55A-6	Classic	Middle Classic	R106:Middle Classic House Construction Fill

Case Number	Artifact Number	Temporal Period	Temporal Phase	Excavation Context
517	R106:25D-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
518	R106:24F-4	Classic	Middle Classic	R106:Middle Classic House Construction Fill
519	R106:35D-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
520	R106:56-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
521	R106:20D-9	Classic	Middle Classic	R106:Middle Classic House Construction Fill
522	R106:54A-5	Classic	Middle Classic	R106:Middle Classic House Construction Fill
523	R106:63-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
524	R106:12C-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
525	R106:24F-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
526	R106:12C-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
527	R106:54B	Classic	Middle Classic	R106:Middle Classic House Construction Fill
528	R106:19E-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
529	R106:10-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
530	R106:33-5	Classic	Middle Classic	R106:Middle Classic House Construction Fill
531	R106:18-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
532	R106:53A-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
533	R106:19E-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
534	R106:10-4	Classic	Middle Classic	R106:Middle Classic House Construction Fill
535	R106:20D-10	Classic	Middle Classic	R106:Middle Classic House Construction Fill
536	R106:58C	Classic	Middle Classic	R106:Middle Classic House Construction Fill
537	R106:35C	Classic	Middle Classic	R106:Middle Classic House Construction Fill
538	R106:10F-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
539	R106:21A-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
540	R106:08C-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
541	R106:34A	Classic	Middle Classic	R106:Middle Classic House Construction Fill
542	R106:17A-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
543	R106:21A-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
544	R106:09A-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
545	R106:55A-5	Classic	Middle Classic	R106:Middle Classic House Construction Fill
546	R106:20-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
547	R106:23B-4	Classic	Middle Classic	R106:Middle Classic House Construction Fill
548	R106:24F-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
549	R106:20D-5	Classic	Middle Classic	R106:Middle Classic House Construction Fill
550	R106:56A-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
551	R106:33-7	Classic	Middle Classic	R106:Middle Classic House Construction Fill
552	R106:19F	Classic	Middle Classic	R106:Middle Classic House Construction Fill
553	R106:54A-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
554	R106:18-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
555	R106:35D-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
556	R106:06E-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
557	R106:33-6	Classic	Middle Classic	R106:Middle Classic House Construction Fill
558	R106:54A-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
559	R106:58A-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
560	R106:37-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
561	R106:20D-11	Classic	Middle Classic	R106:Middle Classic House Construction Fill
562	R106:54A-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
563	R106:19E-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
564	R106:20D-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
565	R106:20D-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
566	R106:37-3	Classic	Middle Classic	R106:Middle Classic House Construction Fill
567	R106:53A-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
568	R106:12C-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
569	R106:07A-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
570	R106:28B-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
571	R106:37-1	Classic	Middle Classic	R106:Middle Classic House Construction Fill
572	R106:30-4	Classic	Middle Classic	R106:Middle Classic House Construction Fill
573	R106:39A	Classic	Middle Classic	R106:Middle Classic House Construction Fill
574	R106:23C-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
575	R106:23B-6	Classic	Middle Classic	R106:Middle Classic House Construction Fill
576	R106:10-5	Classic	Middle Classic	R106:Middle Classic House Construction Fill
577	R106:24E	Classic	Middle Classic	R106:Middle Classic House Construction Fill

Case Number	Artifact Number	Temporal Period	Temporal Phase	Excavation Context
578	R106:23B-5	Classic	Middle Classic	R106:Middle Classic House Construction Fill
579	R!06:06E-2	Classic	Middle Classic	R106:Middle Classic House Construction Fill
580	R106:18-5	Classic	Middle Classic	R106:Middle Classic House Construction Fill
581	R106:33-9	Classic	Middle Classic	R106:Middle Classic House Construction Fill
582	R106:31E	Classic	Middle Classic	R106:Middle Classic House Construction Fill
583	R106:28A	Classic	Middle Classic	R106:Middle Classic House Construction Fill
584	R106:05-0	Classic	Middle Classic	R106:Middle Classic House Construction Fill

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
1	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
2	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
3	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
4	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
5	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
6	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
7	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
8	obsidian	green	green	triangular pressure blade	FOUR-A	medial
9	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
10	obsidian	green	green	chiconautla/amantla	FOUR-A	medial
11	obsidian	green	green	modified prismatic blade	FIVE-A	medial
12	obsidian	green	green	internal platform preparation flake	FOUR-B	intact
13	obsidian	green	green	unidentifiable/angular fragment	UNID	intact
14	obsidian	green	green	transverse core modification flake	FOUR-B	intact
15	obsidian	green	green	internal platform preparation flake	FOUR-B	intact
16	obsidian	green	green	unidentifiable/angular fragment	UNID	intact
17	chert	white	green	unidentifiable/angular fragment	UNID	intact
18	chert	white	green	general flake	FC, GF, BF, UF	intact
19	chert	white	green	unidentifiable/angular fragment	UNID	intact
20	chalcedony	red-brown	chert/chalcedony	unidentifiable/angular fragment	UNID	intact
21	chalcedony	light brown	chert/chalcedony	unidentifiable/angular fragment	UNID	intact
22	chalcedony	white	chert/chalcedony	unidentifiable/angular fragment	UNID	intact
23	chalcedony	white	chert/chalcedony	unidentifiable/angular fragment	UNID	intact
24	chalcedony	white	chert/chalcedony	unidentifiable/angular fragment	UNID	intact
25	obsidian	opaque black	opaque black	plunging blade	FOUR-B	intact
26	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
27	obsidian	opaque black	opaque black	percussion macroflake	TWO	intact
28	obsidian	opaque black	opaque black	irregular pressure blade	THREE	medial
29	obsidian	opaque black	opaque black	irregular pressure blade	THREE	medial
30	obsidian	opaque black	opaque black	irregular pressure blade	THREE	proximal
31	obsidian	opaque black	opaque black	unidentifiable/angular fragment	UNID	intact
32	obsidian	opaque black	opaque black	irregular pressure blade	THREE	medial
33	obsidian	opaque black	opaque black	percussion macroblade	TWO	medial

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
34	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	proximal
35	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
36	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
37	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
38	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
39	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
40	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
41	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
42	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
43	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
44	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
45	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
46	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
47	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
48	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
49	obsidian	opaque black	opaque black	irregular prismatic pressure blade	FOUR-A	medial
50	obsidian	opaque black	opaque black	irregular pressure blade	THREE	medial
51	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
52	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
53	obsidian	opaque black	opaque black	unidentifiable/angular fragment	UNID	intact
54	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
55	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
56	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
57	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
58	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
59	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
60	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
61	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
62	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
63	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
64	obsidian	cloudy grey	cloudy grey	triangular pressure blade	FOUR-A	proximal
65	obsidian	cloudy grey	cloudy grey	triangular pressure blade	FOUR-A	proximal

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
66	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
67	obsidian	cloudy grey	cloudy grey	irregular pressure blade	THREE	proximal
68	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	proximal
69	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
70	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
71	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
72	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
73	obsidian	cloudy grey	cloudy grey	triangular pressure blade	FOUR-A	medial
74	obsidian	cloudy grey	cloudy grey	internal platform preparation flake	FOUR-B	intact
75	obsidian	cloudy grey	cloudy grey	triangular pressure blade	FOUR-A	medial
76	obsidian	cloudy grey	cloudy grey	triangular pressure blade	FOUR-A	proximal
77	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	proximal
78	obsidian	translucent brown-grey	translucent brown-grey	unidentifiable/angular fragment	UNID	intact
79	obsidian	translucent brown-grey	translucent brown-grey	prismatic pressure blade	FOUR-A	medial
80	obsidian	translucent brown-grey	translucent brown-grey	percussion macroblade	TWO	proximal
81	obsidian	translucent brown-grey	translucent brown-grey	prismatic pressure blade	FOUR-A	proximal
82	obsidian	translucent brown-grey	translucent brown-grey	percussion macroblade	TWO	medial
83	obsidian	translucent brown-grey	translucent brown-grey	prismatic pressure blade	FOUR-A	proximal
84	obsidian	translucent brown-grey	translucent brown-grey	irregular prismatic pressure blade	FOUR-A	proximal
85	obsidian	translucent brown-grey	translucent brown-grey	prismatic pressure blade	FOUR-A	medial
86	obsidian	translucent brown-grey	translucent brown-grey	irregular pressure blade	THREE	medial
87	obsidian	translucent brown-grey	translucent brown-grey	prismatic pressure blade	FOUR-A	medial
88	obsidian	translucent brown-grey	translucent brown-grey	prismatic pressure blade	FOUR-A	medial
89	obsidian	translucent brown-grey	translucent brown-grey	prismatic pressure blade	FOUR-A	proximal
90	obsidian	translucent brown-grey	translucent brown-grey	irregular prismatic pressure blade	FOUR-A	medial
91	obsidian	translucent brown-grey	translucent brown-grey	triangular pressure blade	FOUR-A	medial
92	obsidian	translucent brown-grey	translucent brown-grey	irregular pressure blade	THREE	medial
93	obsidian	translucent brown-grey	translucent brown-grey	irregular prismatic pressure blade	FOUR-A	medial
94	obsidian	translucent brown-grey	translucent brown-grey	triangular pressure blade	FOUR-A	medial
95	obsidian	translucent brown-grey	translucent brown-grey	prismatic pressure blade	FOUR-A	medial
96	obsidian	translucent brown-grey	translucent brown-grey	prismatic pressure blade	FOUR-A	medial
97	obsidian	translucent blue-grey	translucent blue-grey	internal platform preparation flake	FOUR-B	intact

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
98	obsidian	clear white-grey striated	other tranaparent/translucent grey	triangular pressure blade	FOUR-A	medial
99	obsidian	clear white-grey striated	other tranaparent/translucent grey	irregular pressure blade	THREE	medial
100	obsidian	clear white-grey striated	other tranaparent/translucent grey	bifacial point	FC, GF, BF, UF	intact
101	obsidian	clear white-grey striated	other tranaparent/translucent grey	transverse core modification flake	FOUR-B	intact
102	obsidian	green	green	blade core segment	FOUR-B	medial
103	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
104	obsidian	green	green	triangular pressure blade	FOUR-A	distal
105	obsidian	green	green	irregular pressure blade	THREE	proximal
106	obsidian	green	green	irregular pressure blade	THREE	medial
107	obsidian	green	green	blade core thinning section	FOUR-B	intact
108	obsidian	green	green	internal platform preparation flake	FOUR-B	intact
109	obsidian	green	green	internal platform preparation flake	FOUR-B	intact
110	obsidian	green	green	percussion macroblade	TWO	medial
111	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
112	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
113	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
114	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
115	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
116	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
117	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
118	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
119	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
120	obsidian	green	green	triangular pressure blade	FOUR-A	medial
121	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
122	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
123	obsidian	green	green	triangular pressure blade	FOUR-A	medial
124	obsidian	green	green	triangular pressure blade	FOUR-A	medial
125	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
126	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
127	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
128	obsidian	green	green	prismatic pressure blade	FOUR-A	medial

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
129	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
130	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
131	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
132	obsidian	green	green	triangular pressure blade	FOUR-A	medial
133	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
134	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
135	obsidian	green	green	triangular pressure blade	FOUR-A	medial
136	obsidian	green	green	triangular pressure blade	FOUR-A	medial
137	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
138	obsidian	green	green	irregular pressure blade	THREE	medial
139	obsidian	green	green	irregular pressure blade	THREE	medial
140	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
141	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
142	obsidian	opaque black	opaque black	irregular pressure blade	THREE	medial
143	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
144	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
145	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
146	obsidian	opaque black	opaque black	irregular pressure blade	THREE	medial
147	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
148	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
149	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
150	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
151	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
152	obsidian	opaque black	opaque black	irregular pressure blade	THREE	medial
153	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
154	obsidian	opaque black	opaque black	irregular prismatic pressure blade	FOUR-A	medial
155	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
156	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
157	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
158	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
159	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
160	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
161	obsidian	opaque black	opaque black	irregular pressure blade	THREE	medial
162	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
163	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
164	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
165	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
166	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
167	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
168	obsidian	opaque black	opaque black	irregular prismatic pressure blade	FOUR-A	medial
169	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	proximal
170	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
171	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
172	obsidian	opaque black	opaque black	irregular pressure blade	THREE	proximal
173	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
174	obsidian	opaque black	opaque black	irregular pressure blade	THREE	proximal
175	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
176	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
177	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
178	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
179	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
180	obsidian	cloudy grey	cloudy grey	irregular prismatic pressure blade	FOUR-A	medial
181	obsidian	cloudy grey	cloudy grey	triangular pressure blade	FOUR-A	medial
182	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
183	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
184	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
185	obsidian	cloudy grey	cloudy grey	triangular pressure blade	FOUR-A	medial
186	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
187	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
188	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
189	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
190	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
191	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
192	obsidian	cloudy grey	cloudy grey	irregular pressure blade	THREE	proximal

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
193	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	proximal
194	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	proximal
195	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	proximal
196	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	proximal
197	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	proximal
198	obsidian	cloudy grey	cloudy grey	secondary decortication flake	TWO	intact
199	obsidian	cloudy grey	cloudy grey	internal platform preparation flake	FOUR-B	intact
200	obsidian	translucent blue-grey	translucent blue-grey	irregular pressure blade	THREE	medial
201	obsidian	translucent blue-grey	translucent blue-grey	prismatic pressure blade	FOUR-A	medial
202	obsidian	translucent blue-grey	translucent blue-grey	prismatic pressure blade	FOUR-A	medial
203	obsidian	translucent blue-grey	translucent blue-grey	triangular pressure blade	FOUR-A	medial
204	obsidian	translucent blue-grey	translucent blue-grey	irregular prismatic pressure blade	FOUR-A	medial
205	obsidian	translucent blue-grey	translucent blue-grey	triangular pressure blade	FOUR-A	medial
206	obsidian	translucent blue-grey	translucent blue-grey	triangular pressure blade	FOUR-A	medial
207	obsidian	translucent blue-grey	translucent blue-grey	prismatic pressure blade	FOUR-A	medial
208	obsidian	translucent blue-grey	translucent blue-grey	triangular pressure blade	FOUR-A	medial
209	obsidian	translucent blue-grey	translucent blue-grey	triangular pressure blade	FOUR-A	medial
210	obsidian	translucent blue-grey	translucent blue-grey	prismatic pressure blade	FOUR-A	medial
211	obsidian	translucent blue-grey	translucent blue-grey	prismatic pressure blade	FOUR-A	medial
212	obsidian	translucent blue-grey	translucent blue-grey	prismatic pressure blade	FOUR-A	medial
213	obsidian	translucent blue-grey	translucent blue-grey	triangular pressure blade	FOUR-A	medial
214	obsidian	translucent blue-grey	translucent blue-grey	prismatic pressure blade	FOUR-A	medial
215	obsidian	translucent blue-grey	translucent blue-grey	prismatic pressure blade	FOUR-A	medial
216	obsidian	translucent blue-grey	translucent blue-grey	triangular pressure blade	FOUR-A	medial
217	obsidian	translucent blue-grey	translucent blue-grey	triangular pressure blade	FOUR-A	medial
218	obsidian	translucent blue-grey	translucent blue-grey	triangular pressure blade	FOUR-A	medial
219	obsidian	translucent blue-grey	translucent blue-grey	irregular pressure blade	THREE	medial
220	obsidian	translucent blue-grey	translucent blue-grey	prismatic pressure blade	FOUR-A	medial
221	obsidian	translucent blue-grey	translucent blue-grey	triangular pressure blade	FOUR-A	medial
222	obsidian	translucent blue-grey	translucent blue-grey	prismatic pressure blade	FOUR-A	proximal
223	obsidian	translucent blue-grey	translucent blue-grey	prismatic pressure blade	FOUR-A	proximal
224	obsidian	translucent blue-grey	translucent blue-grey	irregular pressure blade	THREE	proximal

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
225	obsidian	translucent blue-grey	translucent blue-grey	prismatic pressure blade	FOUR-A	proximal
226	obsidian	translucent blue-grey	translucent blue-grey	irregular prismatic pressure blade	FOUR-A	proximal
227	obsidian	transparent grey striated	other tranaparent/translucent grey	triangular pressure blade	FOUR-A	proximal
228	obsidian	translucent grey striated	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
229	obsidian	translucent grey striated	other tranaparent/translucent grey	irregular prismatic pressure blade	FOUR-A	medial
230	obsidian	translucent grey striated	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
231	obsidian	green	green	blade core segment	FOUR-B	distal
232	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
233	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
234	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
235	obsidian	green	green	triangular pressure blade	FOUR-A	medial
236	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
237	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
238	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
239	obsidian	green	green	modified prismatic blade	FIVE-A	medial
240	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
241	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
242	obsidian	green	green	blade core section	FOUR-B	medial
243	chert	pink-white	chert/chalcedony	general flake	FC, GF, BF, UF	intact
244	chert	pink-white	chert/chalcedony	general flake	FC, GF, BF, UF	intact
245	chalcedony	pink-white	chert/chalcedony	secondary decortication flake	TWO	intact
246	obsidian	opaque black	opaque black	blade core segment	FOUR-B	medial
247	obsidian	opaque black	opaque black	bifacial point	FC, GF, BF, UF	intact
248	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
249	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
250	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
251	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	proximal
252	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
253	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
254	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
255	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
256	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
257	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
258	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
259	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
260	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
261	obsidian	cloudy grey	cloudy grey	initial series blade	THREE	intact
262	obsidian	cloudy grey	cloudy grey	general flake	FC, GF, BF, UF	intact
263	obsidian	cloudy grey	cloudy grey	triangular pressure blade	FOUR-A	proximal
264	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
265	obsidian	cloudy grey	cloudy grey	percussion macroblade	TWO	proximal
266	obsidian	translucent brown-grey with black particulates	other tranaparent/translucent grey	triangular pressure blade	FOUR-A	proximal
267	obsidian	translucent brown-grey with black particulates	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	proximal
268	obsidian	translucent brown-grey with black particulates	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	distal
269	obsidian	translucent brown-grey with black particulates	other tranaparent/translucent grey	modified prismatic blade	FIVE-A	medial
270	obsidian	translucent brown-grey with black particulates	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
271	obsidian	translucent brown-grey with black particulates	other tranaparent/translucent grey	secondary decortication flake	TWO	intact
272	obsidian	translucent grey striated	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
273	obsidian	translucent grey striated	other tranaparent/translucent grey	triangular pressure blade	FOUR-A	medial
274	obsidian	translucent grey striated	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	proximal
275	obsidian	transparent grey striated	other tranaparent/translucent grey	internal platform preparation flake	FOUR-B	intact
276	obsidian	transparent grey striated	other tranaparent/translucent grey	internal platform preparation flake	FOUR-B	intact
277	obsidian	clear white-grey	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
278	obsidian	green	green	initial series blade	THREE	medial
279	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
280	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
281	obsidian	green	green	prismatic pressure blade	FOUR-A	medial

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
282	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
283	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
284	obsidian	green	green	modified prismatic blade	FIVE-A	medial
285	obsidian	green	green	chiconautla/amantla	FOUR-A	medial
286	obsidian	green	green	modified prismatic blade	FIVE-A	medial
287	obsidian	green	green	chiconautla/amantla	FOUR-A	medial
288	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
289	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
290	obsidian	green	green	triangular pressure blade	FOUR-A	medial
291	obsidian	green	green	percussion macroblade	TWO	proximal
292	obsidian	green	green	blade core	FOUR-B	intact
293	obsidian	green	green	blade core segment	FOUR-B	distal
294	obsidian	green	green	percussion macroblade	TWO	proximal
295	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
296	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
297	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
298	obsidian	green	green	irregular pressure blade	THREE	medial
299	obsidian	green	green	triangular pressure blade	FOUR-A	medial
300	obsidian	green	green	triangular pressure blade	FOUR-A	medial
301	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
302	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
303	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
304	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
305	obsidian	opaque black	opaque black	secondary decortication flake	TWO	medial
306	obsidian	translucent brown-grey with black particulates	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	proximal
307	obsidian	translucent brown-grey with black particulates	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
308	obsidian	translucent brown-grey with black particulates	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
309	obsidian	translucent brown-grey with black particulates	other tranaparent/translucent grey	irregular pressure blade	THREE	medial
310	obsidian	translucent brown-grey with black particulates	other tranaparent/translucent grey	triangular pressure blade	FOUR-A	medial

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
311	obsidian	translucent brown-grey with black particulates	other tranaparent/translucent grey	internal platform preparation flake	FOUR-B	intact
312	obsidian	translucent brown-grey with black particulates	other tranaparent/translucent grey	internal platform preparation flake	FOUR-B	intact
313	obsidian	opaque black	opaque black	pressure macroblade	TWO	proximal
314	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
315	obsidian	translucent grey striated	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	proximal
316	obsidian	translucent grey striated	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	proximal
317	obsidian	translucent grey striated	other tranaparent/translucent grey	percussion macroblade	TWO	proximal
318	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	proximal
319	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	proximal
320	obsidian	cloudy grey	cloudy grey	irregular pressure blade	THREE	medial
321	obsidian	opaque grey with black particulates	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
322	obsidian	opaque grey with black particulates	other tranaparent/translucent grey	internal platform preparation flake	FOUR-B	intact
323	obsidian	opaque black	opaque black	unifacial scraper on a macroblade	FC, GF, BF, UF	intact
324	obsidian	opaque black	opaque black	pressure macroblade	TWO	proximal
325	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
326	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
327	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
328	obsidian	opaque black	opaque black	triangular pressure blade	FOUR-A	medial
329	obsidian	cloudy grey	cloudy grey	blade core thinning section	FOUR-B	intact
330	obsidian	cloudy grey	cloudy grey	internal platform preparation flake	FOUR-B	intact
331	obsidian	cloudy grey	cloudy grey	irregular pressure blade	THREE	proximal
332	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
333	obsidian	translucent brown-grey	translucent brown-grey	prismatic pressure blade	FOUR-A	medial
334	obsidian	translucent black and grey banded	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
335	obsidian	translucent grey striated	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	proximal
336	obsidian	translucent grey striated	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	proximal

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
337	chalcedony	white	chert/chalcedony	general flake	FC, GF, BF, UF	intact
338	obsidian	green	green	blade core segment	FOUR-B	m-distal
339	obsidian	green	green	blade core segment	FOUR-B	m-distal
340	obsidian	green	green	blade core segment	FOUR-B	medial
341	obsidian	green	green	irregular pressure blade	THREE	proximal
342	obsidian	green	green	irregular pressure blade	THREE	proximal
343	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
344	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
345	obsidian	green	green	irregular pressure blade	THREE	proximal
346	obsidian	green	green	irregular pressure blade	THREE	proximal
347	obsidian	green	green	irregular pressure blade	THREE	proximal
348	obsidian	green	green	irregular pressure blade	THREE	proximal
349	obsidian	green	green	modified prismatic blade	FIVE-A	proximal
350	obsidian	green	green	triangular pressure blade	FOUR-A	medial
351	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
352	obsidian	green	green	triangular pressure blade	FOUR-A	medial
353	obsidian	green	green	irregular pressure blade	THREE	medial
354	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
355	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
356	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
357	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
358	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
359	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
360	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
361	obsidian	green	green	irregular pressure blade	THREE	medial
362	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
363	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
364	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
365	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
366	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
367	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
368	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
369	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
370	obsidian	green	green	prismatic pressure blade	FOUR-A	medial

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
371	obsidian	green	green	triangular pressure blade	FOUR-A	medial
372	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
373	obsidian	green	green	irregular prismatic pressure blade	FOUR-A	medial
374	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
375	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
376	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
377	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
378	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
379	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
380	obsidian	green	green	triangular pressure blade	FOUR-A	medial
381	obsidian	green	green	irregular prismatic pressure blade	FOUR-A	medial
382	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
383	obsidian	green	green	triangular pressure blade	FOUR-A	medial
384	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
385	obsidian	green	green	triangular pressure blade	FOUR-A	medial
386	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
387	obsidian	green	green	triangular pressure blade	FOUR-A	medial
388	obsidian	green	green	triangular pressure blade	FOUR-A	medial
389	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
390	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
391	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
392	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
393	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
394	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
395	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
396	obsidian	green	green	prismatic pressure blade	FOUR-A	distal
397	obsidian	green	green	triangular pressure blade	FOUR-A	distal
398	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
399	obsidian	transparent grey with black particulates	other tranaparent/translucent grey	triangular pressure blade	FOUR-A	medial
400	obsidian	green	green	modified prismatic blade	FIVE-A	medial
401	obsidian	green	green	modified prismatic blade	FIVE-A	medial

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
402	obsidian	green	green	modified prismatic blade	FIVE-A	medial
403	obsidian	green	green	modified prismatic blade	FIVE-A	medial
404	obsidian	green	green	modified prismatic blade	FIVE-A	medial
405	obsidian	green	green	chiconautla/amantla	FOUR-A	proximal
406	obsidian	green	green	chiconautla/amantla	FOUR-A	intact
407	obsidian	green	green	modified prismatic blade	FIVE-A	medial
408	obsidian	green	green	chiconautla/amantla	FOUR-A	medial
409	obsidian	green	green	secondary decortication flake	TWO	intact
410	obsidian	green	green	secondary decortication flake	TWO	intact
411	obsidian	green	green	unidentifiable/angular fragment	UNID	intact
412	obsidian	green	green	irregular prismatic pressure blade	FOUR-A	proximal
413	obsidian	green	green	blade core section	FOUR-B	distal
414	obsidian	green	green	unidentifiable/angular fragment	UNID	intact
415	obsidian	green	green	transverse core modification flake	FOUR-B	intact
416	obsidian	green	green	internal platform preparation flake	FOUR-B	intact
417	obsidian	green	green	internal platform preparation flake	FOUR-B	intact
418	obsidian	green	green	unidentifiable/angular fragment	UNID	intact
419	obsidian	green	green	internal platform preparation flake	FOUR-B	intact
420	obsidian	green	green	internal platform preparation flake	FOUR-B	intact
421	obsidian	green	green	overhang removal flake	FOUR-B	intact
422	obsidian	green	green	pressure retouch microflake	FIVE-B	intact
423	obsidian	green	green	pressure retouch microflake	FIVE-B	intact
424	obsidian	green	green	pressure retouch microflake	FIVE-B	intact
425	obsidian	green	green	pressure retouch microflake	FIVE-B	intact
426	obsidian	green	green	pressure retouch microflake	FIVE-B	intact
427	obsidian	green	green	pressure retouch microflake	FIVE-B	intact
428	obsidian	green	green	blade core segment	FOUR-B	medial
429	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
430	obsidian	green	green	triangular pressure blade	FOUR-A	medial
431	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
432	obsidian	green	green	triangular pressure blade	FOUR-A	medial
433	obsidian	green	green	triangular pressure blade	FOUR-A	medial
434	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
435	obsidian	green	green	triangular pressure blade	FOUR-A	medial
436	obsidian	green	green	prismatic pressure blade	FOUR-A	medial

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
437	obsidian	green	green	irregular prismatic pressure blade	FOUR-A	distal
438	obsidian	translucent grey striated	other tranaparent/translucent grey	blade core segment	FOUR-B	m-distal
439	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
440	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
441	obsidian	green	green	crested ridge blade	ONE	proximal
442	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
443	obsidian	green	green	irregular pressure blade	THREE	medial
444	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
445	obsidian	green	green	triangular pressure blade	FOUR-A	medial
446	obsidian	green	green	irregular pressure blade	THREE	medial
447	obsidian	green	green	prismatic pressure blade	FOUR-A	distal
448	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
449	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
450	obsidian	green	green	triangular pressure blade	FOUR-A	medial
451	obsidian	cloudy grey	cloudy grey	secondary decortication flake	TWO	intact
452	obsidian	transparent grey with black particulates	other tranaparent/translucent grey	irregular pressure blade	THREE	proximal
453	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
454	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	medial
455	obsidian	translucent black and grey banded	other tranaparent/translucent grey	triangular pressure blade	FOUR-A	medial
456	obsidian	green	green	blade core segment	FOUR-B	distal
457	obsidian	green	green	blade core section	FOUR-B	medial
458	obsidian	green	green	blade core segment	FOUR-B	distal
459	obsidian	green	green	blade core section	FOUR-B	medial
460	obsidian	green	green	percussion macroflake	TWO	medial
461	obsidian	green	green	percussion macroblade	TWO	medial
462	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
463	obsidian	green	green	irregular pressure blade	THREE	proximal
464	obsidian	green	green	triangular pressure blade	FOUR-A	proximal
465	obsidian	green	green	irregular pressure blade	THREE	proximal
466	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
467	obsidian	green	green	irregular prismatic pressure blade	FOUR-A	proximal
468	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
469	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
470	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
471	obsidian	green	green	irregular prismatic pressure blade	FOUR-A	proximal
472	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
473	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
474	obsidian	green	green	irregular prismatic pressure blade	FOUR-A	proximal
475	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
476	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
477	obsidian	green	green	prismatic pressure blade	FOUR-A	proximal
478	obsidian	green	green	triangular pressure blade	FOUR-A	proximal
479	obsidian	green	green	irregular prismatic pressure blade	FOUR-A	proximal
480	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
481	obsidian	green	green	irregular prismatic pressure blade	FOUR-A	medial
482	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
483	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
484	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
485	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
486	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
487	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
488	obsidian	green	green	triangular pressure blade	FOUR-A	medial
489	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
490	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
491	obsidian	green	green	irregular prismatic pressure blade	FOUR-A	medial
492	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
493	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
494	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
495	obsidian	green	green	triangular pressure blade	FOUR-A	medial
496	obsidian	green	green	triangular pressure blade	FOUR-A	medial
497	obsidian	green	green	modified prismatic blade	FIVE-A	medial
498	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
499	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
500	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
501	obsidian	green	green	prismatic pressure blade	FOUR-A	medial

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
502	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
503	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
504	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
505	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
506	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
507	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
508	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
509	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
510	obsidian	green	green	irregular prismatic pressure blade	FOUR-A	medial
511	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
512	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
513	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
514	obsidian	green	green	triangular pressure blade	FOUR-A	medial
515	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
516	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
517	obsidian	green	green	triangular pressure blade	FOUR-A	medial
518	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
519	obsidian	green	green	initial series blade	THREE	medial
520	obsidian	green	green	irregular pressure blade	THREE	medial
521	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
522	obsidian	green	green	triangular pressure blade	FOUR-A	medial
523	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
524	obsidian	green	green	irregular prismatic pressure blade	FOUR-A	medial
525	obsidian	green	green	triangular pressure blade	FOUR-A	medial
526	obsidian	green	green	prismatic pressure blade	FOUR-A	medial
527	obsidian	green	green	triangular pressure blade	FOUR-A	medial
528	obsidian	green	green	triangular pressure blade	FOUR-A	medial
529	obsidian	green	green	irregular pressure blade	THREE	medial
530	obsidian	green	green	prismatic pressure blade	FOUR-A	distal
531	obsidian	green	green	triangular pressure blade	FOUR-A	distal
532	obsidian	green	green	prismatic pressure blade	FOUR-A	distal
533	obsidian	green	green	internal platform preparation flake	FOUR-B	intact
534	obsidian	green	green	blade core section	FOUR-B	medial

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
535	obsidian	green	green	internal platform preparation flake	FOUR-B	intact
536	obsidian	green	green	unifacial scraper on a macroblade	FC, GF, BF, UF	intact
537	obsidian	translucent brown-grey	translucent brown-grey	blade core segment	FOUR-B	proximal
538	obsidian	translucent brown-grey	translucent brown-grey	blade core segment	FOUR-B	m-distal
539	obsidian	transparent grey with black particulates	other tranaparent/translucent grey	initial series blade	THREE	intact
540	obsidian	translucent grey striated	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	proximal
541	obsidian	translucent brown-grey	translucent brown-grey	prismatic pressure blade	FOUR-A	proximal
542	obsidian	translucent black and grey banded	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	proximal
543	obsidian	translucent black and grey banded	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	proximal
544	obsidian	translucent grey striated	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	proximal
545	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
546	obsidian	translucent black and grey banded	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	proximal
547	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
548	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	proximal
549	obsidian	opaque black	opaque black	prismatic pressure blade	FOUR-A	proximal
550	obsidian	transparent grey with black particulates	other tranaparent/translucent grey	modified prismatic blade	FIVE-A	proximal
551	obsidian	cloudy grey	cloudy grey	irregular prismatic pressure blade	FOUR-A	proximal
552	obsidian	translucent black and grey banded	other tranaparent/translucent grey	bifacial point	FC, GF, BF, UF	intact
553	obsidian	translucent grey striated	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
554	obsidian	translucent grey striated	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
555	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
556	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
557	obsidian	transparent grey with black particulates	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
558	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
559	obsidian	transparent grey with black particulates	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
560	obsidian	transparent grey with black particulates	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
561	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
562	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
563	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
564	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
565	obsidian	transparent grey with black particulates	other tranaparent/translucent grey	triangular pressure blade	FOUR-A	medial
566	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
567	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
568	obsidian	transparent grey with black particulates	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
569	obsidian	cloudy grey	cloudy grey	prismatic pressure blade	FOUR-A	medial
570	obsidian	translucent grey striated	other tranaparent/translucent grey	triangular pressure blade	FOUR-A	medial
571	obsidian	transparent grey with black particulates	other tranaparent/translucent grey	irregular pressure blade	THREE	medial
572	obsidian	translucent grey striated	other tranaparent/translucent grey	prismatic pressure blade	FOUR-A	medial
573	obsidian	cloudy grey	cloudy grey	transverse core modification flake	FOUR-B	intact
574	obsidian	translucent grey striated	other tranaparent/translucent grey	internal platform preparation flake	FOUR-B	intact
575	obsidian	cloudy grey	cloudy grey	internal platform preparation flake	FOUR-B	intact
576	obsidian	cloudy grey	cloudy grey	internal platform preparation flake	FOUR-B	intact
577	obsidian	cloudy grey	cloudy grey	internal platform preparation flake	FOUR-B	intact
578	obsidian	cloudy grey	cloudy grey	internal platform preparation flake	FOUR-B	intact
579	obsidian	translucent grey striated	other tranaparent/translucent grey	internal platform preparation flake	FOUR-B	intact
580	obsidian	transparent grey with black particulates	other tranaparent/translucent grey	internal platform preparation flake	FOUR-B	intact
581	obsidian	translucent grey striated	other tranaparent/translucent grey	internal platform preparation flake	FOUR-B	intact

Case Number	Raw Material	Lithic Visual Type	Lithic Type Designation	Technological Class	Reduction Sequence	Condition
582	obsidian	transparent grey with black particulates	other tranaparent/translucent grey	unidentifiable/angular fragment	UNID	intact
583	obsidian	transparent grey with black particulates	other tranaparent/translucent grey	unidentifiable/angular fragment	UNID	intact
584	chalcedony	white	chert/chalcedony	flake core	FC, GF, BF, UF	intact

Case Number	Utilization	Weight (cm)	Length (cm)	Width (cm)	Diameter (cm)	Platform Condition
1	present	2.1	4.1	1.4	•	n/a
2	present	1.4	2.2	1.2	•	n/a
3	lightly utilized	2.4	4.9	1.3	•	n/a
4	lightly utilized	.4	1.5	1.2	•	n/a
5	absent	.5	1.1	1.1	•	n/a
6	present	.5	2.4	.6	•	n/a
7	absent	1.4	2.0	1.3	•	n/a
8	absent	.2	.9	.5	•	n/a
9	present	.7	1.9	.9	•	ro, s-f
10	ambiguous	.5	2.0	.4	•	n/a
11	present, knapped	3.0	3.2	1.2	•	n/a
12	absent	.3	1.5	1.4	•	n/a
13	lightly utilized	.1	.5	.5	•	n/a
14	present	2.9	2.1	1.9	•	n/a
15	absent	.5	1.8	.7	•	n/a
16	present, retouch	4.0	2.9	1.4	•	n/a
17	absent	3.7	1.1	.8	•	n/a
18	absent	3.4	1.0	.6	•	n/a
19	present	4.8	.8	.7	•	n/a
20	present	2.1	1.0	1.0	•	n/a
21	absent	2.2	.9	.6	•	n/a
22	present	2.2	.9	.7	•	n/a
23	absent	2.3	.8	.8	•	n/a
24	absent	2.0	.9	.7	•	n/a
25	absent	4.0	9.6	1.1	•	gr, sq, s-f
26	present	1.1	2.3	1.0	•	n/a
27	absent	11.1	4.4	2.3	•	n/a
28	present	1.1	3.6	1.2	•	n/a
29	present	.4	1.5	1.4	•	n/a
30	present	2.8	5.0	1.3	•	gr, sq-ro, s-f
31	present	9.7	5.0	1.5	•	n/a
32	present	1.6	3.1	1.2	•	n/a
33	present	7.4	3.9	2.4	•	n/a
34	present	.9	3.0	1.2	•	gr, sq, s-f
35	absent	.8	2.2	1.0	•	gr, sq, s-f
36	lightly utilized	.7	2.4	1.0	•	gr, sq-ro, s-f
37	present	1.0	2.0	1.2	•	n/a
38	present	.3	.7	.9	•	n/a
39	present	2.1	3.1	1.5	•	gr, sq, s-f
40	present	1.6	1.3	1.9	•	n/a
41	present	.5	2.8	.6	•	n/a
42	present	.6	2.3	.9	•	n/a
43	absent	.8	3.0	.9	•	gr, sq, s-f
44	present	1.2	2.3	1.3	•	n/a
45	lightly utilized	.3	1.5	.8	•	n/a
46	present	.9	2.0	1.1	•	n/a
47	present	1.1	2.0	1.0	•	n/a
48	lightly utilized	1.3	3.6	1.3	•	gr, sq, s-f
49	absent	1.2	2.0	1.5	•	n/a
50	present	.8	1.9	1.2	•	n/a
51	present	.5	1.2	1.3	•	n/a
52	lightly utilized	.5	2.2	.9	•	n/a
53	absent	.5	2.3	1.0	•	n/a
54	present	.1	1.0	1.0	•	n/a
55	present	.2	1.2	.9	•	n/a
56	present	.5	1.6	1.0	•	n/a
57	lightly utilized	.3	1.4	.9	•	n/a
58	present	.5	1.2	.9	•	sc, ro, s-f
59	present	.4	1.3	.7	•	n/a
60	lightly utilized	.6	2.4	.7	•	n/a
61	present	2.2	3.6	1.3	•	n/a

Case Number	Utilization	Weight (cm)	Length (cm)	Width (cm)	Diameter (cm)	Platform Condition
62	present	2.4	3.3	1.4	•	n/a
63	absent	.8	1.5	1.3	•	n/a
64	lightly utilized	.3	1.5	.8	•	gr, sq-ro, s-f
65	absent	.3	1.1	.8	•	n/a
66	present	1.1	3.1	1.0	•	n/a
67	present	.6	1.2	1.2	•	gr, sq, s-f
68	absent	.4	2.5	.7	•	gr, sq-ro, s-f
69	absent	.7	2.2	.8	•	n/a
70	present	.6	1.9	.9	•	n/a
71	present	.9	2.0	1.4	•	n/a
72	present	.4	2.3	.5	•	n/a
73	present	1.2	2.5	1.1	•	n/a
74	absent	.6	1.9	1.0	•	n/a
75	present	.1	1.0	.7	•	n/a
76	lightly utilized	.8	2.9	1.0	•	gr, sq, s-f
77	present	.6	2.2	1.0	•	gr, sq, s-f
78	present	6.4	5.5	1.7	•	n/a
79	present	.9	2.8	1.1	•	n/a
80	present	2.0	1.7	1.5	•	gr, sc, sq, s-f
81	present	1.3	3.9	1.0	•	gr, sq-ro, s-f
82	present	3.3	2.7	2.0	•	n/a
83	lightly utilized	1.0	2.3	1.0	•	gr, sq, s-f
84	absent	.9	1.9	1.2	•	gr, ro, s-f
85	present	.8	2.1	1.0	•	n/a
86	absent	.9	2.2	1.4	•	n/a
87	present	.5	1.6	1.2	•	n/a
88	present	.3	1.1	.8	•	n/a
89	present	.8	2.5	1.1	•	gr, sq, s-f
90	absent	.4	1.4	1.2	•	n/a
91	lightly utilized	.3	1.5	.7	•	n/a
92	present	.3	2.9	.5	•	n/a
93	absent	.6	.9	1.4	•	n/a
94	lightly utilized	.5	1.5	.9	•	n/a
95	absent	.5	1.0	1.1	•	n/a
96	absent	.2	.9	.7	•	n/a
97	absent	3.5	4.0	2.2	•	n/a
98	lightly utilized	.3	1.4	1.0	•	n/a
99	lightly utilized	.2	1.6	.6	•	n/a
100	tip absent	8.9	4.7	2.0	•	n/a
101	absent	5.2	2.9	1.6	•	n/a
102	absent	2.4	1.7	•	1.2	n/a
103	present	2.3	3.6	.8	•	edge grind, ro, s-f
104	absent	.4	2.3	.9	•	n/a
105	present	.6	1.3	1.1	•	ro, s-f
106	present	1.5	2.5	1.5	•	n/a
107	absent	.2	1.3	.6	•	n/a
108	absent	.3	1.1	.7	•	n/a
109	absent	.6	1.7	1.2	•	n/a
110	absent	5.4	2.0	2.1	•	n/a
111	present	.6	1.4	1.1	•	n/a
112	present	1.6	3.3	1.0	•	n/a
113	present	.2	.8	.8	•	n/a
114	absent	1.0	3.0	.8	•	n/a
115	present	.8	2.0	1.2	•	n/a
116	present	.5	2.2	.8	•	n/a
117	present, notched	1.0	2.5	1.1	•	n/a
118	present	.5	1.4	1.0	•	n/a
119	present	.9	2.0	.9	•	n/a
120	present	.4	1.6	.7	•	n/a
121	present	.4	1.6	.7	•	n/a
122	lightly utilized	.8	2.6	.9	•	n/a

Case Number	Utilization	Weight (cm)	Length (cm)	Width (cm)	Diameter (cm)	Platform Condition
123	present	.9	1.7	1.3	•	n/a
124	present	.8	2.3	.9	•	n/a
125	present	.9	1.5	1.4	•	n/a
126	present	.6	2.0	1.0	•	n/a
127	present	.5	1.6	1.0	•	n/a
128	present	.8	1.7	1.1	•	n/a
129	present	1.1	3.2	1.1	•	n/a
130	absent	1.7	2.5	1.5	•	n/a
131	present	1.8	3.2	1.3	•	n/a
132	present	.6	1.3	1.1	•	n/a
133	present	.9	1.5	1.2	•	n/a
134	present	1.2	1.6	1.4	•	n/a
135	present	.3	.9	.7	•	n/a
136	present	.4	1.3	.7	•	n/a
137	present	.6	2.0	1.0	•	n/a
138	present	.2	1.2	.6	•	n/a
139	present	5.5	2.1	2.2	•	n/a
140	present, notched	5.5	3.7	2.1	•	n/a
141	present	.8	24.0	1.0	•	n/a
142	present	1.2	2.1	1.4	•	n/a
143	present	1.0	1.8	1.1	•	n/a
144	present	2.1	4.0	1.2	•	n/a
145	present	1.1	2.0	1.3	•	n/a
146	present	1.4	2.8	1.1	•	n/a
147	present	.4	2.6	1.0	•	n/a
148	present	.4	2.4	.9	•	n/a
149	present	.9	1.3	1.0	•	n/a
150	lightly utilized	.6	1.1	1.5	•	n/a
151	present	.8	1.4	1.3	•	n/a
152	present	.3	1.3	.9	•	n/a
153	present	.4	1.1	1.0	•	n/a
154	absent	.9	1.3	1.4	•	n/a
155	present, notched	.4	1.6	.7	•	n/a
156	present	.2	1.0	.8	•	n/a
157	absent	.6	2.0	1.0	•	n/a
158	present	.3	1.1	1.1	•	n/a
159	present	.2	1.1	.6	•	n/a
160	present	.2	1.7	.8	•	n/a
161	present	.4	1.8	.9	•	n/a
162	present	.2	1.0	.7	•	n/a
163	present	.2	1.0	.8	•	n/a
164	present	.1	.5	.7	•	n/a
165	present	.4	1.5	.8	•	n/a
166	absent	.3	1.0	1.1	•	n/a
167	present	.2	1.0	.8	•	n/a
168	present	.9	1.3	1.4	•	n/a
169	lightly utilized	1.7	2.8	1.8	•	gr, ro, s-f
170	present	1.8	3.8	1.1	•	gr, sq, s-f
171	present	.9	3.0	.8	•	gr, sq, s-f
172	present	1.0	1.8	1.5	•	gr, sq, s-f
173	present	.8	1.5	1.5	•	gr, sq, s-f
174	present	1.8	2.2	1.6	•	gr, sq, s-f
175	present	.9	3.4	.8	•	sq, m-f
176	absent	.9	2.0	1.3	•	gr, sq, s-f
177	present	.6	2.7	1.0	•	gr, sq, s-f
178	present	1.2	1.8	1.3	•	n/a
179	present	.8	3.0	.8	•	n/a
180	present	.6	1.6	1.0	•	n/a
181	absent	5.5	3.7	1.9	•	n/a
182	present	.5	1.0	1.0	•	n/a
183	present	.5	1.4	.8	•	n/a

Case Number	Utilization	Weight (cm)	Length (cm)	Width (cm)	Diameter (cm)	Platform Condition
184	lightly utilized	.7	2.0	1.0	•	n/a
185	present	.6	1.5	1.0	•	n/a
186	present	1.2	2.5	1.3	•	n/a
187	absent	.5	1.3	1.0	•	n/a
188	present	.3	1.6	.7	•	n/a
189	present	.8	1.4	1.2	•	n/a
190	present	.4	1.1	.8	•	n/a
191	present	.3	1.1	.8	•	n/a
192	present	2.3	3.3	1.3	•	gr, sq, s-f
193	absent	.7	1.5	1.2	•	gr, sq, s-f
194	present	.6	1.1	1.1	•	gr, sq, s-f
195	present	1.0	1.8	.9	•	gr, sq, s-f
196	present	.7	2.6	.9	•	gr, sq, s-f
197	absent	1.0	2.0	1.3	•	gr, sq, s-f
198	lightly utilized	8.0	3.4	2.8	•	n/a
199	present	.8	1.8	1.1	•	n/a
200	present	1.1	2.3	1.1	•	n/a
201	present	.7	2.0	1.1	•	n/a
202	present	2.8	2.8	1.7	•	n/a
203	present	1.3	2.5	1.2	•	n/a
204	absent	1.0	1.0	1.8	•	n/a
205	absent	.5	1.9	.7	•	n/a
206	present	.7	1.3	1.2	•	n/a
207	present	.5	2.0	.8	•	n/a
208	present	.4	1.5	.7	•	n/a
209	present	.6	2.0	1.2	•	n/a
210	present	.5	1.5	1.0	•	n/a
211	present	.4	1.8	1.0	•	n/a
212	present	.5	1.0	1.1	•	n/a
213	absent	.3	1.8	.4	•	n/a
214	present	.4	.6	1.0	•	n/a
215	present	.5	1.6	.6	•	n/a
216	present	.3	1.2	1.2	•	n/a
217	absent	.3	1.5	.7	•	n/a
218	present	.3	.6	1.0	•	n/a
219	present	.2	.9	.5	•	n/a
220	present	.3	1.0	.5	•	n/a
221	present	.8	1.5	1.3	•	n/a
222	present	3.9	4.5	1.8	•	gr, sq-ro, s-f
223	lightly utilized	.7	2.6	.8	•	gr, sq, s-f
224	present	.3	1.2	.7	•	gr, sq, s-f
225	absent	1.7	2.1	1.6	•	gr, sq-ro, s-f
226	present	.7	1.5	1.3	•	ro, m-f
227	absent	.7	2.0	1.4	•	gr, sq-ro, s-f
228	present	1.2	2.6	.8	•	n/a
229	absent	1.5	2.0	1.2	•	n/a
230	present	1.0	2.1	1.5	•	n/a
231	absent	1.3	1.5	•	1.3	n/a
232	present	.4	1.5	1.0	•	n/a
233	present	.6	1.2	1.3	•	n/a
234	present	.7	1.1	1.3	•	n/a
235	present	.9	1.5	1.0	•	n/a
236	present	1.0	2.5	1.2	•	n/a
237	present	1.2	3.5	.9	•	n/a
238	present	.2	1.4	.6	•	n/a
239	present, notched, knapped	.7	2.2	.5	•	n/a
240	lightly utilized	.8	3.8	.6	•	sc, gr, sq, s-f
241	present	1.7	4.0	.8	•	edge grind, sq, s-f
242	absent	1.5	2.0	•	1.5	n/a
243	present	.9	1.2	1.0	•	n/a
244	absent	2.0	2.0	1.8	•	n/a

Case Number	Utilization	Weight (cm)	Length (cm)	Width (cm)	Diameter (cm)	Platform Condition
245	present	2.5	2.5	2.1	•	n/a
246	absent	1.8	3.7	•	1.5	n/a
247	tip absent	1.0	2.0	1.0	•	n/a
248	lightly utilized	.5	1.0	.5	•	gr, sq-ro, s-f
249	lightly utilized	3.0	3.0	.4	•	sq-ro, s-f
250	lightly utilized	.6	2.1	.3	•	gr, sq, s-f
251	lightly utilized	1.8	3.1	.2	•	sq, s-f
252	present	1.6	2.0	.9	•	n/a
253	present	.7	1.3	.9	•	n/a
254	present	1.7	2.0	1.9	•	n/a
255	present	1.0	2.1	.8	•	n/a
256	present	1.9	2.0	1.1	•	n/a
257	lightly utilized	.9	2.5	.7	•	n/a
258	absent	1.6	2.3	1.0	•	n/a
259	absent	1.0	2.3	1.0	•	n/a
260	absent	.4	1.4	.6	•	n/a
261	present	1.9	7.5	1.4	•	gr, sq, m-f
262	present	10.7	2.9	2.6	•	n/a
263	present	1.3	2.4	.8	•	gr, sq, s-f
264	present	.9	1.5	1.2	•	n/a
265	absent	1.9	2.0	2.0	•	gr, sq, s-f
266	lightly utilized	1.4	2.1	.3	•	gr, sq, s-f
267	present	1.1	1.5	1.1	•	gr, sq-ro, s-f
268	present	1.9	3.5	.9	•	n/a
269	present, notched	1.4	2.3	.8	•	n/a
270	present	1.2	2.0	1.1	•	n/a
271	present	5.3	4.1	1.8	•	n/a
272	present	1.5	4.0	.8	•	n/a
273	absent	.4	1.2	.3	•	n/a
274	lightly utilized	1.0	2.4	.5	•	gr, sq-ro, s-f
275	absent	2.0	1.0	.9	•	n/a
276	absent	1.7	1.5	.8	•	n/a
277	present	1.5	2.0	1.3	•	n/a
278	present	4.8	4.3	1.2	•	n/a
279	lightly utilized	.4	1.9	1.0	•	ro, s-f
280	present	.5	1.8	.9	•	ro, s-f
281	present	.4	2.0	.7	•	n/a
282	present	.5	1.4	1.1	•	n/a
283	present	.5	1.2	.8	•	n/a
284	present, notched	.2	.9	1.0	•	n/a
285	ambiguous	1.0	2.2	1.0	•	n/a
286	present, notched	.4	1.5	.7	•	n/a
287	ambiguous	1.2	2.6	1.0	•	n/a
288	lightly utilized	.1	1.5	.3	•	n/a
289	present	.8	2.5	.8	•	n/a
290	lightly utilized	1.1	2.9	1.2	•	n/a
291	present, notched	3.5	2.9	2.2	•	sq, m-f
292	absent	18.1	7.6	•	1.3	edge crush, sc, s-f
293	absent	4.3	2.9	•	1.7	n/a
294	present	7.2	3.0	2.5	•	sc, sq, s-f
295	lightly utilized	1.0	2.7	.7	•	ro, s-f
296	lightly utilized	.5	2.0	.8	•	gr, sq, s-f
297	lightly utilized	1.3	2.7	1.3	•	n/a
298	present	3.2	4.1	1.6	•	n/a
299	present	.8	2.2	1.3	•	n/a
300	present	1.0	2.2	.7	•	n/a
301	present, notched	.5	.8	1.1	•	n/a
302	present	.8	1.3	1.0	•	n/a
303	present	2.1	2.7	1.5	•	n/a
304	present	.2	.8	1.0	•	n/a
305	present	3.1	2.3	1.7	•	n/a

Case Number	Utilization	Weight (cm)	Length (cm)	Width (cm)	Diameter (cm)	Platform Condition
306	present	.5	2.4	.5	•	gr, sq, s-f
307	present	.3	1.1	.8	•	n/a
308	present	1.4	2.8	1.8	•	n/a
309	present	.5	1.2	1.3	•	n/a
310	present	.5	1.1	1.3	•	n/a
311	present	.9	1.7	1.3	•	n/a
312	lightly utilized	.2	1.1	.9	•	n/a
313	lightly utilized	1.3	4.3	.8	•	gr, sq, m-f
314	lightly utilized	1.0	1.5	.8	•	n/a
315	lightly utilized	1.5	3.2	1.0	•	gr, sq-ro, s-f
316	lightly utilized	.7	4.8	.4	•	gr, sq-ro, s-f
317	lightly utilized	7.1	2.3	3.5	•	gr, ro, s-f
318	present	1.6	4.5	.7	•	gr, ro, s-f
319	lightly utilized	.2	5.6	.6	•	gr, sq-ro, s-f
320	present	3.1	3.5	1.4	•	n/a
321	present	.4	2.6	1.0	•	n/a
322	absent	.8	2.0	1.5	•	n/a
323	present	9.8	4.5	1.8	•	n/a
324	present	2.7	3.6	2.7	•	gr, sq-ro, m-f
325	present, notched	5.6	4.1	2.0	•	n/a
326	lightly utilized	.9	3.0	1.0	•	n/a
327	present	2.8	3.4	1.7	•	n/a
328	present	3.3	2.1	1.7	•	n/a
329	lightly utilized	9.5	3.0	4.1	•	n/a
330	lightly utilized	3.3	4.7	2.4	•	n/a
331	present	1.8	3.2	.4	•	gr, sq-ro, s-f
332	present	3.0	4.4	1.3	•	n/a
333	present	.8	2.2	1.0	•	n/a
334	lightly utilized	.6	1.8	.8	•	n/a
335	lightly utilized	2.0	4.8	.9	•	gr, sq, m-f
336	lightly utilized	1.6	2.4	.5	•	gr, sq-ro, s-f
337	lightly utilized	8.5	4.2	.5	•	n/a
338	absent	17.1	5.3	•	2.2	sc, m-f
339	present	28.5	6.6	•	3.0	n/a
340	present	20.1	4.5	•	2.2	n/a
341	absent	1.5	2.8	1.3	•	edge grind, sq-ro, s-f
342	present	2.5	2.9	1.2	•	sq-ro, s-f
343	lightly utilized	.4	1.7	.7	•	sq-ro, s-f
344	present	1.7	.6	.5	•	edge grind, sq, s-f
345	absent	.5	1.8	.8	•	edge grind, sq, s-f
346	absent	.9	2.3	.5	•	sq, m-f
347	lightly utilized	.5	1.1	.7	•	edge grind, sq, s-f
348	absent	.7	1.9	.8	•	edge grind, sq-ro, s-f
349	absent, notched	.3	.9	.8	•	sq, s-f
350	present	1.5	3.1	1.5	•	n/a
351	present	2.0	3.0	1.0	•	n/a
352	present	1.3	2.6	1.0	•	n/a
353	lightly utilized	.5	2.3	.6	•	n/a
354	lightly utilized	.8	2.3	1.2	•	n/a
355	absent	.8	2.7	.8	•	n/a
356	lightly utilized	1.1	2.2	1.3	•	n/a
357	lightly utilized	.5	2.0	1.2	•	n/a
358	lightly utilized	.7	2.5	.9	•	n/a
359	lightly utilized	.5	2.6	.7	•	n/a
360	lightly utilized	.3	2.2	.7	•	n/a
361	present	.6	1.3	1.0	•	n/a
362	lightly utilized	.3	1.5	.5	•	n/a
363	present	.3	1.8	.5	•	n/a
364	lightly utilized	.2	.9	.4	•	n/a
365	absent	.2	1.7	.5	•	n/a
366	present	.5	1.6	.6	•	n/a

Case Number	Utilization	Weight (cm)	Length (cm)	Width (cm)	Diameter (cm)	Platform Condition
367	present	.3	1.1	.6	•	n/a
368	absent	.3	1.9	.5	•	n/a
369	lightly utilized	.5	.9	1.2	•	n/a
370	absent	.3	1.6	.5	•	n/a
371	present, notched	.5	.9	.7	•	n/a
372	lightly utilized	.4	.8	.9	•	n/a
373	present, notched	1.1	1.9	1.2	•	n/a
374	lightly utilized	.6	1.3	.9	•	n/a
375	lightly utilized	.6	1.2	.8	•	n/a
376	present, notched	.4	.7	1.0	•	n/a
377	lightly utilized	.4	.9	.7	•	n/a
378	lightly utilized	.4	.7	1.1	•	n/a
379	present, notched	.6	1.9	1.1	•	n/a
380	present	.5	1.4	.7	•	n/a
381	lightly utilized	.6	2.0	.7	•	n/a
382	lightly utilized	.4	1.0	1.3	•	n/a
383	lightly utilized	.3	.8	.9	•	n/a
384	absent	.3	1.3	.8	•	n/a
385	present, notched	.3	1.3	.7	•	n/a
386	absent	.3	.4	.5	•	n/a
387	absent	.1	.4	.3	•	n/a
388	present	.1	1.0	.3	•	n/a
389	present	.1	.7	.3	•	n/a
390	absent	.1	.7	.4	•	n/a
391	present	.1	.4	.3	•	n/a
392	present	.1	1.0	.4	•	n/a
393	present	.1	.9	.4	•	n/a
394	present	.1	1.0	.3	•	n/a
395	absent	.1	1.2	.4	•	n/a
396	lightly utilized	.1	1.5	.3	•	n/a
397	lightly utilized	.3	1.5	.5	•	n/a
398	present	1.1	1.9	1.1	•	n/a
399	lightly utilized	.3	1.1	.7	•	n/a
400	absent, notched, knapped	.3	.9	.7	•	n/a
401	absent, notched, knapped	.1	1.9	.4	•	n/a
402	absent, notched, knapped	.2	1.5	.4	•	n/a
403	absent, notched, knapped	.3	1.2	1.6	•	n/a
404	absent, knapped	.2	1.0	.6	•	n/a
405	ambiguous	1.6	5.0	.6	•	n/a
406	ambiguous	1.5	4.3	1.3	•	sc, ro, s-f
407	absent, knapped	1.7	2.5	1.1	•	n/a
408	ambiguous	1.2	2.6	.9	•	n/a
409	present, notched	4.3	.9	1.0	•	n/a
410	absent	1.4	1.0	.9	•	n/a
411	present, notched	3.8	.7	.5	•	n/a
412	present	.4	1.0	.7	•	edge grind, sq-ro, m-f
413	absent	2.0	1.5	•	.4	n/a
414	absent	1.0	1.1	1.2	•	n/a
415	present	.5	1.5	1.5	•	n/a
416	absent	.3	.8	.9	•	n/a
417	absent	.1	1.2	1.0	•	n/a
418	absent	3.0	2.5	1.5	•	n/a
419	absent	.2	1.1	.9	•	n/a
420	absent	.1	1.3	.6	•	n/a
421	absent	1.0	2.0	.6	•	n/a
422	absent	.1	.3	.2	•	n/a
423	absent	.1	.3	.2	•	n/a
424	absent	.1	.3	.2	•	n/a
425	absent	.1	.3	.2	•	n/a
426	absent	.1	.3	.2	•	n/a

Case Number	Utilization	Weight (cm)	Length (cm)	Width (cm)	Diameter (cm)	Platform Condition
427	absent	.1	.3	.2	•	n/a
428	absent	1.7	3.2	•	1.5	n/a
429	lightly utilized	1.1	2.2	1.0	•	edge grind, sq, s-f
430	lightly utilized	1.7	3.5	1.2	•	n/a
431	present	1.0	2.0	1.2	•	n/a
432	present	1.2	2.0	1.3	•	n/a
433	lightly utilized	.7	2.2	.9	•	n/a
434	present	1.0	3.2	.6	•	n/a
435	absent	.4	1.3	.9	•	n/a
436	absent	.4	1.3	.9	•	n/a
437	present	.6	1.3	.7	•	n/a
438	absent	17.0	5.9	•	1.4	n/a
439	present, notched	3.9	5.8	1.5	•	edge grind, ro, s-f
440	present	1.4	2.8	1.0	•	sq-ro, m-f
441	lightly utilized	1.2	1.6	1.5	•	sq-ro, s-f
442	lightly utilized	.4	2.3	.8	•	n/a
443	present	1.5	1.8	1.8	•	n/a
444	present	.5	2.1	.8	•	n/a
445	present	.6	1.4	1.4	•	n/a
446	present, notched	.9	2.5	.8	•	n/a
447	lightly utilized	.5	1.8	.7	•	n/a
448	present	.8	1.9	1.1	•	n/a
449	lightly utilized	.2	1.5	.7	•	n/a
450	lightly utilized	.5	1.5	1.1	•	n/a
451	present, notched	1.7	1.9	1.1	•	n/a
452	lightly utilized	1.8	2.4	1.2	•	gr, sq, s-f
453	present	.5	1.6	.8	•	n/a
454	present	.8	2.2	.8	•	n/a
455	present	1.9	1.5	2.2	•	n/a
456	present	6.4	1.9	•	1.7	n/a
457	present	10.0	3.8	•	2.2	n/a
458	present	5.1	3.1	•	1.2	n/a
459	present	2.2	3.5	•	2.0	n/a
460	present	8.5	4.6	3.0	•	n/a
461	present	5.9	4.9	2.3	•	n/a
462	present	1.8	3.0	1.0	•	ro, s-f
463	present	1.6	2.2	1.5	•	ro, s-f
464	absent	.9	2.1	1.2	•	sc, sq, s-f
465	present	1.3	2.3	1.3	•	sq-ro, s-f
466	present	4.3	5.7	1.4	•	ro, s-f
467	present	.7	1.7	1.1	•	sq-ro, s-f
468	present	2.0	2.9	1.5	•	sq-ro, s-f
469	present	.9	1.9	1.2	•	sc, sq-ro, s-f
470	present, notched	1.4	4.0	1.1	•	gr, sq, s-f
471	present	2.2	5.2	1.1	•	ro, s-f
472	present	.7	2.6	.7	•	ro, s-f
473	absent	.5	2.2	.9	•	sq-ro, s-f
474	present	.5	1.4	.8	•	sc, sq-ro, s-f
475	absent	.6	2.6	.8	•	sc, sq, s-f
476	present	1.4	4.6	.6	•	sq, sc, s-f
477	present	.4	2.0	.7	•	sc, sq-ro, s-f
478	present	.8	4.1	.6	•	ro, s-f
479	present	.8	2.5	1.1	•	ro, s-f
480	present	1.3	3.1	1.8	•	n/a
481	present, notched	1.6	3.3	1.3	•	n/a
482	lightly utilized	2.0	3.5	1.2	•	n/a
483	present	1.3	3.3	1.0	•	n/a
484	lightly utilized	1.9	2.6	1.4	•	n/a
485	lightly utilized	1.1	4.0	.9	•	n/a
486	lightly utilized	.6	2.1	.7	•	n/a
487	lightly utilized	.7	2.2	1.1	•	n/a

Case Number	Utilization	Weight (cm)	Length (cm)	Width (cm)	Diameter (cm)	Platform Condition
488	present	1.2	1.8	1.3	•	n/a
489	present	2.0	3.1	1.3	•	n/a
490	present	1.0	1.8	1.3	•	n/a
491	present	1.9	2.3	1.6	•	n/a
492	present	1.0	2.5	1.0	•	n/a
493	present	.6	2.0	.9	•	n/a
494	present	.9	3.0	1.0	•	n/a
495	present	.7	2.7	1.1	•	n/a
496	present	.8	2.7	.9	•	n/a
497	absent, knapped	1.1	3.4	.8	•	n/a
498	present	.9	2.8	1.0	•	n/a
499	present	.9	2.2	1.1	•	n/a
500	present	.5	2.2	.8	•	n/a
501	absent	.8	2.1	1.3	•	n/a
502	absent	.1	1.2	.5	•	n/a
503	absent	1.1	3.2	1.1	•	n/a
504	present	.9	1.7	1.1	•	n/a
505	present	.5	2.0	.8	•	n/a
506	present	.7	1.9	1.0	•	n/a
507	present	.5	2.3	.8	•	n/a
508	present	.4	2.5	.6	•	n/a
509	absent	1.0	2.7	.9	•	n/a
510	present	1.0	1.5	1.4	•	n/a
511	absent	.4	2.8	.4	•	n/a
512	present	.3	1.4	.6	•	n/a
513	lightly utilized	.8	1.9	1.0	•	n/a
514	present	.5	1.8	.9	•	n/a
515	present	.5	1.6	.9	•	n/a
516	absent	.3	1.5	.8	•	n/a
517	present	1.1	2.6	1.3	•	n/a
518	absent	.7	2.2	1.3	•	n/a
519	present	1.9	3.4	1.2	•	n/a
520	absent	1.0	2.5	.8	•	n/a
521	absent	.5	1.7	.6	•	n/a
522	absent	.6	1.1	1.4	•	n/a
523	absent	1.0	1.2	.7	•	n/a
524	absent	.7	2.2	1.0	•	n/a
525	present	.8	2.5	.8	•	n/a
526	present	.8	2.5	.9	•	n/a
527	absent	.7	3.2	.8	•	n/a
528	absent	.2	1.0	.4	•	n/a
529	present	1.0	2.5	1.1	•	n/a
530	present	1.2	2.3	1.3	•	n/a
531	present	1.0	2.9	.8	•	n/a
532	present	.6	2.3	.9	•	n/a
533	absent	.4	1.4	.6	•	n/a
534	absent	.3	.5	•	1.5	n/a
535	absent	.2	1.0	1.0	•	n/a
536	present	7.4	2.0	2.7	•	n/a
537	absent	47.7	3.5	•	3.6	edge grind, m-f
538	absent	26.5	4.0	•	2.4	n/a
539	present	3.4	7.7	.5	•	gr, ro, m-f
540	lightly utilized	3.1	5.6	1.3	•	gr, sq, s-f
541	present	1.6	5.5	.7	•	ro, s-f
542	present	1.2	3.0	1.1	•	sq-ro, s-f
543	absent	.9	3.1	.7	•	unexaminable
544	lightly utilized	1.5	3.3	1.2	•	sq-ro, s-f
545	present	.4	1.5	.8	•	ro, m-f
546	present	1.0	2.2	1.2	•	gr, sq, s-f
547	present, notched	1.0	1.7	1.5	•	sc, ro, s-f
548	present	2.2	4.0	1.1	•	sq-ro, s-f

Case Number	Utilization	Weight (cm)	Length (cm)	Width (cm)	Diameter (cm)	Platform Condition
549	absent	1.0	2.5	1.3	•	sq-ro, s-f
550	absent, notched, knapped	1.2	3.8	.7	•	sq-ro, s-f
551	present	.4	1.6	.5	•	sq-ro, s-f
552	lightly utilized	5.1	3.5	2.2	•	n/a
553	present	.5	1.9	.8	•	n/a
554	present	.5	1.9	1.0	•	n/a
555	present	.4	1.6	.8	•	n/a
556	present	1.6	2.8	1.2	•	n/a
557	present	1.0	2.1	1.5	•	n/a
558	present	1.2	2.1	1.2	•	n/a
559	absent	.4	1.2	1.1	•	n/a
560	absent	.2	2.0	.7	•	n/a
561	present	.3	.9	.9	•	n/a
562	present	3.9	4.2	1.5	•	n/a
563	present	.4	1.4	.9	•	n/a
564	absent	3.0	3.7	2.0	•	n/a
565	present	1.2	3.2	1.1	•	n/a
566	present	1.7	2.6	1.2	•	n/a
567	present	.6	1.5	1.1	•	n/a
568	present	.7	2.5	1.0	•	n/a
569	present	.8	2.2	1.3	•	n/a
570	present	.4	1.8	.8	•	n/a
571	present	1.4	2.0	1.7	•	n/a
572	absent	2.9	2.4	1.7	•	n/a
573	present	5.5	5.2	2.4	•	n/a
574	absent	1.8	2.1	1.7	•	n/a
575	absent	1.0	2.3	2.0	•	n/a
576	absent	.8	1.5	1.4	•	n/a
577	absent	1.8	3.1	1.0	•	n/a
578	absent	1.3	2.0	2.0	•	n/a
579	absent	.6	1.8	1.4	•	n/a
580	absent	.4	1.1	.8	•	n/a
581	absent	2.1	2.0	1.5	•	n/a
582	absent	2.0	4.5	2.5	•	n/a
583	absent	1.6	2.1	1.7	•	n/a
584	absent	31.1	4.0	•	6.0	n/a

Case Number	Descriptive Notes
1	
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10	Resembles Tolstoy's Chiconautla blade (1971:272, Figure 1m).
11	Unifacially pressure flaked thumbnail scraper.
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Case Number	Descriptive Notes
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99	
100	Contracting, thin-stemmed point; resembles Tolstoy's Desmuke point (1971:279, Fig. 2w), or his Tlatilco point (1971: 278-279, Fig. 2v) from Middle Formative-Classic contexts.
101	
102	Bitruncated; 1 crushed end, 10 blade scars.
103	
104	
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117	Notched in use.
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Case Number	Descriptive Notes
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140	Notched in use.
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155	Notched in use.
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Case Number	Descriptive Notes
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231	Truncated distal tip.
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239	Side-notched, possible spokeshave.
240	
241	
242	Bitruncated medial blade core section.
243	

Case Number	Descriptive Notes
244	
245	
246	Bitruncated; multi-faceted proximal end; crushing on both ends.
247	Side-notched, concave base; resembles Tolstoy's Edgewood point (1971:278, Fig. 2q) from Late Formative-Classic contexts, or his Harrel point (1971:280, Fig. 3p) which is restricted to Late Postclassic (Aztec) contexts.
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269	Side-notched, possible spokeshave.
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281	
282	
283	
284	Side-notched, possible crescent eccentric reject.
285	Resembles Tolstoy's (1971:272, Fig. 11) Amantla blade.
286	Side-notched, possible crescent eccentric reject.
287	Resembles Tolstoy's (1971:272, Fig. 11) Amantla blade.
288	
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293	Truncated; split vertically; extensive crushing evident.
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301	Notched in use.
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Case Number	Descriptive Notes
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323	Unifacially flaked medial section of macroblade with some cortical material still visible.
324	
325	Notched in use.
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338	Truncated; split vertically; 9 blade scars including 1 plunging blade scar; platform preparation flake scars and evidence of grinding on proximal end evident.
339	Split vertically; 1 plunging blade scar; cryptocrystalline impurities; extensive crushing.
340	Bitruncated; platform grinding visible on distal end; 1 hinge fracture from blade driven off of distal end.
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349	Side-notched, possible spokeshave.
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Case Number	Descriptive Notes
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371	Corner-notched in use.
372	
373	Notched in use.
374	
375	
376	Corner-notched in use.
377	
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379	Side-notched in use.
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385	edge serrated through use
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400	Crescent eccentric reject.
401	Crescent eccentric reject.
402	Side-notched, crescent eccentric reject.
403	Retouch on lateral edges, possible crescent eccentric reject.
404	Unifacially retouched into drill form.
405	Resembles Tolstoy's (1971:272, Fig. 11) Amantla blade.
406	Resembles Tolstoy's (1971:272; Fig. 11) Amantla blade.
407	Bifacially retouched into arrowpoint-shaped form.
408	Resembles a drill through use.
409	Side-notched in use, possible spokeshave.
410	
411	Side-notched in use, possible spokeshave.
412	
413	Blade core section of a reverse distal core.
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Case Number	Descriptive Notes
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428	Bitruncated; single-faceted proximal; edge grinding around proximal circumference.
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438	Split vertically; 3 blade scars, crushing on proximal end.
439	Side-notched in use, possible spokeshave.
440	
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446	Side-notched in use.
447	
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456	Truncated; distal core tip w/2 reverse distal blades removed; grinding on distal circumference.
457	
458	Split vertically; reverse distal core w/ 4 blade scars, grinding on distal circumference.
459	
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470	Use as a drill evident.
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481	Notched in use.
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Case Number	Descriptive Notes
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497	Unifacially pressure flaked into drill.
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516	Side-notched in use.
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525	Dorsal ridge utilized.
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530	Reverse distal core with distal end ground.
531	Reverse distal core with distal end ground.
532	Reverse distal core with distal end ground.
533	
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536	Unifacially flaked scraper on a macroblade with some cortical material visible.
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Case Number	Descriptive Notes
544	
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547	Side-notched in use.
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551	'Internal cortex' visible on dorsal arris.
552	Tanged stem; resembles Tolstoy's Shumla point (1971:279, Fig. 2z) which occurs most commonly in Formative and Classic contexts, but is also known from Late Postclassic (Aztec) ones.
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Appendix 2

Definitions of Terms

I: Lithic Visual Type and Lithic Type Designation Classes

As discussed in Chapter 5, the variable termed 'Lithic Visual Type' was employed to specify the visually distinct colour, degree of translucency, and presence or absence of inclusions of the lithic specimens analyzed in this study. A second variable, that of 'Lithic Type Designation', was designed to account for the grouping of particular 'Lithic Visual Type' classes into categories of lithic artifacts distinguished by degree of translucency and colour/hue in a manner in which these classes might be cross-identified with visual descriptions of obsidian artifacts associated with particular source areas in the literature. Some 'Lithic Visual Type' classes correspond directly/don't want to obscure variation that may be significant once trace-element testing is performed, maintain distinctions for future possibility of trace-element analysis. Below is a list of each 'Lithic Visual Type' and 'Lithic Type Designation' class followed by a description of each class's characteristics. Colour identification was based on subjective criteria, but was cross-checked from memory (this is a warning) with the use of a Munsell Colour Chart. For the time being, I have provided the Munsell Soil Color Chart (1994 Revised Edition) colour codes most closely approximating the colours observed in the collection. Degree of translucency was defined as ranging on a continuum from transparent to opaque and was determined by shining light through each specimen against a white backboard.

i: Lithic Visual Type Classes

Green Obsidian: Highly homogenous and fine grained, translucent obsidian ranging in hue from golden sheen, emerald, bottle green. [Munsell 5G3/2 or 2.5/2].

Opaque Black Obsidian: Highly homogenous and rather fine grained, opaque except at the slightest thin section (i.e. thin edges), glossy black. [Munsell N5GY 2.5/1].

Opaque Slate Grey with Black Particulates Obsidian: Highly brittle and dense opaque matte, grainy slate grey; no transmission of light. [Munsell N4].

Cloudy Grey Obsidian: Highly homogenous and fine grained translucent grey with lighter coloured cloudy inclusions/particles in fine grained matrix, somewhat glossy; [Munsell N4 with inclusions similar to N5 or N6].

Translucent Brown-Grey Obsidian: Highly homogenous and fine grained, translucent obsidian, grey with a brown hue or overcast. [Munsell 10YR 1/3 or 1/4].

Translucent Brown-Grey with Black Particulates Obsidian: Not so fine grained, but homogenous obsidian except for the inclusion of small (approximately 1 mm in diametre) opaque black particulates randomly distributed throughout the matrix; grey with light brown hue or overcast [Munsell 10YR 1/3 or 1/4, particulates resembled N 2.5].

Translucent Blue-Grey Obsidian: Fine grained and homogenous glossy and translucent; grey obsidian with highly distinctive cold blue hue/cast. [Munsell 5B 4/1] .

Clear White-Grey Obsidian: Fine grained and homogenous transparent (clear) white obsidian with just a hint of light grey. [Munsell 5PB 8/1]

Clear White-Grey Striated Obsidian: Fine grained and homogenous transparent (clear) white-grey obsidian with streaks of translucent dark grey/black inclusions. [Matrix close to Munsell 5PB 8/1, inclusions close to 5PB 3/1]

Transparent Grey Striated Obsidian: Homogenous transparent light grey obsidian with grey-black striated inclusions. [Munsell 10B 8/1, inclusions resemble 5PB 3/1]

Translucent Grey Striated: Highly homogenous and fine grained translucent light grey obsidian with dark grey striations. [Munsell 10B 7/1, with 5PB 4/1 striations].

Transparent Grey with Black Particulates: Grainy transparent grey obsidian with small, round black particulates (measuring approximately 1 mm in diametre). [Munsell 5B 7/1, with N3 inclusions].

Translucent Black and Grey Banded: Grainy translucent obsidian of alternating bands of dark grey and light black. [Munsell N 4 and N 3].

White Chert/Chalcedony: Grainy and semi-transparent white material. [Munsell N 8]

Red-Brown Chert/Chalcedony: Smooth and glossy reddish brown material. [Munsell 2.5YR 3/6]

Light Brown Chert/Chalcedony: Smooth and glossy light brown material. [Munsell 5YR 4/4].

Pink-White Chert/Chalcedony: Smooth and glossy white material with pinkish hue and some mottling in pink on white matrix. {Munsell 7.5YR 8/1]

<u>ii: Lithic Type Designation Classes</u>

Green Obsidian: Refer to preceding/above description.

Opaque Black Obsidian: Refer to preceding description.

Cloudy Grey Obsidian: Refer to preceding description.

Translucent Brown-Grey Obsidian: Refer to preceding description.

Translucent Blue-Grey Obsidian: Refer to preceding description.

Other Transparent and Translucent Grey Obsidian: Includes all Lithic Visual Type classes of obsidian not clearly assignable to any of the above five Lithic Type Designation classes.

Chert/Chalcedony: Includes all chert and chalcedony Lithic Visual Types listed and described above.

II: Technological Classes and Metric Statistics

Each lithic specimen was assigned to 1 of the following 26 technological classes. The characteristics of almost all of these technological classes have been previously defined by other researchers and where necessary their work is referenced. Each class description is followed by a set of descriptive statistics pertaining to the occurrence of that technological class in the lithic collection examined in this thesis. Illustrations of some of the artifacts assigned to these classes are provided at the end of this appendix. All artifacts have been drawn to scale.

i: Flake Core: A Flake Core is here understood as any mass of raw material from which amorphous or non-standardized General Flakes are removed, usually by a direct or an indirect percussion technique. Flake cores have long been recognized in the literature (see Whittaker 1994:85-126 for a good discussion of general flake core technology; see also Inizan et al. 1992).

Count: 1
Total Weight: 31.1g
Mean Weight: 31.1g
Mean Diametre: 6.0 cm

ii: General Flake: The term, General Flake, is used in this study to refer to any amorphous or non-standardized lithic flake which has been removed either through direct or indirect percussion that cannot be accounted for by any of the technological classes associated with blade-core technology. Many lithic analyses are concerned with creating further subdistinctions among flake types (e.g. Shott 1994), but the rarity of General Flakes coupled with the obvious bias towards blade-core technology in the lithic collection examined here precludes the necessity and usefulness of such a separate classification system.

Count: 5
Total Weight: 25.5 g
Mean Weight: 5.1
Mean Length: 2.3 cm (Std Dev.: 1.3; Std. Error: .59)
Mean Width: 1.3 (Std. Dev.: .89; Std. Error: .39)

iii: Blade Core: The term Blade Core has been reserved in this study to apply only to those specimens that are intact (non-fragmented) blade cores. A Blade Core, as well as Blade Core Segments (see below) are distinguished by a number of characteristics including the presence of scars from previous pressure blade removal and a prototypical conical form (cf. Crabtree 1968).

Count: 1
Total Weight: 18.1 g
Mean Weight: 18.1 g
Mean Length: 7.6 cm
Mean Diametre: 1.3 cm

iv: Blade Core Segment: A Blade Core Segment is a fragment of a blade core that retains either the platform or the distal end of the original core and at least an estimable two-thirds of the total core length or, alternatively, consists of at least a near complete medial section of a core.

Count: 13
Total Weight: 179.9 g
Mean Weight: 13.8 g (Std. Dev.: 14.09; Std. Error: 3.9)
Mean Length: 3.7 cm (Std. Dev.: 1.57; Std. Error: .43)
Mean Diametre: 1.9 cm (Std. Dev.: .737; Std. Error: .20)

v: Blade Core Section: An artifact is identified as a Blade Core Section if it is a fragment of a blade core segment regardless of its size.

Count: 5
Total Weight: 16.0 g
Mean Weight: 3.2 g (Std. Dev.: 3.87; Std. Error: 1.73)
Mean Length: 2.3 cm (Std. Dev.: 1.38; Std. Error: .62)
Mean Diametre: 1.5 cm (Std. Dev.: .69; Std. Error: .31)

vi: Secondary Decortication Flake: The Secondary Decortication Flake is produced through the process of removing cortical material from a mass of raw material in preparation for further technological reduction. Exhibiting ventral attributes characteristic of percussion flaking, less than fifty percent of a Secondary Decortication Flake's dorsal surface retains cortical material.

Count: 7
Total Weight: 26.3 g
Mean Weight: 3.6 g (Std. Dev.: 2.327; Std. Error: .879)
Mean Length: 2.3 (Std. Dev.: 1.17; Std. Error: .44)
Mean Width: 1.63 cm (Std. Dev.: .687; Std. Error: .260)

vii: Crested Ridge Blade: A Crested Ridge Blade is a triangulate blade characterized by the presence of a medial dorsal ridge, which has taken form through the removal of flakes transversely along that forming medial ridge, and the flake scars from such transverse flaking (Crabtree 1968:455-456). In blade-core technology, a Crested Ridge Flake is sometimes created on and removed from a core face that is being reduced for subsequent pressure blade removal to begin the formation of long increasingly parallel ridges on that core face that may then serve as 'guidelines' for further blade removal. When necessary, the Crested Ridge Flake is formed and detached from the blade core very early on in the process of reduction and can be considered integral to the core preforming stage.

Count: 1
Total Weight: 1.2 g
Mean Weight: 1.2 g
Mean Length: 1.6 cm
Mean Width: 1.5 cm

viii: Percussion Macroflake: A Percussion Macroflake (Clark and Lee 1984:255) is a large and amorphous flake associated with the initial reduction of a mass of raw material to a macrocore that also retains evidence on its ventral surface for its removal through a percussion technique.

Count: 2

Total Weight: 19.6 g
Mean Weight: 9.8 g (Std. Dev.: 1.838; Std. Error: 1.3
Mean Length: 4.5 cm (Std. Dev.: .141; Std. Error: .100)
Mean Width: 2.6 cm (Std. Dev.: .495; Std. Error: .350)

ix: Percussion Macroblade: A blade is a type of stone flake that bears straight and parallel lateral edges and that is twice at least twice as long as it is wide (Crabtree 1972:42; Parry 1987:34). A Percussion Macroblade (Clark and Lee 1984:255) retains such blade-like morphological characteristics, yet it is also larger and its margins somewhat more irregular than a Pressure Blade (see below), while its ventral surface bears evidence for its removal through a percussion technique. On occasion, macroblades may have been removed through indirect percussion (Clark 1988:15).

Count: 9
Total Weight: 43.7 g
Mean Weight: 4.9 g (Std. Dev.: 2.223; Std. Error: .741)
Mean Length: 2.8 cm (Std. Dev.: 1.026; Std. Error: .342)
Mean Width: 2.3 cm (Std. Dev.: .543; Std. Error: .181)

x: Pressure Macroblade: A Pressure Macroblade bears similar morphological and dorsal features similar to a Percussion Macroblade (see above), but retains evidence on its ventral aspect of its removal from a developing core through a pressure technique. The possibility also exists that I may have confused remnant ventral characteristics of a pressure technique with those of an indirect percussion technique, as they are similar, and that these specimens are actually percussion macroblades removed through indirect percussion (following Clark 1988:15).

Count: 2
Total Weight: 4.0 g
Mean Weight: 2 g (Std. Dev.: .990; Std. Error: .700)
Mean Length: 3.9 cm (Std. Dev.: .495; Std. Error: .350)
Mean Width: 1.7 cm (Std. Dev.: 1.344; Std. Error: .950)

xi: Initial Series Blade: The Initial Series Blade (Clark 1988:15) is one of the first flake types to be consistently produced with the switch in core reduction from a primarily percussion technique to a pressure technique. Initial series blades have been variously described, but it is generally agreed that the Initial Series Blade is short and irregular in form and retains scars on its dorsal surface from previous macroflake and macroblade removal by a percussion technique, while the ventral aspect bear evidence of detachment by a pressure technique.

Count: 4
Total Weight: 12.0 g
Mean Weight: 3 (Std. Dev.: 1.393; Std. Error: .696)
Mean Length: 5.7 cm (Std. Dev.: 2.198; Std. Error: 1.099)
Mean Width: 1.1 cm (std. Dev.: .395; Std. Error: .197)

xii: Irregular Pressure Blade: An Irregular Pressure Blade is a pressure blade with irregular margins and often irregular dorsal ridges. Moreover, on both sides of the dorsal ridges are remnants of previous blade removal scars (Crabtree 1968:455). It is also believed to be representative of the switch in the blade-core manufacturing process to a predominant pressure technique

(Healan et al. 1983; Healan 1989:279-280). Upon closer examination of the ventral aspects of these specimens, it may become clearer that such blades were removed by a percussion, rather than a pressure technique and thus may better correspond with the 'small percussion blades' (Clark 1988:15) of Clark's reconstructions of Mesoamerican blade-core technology. For the purposes of this analysis, it is essential to note that whichever technological designation may be assigned to this class of technological specimen, these artifacts are still representative of a stage of blade-core reduction directly following the forming of a macrocore and immediately preceding the development of a large polyhedral core.

Count: 43
Total Weight: 53.2 g
Mean Weight: 1.2 g (Std. Dev.: 1.021; Std. Error: .156)
Mean Length: 2.2 cm (Std. Dev.: .863; Std. Error: .132)
Mean Width: 1.1 cm (Std. Dev.: .400; Std. Error: .061)

xiii: Triangular Pressure Blade: A Triangular Pressure Blade resembles a typical prismatic pressure blade in terms of its lateral margins, but it bears only a single dorsal ridge, thus making it appear triangular in cross-section. According to Crabtree (1968:465), the manufacture of a Triangular Pressure Blade is performed by the placement of the pressure tool bit on the core platform directly above one core face ridge, rather than in between two ridges as is the case in the manufacture of the Prismatic Pressure Blade (see below).

Count: 87
Total Weight: 76.4 g
Mean Weight: 0.9 g (Std. Dev.: .913; Std. Error: .098)
Mean Length: 1.9 cm (Std. Dev.: .800; Std. Error: .086)
Mean Width: 1.0 cm (Std. Dev.: .409; Std. Error: .044)

xiv: Prismatic Pressure Blade: The Prismatic Pressure Blade is the standardized trapezoidal pressure blade generally assumed to be the ultimate goal of all Mesoamerican blade technologies. It is twice as long as it is wide with straight and parallel lateral edges and bears two equally straight and parallel dorsal ridges which give this flake its trapezoidal cross-section. The Prismatic Pressure Blade is considered more efficient than its triangulate variant as it has more acute edge angles (Crabtree 1968:463). Please note: the term Prismatic Pressure Blade is employed here for the sake of inter-analysis consistency. Strictly speaking, the term 'prismatic' may refer to any object with perpendicular planes intersecting in an unspecified pattern.

Count: 298
Total Weight: 269.2 g
Mean Weight: 0.9 g (Std. Dev.: .741; Std. Error: .043)
Mean Length: 2.2 cm (Std. Dev.: 1.613; Std. Error: .093)
Mean Width: 0.9 cm (Std. Dev.: .309; Std. Error: .018)

xv: Irregular Prismatic Pressure Blade: An Irregular Prismatic Pressure Blade has all the characteristics of a Prismatic Pressure Blade (see above), except that it has more than two dorsal ridges. The manufacture of these irregular blades may be related to either the knapper's level of skill or the degree of advanced reduction which the core has reached.

Count: 23

Total Weight: 21.2.2 g
Mean Weight: 0.9 g (Std. Dev.: .480; Std. Error: .100)
Mean Length: 1.9 cm (Std. Dev.: .909; Std. Error: .190)
Mean Width: 1.2 cm (Std. Dev.: .320; Std. Error: .067)

xvi: Modified Pressure Blade: The category Modified Pressure Blade includes any of the above pressure blade types that have been intentionally modified through pressure retouch microflaking.

Count: 14
Total Weight: 11.1 g
Mean Weight: 0.8 g (Std. Dev.: .820; Std. Error: .219)
Mean Length: 1.9 cm (Std. Dev.: .991; Std. Error: .265)
Mean Width: 0.8 cm (Std. Dev.: .329; Std. Error: .088)

xvii: Chiconautla/Amantla Pressure Blade: The Chiconautla/Amantla Pressure Blade takes its name from Tolstoy's (1971: 272, Figure 1l and 1m; discussion on p. 275) identification of these two particular forms of hypothesized use-wear. Specimens with a pattern of attrition on the lateral edges bearing a resemblance to Tolstoy's drawings of these two types of use-wear have been terminologically isolated so that the question of whether such artifacts exhibit evidence of use-wear rather than intentional modification might be resolved in a future analysis employing a comparative experimental use-wear collection.

Count: 6
Total Weight: 7.0 g
Mean Weight: 1.2 g (Std. Dev.: .393; Std. Error: .161)
Mean Length: 3.1 cm (Std. Dev.: 1.230; std. Error: .502)
Mean Width: .9 cm (Std. Dev.: .320; Std. Error: .131)

xviii: Blade Core Thinning Section: A Blade Core Thinning Section (Hirth and company, personal communication 1994) is a slice of a blade core that may be removed during the regeneration of a blade core's platform. It resembles a blade core section, but bears blade scars only around roughly half of its circumference.

Count: 2
Total Weight: 9.7 g
Mean Weight: 4.8 g (Std. Dev.: 6.576; Std. Error: 4.650)
Mean Length: 2.1 cm (Std. Dev.: 1.202; Std. Error: .850)
Mean Width: 2.3 cm (Std. Dev.: 2.475; Std. Error: 1.750)

ixx: Internal Platform Preparation Flake: An Internal Platform Preparation Flake (Hirth and company, personal communication, 1994) is diagnostic to platform preparation and core rejuvenation as it is a byproduct of the manufacture of a new or rejuvenated platform facet. It is a small rounded or oblong percussion or pressure flake often exhibiting blade scars on those edges running perpendicular to its axis of force, while the remainder of its body is single-faceted.

Count: 27
Total Weight: 26.6 g
Mean Weight: 0.9 g (Std. Dev.: .924; Std. Error: .178)
Mean Length: 1.8 cm (Std. Dev.: .892; Std. Error: .172)
Mean Width: 1.2 cm (Std. Dev.: .494; Std. Error: .095)

xx: Transverse Core Modification Flake: A Transverse Core Modification Flake (Hirth and company, personal communication 1994) is a flake struck off the face of a blade core parallel to the core's platform and transverse to the blade ridges around the core face. Hirth and his students, who are presently conducting a series of blade-core replication experiments, believe it be a core recovery tactic. A Transverse Core Modification Flake can be identified as it retains those distinctive characteristics of a blade core's dorsal aspect, but with blade ridges running perpendicular to the axis of force and characteristics of a percussion technique of removal on its ventral aspect.

Count: 4
Total Weight: 14.1 g
Mean Weight: 3.5 g (Std. Dev.: 2.327; Std. Error: 1.164)
Mean Length: 2.9 cm (Std. Dev.: 1.621; Std. Error: .811)
Mean Width: 1.8 cm (Std. Dev.: .404; Std. Error: .202)

xxi: Plunging Blade: First identified in the literature by Crabtree (1968:466), a Plunging Blade is a blade that runs the axial length of a blade core and retains the distal tip of its parent core on the blade's distal end as a result of an error in the manufacturing process.

Count: 1
Total Weight: 4.0 g
Mean Weight: 4.0 g
Mean Length: 9.6 cm
Mean Width: 1.1 cm

xxii: Pressure Retouch Microflake: A Pressure Retouch Microflake is the by-product of retouch microflaking by a pressure technique on a blade edge. To my knowledge, no analysis of a Mesoamerican blade-core assemblage has included this debitage category, but a similar debitage type is discussed in detail as 'bending flakes' in an article by Cotterell and Kamminga (1987). Such flakes can be easily confused with the type of 'shatter' microflakes that are an ubiquitous form of debitage produced by the reduction of any brittle, vitreous material. I would caution that Pressure Retouch Microflakes can be identified as such only if derived from a secure archaeological context wherein some form of intentional pressure microflaking or retouch is known to have been conducted (as can be evidenced by the presence of intentionally retouched tools in association with said debitage), by the observation of some degree of consistency in form and attributes shared among all specimens of the technological class, and by the recognition of attributes associated more with a pressure rather than percussion technique on the ventral aspects of such artifacts (a task best attempted microscopically). Furthermore, it should be noted that the recovery of such specimens in an archaeological context is wholly dependent on the retrieval method employed by the archaeologist. As a case in point, Pressure Retouch Microflakes occur in the collection analyzed here only in the subassemblage 'R106: Early Classic Workshop Deposit' which was, due to time constraints, originally removed as part of an intact deposit of earth containing artifacts that I was later able to carefully screen, whereas none of the other excavations from which specimens analyzed in this thesis were derived have employed screening methods.

Count: 6
Total Weight: 0.6 g

Mean Weight: 0.1 g (Std. Dev.: 0; Std. Error: 0)
Mean Length: 0.3 cm (Std. Dev.: 0; Std. Error: 0)
Mean Width: 0.2 cm (Std. Dev.: 0.0; Std. Error: 0.0)

xxiii: Overhang Removal Flake: An Overhang Removal Flake is a small oblong flake that appears to have been removed from the edge of a blade core at a point where force is to be next applied to remove a blade. Crabtree (1968:457) has noted that the removal of platform overhang flakes becomes more critical to the task of core maintenance as the core decreases in size. The presence in abundance of Overhang Removal Flakes in an archaeological context might then be indicative of the past working of cores to near exhaustion, but their recovery has not yet been reported from any Mesoamerican sites. The recovery of one such artifact within the 'R106: Early Classic Period Workshop Deposit' subassemblage only is again reflective of the differential artifact retrieval method used for that cultural deposit.

Count: 1
Total Weight: 1.0 g
Mean Weight: 1.0 g
Mean Length: 2.0 cm
Mean Width: 0.6 cm

xxiv: Bifacial Point: A Bifacial Point is a bifacially reduced projectile point or dart.

Count: 3
Total Weight: 15.0 g
Mean Weight: 5.0 g (Std. Dev.: 3.951; Std. Error: 2.281)
Mean Length: 3.4 cm (Std. Dev.: 1.353; Std. Error: .781)
Mean Width: 1.7 cm (Std. Dev.: .643; Std. Error: .371)

xxv: Unifacial Scraper on a Macroblade: A Unifacial Scraper on a Macroblade is morphologically identifiable as a scraper manufactured by the reworking and steepening of the working edge of a macroblade.

Count: 2
Total Weight: 17.2 g
Mean Weight: 8.6 g (Std. Dev.: 1.697; Std. Error: 1.200)
Mean Length: 3.2 cm (Std. Dev.: 1.768; Std. Error: 1.250)
Mean Width: 2.2 cm (Std. Dev.: .636; Std. Error: .450)

xxvi: Unidentifiable/Angular Fragments: As is common to most lithic studies, a certain number of specimens from the collection could not be assigned to any previously identified and defined technological class as they lacked any diagnostic or identifiable technological attributes. Generally, these artifacts had a chunky, angular appearance and so have been designated here as 'Unidentifiable/Angular Fragments' (after Parry 1987:34). These artifacts were most likely the result (by-products) of early stage raw material reduction, but no systematic replicative studies have yet been conducted in an attempt to systematically account for their archaeological occurrence. Angular Fragments have been reported at quarry sites (e.g. Stocker and Cobean 1984).

Count: 17
Total Weight: 51.4 g
Mean Weight: 3.0 g (Std. Dev.: 2.332; Std. Error: .566)
Mean Length: 1.9 cm (Std. Dev.: 1.615; Std. Error: .392)

Mean Width: 1.1 cm (Std. Dev.: .545; Std. Error: .132)

III: Condition Categories

In this study, the variable Condition refers to the degree and nature of fragmentation of a specimen. Most specimens/artifacts assigned to non-implement, debitage technological classes, including Unidentifiable/Angular Fragment, Blade Core Thinning Section, Internal Platform Preparation Flake, Overhang Removal Flake, Pressure Retouch Microflake, Plunging Blade, and Transverse Core Modification Flake, were simply recorded as 'Intact' as specimens of these categories rarely, if ever, achieve ideal form. The assignment of a specimen to a condition category was based on the identification of the presence or absence of key morphological attributes associated with the proximal, medial, and distal aspects of that specimen type.

i) Intact: An implement specimen was recorded as being 'Intact' if it was very close in appearance to its idealized morphology.

ii: Proximal: The designation 'Proximal' refers to all specimens that retain the platform, bulb of percussion and usually some part of a medial section.

iii: Medial: The designation, 'Medial', was assigned to all specimens that lacked any proximal and distal characteristics, but consisted of those attributes recognizable as associated with the central section of specimens for each particular technological class.

iv: Distal: The designation, 'Distal, was assigned to all specimens that retained flake termination attributes characteristic of a distal end of a pressure or percussion flaked item and some part of the medial section, but lacked those of the proximal end.

IV: Platform Condition Categories

The platform treatment and morphology of all proximal blade-related specimens was systematically examined and recorded. Platform surfaces were recorded as ground, scratched, scratched and ground, rim ground or as lacking any of these surface modifications. Platform surfaces were also recorded as single-faceted or multi-faceted. The shoulders of each proximal blade-related specimen were also noted as being rounded, squared, or as exhibiting a combination of these two morphological variables.

i: Ground: Evidence of an intensive grinding of the platform surface was recorded for each specimen as 'Ground' if the specimen in question exhibited a complete transformation of its platform surface from glassy to grainy.

ii: Scratched: The platform of a specimen was recorded as 'Scratched' if obvious macroscopic striations that did not seem to be the result of post-depositional processes could be observed. Crabtree (1968:457) was one of the first researchers to note that the scratching of a blade core platform surface would aid the knapper in the proper positioning of her/his pressure tool tip and help to prevent its slippage. An examination of the directionality of these striations, which might serve to be an excellent means of assessing their intentional formation by human action (M. Spence, personal communication 1995), has not yet been performed.

iii: Ground and Scratched: That platform of a specimen was recorded as 'Ground and Scratched' if it retained evidence for both these attributes (see above descriptions).
iv: Edge/Rim Ground: Following Sheets (1971), the dorsal edge of each platform was examined for evidence of rim grinding or 'nibbling' (M. Spence, personal communication 1995). If present, this attribute was recorded as 'Edge/Rim Ground'.
v: Single-Faceted: The platform of a specimen was recorded as 'Single-Faceted' if that platform appeared to be a single, smooth plane with no faceting.
vi: Multi-Faceted: The platform of a specimen was recorded as 'Multi-Faceted' if it exhibited multiple flake scars on its surface.
vii: Rounded: The platform of a proximal specimen was recorded as 'Rounded' if both of the specimen's shoulders were curved.
vii: Squared: The platform of a proximal specimen was recorded as 'Squared' if both of the specimen's shoulders formed acute angles with the planar line of the dorsal platform edge.
vii: Rounded-Squared: The platform of a proximal specimen was recorded as 'Rounded-Squared' if one of its shoulders was rounded while the other was squared.

V: Reduction Sequences

As has been discussed at length elsewhere in this thesis, each lithic artifact was assigned to one of eight possible Reduction Sequences based on the material expectations representing each sequence in terms of technological classes. Below is a list of the technological categories witnessed in this collection as encompassed by each Reduction Sequence; the material expectations for each Reduction Sequence are mutually exclusive for clarity, but in reality some overlap would be expected. For a more complete list of the possibilities (i.e. technological categories not included in this collection) please see the general model of blade-core technology introduced in Chapter 4.

i: Reduction Sequence 1: Crested Ridge Blade
ii: Reduction Sequence 2: Secondary Decortication Flake, Percussion Macroflake, Percussion Macroblade, Pressure Macroblade.
iii: Reduction Sequence 3: Initial Series Blade and Irregular Pressure Blade.
iv: Reduction Sequence 4a: Triangular Pressure Blade, Trapezoidal Pressure Blade, Irregular Trapezoidal Pressure Blade, and Chiconautla/Amantla Pressure Blade.
v: Reduction Sequence 4b: Blade Core, Blade Core Segment, Blade Core Section, Blade Core Thinning Section, Transverse Core Modification Flake, Plunging Blade, Internal Platform Preparation Flake, and Overhang Removal Flake.
vi: Reduction Sequence 5a: Modified Prismatic Blade.
vii: Reduction Sequence 5b: Pressure Retouch Microflake.
vii: FC, GF, BF, UF: Flake Core, General Flake, Bifacial Point, Unifacial Scraper on a Macroblade.
viii: Unidentifiable/Angular Fragments: Angular Fragments. and Unidentifiable Specimens.

VI: Utilization Categories

Each lithic artifact was examined for evidence of utilization with the aid of a Bausch and Lomb stereoscopic microscope with a magnification range of 10x-25x and an external incandescent light source that could be mechanically focused on the observation tray. Utilization was determined through the comparison of specimens with a number of sources including written descriptions (Parry 1987:67-92) and published photographs of comparative collections (Clark 1988:221-253). The presence of use-wear was identified conservatively and only where such similarities between a specimen and a published comparative item were patterned and clear. Following convention (Parry 1987; Clark 1988; Keeley 1980), each edge of each specimen was examined.

i: Present: Clear, patterned indications of use-wear patterning comparable to known expectations are observable.
ii: Absent: Clear and patterned indications of use-wear patterning comparable to known expectations are observable.
iii: Lightly Utilized: Specimens that bear evidence of an observable and seemingly patterned form of attrition that is both minimal and cannot be confirmed through comparison with recorded examples of experimentally derived use-wear, were recorded as being 'Lightly Utilized'. It is also possible that some specimens labeled as such may have developed the observable pattern(s) of attrition through post-depositional surface modification.
iv: Tip Absent: This category of Utilization applies only to projectile points. It is indicated under the variable of 'Utilization' for those projectile point specimens that are missing the point tip.
v: Present and Notched: Presence of clear and patterned use wear appearing in tandem with the material scarring results of pressure notching is observable.
vi: Absent and Notched: Absence of clear or patterned use-wear remnants, but strong negative remnants of pressure notching are apparent.
vii: Present and Knapped: Clear and patterned use wear appearing in tandem with evidence for secondary (not related to initial manufacture of object) pressure flintknapping can be observed.
viii: Absent and Knapped: Absence of clear or patterned use wear scarring, but presence of evidence for secondary modification of an edge through pressure knapping can be observed.

VII: Techniques of Measurement/Metrics

Several indices of measurement (variables) were recorded for comparative purposes. These included the weight, length, and width of each specimen. The diameter of all core artifacts was measured and recorded. The platform width of some proximal specimens was also recorded, but not systematically.

i: Weight: The weight of each specimen was measured in the unit of grams (g) with the use of a balanced scale.
ii: Length: The length of each specimen was recorded in centimeters (cm) with the use of a straight-edged ruler. Length of a

specimen was measured along the greatest medial longitudinal axis of the artifact as oriented from the point of impact (axis of force)/platform to its distal tip.
iii: Width: The greatest measurement perpendicular to the axis of length of a specimen was recorded in centimeters (cm).
iii: Platform Width: The Platform Width of some Proximal and some Intact specimens was measured as the greatest width across the ventral and dorsal aspects of the platform (after Joukowsky 1980:327) using a straight-edged ruler and recorded in centimeters (cm).
iv: Diameter: The diameters of all Flake Core, Blade Core, and Blade Core Segment specimens were measured by wrapping a cloth measuring tape around the widest/thickest medial circumference of the artifact and recorded in centimeters (cm).

Figure 11: (Proximal Section) Prismatic Pressure Blades

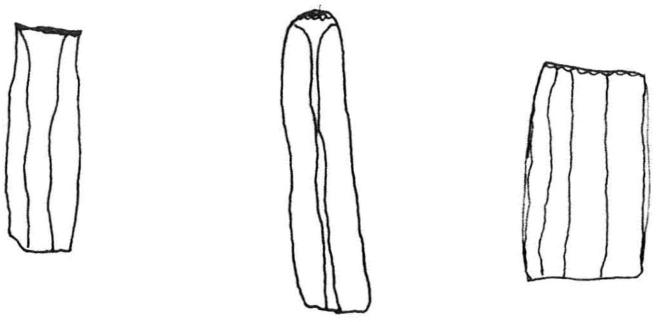


Figure 12: (Medial Section) Prismatic Pressure Blades

Figure 13: (Distal Section) Prismatic Pressure Blades with Profiles

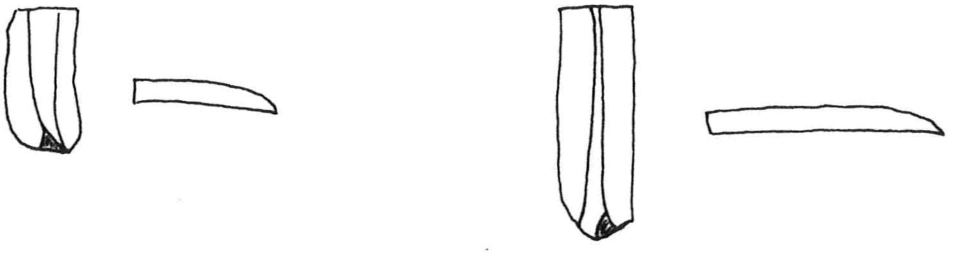


Figure 14: Irregular Prismatic Pressure Blades

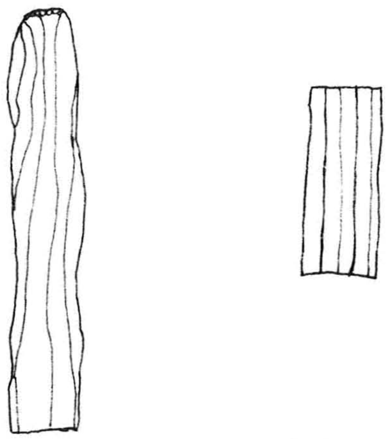


Figure 15: Triangular Pressure Blade

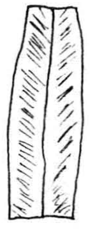


Figure 16: Irregular Pressure Blades

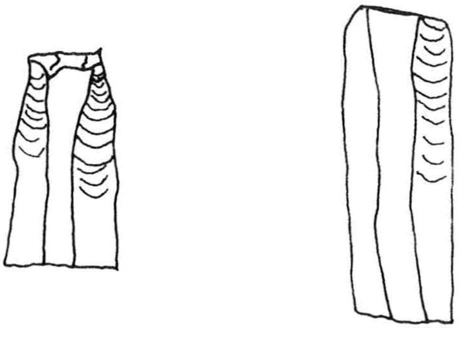


Figure 17: Blade Cores

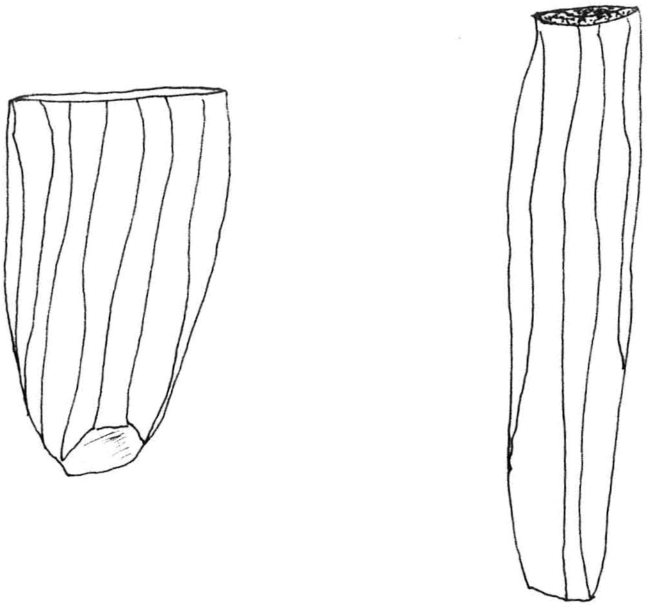


Figure 18: (Proximal) Blade Core Segment

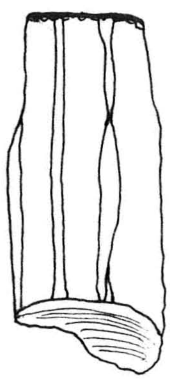


Figure 19: Blade Core Section

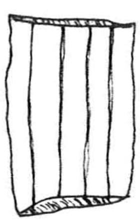
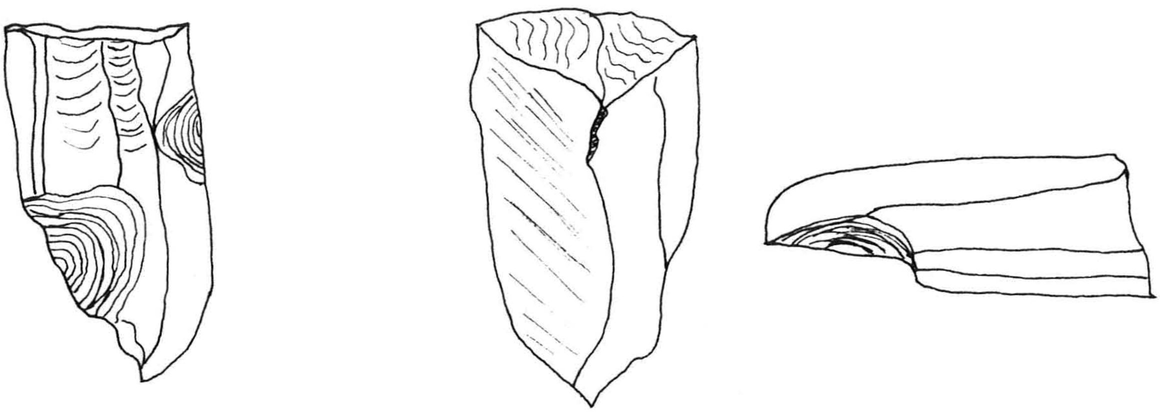


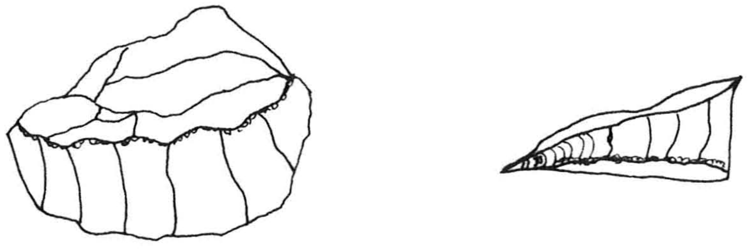
Figure 20: Battered and Laterally Split Blade Core



Dorsal Ventral Profile

Figure 21: Bifacial Points

Figure 22: Blade Core Thinning Section



Plan View **Profile**

Figure 23: Internal Platform Preparation Flake

Plan View **Profile**

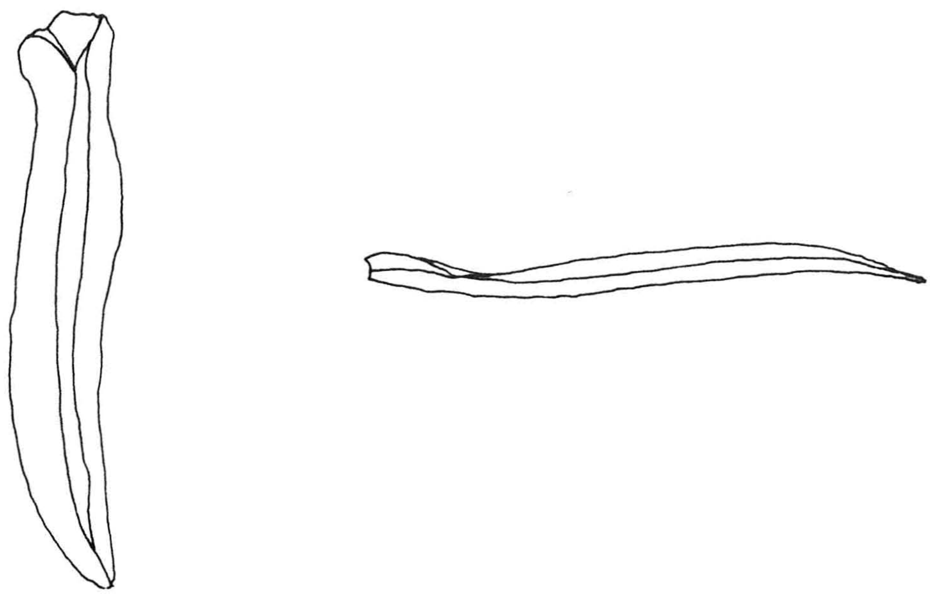
Figure 24: Pressure Retouch Microflakes

Ventral

Figure 25: Overhang Removal Flake

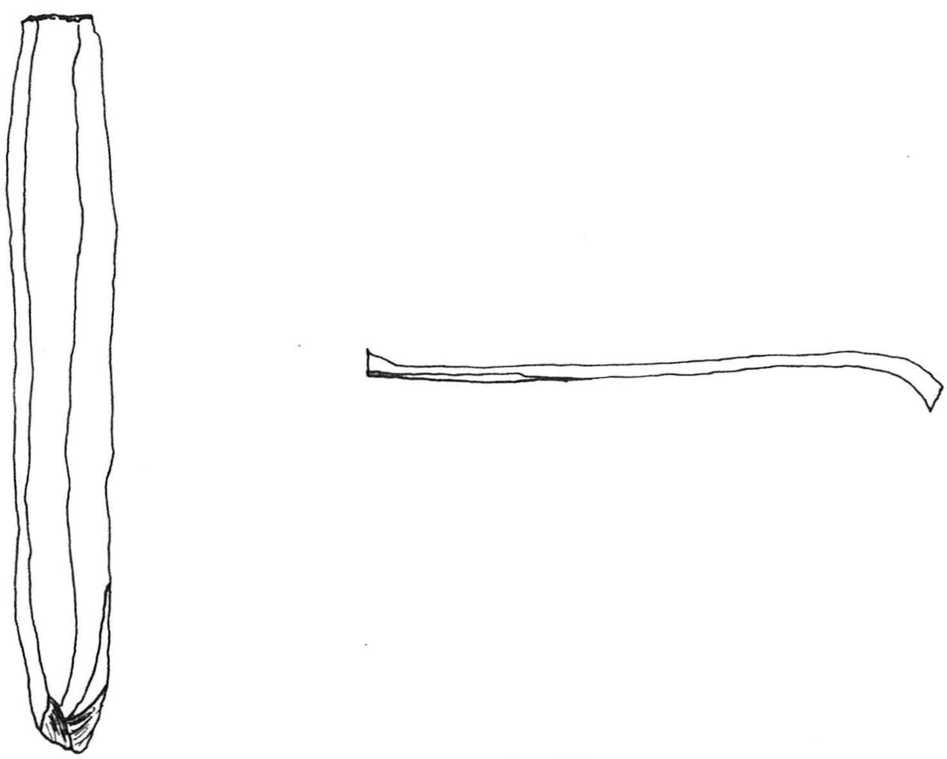
Ventral

Figure 26: Initial Series Blade



Dorsal Profile

Figure 27: Plunging Blade



Dorsal Profile