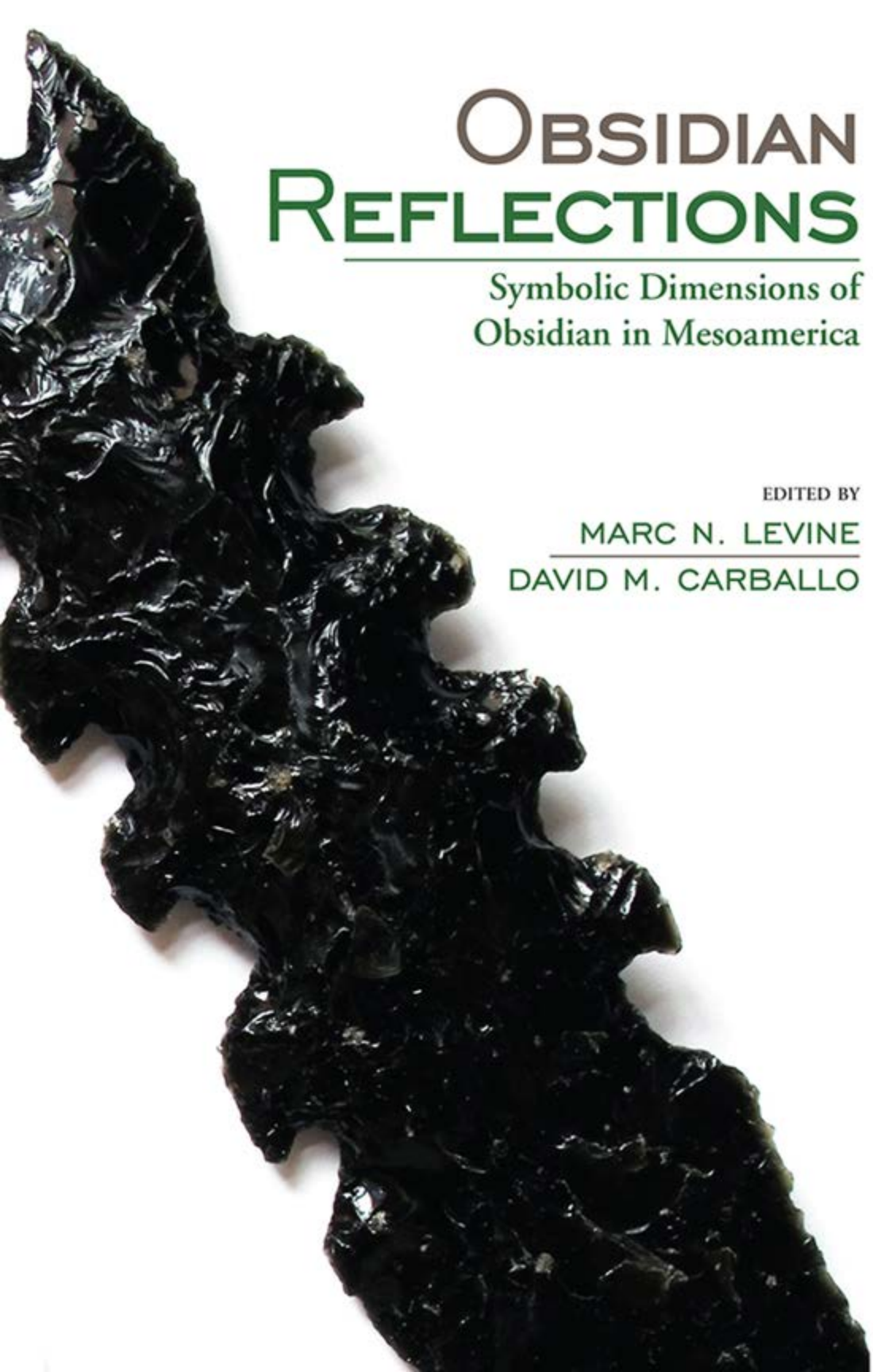

Obsidian Reflections

Symbolic Dimensions of Obsidian in Mesoamerica

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For Ronnie (ML) and Jenny (DC)

Obsidian Reflections

CHAPTER ONE

Reflections on Obsidian Studies in Mesoamerica

Past, Present, and Future

Marc N. Levine

Since the 1960s, obsidian studies have become a major area of research within Mesoamerican archaeology and have made important contributions to understanding the prehispanic past. The great archaeological focus on obsidian is understandable. Notwithstanding its brittleness, obsidian preserves indefinitely in virtually all environments, is nearly ubiquitous at ancient sites in Mesoamerica, and has compositional properties amenable to sourcing—allowing researchers to link individual artifacts with parent material from dozens of quarries. Obsidian crafting is also a subtractive technology that provides the analytical advantage of having artifacts from nearly every stage of manufacture represented in the archaeological record. Researchers have long recognized and exploited the aforementioned material characteristics of obsidian but have less frequently taken full advantage of other sources of information—especially iconographic, ethnohistoric, and ethnographic—to examine the cultural context of obsidian and its meaning in Mesoamerican societies.

The vast majority of volumes devoted to Mesoamerican obsidian and other lithic technologies have addressed questions either directly or indirectly related to political economy (e.g., Gaxiola and Clark 1989; González Arratia and Mirambell 2005; Hester and Shafer 1991; Hirth 2003a, 2006; Hirth and Andrews 2002; Hruby, Braswell, and Mazariegos 2011; Soto de Arechavaleta 1990). These fundamental efforts represent decades of diligent research that have advanced our understanding of obsidian's material characteristics, how it was crafted into objects, exchanged, and used in cultural practices. Archaeological studies of political economy include a variety of materialist

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approaches concerned with examining how political elites fund their activities through the mobilization or extraction of surplus goods and labor from the populations they administer (Brumfiel and Earle 1987a:3; Clark 1987; Hirth 1996:205–6; Smith 2004:77). Within this framework, most work on obsidian has addressed aspects of technology and function to better understand these elements in their own right but also to examine the nature of elite involvement in managing or controlling obsidian production, distribution, or consumption. Ultimately, many of these studies tie into larger efforts to examine variability in the development of complex societies.

In contrast, the chapters in this volume seek to broaden the field of obsidian studies to examine the interplay among people, obsidian, and meaning and how these relationships shaped patterns of procurement, exchange, and use. Thus, while the efforts put forth here remain linked to studies of function and technology, they also depart from political economy perspectives in a number of ways. First, our scope of analysis includes political and economic factors but also consciously emphasizes obsidian's sociocultural and symbolic dimensions. Second, in addition to considering how obsidian may have functioned in past practices, we consider how decisions and motivations were also guided by understandings rooted in cultural logic and embedded in historical contexts. Thus, our point of departure is not limited to questions of how obsidian may have fulfilled structural or personal needs—as we might perceive them—but also includes how people "made sense" of obsidian and the manner in which their dealings with this material were bound up in crosscutting political, economic, social, and cultural relationships.

This project shares a kinship with recent efforts that seek to complement materialist approaches to political economy with more complete considerations of how indigenous worldview and religion, often articulated through ritual, also shape the organization and execution of economic pursuits (e.g., Agbe-Davies and Bauer 2010; McAnany 2010; McAnany and Wells 2008; Rice 2009; Schortman and Urban 2004; Spielmann 2002; Wells 2006; Wells and Davis-Salazar 2007). For instance, E. Christian Wells (2006:284) identifies "ritual economy" approaches as those concerned with "the materialization of socially negotiated values and beliefs through acquisition and consumption aimed at managing meaning and shaping interpretation." These efforts attempt to fuse political economy and agency approaches to examine contexts in which economic activities merge with religious ritual or are otherwise ritualized in culturally meaningful ways. While a limited number of researchers have begun to more fully explore the symbolic and ritual dimensions of obsidian production and use, they remain the minority (e.g., see Carballo 2007, 2011;

Clark 1989a; Darras 1998; García Cook and Merino Carrión 2005; Heyden 1988; Hruby 2007, 2011; Parry 2002a; Pastrana 2007; Saunders 2001; Sugiyama 2005:124–40; Taube 1991).[1]

By design, the subject matter covered in *Obsidian Reflections* is simultaneously narrow and broad. Focusing on obsidian alone encourages a cohesiveness born of similar methodological and theoretical possibilities because of obsidian's intrinsic properties and a shared Mesoamerican cultural context. At the same time, the contributing authors examine a diversity of intersecting points where relationships between obsidian and people cohere. This encourages investigations that more freely explore contexts of meaning that crosscut traditional analytical foci, such as "craft production" (see Hirth 2009). Although this introductory chapter argues that obsidian studies should explore a greater range of meanings in the past, especially the symbolic dimensions that emerge through complex relationships between people and obsidian, authors implement this program to varying degrees. The theoretical breadth of this volume promotes an implicit dialogue among authors and readers, who must come to their own conclusions regarding where the future of obsidian studies lies.

In the following section, I present a brief review of Mesoamerican obsidian studies and theoretical approaches to provide a historical vantage point from which we might craft new and innovative directions. As John Clark (2003a:43) has argued, chipped-stone studies in Mesoamerica have tended to be "parochial and, to a large extent, atheoretical." I argue that addressing questions concerned with meaning can complement functional and technological inquiries to both invigorate and push obsidian studies into new theoretical territory (see also Clark 2007). In the penultimate section of this chapter, I carry out a reconnaissance of this territory, discussing the materiality of obsidian from the perspective of life history approaches, embodiment, object agency, and landscape, as well as Peircian semiotics. Finally, while this volume focuses explicitly on obsidian in Mesoamerica, the overarching ideas will have far-reaching implications for lithic studies in general, as well as studies of material culture.

OBSIDIAN STUDIES IN MESOAMERICA: A BRIEF THEORETICAL REVIEW

Drawing on summaries by John Clark (2003a) and Payson Sheets (1977, 2003), this discussion traces the development of obsidian studies in relation to larger theoretical currents and changing goals through time, primarily in Americanist archaeology over the past half century or so. Rather than attempt systematic

coverage, I present a historical sketch of this work, beginning with the period just after the modernization of Americanist archaeology as a discipline.

Obsidian Artifacts as Cultural Norms and Historical Indexes

In the first half of the twentieth century, during the heyday of "cultural-historical" or "normative" archaeology (Willey and Sabloff 1993), Mesoamericanists placed little emphasis on the analysis of chipped-stone artifacts. They were preoccupied with the formidable goals of describing and defining numerous archaeological cultures and chronological sequences, and obsidian artifacts appeared to present few attributes conveying discrete cultural or temporal information. Greater attention was reserved for more conspicuous archaeological features, such as architecture, carved-stone monuments, and fine pottery (Sheets 1977). Thus, it is no wonder that systematic and comprehensive descriptions of chipped-stone material did not regularly appear in field reports until the 1950s (e.g., see Coe 1959; García Cook 1967; Kidder 1947; Lorenzo 1965; Müeller 1966; Ricketson 1937; Willey et al. 1965). These early reports follow a similar format, presenting brief artifact descriptions with often vaguely defined classifications of chipped stone. The resulting artifact types were essentially treated as isomorphic with distinct archaeological cultures and useful only insofar as they reflected regional cultural histories and instances of cultural contact. William Coe (1959:18) expressed this sentiment in his excavation report from work at Piedras Negras, writing that "the quantity of flake-blades and obsidian varieties might help in culture area placement but little more."

While utilitarian artifacts received only terse treatment, researchers paid greater attention to unusual or elaborate obsidian objects, such as those found in "ceremonial" contexts. This attraction to ritual is reflected in Alfred Kidder's (1947) classification of chipped stone from Uaxactun, where he made a primary functional distinction between utilitarian and ceremonial artifacts (see also Coe 1959; Willey et al. 1965). Yet even those ceremonial artifacts recovered in elaborate ritual caches failed to provoke more in-depth interpretations.[2]

Artifact classification, of course, remains a useful heuristic tool for organizing and managing variability within artifact assemblages. Nonetheless, these taxonomies themselves have limited explanatory power and, when reified, run the risk of inadvertently eliding emic understandings that can reveal important interconnections between artifacts and people (see Meskell 2004:39–46). While archaeologists tend to categorize items by material type or function, other regimes of meaning in the past may have guided "the order of things" in

a particular time and place. It may prove useful to transcend current orthodoxies of classification (Sheets 2003) to explore other facets of meaning that reside in relationships between people and things.

Functional Approaches to Understanding Obsidian Artifacts

Gaining traction during the 1960s and 1970s, the new archaeology (Binford 1962, 1967; Flannery 1972) was a boon to obsidian studies in Mesoamerica. Around 1970, Clark (2003b:253–56) recorded a notable increase in the number of master's theses, PhD dissertations, and journal articles focusing on Mesoamerican flaked stone. The new or processual archaeology adopted methods of positivist science to query the archaeological record and sought to discover universal laws of cultural change, combining elements of systems theory, ecological theory, and neo-evolutionary theory. In Latin America, where archaeology retained a much closer disciplinary connection to history, the new archaeology made much less of a sustained impact (Gándara 2012:37; Politis 2003:249).

The stated goals of processual archaeology effectively democratized artifact assemblages. From the lowliest obsidian flake to the most exquisite eccentric, all were important insofar as they contributed to the total adaptive cultural system. In Lewis Binford's (1962:219) highly influential processual manifesto, he delineated three categories of material culture serving discrete technomic, sociotechnic, or ideotechnic functions that could be mapped onto corresponding technological, social, or ideological subsystems. When put into practice, however, researchers struggled to link artifacts with all three subsystems. Rooted in a materialist framework that advocated scientific rigor through hypothesis testing, technomic aspects were deemed the most empirically accessible, whereas sociotechnic understandings were less so and ideotechnic features were almost hopeless (Preucel 2006:115). This pattern held true for obsidian studies as well, which seldom strayed from questions concerning technology and function (but see Stocker and Spence 1973). Binford (1962:220) argued that artifact style, a valence of all material culture, played an active role in the "total cultural system," which could play a part in signaling group affiliation and identity (see also Wobst's [1977] theory of information exchange). Yet few attempted to link chipped-stone artifact style with identity, probably because of the general formal homogeneity of most common obsidian artifacts.

Experimental obsidian studies, including replication and use-wear analyses, flourished in this theoretical environment (e.g., Crabtree 1968; Lewenstein 1981; Mirambell 1964; Sheets and Muto 1972; Wilk 1978) and continue to make

important research contributions today (Aoyama, this volume; Hirth 2003b, 2006; Stemp and Awe, this volume). This era also witnessed the development of ethnoarchaeology, initially bent on developing middle-range theories to explain general patterns of cultural behavior—including those related to obsidian production and use (e.g., Clark 1989b, 1991).

At the end of the 1960s, methodological advances in adapting trace-element analyses to archaeology (Jack and Heizer 1968; Stross et al. 1968) enabled researchers to match obsidian artifacts with parent material from their respective sources (Clark 2003a:19). This breakthrough invigorated obsidian studies, especially in the area of trade and exchange. William Rathje's (1971:283) oft-cited study of exchange argued that complex society in the Maya lowlands initially developed to provision people with basic resources, such as obsidian, salt, and groundstone—all of which had to be imported from afar (but see Marcus 1983:479). Jane Pires-Ferreira's (1976) analysis, presenting a distance-decay model of Formative period exchange, also represented a functional, ecological approach (cf., Zeitlin 1982:261–65).

Processual archaeologists also investigated craft production as a means to address broader-scale questions related to the evolution of social complexity. Generally speaking, as societies grew more complex, production became progressively more efficient; workshops were larger, more concentrated, and disaggregated from the household. In Mesoamerica, large-scale obsidian production could at once signify a state-level society and be implicated in its development. "The Obsidian Industry of Teotihuacán" by Michael Spence (1967) was a landmark study of craft production and specialization. In it he argued that obsidian production at the ancient city generated enough surplus to provision the entire Teotihuacan Valley by the end of the Terminal Formative. By the Early Classic, Spence argued, Teotihuacan was exporting even farther, to regions including the eastern Maya realm. René Millon (1973:45) later asked, "Did the growth potential represented by the expansion of the craft of obsidian working play a significant role in the rise of Teotihuacan as a city?" Researchers took seriously the prospect that obsidian production and exchange could constitute "prime movers" in processes of cultural evolution and urbanization.

Expanding on Spence's work, William Sanders and Robert Santley (1983) calculated the energetic requirements of various agricultural and craft works at Teotihuacan, concluding that obsidian production and distribution was relatively cost-efficient, thus conveying an adaptive advantage to centers such as Teotihuacan that were located near sources. They argued further that Teotihuacan's state-sponsored obsidian industry generated surpluses that were

exchanged for food and used to buffer against periodic agricultural shortfalls (ibid.:284). Thus, for Sanders and Santley, political control over obsidian production and exchange was key to Teotihuacan's process of urbanization and explains why Classic Maya centers, mostly located far from obsidian sources, did not develop in the same way.

The new archaeology also stimulated a reassessment of lithic classification in Mesoamerica. Payson Sheets (1975) proposed a classification that grouped artifacts according to manufacturing behavior rather than function, and this approach continues to influence Mesoamerican lithic studies today (see also Sheets 2003).

Many of the empirical and processually minded methodologies devised for examining obsidian remain as vital as ever. They include a host of quantitative and qualitative studies of artifact patterns and distributions, experimental studies, ethnoarchaeological approaches, site formation processes, and others. Much work remains, however, in the quest to better understand obsidian tool technology and use. We still lack a comprehensive understanding of diversity in blade production strategies through space and time as well as their social and cultural contexts (Hirth 2003b; Parry 2002b; Rodríguez-Alegría 2008; Titmus and Clark 2003). Also, our inability to develop methodologies to efficiently and convincingly determine variability in obsidian tool use continues to hinder more detailed interpretations. Future obsidian research must continue to pursue functional and technological approaches while also recognizing how these studies provide opportunities to investigate cultural domains of meaning.

Obsidian and Power: Marxist and Structural Influences

In the 1970s, increasing archaeological interest in Marxist concepts generated new theoretical tools for approaching obsidian studies. Marx and Engels notably argued for the importance of social and economic relations of production and exchange and how these relations created social inequalities (Gilman 1981:4–5). Furthermore, Marxist theory held that political leaders were fundamentally self-interested and bent on exploiting the "masses." Archaeologists were thus understandably drawn to contexts of production, especially the relationship between elites and crafters (e.g., Earle 1982). Much earlier, V. Gordon Childe had linked the "rise of civilization" with changes in the nature and development of craft production, but these ideas failed to immediately take root (Patterson 2005:308). Archaeologists in Mexico and Central America eventually embraced Marxism to a greater extent than their North American

colleagues (Gándara 2012:37). Obsidian production, whose by-products were highly visible in the archaeological record, made these contexts particularly attractive. With the convergence of Marxist and processual-fueled interests in craft production, exchange, and the development of complex societies, studies shifted to political economy to examine how political leaders were involved in the obsidian economy. The clearest route to explore these questions was through studies of obsidian exchange and production.

Marxist-inspired thinking concerning political economy and structural inequalities at the global scale also fueled the development of dependency theories (e.g., Frank 1967), including Immanuel Wallerstein's (1974) world systems theory, which was particularly influential among archaeologists (e.g., Ekholm and Friedman 1979; Kohl 1978). Obsidian and other trade goods that preserve well in the archaeological record have figured prominently in world systems interpretations. Mesoamericanists have applied Wallerstein's framework, perhaps with greater zeal than anywhere else in the ancient world, to explain how regional inequalities developed as core areas exploited and orchestrated the underdevelopment of their peripheries (e.g., Blanton and Feinman 1984; Whitecotton and Pailes 1986). The development of a world systems structure in Mesoamerica depended on the circulation of luxury goods rather than commodities as Wallerstein's original thesis had intended (Schneider 1977). Widely considered a commodity for periods postdating the Formative or Preclassic, obsidian has seldom appeared in world systems or prestige good models. Recent iterations of world systems theory, however, such as that proposed by Richard Blanton and colleagues (2005), maintain that distinctive fine green obsidian was a "bulk luxury" and indeed "system shaping" (see also Smith and Berdan 2003). Yet Blanton and his coauthors (2005:280) also concede the limitations of world systems approaches, asserting that "any study of Mesoamerican goods that aims to be more analytically satisfying . . . must find ways to better address the questions of how goods come to be endowed with meanings—for commoners as well as an elite—that flow from their uses in social life." Marxist approaches prioritize contexts of production, which remain unquestionably important, but scholars such as Daniel Miller (1998:11) point out that "the key moment in which people construct themselves or are constructed by others is increasingly through relations with cultural forms in the arena of consumption."

Structural approaches emerged in tandem with processual archaeology but took a different tack in exploring the underlying rules or codes of culture and binary oppositions that guide human behavior (Hodder 1986:35–56). These structural approaches are relevant to obsidian studies insofar as they

represent landmark attempts to address questions of meaning, symbolism, and cognition—which served as a counterpoint to materialist points of view. Though influential on Anglophone archaeological theory, explicit structural interpretations were not widespread in practice and were relatively rare in Mesoamerican archaeology.[3] Nonetheless, as we shall see in the discussion that follows, efforts to approach meaning in the archaeological record owe a debt to structuralist interpretation and its influence on Marxist thinking.

By the 1980s, a number of scholars had decried the nonexistent or secondary role of ideology in explanations of cultural change rooted in ecological–systems theory frameworks (Demarest 1992). This concern stemmed in part from Marx's explanation of how ideology effectively concealed or naturalized social inequalities but diverged from his contention that it played only a secondary role. Structural Marxist reformulations by Louis Althusser held that power could derive equally from ideological and materialist bases and that dialectical contradictions among social segments could account for structural change (cited in Preucel 2006:116). Few archaeologists attempted explicitly Marxist readings of material culture (but see Gilman 1981; Kristiansen 1984; Leone 1984; McGuire 1992; Nalda 1981), yet many Mesoamericanists tacitly accepted the top-down dominant ideology thesis as a viable theory of class relations. Marxist thinking highlighted connections between political interests and the economy, which helps to explain why obsidian studies gravitated en masse toward questions reformulated in terms of political economy in the late 1980s and the 1990s.

Obsidian, Political Economy, and Agency

Elizabeth Brumfiel and Timothy Earle's (1987b) edited volume, *Specialization, Exchange, and Complex Societies*, signaled a substantive shift toward political economy approaches in archaeology (see also Hirth 1984). In their introduction, they asserted that craft specialization studies could be classified into political, adaptationist, or commercialist models, based on how they conceived of elites' relationship to the economy (Brumfiel and Earle 1987a). This classificatory scheme also provides a useful summary of archaeological studies of political economy in general (Smith 2004:76–77). Brumfiel and Earle's "political" approaches presumed that ruling elites structured and manipulated economic apparatuses to their benefit, while "adaptationists" saw elites as more altruistic economic coordinators and regulators working for everyone's benefit. "Commercial" approaches downplayed the roles of elites and political institutions in controlling the economy and instead paid greater attention to

the impact of market forces at multiple scales. Brumfiel's (1987) analysis of the Aztec political economy included a discussion of the production, circulation, and use of obsidian. She argued that the production of elite goods, such as obsidian jewelry, expanded as the capital grew. These elite-crafted goods marked high status, aided in cementing military alliances, were deployed as "political capital," and communicated Aztec state ideology (ibid.:111–16). This example illustrates that political economy remained processually minded and, although substituting economic for environmental systems, continued to devise explanatory frameworks that emphasized integrated functional relationships.

Growing dissatisfaction with ecosystems theory and inattention to the role of people in culture change culminated in Brumfiel's (1992) distinguished lecture to the American Anthropological Association, titled "Breaking and Entering the Ecosystem—Gender, Class, and Faction Steal the Show." In this address, Brumfiel called for greater attention to internal and dialectical sources of social change stemming from disparate groups and their conflicting interests. She also asserted that people, "not reified systems, are the agents of culture change," and thus agency-centered approaches were needed to temper ecosystems-centered analytics (ibid.:558–59). Brumfiel further advocated that archaeologists pursue studies of political economy, focusing on "variation in the intensity of household production, variation in household composition and organization, variation in demographic trends, the occurrence of enclave communities and prestige economies, and the intensity and organization of warfare and surplus extraction" (ibid.:560).

Michael Smith (2004:77) suggests that since the publication of Brumfiel and Earle's (1987b) influential volume, archaeological research on political economy has split in two directions. The first group has continued to develop materialist-based studies, while the second has branched off to pursue agency and practice theory approaches. This divergence corresponds with the more general cleavage in Americanist archaeology resulting from the post-processual critique of new archaeology.

Further development of materialist approaches, which Smith (2004:77) refers to as "archaeological political economy," shares "a global perspective on economies as open systems; attention to the economic dimensions and implications of political behavior and institutions; a concern with inequality and social classes; and a focus on processes of local historical change rather than broad processes of cultural evolution" (see also Earle 2002; Hirth 1996). Thus far, archaeological political economy has focused heavily on exchange and craft production while placing less emphasis on contexts of consumption. As of late, formalist-inspired studies of commercialization, markets, and

marketing have emerged as major research foci in Mesoamerica (e.g., Dahlin et al. 2007; Feinman and Garraty 2010; Garraty 2009; Garraty and Stark 2010; Hirth 1998; Smith 2004; Smith and Berdan 2003). Most obsidian studies carried out since the mid-1990s or so fit comfortably within the confines of archaeological political economy.

Moving in a second direction are studies of political economy that incorporate agency and practice theory—overlapping terms discussed here together. Archaeologists were attracted to practice theory as a means of theorizing a past populated with dynamic actors, drawing on the works of a number of scholars, including Pierre Bourdieu, Anthony Giddens, Michel De Certeau, and Sherry Ortner. Giddens's (1979) theory of structuration, for example, explains the duality of practice and structure: while practices are constrained by structure, they also collectively comprise structure and thus transform it as well. For Bourdieu (1977), people's actions in the world reflect their "habitus," or their internalized social dispositions, sensibilities, and practical knowledge. These regularized practices can either harmonize with or improvise upon what came before them, but people's knowledge of habitus is always incomplete and their actions may not play out as they intended. Practice theory thus offers an understanding of people as social agents whose practices occur within a sociocultural setting or structure that is also historically and environmentally contingent. While agents enact practices within a field of possibilities delimited by structure, the coalescence of these practices is what recursively constitutes structure.

Marcia-Ann Dobres and John Robb's (2000) edited volume, *Agency in Archaeology*, was a watershed moment that represented a coming of age for archaeological applications of practice theory and agency. In Mesoamerica, researchers have incorporated practice-based approaches into studies of craft production (e.g., Inomata 2001; Kovacevich 2007), exchange (e.g., LeCount 1999), and consumption, especially ritual feasting contexts (e.g., Barber and Joyce 2007; Brumfiel 2004). Though some of the agency-oriented studies cited here include obsidian data in their interpretations, few researchers have approached studies of obsidian from the perspective of practice theory (but see Hruby 2007).

A number of researchers have sought to build on practice theory approaches in constructing more comprehensive theoretical frameworks for understanding how subjects are constituted through their relationships with other people, places, and things in the world (e.g., see Hodder and Hutson 2003:106). These interactions—embedded in historical strands—are the crucible of meaning, identity, and understandings that inform practice. People come to understand the world around them and who they are themselves through interactions with objects, places, and other people. The nuts and bolts of how these interactions

are constituted, however, remain incompletely defined (Hutson 2010) and will require further adaptation for obsidian studies.

The following section segues into a discussion of related concepts that fit well under the rubric of materiality: the constitution of the material world and how objects actively engage with people on multiple levels (Meskell 2004; Miller 1998). Viewed here as complementary to theories of practice, materiality-oriented studies have spawned a number of approaches and conceptual tools that help us examine the relationship between people (subjects) and things (objects).

EMERGING DIRECTIONS IN OBSIDIAN STUDIES

Investigating the meaning of obsidian in archaeological contexts will contribute to deeper understandings of sociocultural, political, and economic life in ancient Mesoamerica. But why focus on meaning? To investigate meaning is to query obsidian's place in Mesoamerican cosmovision and ideology, how this relates to political economy, and how obsidian and people came together through embodied ritual and everyday practices (Hodder and Hutson 2003:156–57). Thus, meaning is relational and agent-centered insofar as it flows from an embodied understanding of oneself in relation to both material and ideational worlds. By approaching meaning, we can better understand the motivations and intentions underlying actions and events in the past. The pursuit of meaning must remain rooted in contextual readings of archaeological data but may also draw on the critical use of analogy, gained through ethnohistoric, iconographic, and ethnographic data sets (see Wylie 1985). Recent theoretical works considering the materiality of objects represent innovative approaches that hold promise for exploring symbolic understandings of obsidian in the archaeological record.

Everywhere the lives of people and obsidian cross paths represents an entry point for studies of materiality (Buchli 2002; Meskell 2004; Miller 1987, 1998, 2005). "Materiality," Lynn Meskell (2004:11) explains, "is our physical engagement with the world, our medium for inserting ourselves into the fabric of that world, and our way of constituting and shaping culture in an embodied and external sense." Meskell's definition emphasizes the agent-oriented nature of meanings in the past; they always come through someone's point of view, so meaning cannot simply be extracted from material culture itself. Furthermore, as our interpretations approach an insider's view in the past, we must reflect on our inability to completely escape our subjectivities in the present. Contrary to charges of attempting "paleopsychology" (Binford 1967), this view concedes that we may never pry loose singular and unadulterated understandings in and

of the past. The following subsections discuss how life history, embodiment and phenomenological approaches, and Peircian semiotics may help establish theoretical links between obsidian and meaning.

Life History Approaches

Life history or object biography approaches seek to reveal how meanings associated with obsidian artifacts emerge over the course of their "careers" (Appadurai 1986; Kopytoff 1986). This line of inquiry is predicated on the assumption that although people appear to create, manipulate, and master the use and deployment of objects, these same objects are reservoirs of meaning that can transform human thought, action, and identity (Gosden and Marshall 1999). The biographies of obsidian artifacts are enmeshed with human biographies from the day they are quarried to the day they are discarded. In fact, some may even reenter the social sphere, for instance, as heirlooms, curated ritual items (e.g., Brown 2000), or artifacts carried off for study by archaeologists.

Although life history approaches can trace the lineage of any given artifact, they may also examine broad categories of obsidian artifacts in terms of their variable origins and patterns of physical modification (see Ward 2004:12). In Mesoamerica, raw obsidian was transformed into prismatic blades through a series of variable production stages (Clark and Bryant 1997; Sheets 1975) that could occur across considerable units of space and time (see Healan 2009). While chunks of obsidian were typically reduced into macro-cores at or near the quarry, the successive steps, including further reduction to polyhedral core and actual blade making, often occurred elsewhere (e.g., Cobean 2002:151; Pastrana 2002:22–24). A finished blade therefore represented a collaborative effort of at least two or more crafters who may have never met. In this sense, these blades were "multiply authored," and some residues of these interactions may "adhere" to the artifacts themselves (Gosden and Marshall 1999:173; see also Witmore's [2007:557] "polychronic transactions"). Blademakers, for instance, may have distinguished exceptionally well-prepared polyhedral cores as the handiwork of a particularly skilled craftsman unknown to them. What are the social, economic, and political implications of such collective forms of production that transcend space and time?

Given that the most significant obsidian deposits are found in highland regions of Mesoamerica, did obsidian retain meaningful associations with these mountainous areas? Furthermore, as it was relayed across great distances and diverse environments, did obsidian take on additional connotations (see Helms 1993)? We can assume that Mesoamerican groups were able

to distinguish many—but probably not all—of the different types of obsidian based on their variability in color, inclusions, translucence, workability, and other characteristics (see Darras, this volume; Pastrana and Athie, this volume). It follows, then, that discernible varieties of volcanic glass may have evoked distinct meanings associated with their particular geographic origin and associated social groups. Recent studies demonstrate that color and other visual characteristics of material culture can provide important clues as to their meaning and role in ancient societies (Boivin and Owoc 2004; Gage et al. 1999; Hurcombe 2007:539–40; Jones and MacGregor 2002; Lucero 2010). Given its high quality and unusual green color, obsidian from the Pachuca source is one of the most likely to have evoked discrete meanings relative to other types (see Aoyama, this volume; Levine, this volume; Pastrana and Athie, this volume).

Embodiment, Object Agency, and Landscape

Efforts to better understand how people come to know themselves and the physical and social worlds around them have led to archaeological theories of embodiment and landscape. Both concepts draw on phenomenology, which rejects Cartesian notions of separate mind and body—instead arguing that people move through and come to know the world through embodied, sensual experience (Hamilakis, Pluciennik, and Tarlow 2002; Hodder and Hutson 2003:106–24; Joyce 2003, 2005; Kus 1992; Meskell and Joyce 2003; Tilley 2004:1–31). This constant state of "being in the world" takes on spatial and temporal dimensions, where histories of embodied experience become rooted in memory or the landscape (Csordas 1994; see also Ingold's [1993] concept of "dwelling" and Barrett's [1999] "inhabitation").

Interest in bodies is nothing new to archaeology, but as Ian Hodder and Scott Hutson (2003:113) explain, conventional "archaeology of the body" approaches conceive of the body as an object, whereas more recent "archaeologies of embodiment" make bodies the subject of culture. The former body-as-object approaches treat the body as a locus of display or as an artifact in itself (Joyce 2005:139). Obsidian ornaments such as earspools and labrets are commonly theorized in this fashion, as signs marking high-status bodies (e.g., Otis Charlton 1993). Conversely, Rosemary Joyce (2005:142–43) encourages more active readings of how clothing, ornamentation, and bodily modification transform and shape people's experiences. From this embodied archaeological perspective, for instance, obsidian earspools might be interpreted as part and parcel of larger projects concerned with the constitution of personhood (Hutson 2010:123–26; see also Fowler 2004; Gillespie 2001; Haskell 2012).

A consideration of embodied practice may lead to deeper understandings of how people come to know themselves and obsidian through contexts of procurement, crafting, trade, and consumption. We might see obsidian in a new light through an embodied approach to obsidian mining, for instance, drawing on the experiences of workers who toiled at the extensive quarries at Pachuca and Pico de Orizaba (see Pastrana and Athie, this volume). What were the occupational hazards, and how did workers approach these challenges? How might their experiences reveal novel understandings of obsidian deposits within a larger animate and sacred landscape?

Studies that break down the crafting process into a discrete sequence of steps, or *chaîne opératoire*, have greatly clarified our understanding of how particular objects were made (Lemmonier 1992). Yet these studies tend to present a disembodied perspective insofar as obsidian is acted upon, with little consideration of how obsidian might also affect the crafter. Recent studies reveal archaeology's ocularcentric orientation to knowing the past, relying heavily on sight while seemingly indifferent to how other senses (hearing, smell, touch, taste) inform experiential knowledge (Witmore 2006). An archaeology more attuned to the senses should elicit richer and more complete appreciations of embodied human experience in the past (Day 2013; Fahlander and Kjellström 2010; Hamilakis 2002; Houston and Taube 2000; Kus 1992; Meskell 1996). In regard to obsidian production, a haptic approach may be especially promising, given that a crafter's knowledge does not come from verbal instructions alone but also through a tactile "feel" gained from repetitive physical movements. Thus, part of an artisan's practical knowledge of how to strike blades from a polyhedral core, for instance, resides in the concerted effort of his or her muscles, tendons, and bones (John Clark, personal communication, 2010). In this vein, we might ask how obsidian working may have transformed the body, such as increasing manual dexterity and strength or adversely affecting health, including joint degeneration or other ailments. Concerning the latter, how did working with obsidian provoke physical pain (Kjellström 2010) and, conversely, how did people enlist obsidian's medicinal qualities to treat pain (see Pastrana and Athie, this volume)?

At present, it is difficult to imagine how studies of smell or taste could aid obsidian studies, but an appreciation of hearing is more accessible. We can learn more about the overall experience, for instance, of obsidian crafters immersed in distinctive sonorous environments or "soundscapes" (ibid.; see also Bruchez 2007; Scarre and Lawson 2006; Witmore 2006). Considering the acoustic properties inherent to the material itself, how might the sounds of obsidian tool use or crafting, such as the ring of a freshly removed blade,

signal a correct stroke or other indexes of meaning? Mesoamericanists have scarcely begun to ruminate on the aural linkages between objects and people, yet these acoustic dimensions may broker new insights (see Barber, Sánchez, and Olvera 2009; Hosler 1994; Houston, Stuart, and Taube 2006:153–63; Sheets 2002).

At a very basic level, people used obsidian, but materiality-related approaches necessitate reflection on how these objects "acted upon" people in different ways. Formal and informal obsidian tools were enlisted for cutting, scraping, sawing, and perforating objects (and sometimes bodies). Through such acts, one would have come to know the object world in a new way. For instance, a crafter would have gained a new familiarity with different properties (e.g., hardness, texture) of trees or plants through the edge of an obsidian blade. Obsidian implements were also used in ritual practices, such as bloodletting, activating relationships with supernaturals, and fulfilling sacred obligations (García Cook and Merino Carrión 2005; Graulich 2005). Did bloodletting performed with obsidian lancets, as opposed to plant spines or bone awls, carry different connotations? These inquiries lead to fundamental issues concerning the nature of people, things, and their relationship to one another. Put simply, as Clark (2007:23) asks, "where does the individual artisan stop and the craft begin? Where are the boundaries between persons and things" (see also Malafouris 2010:14).

Scholars continue to debate the degree to which objects may be thought of as having agency, or the ability to affect outcomes in the world (e.g., Gell 1998; Gosden 2005; Latour 2005; Meskell 2004; Witmore 2007). I find myself siding with those who view objects as having limited agentic qualities activated through their relationships with people. Obsidian's innate qualities, such as its sharp edges or ability to conduct or reflect light (Saunders 1998), establish some ground rules for these relationships (see Hendon 2010:85). Rejecting the notion that obsidian can act altogether independently, it may be helpful to imagine how obsidian's presence may have created certain possibilities and opportunities while closing off others. For instance, in some cases the demand for obsidian may have stimulated the establishment of new trade networks, opening the door to a host of more far-reaching sociopolitical and cultural exchanges. Newfound access to obsidian tools and implements could have altered modalities of subsistence, ritual life, and crafting. To be sure, there are human intentions and motivations underlying these processes, yet obsidian itself still represents part of the equation. Imagine for a moment how the absence of geological deposits of obsidian in Mesoamerica would have altered its history.

A growing number of scholars, however, note that dualistic constructs underlying modernist thought (e.g., people/things, culture/nature) problematically discount the possibility of non-human agency, even when studying cultures where rigid boundaries between the animate and inanimate, for instance, are absent. Archaeologists participating in this "ontological turn" are rethinking western axioms of being, agency, materiality, and relations and how they may impede deeper understandings of cultures with different ontological moorings (Alberti et al. 2011). One group has rallied under the banner of "symmetrical archaeology," arguing for the interpenetration of people and non-human entities that essentially co-create one another (e.g., Olsen 2010; Webmoor and Witmore 2008; Witmore 2007). They call for a more symmetrical consideration of people and things, which have different agentic qualities that come about through hybridized relationships. In many respects, symmetrical archaeology is an offshoot of actor-network theory (ANT), which challenges purported anthropocentric outlooks that underestimate the agency of things and their multivalent relationships with people and other things (e.g., Latour 1999, 2005; Law and Hassard 1999; see also Knappett 2005; Knappett and Malafouris 2008).

In a like-minded manner, others have rallied around "animism" as an entry point for investigating how many non-western ontologies accept the beingness of non-human entities who have spirits or other essences that confer degrees of personhood (Alberti and Bray 2009; Brown and Walker 2008; Mills and Ferguson 2008; VanPool and Newsome 2012). Animism is a well-documented feature of Mesoamerican religious belief today (Brown and Emery 2008; Monaghan 1995:98–105, this volume) and has deep roots in prehispanic times as well (Darras, this volume; Houston, Stuart, and Taube 2006:98–101; Marcus and Flannery 1994:57–60). In regard to obsidian studies, animated archaeological analysis may be particularly useful for studying ceremonial offerings, deposits, or caches. For instance, if people at ancient Teotihuacan considered obsidian figurines and eccentrics to be in some sense alive, then this could transform our understanding of symbolically charged contexts where these artifacts are found at the Feathered Serpent Pyramid, the Pyramid of the Moon, and elsewhere (cf., Sugiyama 2005:135–40; see also Parry, this volume).

Archaeological attention to landscape (e.g., Ashmore and Knapp 1999; Bender 1993; Tilley 1994) also represents entry points for studies of obsidian and meaning. As discussed earlier, the most significant obsidian deposits in Mesoamerica reside in mountainous volcanic (or once volcanic) regions that carry associations with primordial origins and powerful deities (Darras, this

volume; Levine, this volume; Pastrana and Athie, this volume; Serra Puche, Lazcano Arce, and García Méndez, this volume). How did embodied experiences of these places and deposits of volcanic stone create and transform social identity and meanings (Tilley 2004)? Furthermore, we must also rethink the degree to which obsidian artifacts, even the most mundane flake tools, may be alienated from their makers. Did any residues of meaning "travel" with obsidian itself? As traders traversed the landscape, the economic value of their obsidian cargo certainly increased, but were there other senses of value this movement fixed in the material itself? It seems premature to assume that obsidian objects, even unremarkable artifacts, would have been wholly alienated from meanings associated with different points in their social lives. Integrated studies that examine how obsidian mediated human experience and identity, especially in relation to landscape and mobility, present untapped avenues for continued research (see Van Dommelen and Knapp 2010). Increasingly sophisticated geographic information systems (GIS)–based analyses that model human movements across the landscape, in conjunction with analyses of social relationships, are poised to make important contributions to obsidian exchange studies in the coming years (White and Barber 2012; see also Carballo and Pluckhahn 2007; Golitko et al. 2012). Peircian semiotics, discussed in the following section, represents an altogether different approach to examining meaning in the archaeological record that may prove useful for the obsidian analyst.

Peircian Semiotics

Robert Preucel (2006:3) defines semiotics as "the multi-disciplinary field devoted to how humans produce, communicate, and codify meaning." Charles Peirce's (1991) theoretical work on semiotics, completed about a century ago, is only now generating interest among archaeologists as a viable tool for broaching the material-ideal divide (e.g., Carballo, this volume; Forde 2006; Preucel 2006; Preucel and Bauer 2001). Often contrasted with Ferdinand de Saussure's better-known work in semiotics (Hodder and Hutson 2003:59–65), Peirce maintained that each sign exists in a three-way relationship with itself, the object it refers to, and the interpretant. In this scheme, the *sign* is the signifier representing something other, that is, the *object*, which is a "real" thing or idea. The *interpretant* is the thought process that makes sense of the sign and is located in the mind of an actor linking object and sign. Thus, as James Hoopes (1991:9) explains, "the meaning of every thought is established by a triadic relation, an interpretation of the thought as a sign of a determining object." Peirce's theory is relational in that all signs link to other signs, objects,

and interpretants in an endless chain linking past and future. It follows, then, that signs can be viewed as generating others and therefore having some measure of agency (Preucel 2006:55–56).

Peirce's work distinguishes three different relational modes of signification: symbols, icons, and indexes.[4] While *symbols* are signs that relate to their referent in a completely arbitrary manner, *icons* are non-arbitrary in that they actually resemble—to varying degrees—what they represent. Thus, a red octagonal sign on the roadside signifying "stop" is an example of a symbol (as is the word *stop*), whereas a road sign depicting stick figures of children "at play" is an icon resembling a particular human hazard. There can be variable levels of iconicity, such as the difference between an impressionist painting of a water lily–covered pond and a photograph of that same pond. Signs that are *indexes* have some real connection to their referents, though they may not resemble them in a direct manner. For example, Peirce explains that a weathervane points in the direction of the prevailing wind and is an *index* of that wind. Our aforementioned sign portraying children at play may also index activities at a roadside playground that could potentially spill onto the street at that particular point.

Peirce's three types of relational signs also comprise a nested hierarchy in that symbols (the most complex) include indexes (less complex) that, in turn, incorporate icons (ibid.:249). Without reifying a sort of semiotic "ladder of inference," archaeological studies of obsidian will likely find icons and indexes easiest to approach, with symbols less so. When possible, comparative iconographic analysis, as well as ethnohistoric and ethnographic data, will greatly aid in this enterprise (see Carballo, this volume). At a minimum, Peirce's icons, indexes, and symbols provide a lexicon that can make interpretive chains of inference more explicit.

In the preceding discussion, I suggested that life history approaches, theories of embodiment and object agency, phenomenology and landscape, and even Peircian semiotics provide interpretive tools that may facilitate more holistic understandings of obsidian in the past. Nonetheless, this volume as a whole promotes theoretical ecumenism. Newer interpretive approaches must, of course, interdigitate with continuing advances in technological and experimental studies of obsidian, as well as broader theoretical work in political economy. The more pressing argument here is that researchers must consider obsidian's symbolic and sociocultural associations as seriously as its functional, economic, and political dimensions. Combining archaeological data with insights from critical studies of iconographic, ethnohistoric, and ethnographic information provides the most solid foundation for investigating the symbolic dimensions of obsidian in the past.

Figure 1.1. *Map of Mesoamerica including major obsidian sources*

ORGANIZATION OF THIS VOLUME

Rather than delve into a comprehensive treatment of any one theme, region, or place, *Obsidian Reflections* covers a variety of topics spanning the Formative to Postclassic periods and marshaling evidence from throughout Mesoamerica, including case studies from Mexico, Belize, Guatemala, and Honduras (figure 1.1). Importantly, this expansive approach highlights diversity in the ways Mesoamerican cultural groups conceptualized their relationship to obsidian and its role in their lives. These case studies collectively argue against structural interpretations of obsidian and meaning that fall back on so-called pan-Mesoamerican beliefs that ignore local cultural knowledge and historical contexts. The international cadre of authors assembled here also represents scholarship from traditions with varying methodological and theoretical approaches to obsidian studies.

Obsidian Reflections comprises chapters grouped into three sections: (I) Ethnohistorical and Ethnographic Perspectives, (II) Symbolic Dimensions of Obsidian Production and Exchange, and (III) Interpreting Obsidian in Ritual Offerings and Use. These headings give the volume a semblance of organization, yet most authors cover subject matter that crosscuts more than

one of these themes. Here, I provide a brief preview of the chapters that follow.

In the first chapter of section I, Véronique Darras utilizes ethnohistoric records, primarily the *Relación de Michoacán*, to discuss obsidian in mundane, ritual, and symbolic contexts among the Late Postclassic Tarascans of west Mexico. Her contribution illuminates obsidian's significance as expressed in Tarascan cosmology and examines how conceptions of obsidian were incorporated into narratives expressing elite ideology. In chapter 3, Alejandro Pastrana and Ivonne Athie examine Nahua conceptions of obsidian in Late Postclassic central Mexico. They draw on ethnohistoric and archaeological data sets to consider native understandings of obsidian's origin and place in the world, including its medicinal uses, sensual associations, how it was mined, how it was processed into tools and implements, and its links to powerful deities. The next chapter, by John Monaghan, provides an ethnographic perspective of the meaning of stone tools and their contemporary equivalents for Mixtec people from the village of Santiago Nuyoo in highland Oaxaca (Mexico). In contrasting these modern understandings and attitudes with depictions of stone tools in the conquest era Mixtec codices, Monaghan illustrates how ethnographically derived knowledge imbricates with codical renderings of related ideas and, by extension, how these insights may be useful in examining the symbolic dimensions of stone tools in prehispanic times. The chapters in section I demonstrate the importance and diversity of obsidian's symbolic dimensions for Mesoamerican societies today and in the recent past, providing the reader with a useful baseline of knowledge prior to delving into the more archaeologically oriented chapters that follow.

The chapters in section II address how obsidian's symbolic connotations may have come into play when making decisions concerning production and exchange. Kazuo Aoyama draws on a large bank of archaeological data from the southern Maya area (Copán, Pasión, and Petexbatun regions) to address symbolic and ritual dimensions of obsidian production, use, and exchange. His diachronic study (1400 BCE–1100 CE) highlights the prominent role of elites in exchange, production of obsidian eccentrics, ritual disposal of obsidian debris, and the deposition of obsidian in symbolically charged caches. In chapter 6, I examine the economic, political, sociocultural, and symbolic dimensions of obsidian exchange patterns at Late Postclassic Tututepec, located on the coast of Oaxaca. This effort investigates the meaning of obsidian exchange for the Mixtec of Tututepec from three overlapping registers: in terms of function and technology, in relation to culturally defined ideas and worldview, and from the perspective of how obsidian objects intersected with people's lives through daily practices.

In section III, authors focus more precisely on obsidian from ritually charged contexts, how these implements were used, and their meaningful connotations. David Carballo discusses an elaborate Terminal Formative period (100 BCE–150 CE) cache found associated with a temple structure at La Laguna, in northern Tlaxcala, Mexico. The cache presents a complex offering of large obsidian bifaces and eccentrics, in addition to shell, pyrite, and greenstone artifacts. Carballo's interpretation of this deposit draws on Peirce's semiotic framework and integrates archaeological, iconographic, and ethnohistoric data sets to render a better understanding of its significance. In chapter 8, W. James Stemp and Jaime J. Awe take readers "down under" in their examination of ritual obsidian use at caves in western Belize. Through a meticulous analysis of obsidian use-wear and artifact distribution patterns at five caves, Stemp and Awe attempt to more clearly define the diversity of ritual practices occurring in these subterranean contexts during the Late Classic (700–830 CE) and Terminal Classic (830–950 CE) periods. Chapter 9, by Mari Carmen Serra Puche, Jesús Carlos Lazcano Arce, and Mónica Blanco García Méndez, examines obsidian and ritual practices from Epiclassic period (650–900 CE) Xochitecatl-Cacaxtla, in the Mexican state of Tlaxcala. Their study focuses on excavations at two residential terraces and the discovery of a range of ritual artifactual remains, including several obsidian lancets used for bloodletting. These obsidian implements were an integral component of domestic ritual that served a number of purposes.

In William Parry's concluding chapter, he offers a commentary on the preceding chapters, nested within a broader discussion of the non-utilitarian aspects of obsidian from Classic period contexts at Teotihuacan and the Basin of Mexico. Furthermore, Parry offers a synthetic appraisal of obsidian from mortuary contexts at Teotihuacan and concludes that the meaningful associations of these artifacts most likely lie with the mourners who placed the objects with the dead rather than with the dead themselves. Finally, Parry acknowledges the need to investigate obsidian's meaningful connotations from multiple perspectives and encourages further development of holistic approaches to lithic studies in the future.

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NOTES

1. The efforts here also draw inspiration from research examining the symbolic dimensions of metallurgical technology and meaning (Hosler 1994; Lechtman 1977, 1984). In addition, a number of researchers working outside of Mesoamerica have looked into the symbolic dimensions of chipped-stone tool procurement, production, trade, and use (e.g., Brumm 2010; Taçon 1991; Ward 2004; Whittle 1995).

2. For instance, at the site of Altar de Sacrificios, Cache 6 was found under an altar in front of the tallest mound (Str. B-I). It contained 677 obsidian blades and debitage, along with 9 chert eccentrics (Smith 1972:236). Yet this cache and a litany of others were described sparingly in the site report and related appendixes (Willey 1972:214, 1973:35). Fieldwork at Altar de Sacrificios was carried out from 1958 to 1963.

3. Yet structuralist influences may be seen in later archaeological works (e.g., López Luján 2005; Pastrana and Athie, this volume).

4. Peirce later described at least ten different kinds of signs (see Preucel 2006:table 3.3).

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UNAM	Universidad Nacional Autónoma de México

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CHAPTER TWO

Ethnohistorical Evidence for Obsidian's Ritual and Symbolic Uses among the Postclassic Tarascans

Véronique Darras

The Tarascans, like the majority of other Mesoamerican groups, relied heavily on obsidian for the manufacture of their tools and weapons. During the Late Postclassic period (1100–1522 CE), obsidian was employed especially in the production of prismatic blades, a new technology in the region. The in situ development of this technology led to a change in its status and pattern of use. While relatively rare and used only by elites in particular contexts during the centuries preceding the rise of the Tarascan state, blades became "banalized" in the Postclassic, transforming into products of mass consumption.

However, despite the ubiquity of obsidian blades in the archaeological record, investigations carried out in the Zacapu and Patzcuaro regions of Michoacán have also uncovered evidence linking these artifacts to symbolic practices. These practices indicate the marked preference for Ucareo obsidian by the Patzcuaro elite (Perlstein Pollard 2003; Perlstein Pollard and Vogel 1994), the use of the Pénjamo source of green obsidian by the Tarascans of Zacapu to manufacture blades, and the elevated concentrations of blades in certain locations—such as the small natural caves of the Zacapu Malpais and its surroundings (Darras 1998, 2005a; Migeon 1990). These archaeological patterns could be interpreted in a number of ways, such as emphasizing symbolic associations with the color green, symbolic representation of certain sources, and rituals carried out with blades.

Yet while archaeological evidence attests to obsidian's abundance and usage in all spheres of life, both domestic and ritual, ethnohistory associates it with religious practices linked to cosmology. For instance, the mythic narrative of

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the *Relación de Michoacán* portrays obsidian as sacred, embodying royal and divine power.

In this chapter, I address the symbolism of obsidian based on the ethnohistoric data available for Michoacán, with the *Relación de Michoacán* as the principal text. I leave the symbolic issues of the archaeological record aside in this work, as I have previously discussed them elsewhere (Darras 1998, 2010). My objectives are twofold: first, to highlight the role of obsidian in Tarascan cosmology and second, to demonstrate that the obsidian blade was a catalyst in the political and ideological legitimization of the reigning dynasty at the time of the Spanish Conquest. The importance of this study is even more significant given that chert, typically found alongside obsidian, is absent in the Tarascan archaeological record, while the prismatic blade was a relatively recent technological development.

OBSIDIAN AND CHERT: AN INSEPARABLE COUPLE

The study of the symbolism of lithic material in Mesoamerican societies—particularly obsidian and chert—may draw on ethnohistoric, iconographic, archaeological, or even ethnographic records. Since the early 1980s, many researchers have portrayed these lithic materials as key components of Mesoamerican worldview. Studies of Maya, Mexica, and Tarascan rituals and deities demonstrate the semiotic significance of obsidian and chert, as well as their role in ritual and mythology (Athié Islas 2006; Baudez 2002; Clark 1989; Darras 1998; Graulich 1982, 1987, 2005; Heyden 1988; Olivier 1997; Saunders 2001; Sodi Miranda 2006). While these roles were initially understood thanks to ethnohistory and iconography, archaeology has more recently improved our comprehension of the meanings attributed to these materials and their associated objects (e.g., flakes, blades, bifacial knives, anthropomorphs, eccentrics), their contexts (e.g., funerary and offering deposits), their spatial distribution and associations, and their morphological characteristics (Andrieu 2009; López Austin and López Luján 2009; Sugiyama and López Luján 2006).

In Maya and Mexica cosmology, obsidian seems to have been inseparable from chert, and their opposition is frequently emphasized (Baudez 2002:234; Graulich 1987:110), especially their colors symbolizing a light-dark contrast. Raw obsidian is most often associated with cold, the color black, and the underworld (Graulich 1987:110; Olivier 1997), while chert, warm and light colored, is perceived as a metaphor of celestial divinity (Graulich 1987:110). While representing opposing cosmological concepts, however, obsidian and chert are frequently associated with one another within offerings, particularly among

the Maya, where they often alternate in the form of stratified deposits symbolizing the levels of the underworld (Baudez 2002; Hruby 2007).

In this general context, examining the symbolism of obsidian in Tarascan society is all the more interesting given that, unlike their neighbors, they did not use chert. This material is not found in the local geology, and to date, worked chert (e.g., bifacial pieces that would have been acquired through exchange) has not been recovered in the archaeological record. There are, however, a handful of exceptions, including a few examples of small chert and white chalcedony (a material similar in appearance to chert) projectile points from the Zacapu Basin—recovered in earlier Classic period funerary contexts (Darras 1993; Pereira 1999)—and a few white bifacial fragments (chalcedony or chert) recovered during surface collection at Tzintzuntzan (Perlstein Pollard 1993).

OBSIDIAN, AN ABUNDANT RESOURCE

The Tarascan region (figure 2.1) offers numerous sources of obsidian, with the principal ones concentrated in two areas: Zináparo (El Varal, Zináparo, Cerro Prieto), northwest of Zacapu, and Ucareo-Zinapécuaro (Ucareo, Zinapécuaro, Cruz Negra), to the east of Lake Cuitzeo. Zináparo and Ucareo-Zinapécuaro are located 30 and 110 kilometers from Zacapu and 70 and 130 kilometers from Patzcuaro, respectively. Beyond this zone, Pénjamo was another potentially important source for the Tarascans, located on the northern side of the Río Lerma. While all of these sources offered high-quality obsidian, they were exploited differently. Contrasts are observed in the form of the obsidian deposits, the morphology of the raw material, and the color: the populations had access to a wide palette of colors and other visual attributes (e.g., black, translucent gray, opaque gray, red, translucent green).

PRISMATIC BLADES IN MICHOACÁN, A RECENT HISTORY

Despite uncertainties regarding obsidian's initial appearance and region of origin (Darras 2005b), prismatic blades were present throughout the majority of Mesoamerica beginning in the Late Preclassic, at approximately 1200 BCE. Nevertheless, in west Mexico and particularly northern Michoacán, prismatic blades were only introduced (as a minor imported product) at the end of the Preclassic. It is only at the end of the Epiclassic (750–900 CE) for extreme west Mexico and the end of Early Postclassic (900–1100 CE) for northern Michoacán that this technology was introduced locally, replacing the older

Figure 2.1. *Tarascan region of west Mexico.*

tradition of percussion blades. At the time of these technological changes, the Tarascan population of northern Michoacán was also undergoing tremendous political transformation. The development of this technology was simultaneously accompanied by a process that led to the "banalization" of prismatic blades, that is, they became a ubiquitous product consumed by people of all statuses. This abrupt change in patterns of prismatic blade use must have been linked to the local character of production and its practice: flexible setting, the independence of its artisans, absence of elite control over raw material sources, and the pattern of production and distribution—all factors capable of explaining the weak economic value attributed to the obsidian blade (Darras 2005a, 2008, 2010).

THE RELACIÓN DE MICHOACÁN

When the Spanish arrived in Michoacán in 1522, they discovered a prosperous kingdom governed by Tangaxoan—the Tarascan ruler, or *cazonci*—the final representative of the Uacusecha dynasty. Less than twenty years after this first contact and at the behest of the viceroy of Spain, the history and customs of this people without writing were transcribed in Spanish, probably by Fray

Jeronimo de Alcalá, in an exceptional document: the *Relación de Michoacán* (RM). With the exception of two pages, the first part, dedicated to religion, has disappeared. The second part relates the official history of the reigning dynasty recited each year during the festival of arrows, while the third part describes Tarascan society's social, political, and economic organization at the moment of contact with the Spanish. This text retraces the Uacusecha lineage's rise to power, the genesis of which appears intimately linked to the lake region of Zacapu, 30 kilometers from Lake Patzcuaro (see Espejel Carbajal 2008). The narrative structure of events reveals that profound social and ideological transformations had begun in this region during the twelfth century CE and that they led to a radical upheaval of power structures, resulting in the founding of a monarchic state in the Patzcuaro Basin in the mid-fourteenth century.

OBSIDIAN IN THE RELACIÓN DE MICHOACÁN

A critical reading of the RM, employing a contextual and semantic approach, clearly demonstrates that the Tarascans attributed an important role to obsidian. Nevertheless, it is necessary to consider the problems inherent in relying on such a source. First, the content of the RM represents a mythical narrative copied down after the Conquest. Second, it is based on a reiteration of the final version of an official history that was brutally interrupted by the Spanish.

Among the historical texts pertaining to the Tarascan region, references to obsidian are especially rare, and only brief allusions appear in the RM. Nonetheless, several types of information are present: direct data derived from iconographic or textually explicit evidence and indirect data derived from textual references that are implicit and require greater interpretation. The information can be grouped into five general areas: the organization of blade production, etymology, concrete uses, and symbolic functions related to religion and political power. I will discuss only the final four of these spheres.

Difficulties of Terminology

It is useful to review the problems associated with the terminology used in the texts to name obsidian and its instruments. Marc Thouvenot (1984), John Clark (1989), and Alejandro Pastrana (1991, 2007) have provided useful discussions concerning the diversity of Nahua terms employed to designate objects and concepts related to this stone. My ethnohistoric focus led me to examine other aspects of terminology to interpret the written documents more precisely. After several readings, it became evident that the chroniclers were not familiar

with obsidian and did not know its scientific name.[1] To classify this unknown stone and distinguish its varieties, the chroniclers relied on their own reference systems to compare obsidian by analogy (appearance, color, brilliance) to more familiar classes of stone. With the exception of Bernardino de Sahagún[2] (1981) and, to a lesser extent, Francisco Hernández (1959), who provide details about the varieties of obsidian, the other chroniclers' definitions are imprecise.

In general, as a mineral, obsidian was named or translated by the generic term *pedernal,* or "chert" (e.g., Gilberti 1989 [1559]; *Relación de Tiripitío* [RG 1987]; Ximenez 1967). Other descriptive terms were related to obsidian's appearance, including *piedra negra* (black stone) and *piedra muy relumbrante, negra como azabache* (very shiny stone, black as jet; Acosta 1940 [1590]:231; Durán 1967, 2:36–37; Motolinía 1984:175). But fortunately, since the chroniclers focused particularly on tools (e.g., blades) and their properties, worked obsidian can be designated by a variety of terms associated with its characteristics. For instance, Toribio de Motolinía (1984:32, 175) makes references to *piedra aguda* (sharp stone) and *navaja de piedra negra* (black stone blade), while in the writings of Sahagún (1981, 3:196) and others (RM 1977 [1574]:111), we see the terms *navaja de piedra* (stone blade), *navajitas de piedra* (little stone blade), and *piedra de navaja* (stone for blades). Similarly, José Acosta (1940 [1590]:144) makes reference to *piedra en que se hacen las navajas* (stone from which blades can be made) and *lancetas* (lancets), while the term *navajuelas* (razors) appears in the *Relación de Itztepexic* (RG 1984:264).

In accordance with the descriptions and the few existing images (e.g., Florentine Codex, Codex Mendoza, RM), each of the aforementioned expressions,[3] including the word *blade* or *lancet*, probably refers to instruments archaeologists call obsidian blades or bladelets. In contrast, the isolated use of the terms *navajón* (large blade), *cuchilla* (blade), or *cuchillo* (knife) by the chroniclers (Mendieta 1971; Motolinía 1971; Torquemada 1975) are much less precise, which complicates the identification of the particular object (blade, flake, bifacial knife, or bifacial point?) and the associated raw material (chert, obsidian, or another class of stone?). Only in juxtaposition with the word *chert* or where more detailed contextual information is provided, such as a description of sacrifice versus autosacrifice, can we occasionally infer the nature of the instrument. Finally, some of the same chroniclers further confuse the situation by combining the words *blade* and *knife* (Torquemada 1975, 3:178), writing *navaja o cuchillo* (blade or knife) or *cuchillo de navaja* (blade knife) to refer to the same object or action (see also Durán 1967, 2:171, 282).

Despite its presence in the RM, obsidian itself is never mentioned or described explicitly; yet objects made of obsidian are mentioned repeatedly.

Maturino Gilberti (1989 [1559]:120), who appears not to have been familiar with the general word for this stone, translates the terms *thzinpuendeni* as "to be the place of chert" and *thzinapemuri* as "very sharp object." In his dictionary, the root *tzina(p)* is also closely linked to terms that refer to healing (ibid.:121). In another example, Juan Bautista de Lagunas gives us the following definition:

> CUINA, es afeytar, tresquilar o rapar: y este puede venir del sonido de la tijera o tijeras. Y también de Cuihnarhi: que es un genero de macanas, que ellos tenian, y usaban en sus guerras, que tenian al cabo un pedernal tan agudo, que adonde daban el golpe todo lo rapaban. Y asi, la navaja se llamara, Cuinarahperaqua o Tzinapu. Y de aqui sale Tzinaphiquaro, lugar de navajas y adonde las toman, o compran: porque allí hay la piedra de que las hacen. Y así por la semejanza dirán a las nuestras, Castiranaputhzinapu o Cuinarahperaqua . . . Cuinarhtzini, rapar o afeitar la cabeza. (de Lagunas 1983 [1574]:267–68)

> [CUINA, is to shave, shear, or crop: and this comes from the sound of the shears or scissors. And also from Cuihnarhi: which is a type of macana, that they had and used in their wars, that had at the tip a very sharp chert, which sheared off all that it struck. And thus, the blade was called Cuinarahperaqua or Tzinapu. And from this derives Tzinaphiquaro, place of blades and to where they are taken, or bought: because there is found the stone from which they are made. And so, due to the resemblance, they call ours, Castiranaputhzinapu or Cuinarahperaqua . . . Cuinarhtzini, to shave or shear the head.] (English translation by M. Elliott)

This definition is informative regarding the terminology used to designate obsidian, as well as one of its uses. We observe that tzina(p) is related to words that designate a haircut or the action of cutting or shaving and that these are composed of the root *cuina*. In fact, both roots (tzina(p) and cuina) appear linked by their complementary nature; one refers to the instrument (for cutting) and the other to the action (to cut). We also learn that in warfare, the Tarascans used a type of *macana* (blade-edged sword) named *cuihnarhi,* translated as *un pedernal agudo,* or "sharp chert." Thus, the Tarascan dictionaries from the end of the sixteenth century translate the word *tzinapu* as "chert."

The same term appears frequently in the RM to designate projectile points without specifying whether it refers exclusively to obsidian objects. In practice, it appears that the chroniclers used the word *chert* systematically to refer to all worked stone points regardless of raw material, color being the only distinguishing characteristic. This association of projectile points with chert

can be found in other texts too, which indicates a general tendency among the chroniclers (Durán 1967, 2:208). Based on this information, it is pertinent to consider that in the RM the term *chert* designates bifacial objects of variable morphology, of various colors, and produced from different classes of stone. The *pedernal colorado,* or "red chert," frequently cited in the RM could be reddish-brown obsidian projectile points, while the black points could be either obsidian or basalt (RM 1977 [1574]:21, 88).

While "chert" is used interchangeably for obsidian, basalt, or other raw materials, in contrast, the more precise expressions *navajas de la tierra* (blades from the earth) and *navaja de piedra* (stone blade) appear to refer to one stone only: obsidian. Based on the definitions and terms employed in the majority of the ethnohistoric texts, the word *blade* in the RM refers to a specific object, the obsidian blade, which seems to be erroneously translated as "knife"—general and imprecise—in other publications (Corona Nuñez 1977: XVIII; Le Clézio 1984:31; Perlstein Pollard 1993:138).

In sum, the terminology used in the RM allows us to deduce that the obsidian objects mentioned are of two types: projectile points and, later, blades. A third object, closely related to these, should be mentioned: the obsidian core, which I discuss below.

Etymological References

I continue with topics linked directly or indirectly to obsidian, beginning with etymology. We know that the names used for the two principal centers of obsidian production in Michoacán, Zinapécuaro and Zináparo, are composed of the root *(t)z(h)inap* and the locative suffix *-ro*. The first, Zinapécuaro, is cited various times in the RM as a strategic Tarascan settlement. The volcano and its surroundings were the location of an important cult to the creator goddess, Cuerauáperi. Ceremonies were carried out with sacrifices during the annual festivals in which the victims' hearts and blood were thrown into the hot springs of "Monte Araro" (RM 1977 [1574]:9–10). In the text, there is no reference to Zinapécuaro as "place of obsidian" or "place of healing," although Gilberti (1989 [1559]) related the tzina(p) root to this notion. The etymological similarity between the words *obsidian* and *curative* is interesting, since we know that therapeutic properties were attributed to obsidian, as well as to the hot springs (Argueta 1980:131; Motolinía 1984; Sahagún 1981). In sum, the hypothesis of an indirect association between obsidian and Cuerauáperi cannot be dismissed, since it appears that some links can be established among the mountain, water, healing, and obsidian.

In contrast to Zinapécuaro, Zináparo never appears in the RM, nor is it found in the list of conquered towns mentioned in the narrative—perhaps because few towns in this region were worthy of being conquered or mentioned in the list. Furthermore, Zináparo's royal function as part of the Viceroyalty of New Spain only occurred in 1618 (SHCP 1940:715). Although the colonial town was established over a prehispanic settlement of the same name, the Tarascan toponym of Zináparo had probably been attributed after the Conquest, when it was founded, because of its mineral resources and etymological reference to its counterpart, Zinapécuaro.

Some Uses of Obsidian Related to Religious and Political Practices

Another important aspect to consider is references to obsidian use in the RM that carry either religious or political connotations. These contexts include cutting hair, sacrifice, warfare, ritual hunting, and, finally, violent acts of justice or enmity.

Cutting Hair

The first two pages of the RM describe a festival in which sacrificial rites were carried out in honor of Cuerauáperi and other gods. The priests cut the hair of the faithful, added it to the blood of sacrificial victims, and then cast this mixture into the fire as an offering:

> Después de hecho el sacrificio; salían aquellos dos llamados hauripicípecha, que quiere decir quitadores de cabellos, y andaban tras la gente, hombres y mujeres, y cortábanles los cabellos con unas navajas de la tierra . . . y tomaban de aquellos que habían quitado, y metíanlos en la sangre de los que habían sacrificado y echábanlos en el fuego. (RM 1977 [1574]:10)

> [After performing the sacrifice, those two, called Hauripiupecha, which means hair pullers, come out and follow the people, both men and women, and cut off their hair with some locally made knives (with some blades from the earth). They place some of the hair they cut off in the blood of those who have been sacrificed and then put it in the fire.] (English translation by Craine and Reindorp 1970:16; addition by author in parentheses)[4]

In addition to the information contained in the etymology of the description of the priests, "those who cut hair," the text indicates that hair cutting was performed in ceremonies during which captives were sacrificed and was

carried out by priests with blades. This rite was practiced with all the inhabitants present, regardless of sex. Hair cutting appears to be associated with a ritual act and a change of state; another passage of the RM also reveals that it was perceived as a transformation:

> Y juntáronse todos los chichimecas y llegaron a un lugar llamado Zirimbo a la orilla de la laguna, y no fueron más de los señores en una canoa, y rescibiéronlos muy bien los de la laguna y dijérenles: "Seáis muy bien venidos, señores." Y después de haber comido, llamaron un barbero y cortáronles los cabellos que tenían largos, e hiciéronles en las molleras unas entradas. (RM 1977 [1574]:32)
>
> [All the Chichimecas gathered and went to a place called Zurumbo on the bank of the lake. The lords, leaving the others behind, went over in a canoe to be received warmly by the Islanders. After eating, the islanders called a barber and had the Chichimecas' long hair cut, making some round, bare spots like temples on the crown of their heads.] (English translation by Craine and Reindorp 1970:119)

In Tarascan society, hairstyle signaled specific social or ethnic ties.[5] In this last description, the cutting of hair and the adoption of a new hairstyle marked a change in social status, from "Chichimec" to *Señor del lago* (lord of the lake), a civilized person supplied with recognizable insignias (Kirchhoff 1956). The ritual act of cutting hair described in the first pages of the RM perhaps symbolically reproduces this change of status and recalls the Chichimec origin of the Uacusecha lineage.

According to the chroniclers, the use of obsidian blades as privileged instruments for cutting hair constituted one of its most frequent uses in Mesoamerica (see also the Codex Mendoza; Sahagún 1981; Torquemada 1975). The people of Michoacán, called Quaochpanme by the Mexica, or "the men with shaven or shorn worn heads" (Sahagún 1981, 3:206), kept their hair short, *cortado con navaja* (cut with a blade). This is indicated by a few references in the text of the RM and its numerous illustrations, with the exception of women who usually appear to have long hair, despite the ceremonial context where priests cut their hair as well (similar to the description by Sahagún). Similarly, the cazonci, priests, and dignitaries also appear to have had a special hairstyle: it was more elaborate, short with the front bound tightly with deerskin and a braid that hung down the back.

Thus, these data indicate that short hair, at least in the front, was a general style that would have likely required a high quantity of obsidian blades to maintain. When used for cutting hair in specific contexts, obsidian blades

contributed both to ritual acts carried out in honor of Cuerauáperi and to the construction of social and ethnic identity of Tarascan people.

Autosacrifice

The RM abounds in references to ritual incisions, although only one citation mentions the type of instrument used:

> Dijo Tariácuri: así es la verdad, hermanos. Dad acá este bolsón. Y diéronsele y sacó de allí una navaja para sacrificar las orejas y díjoles: Mirá, llevad esta navaja para sacrificar las orejas. Con esta daba yo de comer al dios del fuego que hace llamas en medio de las casas de los papás. (RM 1977 [1574]:53)
>
> ["So it is," said Tariácuri, "give me that bag." From it he took a knife (a blade) used for the sacrifice of ears and said to them: "Take this knife (this blade); with it I fed the Fire God who makes fires in the midst of chief priests' houses."] (English translation by Craine and Reindorp 1970:137; additions by author in parentheses)

The obsidian blade appears here as an instrument of autosacrifice and in this case is considered an important object used by Tariácuri to feed blood to his god, Curicaueri. It was kept in a bag that is not described and would have been used in a special location, the chief priests' house (*casa de los papas*). By giving the blade to his cousins (or brothers), Tariácuri transmits part of his strength and that of his god, Curicaueri, and this blade transforms indirectly into the instrument that will eventually spoil Naca's plot (to assist the cacique Carícaten, besieged on the island of Xaracuaro, Zurunban entrusts a mission to a priest named Naca: to gather people to make war and defeat Tariácuri).

The other references to autosacrifice are discrete yet frequent, with the chronicler often referring to acts such as "sacrificar las orejas" or "sacrificio de las orejas" (to sacrifice from one's ears or the sacrifice from the ears). Even when other parts of the body were surely punctured or perforated, such as the tongue (see the Relaciones from Tamazula [RG 1987:398] and Tiripitío [ibid.:342]), here, the ears are the only organ mentioned. The few details in the description of the ritual act suggest that a very sharp instrument was used to incise deep cuts in the ears:

> yéndose a su casa, por el camino sacrificáronse las orejas, que se hecieron grandes aberturas en ellas, y hendiéronselas como solían hacer a los que tomaban en adulterio, y iban corriendo sangre de ellas y dando gritos. (RM 1977 [1574]:73)

[On the other hand, the adulterers, on the way home, sacrificed their ears making deep gashes and splitting them as was their customary way of punishing those who were taken in adultery. They went home shouting with blood flowing from their ears.] (English translation by Craine and Reindorp 1970:154)

The act of bleeding oneself appears in the RM to be a very common practice among the people and was carried out in special contexts related to the cults of Curicaueri and Cuerauáperi. When collective, autosacrifice was a part of religious ceremonies such as the *Phurécuta-quaro* (RM 1977 [1574]:70) or was carried out during military operations with the goal of earning the favor of the gods and assuring victory:

Conquistaron los pueblos siguientes: Hetúquaro . . . y llegaron a Uaniqueo, y los de Uaniqueo eran valiente hombres, y no los pudieron vencer, y aparáronse a medio día, y viendo esto Hirípan y Tangaxoana, sacrificáronse las orejas, y toda la gente, por podellos vencer. (ibid.:151)

[They also conquered the villages of Hetuquaro and Hoporo. Tangaxoan and Hiripan went on to the conquest of Xajo Chucandiro, Teremendo, and then came to Baniqueo where the men were so valiant that they could not be conquered. There was a momentary cessation of hostility at midday. In view of the circumstances, Hiripan, Tangaxoan, and all their people sacrificed their ears in order to assure success in the conquest.] (English translation by Craine and Reindorp 1970:218)

These practices could also be made through individual initiatives to express faith in their gods. However, they were always linked to other rituals that honored Curicaueri, such as the making of arrows, hunting deer, and collecting firewood for maintenance of the sacred hearths (RM 1977 [1574]:44).

Autosacrificial rites could be performed outdoors, in the mountains, or on roads and, in this case, almost exclusively in the daytime. Dignitaries also carried out autosacrifice in the temples and the "casa de los papas" at night, later mixing their blood with the ashes of the sacred fireplaces (ibid.:53, 234). This place was open to commoners (ibid.:204, 206), and it is assumed that everyone carried out the same rites in its interior. One passage in the RM reveals that commoners performed autosacrifice frequently and confirms that individual communication between them and the gods was possible:

Decían que sus dioses les aparecían en sueños, y hacían todo lo que soñaban, y hacianlo saber al sacerdote mayor, y aquel se lo hacía saber al Cazonci. Decía que a los pobres que habían traído leña y se habían sacrificado las orejas, les

aparescían en sueños sus dioses, y les decían que habían dicho, que les darían de comer, y que se casasen con tal o tal persona. (ibid.:231)

[These people imitate parts of their dreams and do as much of what they dreamed as they can. They report their dreams to the chief priest who in turn conveys the information to the Cazonci. They say that the poor who bring in wood and sacrifice their ears dream about their gods who are reported as having told them that they would be given food and that they should marry such and such Christian girls.] (English translation by Craine and Reindorp 1970:53–54)

Other texts in the Relaciones Geográficas del siglo XVI (RG) that refer to the territory administered by the Tarascans during the prehispanic period appear to confirm the frequent nature of autosacrifice, which might be carried out daily by the people to honor their gods (RG 1987:342). Finally, data taken from written sources concerning neighboring regions, although under Mexica domination, indicate that autosacrifice was carried out by women in special circumstances, in their homes or other locations:

Solos los principales tenían a dos o tres y a cuatro mujeres; la gente común podía tener más que una. Los que permanecían en sus matrimonios, hacían penitencia por sus pecados . . . Purificábanse, bañandose a media noche; entonces, se sacaban mucha sangre de las orejas, brazos y piernas. Tenía cada pueblo, para hacer esta penitencia, unas casas apartadas en el campo, y éstas eran para los varones. Y, mientras ellos hacían penitencia en las dichas casas, sus mujeres la hacían en las casa de su morada. (ibid.:237).

[Only the principals had two or three and up to four wives; commoners could have more than one. Those who remained in their marriages, making penitence for their sins . . . Purifying themselves, bathing at midnight; then, they let much blood from their ears, arms, and legs. Each village, to carry out this penitence, maintained some houses in the field, and these were for the men. And, while they made penitence in those houses, their wives did the same in their regular dwellings.] (English translation by M. Elliott)

These different readings indicate that obsidian blades were used as instruments of autosacrifice and that these rites were carried out in outdoor settings, on roads, while hunting or collecting firewood for the gods, as well as in closed cult locations associated with sacred fireplaces. While they might be carried out during specific religious ceremonies or military conflicts, in certain cases autosacrifices would have been executed outside of official contexts, as part of more personal religious acts. Practiced by the cazonci, priests, dignitaries,

warriors, and commoners, autosacrifice appears to have been above all a way to dream and communicate with the other world, similar to the Mexica world where obsidian was related to divination (Olivier 1997:134–35).

Human Sacrifice

I now examine what the RM says about human sacrifice with the goal of understanding the instruments employed. The Tarascans practiced human sacrifice by heart extraction to celestial deities but also to terrestrial deities (Pereira 2010:267; RM 1977 [1574]:9, 159). Two illustrations show the priests performing the sacrifice, stabbing a long unidentifiable object into the victim's chest (RM 1977 [1574]:59, 197). In two other instances, those performing the sacrifice appear with a special instrument in their right hand that consists of a diamond-shaped point, its upper half painted red and hafted in the end of what is probably a long bone (ibid.:179, 230), which Paul Kirchhoff (1956) identifies as a short shaft with a fist at the far end. The first sheet represents the priests Curitiecha and Petamuti, each supplied with the attribute most representative of his function, which allows us to deduce that the object associated with those carrying out the sacrifice is the instrument used to extract the heart (figure 2.2).

The detailed drawing indicates that the point was likely a lanceolate-shaped knife, but the raw material cannot be identified. The painted portion, located at the tip of the knife, probably represents bloodstains, although it could also correspond to an area that was actually painted (also symbolizing blood), as in the case of numerous chert knives found in the offerings of the Templo Mayor and Tlatelolco (Athié Islas 2006; Broda, Carrasco, and Matos Moctezuma 1987; González Rul 1979; López Luján 1993; Rees Holland 1989). However, it is unlikely that the famous chert bifacial knife (Graulich 1982:52; Motolinía 1971:32), the Mexicas' preferred instrument for sacrifice to celestial deities, was used in Tarascan Michoacán because none have been found to date archaeologically.[6] Alternatively, numerous obsidian bifacial knives have appeared in excavations or surface collections (Darras 2005a; Healan 1994; Perlstein Pollard 1993). According to Michel Graulich (1982:52), sacrifices to the celestial fire by heart extraction could only be carried out with a chert knife, as chert was the spark of heaven (Graulich 1987:108–9; Motolinía 1971:226), while Mexica obsidian knives were used for slitting throats and dismembering sacrifices to earthly deities (Graulich 1982:53).

Although information in the RM does not allow us to distinguish instruments used in sacrifices to celestial versus terrestrial deities, it seems that the obsidian knife was the only one used in both contexts. If there was a desire to

Figure 2.2. *"Los sacrificadores" and the "Petamuti" (detail from plate XXX, RM, Ms.ç.IV.5. de El Escorial, 1541, © PATRIMONIO NACIONAL).*

symbolize the opposition of the celestial and the terrestrial, perhaps the priests played with the type of obsidian used (black-gray or translucent-opaque), or they may have painted the knives to draw attention to the contrast.

Warfare and the Hunt

The text and illustrations of the RM are more informative regarding weapons of war and hunting rituals, including deer and other animals. Tarascan warriors used a diverse arsenal, with the bow and arrow most common, followed by the oak club and finally wooden spears with fire-hardened points. Arrows, amply illustrated and described in the RM, are composed of a cane shaft tipped with a worked stone point, referred to as "chert," with one of

the four colors that symbolize the four parts of the world: black, white, red, and yellow. However, these descriptions are imprecise regarding the actual stone used.

Archaeological excavation of Late Postclassic contexts has provided a significant quantity of arrowheads in domestic, ceremonial, and funerary contexts. The majority of these projectile points are made from gray streaked and black obsidian, a few others from red obsidian, and still others from black basalt. Some of the obsidian is translucent, even transparent, and may be the "white obsidian" described by Sahagún, as proposed by Clark (1989:306).

Justice and Royal Intrigue

A number of accounts describe the use of obsidian blades to mutilate or execute, as an instrument of justice used by the cazonci. Blades were used to punish those who committed sorcery: "Y el que era hechicero, rompíanle la boca con navajas y arrastraban vivo, y cubríanle de piedras, y ansí lo mataban" (RM 1977 [1574]:201). [And those who were witches, they would tear up their mouths with blades, and drag them alive and cover them with rocks, and this is how they were killed] (English translation by M. Levine). A similar treatment was reserved for those who had committed rape or adultery: "Si era fuerza de mujer, mandaba que les rasgasen la boca, hasta casi las orejas, con una navaja de pedernal" (ibid.:343). [If a woman was forced, they shall have their mouth slit, almost to their ears, with a chert blade] (English translation by M. Elliott).

In some cases, the ears of adulterers were pierced and torn off with the same instrument (ibid.:73). Plate XXXV also illustrates the sentences pronounced by the cazonci and depicts some of the weapons used for their execution: two men drive an elongated instrument into the adulterers' genitals with the use of a club (ibid.:200). This instrument, interpreted by José Corona Nuñez (1977) as a point made from cane, could also be a wooden spike, as suggested in the RG (1987:343).

The obsidian blade also appears as a personal instrument of Tariácuri, which he uses indirectly when plotting to do away with his enemies. Tariácuri twice passes blades along to those close to him (cousins or brothers, as well as daughters or wives) and entrusts them with an assassination mission (RM 1977 [1574]:53–54, 161–62). These blades, property of Tariácuri and thus endowed with much precaution and respect, remain hidden in a bag or cloth mantle to be distributed in special circumstances. In one case already mentioned, the blade serves as Tariácuri's instrument of autosacrifice and is also used by his delegates as part of a plot that leads to the death of his enemy, Naca. In another case, the blades are fearsome weapons intended to slit the throat of an

Figure 2.3. *Tariácuri's daughter uses a blade to slit the throat of a man from Curinguaro (plate XXVI, RM, Ms.ç.IV.5. de El Escorial, 1541, © PATRIMONIO NACIONAL).*

individual from Curinguaro (see figures 2.3 and 2.4). By entrusting others with his own blades, Tariácuri expresses his power by allowing them to become the indispensable instruments to guarantee victory, and, at the same time, he participates symbolically in the assassination.

All of these practices involving obsidian blades described in the RM express a special link between religion and warfare but provide no information regarding utilitarian uses. Of course, given the RM's historic-religious emphasis, it is not unusual that among all of the possible uses of obsidian, only those occurring in highly symbolic or political and religious contexts are mentioned. Beyond its practical applications, other references reveal that obsidian was a sacred stone linked to power and inseparable from the destiny of the gods and the Tarascan rulers.

Obsidian, Power, and Cosmology

Stone of Power

Commentators on the RM (Corona Nuñez 1977; Kirchhoff 1956; Le Clézio 1984) identify obsidian as the stone that embodies the god Curicaueri and symbolizes his royal power. Nonetheless, there is some difficulty when attempting to define this stone precisely because some of its properties appear to rely on an inconsistent interpretation of the terminology used in the account. Corona Nuñez (1977:XVIII) identifies the stone of power as a sacrificial knife, while in the same publication, Tudela describes it as a block from which was removed "la navaja," or a piece of stone that represents Curicaueri (RM 1977 [1574]:125).

Figure 2.4. *Detail from plate XXVI, RM, Ms.ç.IV.5. de El Escorial, 1541, © PATRIMONIO NACIONAL).*

Le Clézio associates the stone of power with a womb, a knife (ibid.:163), or a sacrificial knife (ibid.:31). However, a close reading of the text reveals that references to the stone do little to clarify its nature, and none refer specifically to a sacrificial knife.

Figure 2.5. *Tariácuri distributes part of his god, Curicaueri (detail from plate XVII, RM, Ms.ç.IV.5. de El Escorial, 1541, © PATRIMONIO NACIONAL).*

In contrast, we learn that Curicaueri, symbolized by this stone, can break himself into many pieces and multiply; these pieces, which make up "a portion of Curicaueri," are mentioned in the text (RM 1977 [1574]:82, 109, and so on) and in only one case are specified as blades (ibid.:126). All other references related to Curicaueri use the term *piedra* (stone) or name the god directly (ibid.:82, 127, 165). Finally, other passages inform us that Curicaueri's color is black (ibid.:77, 137) and that he is cold to the touch and must be wrapped in a cloak. Analogies drawn from other sources related to the Mexicas, especially those concerning Tezcatlipoca (Durán 1967; Graulich 1982, 1987; Olivier 1997) and juxtaposed with the different properties of the Curicaueri effigy, allow me to deduce that he was a block of cold, black stone from which blades were extracted. These three characteristics (black, cold, and blade) likely correspond to a particular object: a core for making black obsidian blades. Still, it is important to recall that the only graphic representation of the stone embodiment of Curicaueri is ambiguous and does little to strengthen the interpretation here (RM 1977 [1574]:125, plate XVII; see figure 2.5).

According to the RM, the sun god of the Uacusechas was represented in material form as a core for blades. The cazonci and priests carefully guarded this effigy of Curicaueri in a cloak or deerskin and never left it unattended (ibid.:18). Protected in this way, material representations of the god were

worshipped and considered sacred bundles (Corona Nuñez 1977; Olivier 1995:115; RM 1977:XVIII) that were carried on the backs of priests or remained in temples or special houses (RM 1977 [1574]:82, 126).

Those who possessed a part of Curicaueri were bestowed with legitimate power (ibid.:109, 125), political credibility, and a political-religious identity (ibid.:82) that permitted them to proclaim their allegiance to the ideological system of the cazonci (and, by extension, to the Uacusecha) and be recognized as a subject to him and Curicaueri. Authorities of the towns that depended on the cazonci maintained some material that embodied Curicaueri and that symbolized their participation in the official religion. By distributing pieces of the Curicaueri effigy to his nephews and son (ibid.:125–26) or subjects like Chapa (ibid.:109), Tariácuri symbolically delegated a part of his power, of divine origin:

> Díjoles Taríacuri: yo os quiero dar una parte de Curicaueri, ques una navaja de las que tiene consigo, y ésta pondréis en mantas, y la llevaréis allá, y a ésta traeréis vuestra leña, y haréis un rancho y un altar donde pondréis esta navaja. Y partieron con su navaja y pasaron la laguna y empezaron a hacer un cu, y una casa de los papas, y la casa del águila, y un trox a la navaja que los dio Tariácuri. (ibid.: 125–27)

> [Then Tariácuri said: I want to give you a part of Curicaueri which is a blade of those you have, but this one you will put it in a cloak, and take it back with you. You shall gather wood for this blade and you shall build a house and an altar where you will put this blade. They departed taking their blade, crossed the lake and began to build a temple and a house for the chief priests. They also built a house for the Eagles, and an altar for the blade which Tariácuri gave them]. (English translation by M. Elliott)

The symbolic value attributed to certain obsidian objects and the cult that produced them is found in other regions of Mesoamerica, such as central Mexico and the highlands of Guatemala, where various divinities appear to be associated with obsidian. Like Curicaueri, Tezcatlipoca materializes in black obsidian (Durán 1967, 1:37; León-Portilla 1985; Olivier 1997). One of the most interesting references is found in the *Relación de Itztepexic*:

> Adoraban y sacrificaban, por dios, a una navaja negra de más de dos codos (. . . 16 pulgadas, alrededor de 41 cm.), sin figura ninguna, más que la componían de plumas verdes, ricas. Y l[a] llevaban en cerros altos y en cúes para sus sacrificios, y a las batallas, cuando se ofrecía ir a ellas. (RG 1984:255–56)

[They worshipped and sacrificed, as a god, a black blade that measured more than two *codos* (. . . 16 inches, or around 41 centimeters), with no face other than an adornment of rich, green feathers. And they brought it to high hills and to *cúes* for sacrifices, and to battles, when it offered to accompany them.] (English translation by M. Elliott)

Beyond its formal content, this same reference reveals the distinction between the size of the object of the cult, referred to as a "blade" or "stone for blades," and that of instruments called *navajuelas* (razors) that were used for bloodletting in honor of this large blade. It is interesting that the object of the cult is a blade, a manufactured object, rather than simply the raw material.

Obsidian and Cosmology

Other passages in the RM discuss the symbolic value and key role of obsidian objects in Tarascan cosmology directly, particularly their links to the gods of the four parts of the world. In addition to obsidian cores and blades, chert arrowheads are personalized objects that embody Curicaueri and other gods:

Estas flechas son dioses, con cada una déstas, mata nuestro dios Curicaueri y no suelta dos flechas en vano. (RM 1977 [1574]:118)

[These arrows are gods; with each one of these, our God Curicaueri kills, and he does not loose two arrows in vain.] (English translation by M. Elliott)

Mejor fuera que no las quemárades, sino que buscáramos un cuero o carcax, y las pusiéramos en él, y las pusiéramos a nuestro dios Hurendequauécara, porque deben tener alguna deidad estas flechas, y viniera nuestro dios algunos días con ellas. (ibid.:89)

[It would have been better had you not burned them; rather we should have found a hide or a quiver to put them in and offered them to our God Hurendequauécara, because these arrows must have some quality of deity and our god came with them for a few days.] (English translation by M. Elliott)

In addition, the divine character of these arrows is evident in their names (ibid.:21, 88), their colors and feathers (white, black, yellow, and red [ibid.:88]), and their use in offering rites during hunting, war, or declarations of war (ibid.:45). Personalized attributes of warriors, the arrows not only represent the gods of the Uacusechas, but their decoration also represents a codified language. Bearing symbols of the Uacusecha identity, arrows transmit messages and warnings to enemies (ibid.:89). The religious importance of these arms is better appreciated by observing the recurrence of their association with deer

hunting, the collection of firewood, and the number four (e.g., four quivers, four arrows, four colors). Only an arrow, a divine weapon that symbolized the four parts of the world, could kill the deer that provided sacred food and whose skin served as wrapping of the gods.

Obsidian can also be related to dreams and bad omens, particularly when the equilibrium of the kingdom is threatened by behavior that deviates from the norm. If the religious classes neglected their duties, it could provoke supernatural phenomena that upset the natural and cosmic order, bringing famine and bad omens:

> y empezaron las mujeres mayores de parir piedras de navajas, y no hacían sino parir navajas negras, y blancas, y coloradas, y amarillas, todo esto, parían y empezaron a hacer cúes por todas partes y estaban todos cercados de rajas de encina, y empenzáronse de emborrachar, y llamaban las madres de la nube negra, madre de la nube blanca, y otra madre de la nube amarilla, y otra madre de la nube colorada. (ibid.:111)
>
> [The older women began to produce knives made of black, white, red, and yellow stone (began to give birth to blades, and the only thing they did was to give birth to black blades and white and red and yellow blades). They also began to build temples everywhere, all fenced about with oak planks. Then they began to get drunk and they were called Black Cloud Mother, White Cloud, Yellow Cloud, and Red Cloud Mother.] (English translation by Craine and Reindorp 1970:183; addition by author in parentheses)

This passage reveals three key points: (1) elderly women give birth to stone blades, which represent the four colors of the world directions; (2) these blades are gods produced in great quantities that do not respect the cosmic order and for whom many new temples must be constructed; (3) apparently, these gods transform into cloud deities that people invoke while drinking. This description represents a state of chaos, provoked by the gods (particularly the mother goddess) to express their anger through the elderly women who give birth to cold and sharp stones. We find here a recurring element of Mesoamerican mythology in that the uterus and the vagina, feminine elements that give life, appear associated with caves, the hearts of the earth that open to the exterior world (López Austin 1973:56), and, by extension, to the mother-deity who gives birth to the gods and to divine, masculine stone instruments (Alcina Franch 1995:318–19; López Austin 1973:55). Various myths describe these phenomena, such as that of Itzpapalotl, who shatters into five cherts of different colors (Codex Chimalpopoca; Leyenda de los Soles 1975:124) and that of Citlalicue, who gives birth to a chert knife, which is related to the origin of the 1,600 gods

and goddesses born at Chicomoztoc (see Alcina Franch 1995; Graulich 1987, López Austin 1973; Mendieta 1971; Olivier 1997; Torquemada 1975).

Obsidian, the Sky, Volcanoes, and Water

In Mesoamerican mythology, obsidian is a sacred stone associated with the subterranean world (e.g., Sololá 1980:49), and some authors explain this link by its black color and cold appearance (Graulich 1982). Obsidian, linked to the entrails of the earth where it originates, appears associated with volcanoes and, by extension, with mountains. The ethnohistoric sources indicate that these places were sacred and used for important religious rituals. The ancestors dwelled in these deified places (Broda, Carrasco, and Matos Moctezuma 1987; León-Portilla 1995:296–97; López Austin 1973:62–65; Sahagún 1981; Torquemada 1975), which had their own names and were conceived of as water tanks maintained by the rain gods (León-Portilla 1995:296). Like the Mexica, the Tarascans attributed a similar sacred role to mountains and organized part of their religious life around this belief, building temples on peaks and carrying out ceremonies in these locations (RM 1977 [1574]:70, 106, 139, 148). Furthermore, these mountains provided sacred food (firewood, incense, deer) and represented an excellent place for human beings to maintain privileged relationships with the gods.

The first pages of the RM speak about the Zinapécuaro mountain and its surroundings, rich in thermal springs and on whose peak was founded the temple of Cuerauáperi. This deity is identified in the text as the mother-goddess, goddess of the earth, of life, and of death. Associated with the thermal springs that flow from the earth, Cuerauáperi appears also as a celestial goddess because it is from these waters that clouds form and bring rain (ibid.:9–10). Like Cuerauáperi, who controls the earth-sky cycle, the volcano appears as the place of contact between the earth and sky. Its peak, *la puerta del cielo,* or "the portal to the sky" (ibid.:35), is where the gods of the sky appear (ibid.:134–35, 232). Furthermore, if we accept its etymology, the Zinapécuaro mountain is clearly designated as the place of obsidian. This conjunction leads us to draw a link between obsidian and the earth goddess who originates in Zinapécuaro. Verification of this association of ideas would confirm the pertinence of obsidian to the subterranean world, something that could clarify the qualifier *navajas de la tierra* (blades from the earth), used to designate blades at the beginning of the RM (ibid.:10) and also in the *Relación de Itztepexic* (RG 1984:249).

By extension, we can interpret the symbolism associated with the description of the elderly women giving birth: the mother-goddess uses these women to give birth to the four parts of the world in the form of obsidian blades.

They emerge from the belly of the goddess, from the entrails of the earth, and are transformed into celestial deities. The blades that emerge from the earth are gods that transform into clouds and are associated with water, having both celestial (rain) and terrestrial origins (hot springs). We now understand that obsidian blades serve for extracting blood, "precious water" (León-Portilla 1985:93), and by feeding the gods, they contribute to the proper functioning of the cosmos.

CONCLUSION

According to the RM, the obsidian core was a sacred and divine object that embodied the tutelary and sun god, Curicaueri. Obsidian was also related to the earth goddess, Cuerauáperi, and to the creation of the other celestial gods in the form of stone for blades, blades, and colored projectile points. Sacrifices to the celestial and terrestrial deities were probably made with an obsidian instrument. Among the Tarascans, obsidian therefore appears to have had a use equivalent to that of chert in Mexica cosmology. Nonetheless, I suggest that in this case color was more significant than the raw material itself, and thus, different shades of obsidian could have represented the light-dark contrast. Moreover, while black obsidian was linked to the underworld among the Mexica, it does not necessarily follow that for the Tarascans black would be linked to this concept. Translucent obsidian could have been associated with a light color and the celestial world, while translucent green could have been related to functions associated with water, life, rebirth, and vegetal abundance (Thouvenot 1982), perhaps maintained by a link to the subterranean and aquatic world (Duverger 1979:48).

Finally, my analysis of the RM affirms the catalyzing role of obsidian in processes of political and ideological affirmation for the reigning dynasty. In the text, the sacred stone and its divine pieces transform into instruments of royal and divine power. As insignias of power, instruments of justice, guarantors of military victories, and instruments that contribute to the rebirth of life and that bring death, obsidian blades become the preferred instruments to honor the gods and maintain the cosmic and terrestrial order.

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NOTES

1. Derived from the latin *obsianus petra,* or stone of Obsius, and named for the individual who is supposed to have discovered it in Ethiopia (1601), this scientific name was created in the seventeenth century to specify vitrified lava (*Oxford Latin Dictionary* 1982; *Webster's Ninth New Collegiate Dictionary* 1989).

2. In Náhuatl, varieties of obsidian are clearly differentiated, and the Spanish transcriptions made by Sahagún demonstrate their etymological particularities. Terms used to name these varieties end in the same suffix, -itztli (worked obsidian), and raw obsidian is called *itzetl* (Sahagún 1981, 3:334). Nevertheless, Sahagún's classification reveals his confusion, caused by the existence of distinct varieties of obsidian and by the absence of adequate terms to designate them. Thus, "blood chert" (*pedernal de sangre*) (ibid.:75) could in reality be a reddish obsidian; a variety of green obsidian (or a specific type of instrument?) is classified in the section "emeralds," while the other varieties were listed under the grouping "jasper," yet black obsidian is classified under the family "emeralds" because of its brilliance (ibid., 2:334).

3. No fewer than seven chroniclers describe obsidian blades and their production process. See Clark (1982, 1989) and Thouvenot (1984).

4. Although somewhat unsatisfactory, I utilize Craine and Reindorp's (1970) English translation of the *Relación de Michoacán*. I make important corrections and additions where necessary.

5. We find the same concept in Aztec society, where hairstyle indicated social rank and hair was valued as a trophy (Duverger 1979:187–90). The cutting of warriors' hair before their sacrifice marked an irreversible rupture with their prior state.

6. A few projectile points of white chalcedony have been found in the region from earlier time periods, but they could have been associated with a similar symbolic meaning.

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INAH	Instituto Nacional de Antropología e Historia
UNAM	Universidad Nacional Autónoma de México

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CHAPTER THREE

The Symbolism of Obsidian in Postclassic Central Mexico

Alejandro Pastrana and Ivonne Athie

As part of our ongoing research on the distribution of obsidian within the Aztec Triple Alliance (Pastrana 2007), we conducted a preliminary study focusing on obsidian's meaning and function among the Nahuas during the Late Postclassic period in central Mexico. The study draws on archaeological and historical information, from excavations and written accounts, dating to both the prehispanic and Colonial periods. The objective is to understand the social and spatial distribution of obsidian for Mesoamerican societies, including its place and possible function in prehispanic religion.

We attempt to identify where and how the economic and military importance of obsidian was manifest in the polytheist religion of the empire of the Triple Alliance (1325–1521 CE). Obsidian was a strategic resource, a multifunctional material used as an instrument and as a raw material. Working and using obsidian tools was a key feature cited by Paul Kirchhoff (1943) in his definition of Mesoamerica as a culture area, thus indicating this material's economic importance for society in general. Pedro Carrasco (Carrasco and Broda 1978:54) emphasizes that instruments of wood, such as *coas* (agricultural digging stick) or looms—or even artifacts of stone and bone—were relatively simple in terms of tool technology and rather easy to acquire. Thus, control over these resources cannot constitute the determinant factor for the organization of production or the economy in its totality. In regard to more spatially restricted materials, such as obsidian and copper, it is necessary to examine more deeply what is known of its acquisition and use.

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Figure 3.1. *Representations of projectile points (*Codex Magliabecchiano 1904*:figure 7r).*

Previous research on obsidian has emphasized its economic importance in productive, domestic, and artisanal activities and how these activities correspond to different levels of relative specialization. The importance of obsidian in military activities is made clear through archaeological evidence and in written documents (figure 3.1), where images of warriors appear with obsidian projectile points. The spatial distribution of obsidian artifacts, locally and regionally, attests to its trade through extensive exchange systems. Furthermore, obsidian was a fundamental component of several dedicatory offerings at the Templo Mayor at Tenochtitlan (Athie 2001) (figure 3.2). Obsidian's great utility resulted in increasingly high demand, supplied through a complex system of mining, knapping, crafting, transport, and distribution through various networks to serve diverse productive, military, and religious activities.

Our discussion follows obsidian's general production sequence, beginning with its natural characteristics, varieties, forms of extraction, knapping processes, and distribution. In addition, we discuss prehispanic beliefs concerning obsidian's origin and how its magico-religious attributes were linked to different gods. In sum, we attempt to synthesize the fragmentary information about obsidian from the perspective of Nahua religious beliefs and its

relationship to the imperial ideology of the Triple Alliance in the Late Postclassic. We also discuss examples from the Maya area that are not necessarily contemporaneous but do allow for useful comparisons that help our understanding of overriding religious conceptions of obsidian among other Mesoamerican societies.

In prehispanic times, obsidian was mined from several sources located along the Trans-Mexican Volcanic Belt in the highlands of Central Mexico. Most of these sources included gray- or black-colored obsidian, with much smaller quantities of reddish-brown material known commonly as *meca*, meaning stained or mottled. Green obsidian was found at only a few sources in Central Mexico, including Tulancingo and Sierra de las Navajas—both in the Mexican state of Hidalgo. High-quality green obsidian from the latter source, also known as the Pachuca source, included transparent, opaque, and golden varieties. The Aztec Triple Alliance relied most heavily on black-gray obsidian from the Otumba source and the predominantly green obsidian from Pachuca.

To understand the significance of obsidian and its place in Late Postclassic religion, we must define several aspects of this unusual material and its association with

Figure 3.2. *Reproduction of an obsidian scepter associated with the Mexica culture and dating to the Late Postclassic period (1300–1521 CE); an original can be found at the Museo del Templo Mayor.*

prehispanic beliefs among people of the central Mexican highlands. Obsidian was an exceedingly important commodity in prehispanic society, used to make a variety of instruments, weapons, religious items, and high-status objects. The volcanic glass's unique physical characteristics, including its strength, predictable fracture patterns, sharp edges, transparency, reflection, and shimmer, were all exploited. It was distributed extensively and played a role in all dimensions of prehispanic society, including both economic and ideological realms.

Francisco Hernández, a Spanish physician and naturalist who worked in Mexico during the 1570s, provides this valuable description of obsidian, known as "Iztli" in the Nahuatl language:

> Los cuchillos, navajas, espadas y puñales que usan los indios, y casi todos los instrumentos cortantes que solían emplear en otro tiempo (antes de que conociesen el uso del hierro), se han fabricado siempre de la piedra IZTLI en la lengua vernácula. Son estas piedras de distintos colores, azul, blanco o negro, pero todas translúcidas. Entre los españoles se hacen de ellas, adornadas de oro y plata, aras tenidas en gran estima que reflejan con admirable claridad los objetos que se les acercan; tan tersas y brillantes quedan cuando se han tallado y repulido. Sacadas de las minas, de las cuales hay muchas en México, se parten en pedazos medianos y de suyo angulosos y se frotan con otras piedrecillas más ásperas, y después, con un palo que tiene un garfio saliente como el de la llamada píxide o el del arcabuz, sujetando la piedra con los dedos gordos de los pies y arqueando lateralmente las piernas, arrancan los artesanos láminas gruesecillas con una destreza y precisión admirables; tienen éstas una faja central prominente por uno y otro lado, dos dorsos y dos filos, y son más o menos de una cuarta de largo y poco más de un dedo de ancho, de filo tan penetrante que nada puede haber más agudo, pero frágiles, que fácilmente se embotan, y que con un golpe saltan deshechas en menudos pedazos. Con estos cuchillos fijados y soldados con la goma que los indios llaman Tzinacancuítlal a un madero de cuatro dedos de ancho y del largo de una espada común, fabrican espadas tan fieras y atroces, que dividen a veces a un hombre en dos partes de un solo tajo, con tal de que sea éste el primero, pues todos los demás son casi nulos e inútiles, tales son la agudeza de esta arma y su fragilidad. Arrancando después estos cuchillos y afilándolos de nuevo, los ponen en las puntas de las flechas que, lanzadas con la tensión y fuerza de los arcos, traspasan y aun matan a los enemigos que pelean de lejos, de suerte que no las usan menos los indios en sus guerras que los nuestros las espadas, ni es menor su destreza en lanzarlas.

[The knives, blades, sword, and daggers used by the Indians, and nearly all the cutting instruments they used in the past (before they knew the use of iron), have always been made of the stone IZTLI in their native language. The stones are of different colors, blue, white, or black, but all translucent. Among the Spaniards they are made into ornaments of gold and silver, greatly valued and which reflect with astonishing clarity the objects that are near them; so smooth and shiny they are when they have been carved and polished. Taken from the mines, of which there are many in Mexico, they are cut into medium-sized pieces that have sharp edges and they are rubbed with other small stones that are rougher and then with a stick that has a protruding hook, such as the one from the so-called píxide or that of the harquebus; holding the stone with the big toes and arching the legs sideways, the craftsmen remove thick sheets with admirable dexterity and precision; these have a central and prominent ridge on both sides, two backs, and two cutting edges, and they are more or less a span long and a little more than a finger wide, of such penetrating cutting edge that nothing can be sharper, but fragile, they easily become dull, and with one blow they shatter into small pieces. With these knives fixed and welded with the glue the Indians call Tzinacancuítlal to a stick four fingers wide and as long as a common sword, they make swords so fierce and atrocious that sometimes they cut a man in two with one cut, as long as this is the first [cut], as all the others are nearly null and useless, such are the sharpness and fragility of this weapon. Removing then these knives and sharpening them again, they put them in the points of the arrows, which, thrown with the tension and strength of the bows, pierce through and even kill the enemies that fight in the distance, therefore the Indians use them in their wars as much as we use swords and with the same dexterity.] (Hernández 1959:406–7; English translation by the authors)

THE SIERRA DE LAS NAVAJAS MINES

Archaeological exploration of Aztec-associated activity areas at Sierra de las Navajas (Pachuca) has located evidence of religious practices related to both subsurface mining and surface exploitation. The deep mining operations include at least 500 pits and shafts, measuring approximately 1 meter in diameter and up to 30 meters deep, some of which include tunnels and chambers. Incense burner fragments, likely associated with religious activity, have been recorded on the surface surrounding the mine entrances and inside some of the tunnels.

Fragments of incense burners, domestic ceramics, and hammerstones have also been found in the craft workshops associated with large concentrations of lithic debris. The presence of incense burners suggests that ceremonial

activities accompanied the production of several types of artifacts. In the mining camps, we found incense burners in direct association with high concentrations of obsidian tool preforms, which would have been later transported to population centers. Thus, we found evidence of religious activity associated with the successive productive stages of extraction, manufacture, and storage of preforms. The mining process itself was guided by religious concepts that determined the schedule and order of productive activities and also expressed—through certain mythical narrations—how humans related to the gods in carrying out specific objectives of their work. For example, there were prohibitions against cutting down particular trees when there was a full moon because the wood would split (Eliade 1983). When engaged in obsidian mining or crafting, similar prohibitions or ritual requirements may have needed to be fulfilled.

In regard to exchange during the Late Postclassic, we know that most trade was carried out under the auspices or protection of specific deities who acted as patron gods. The collective group of prehispanic deities, or pantheon, was organized as a hierarchical and multiethnic kin structure, which in theory was a reflection of society (López Austin 1998). In this structure, deities specialized in particular areas, such as war, agriculture, and commerce. Ethnohistoric data concerning how social organization and religious beliefs were related to the obsidian process are brief and fragmented, whereas there is greater information concerning how other undertakings—such as agriculture, metallurgy, and lapidary—were related to corresponding patron gods and festivities.

During the initial process of obsidian procurement, miners must have thought they were disturbing the earth's entrails and the order of the gods of the underworld. From the perspective of this pre-modern and non-western mentality, minerals were likened to animate beings that grew in the matrix of the earth; they required sacred time to develop, and the miners interrupted that time (Eliade 1983). In addition, workers were intimidated by the dangers of mining, such as frequent cave-ins and other accidents. Mircea Eliade (1963) explains that for the "primitive" or pre-modern mentality, the magic of the myth is that it can reassure people that what they are about to do has been done before by the gods and heroes. It helps to cast away doubts about the result of their endeavors and makes them feel close to the gods. Aztec miners were aided by patron deities who helped them manage the risks involved in their hazardous work, including penetrating deep into the prohibited underworld (Mictlan kingdom). They believed they would return to the surface alive because the gods had already achieved this feat in ancestral times.

Figure 3.3. *Anthropomorphic sculpture of Ehecatl-Quetzalcóatl. Found at an Aztec period mine by modern miners, Sierra de las Navajas, Hidalgo.*

Archaeological Evidence

In our archaeological explorations on the summit of Sierra de las Navajas, we found evidence of ritual offerings made to the rain deity Tlaloc, including a small platform and fragments of ceramic Tlaloc vessels—possibly made locally (Cruz 1994). In the mining areas used by the Aztecs, we found at least one ritual burial and a sculpture representing the wind god Ehecatl inside a mine (figure 3.3). Representations of Itzpapalotl, the obsidian butterfly goddess, were also recovered in one of the workshops (figure 3.4). In addition, a relatively high concentration of incense burner fragments was discovered in the workshops, mining camps, and storage camps. This array of ritual and religious material supports the proposition that the obsidian source and mining operations were conceived under the cosmovision of the Aztec Triple Alliance. Sierra de las Navajas had been located in a province belonging to the Acolhua kingdom of Texcoco before falling into the hands of the Triple Alliance in 1428 CE (Acuña 1985).

Figure 3.4. *Pottery fragments with Itzpapalotl imagery. Found at obsidian workshop in Colonial period exploitation zone, Sierra de las Navajas, Hidalgo.*

OBSIDIAN AND MYTH

The analysis of myths provides models of human behavior that correspond to different stages of the development of societies. Therefore, we attempt to identify the myths that regulated the obsidian process because they must reflect the importance given to the process and its different aspects: magico-religious and socioeconomic (Eliade 1994). Eliade (1963:18–19) explains that

> myth, as experienced by archaic societies, (1) constitutes the History of the acts of the Supernaturals; (2) that this History is considered to be absolutely *true* (because it is concerned with realities) and *sacred* (because it is the work of the Supernaturals); (3) that myth is always related to a "creation," it tells how something came into existence, or how a pattern of behavior, an institution, a manner of working were established; this is why myths constitute the paradigms for all significant human acts; (4) that by knowing the myth one knows the "origin" of things and hence can control and manipulate them at will; this is not an "external," "abstract" knowledge but a knowledge that one "experiences" ritually, either by ceremonially recounting the myth or by performing the ritual for which it is the justification; (5) that in one way or another one "lives" with the myth, in the sense that one is seized by the sacred, exalting power of the events recollected or re-enacted [original italics].

Given the economic, commercial, and military importance of obsidian for the cultural groups that came together under the power of the Triple Alliance, its origin, exploitation, distribution, and use must have also been considered in religious terms.

Obsidian in Late Postclassic Mesoamerica

Nahua people appear to have acknowledged different types of obsidian, and their classification of this material may have been based on its technical and aesthetic attributes, in addition to their religious beliefs. John Clark (1989) analyzed information provided by Early Colonial period Spanish chroniclers, such as Fray Bernardino de Sahagún, who described several types of obsidian. What Hernández (1959) described as "white obsidian" may refer to the gray transparent obsidian found at several sources, such as Otumba, Paredón, Pico de Orizaba, and El Chayal (Guatemala). Obsidian from these sources varies in terms of texture and color. Toltecaliztli, or "obsidian of the masters," is described as green-blue obsidian that is characteristic of the Sierra de las Navajas source and includes different degrees of transparency, gloss, and golden-like shimmer. Another variety refers to Itztlacozauhcan, or "Place of

the golden obsidian or the yellow crystal" (Acuña 1985:313), and may be associated with a particular type of green-golden obsidian found exclusively at the Pachuca source. An additional variety of obsidian was known as Itzcuinnitztli, which had a mottled appearance, including yellow, brown, and red colors. This corresponds to the type colloquially referred to as "meca" obsidian, which is present in small quantities in most sources (Glascock et al. 1994).

Black opaque obsidian, the most common variety at most sources, may correspond to obsidian from Otumba—which was used by the Triple Alliance to make scrapers and bifacial instruments, reserving the green obsidian for elaborate prismatic blades. Black lustrous obsidian is very dark, with a glassy texture and varying degrees of transparency and translucency. It may come from several sources, including Zacualtipan, Otumba, Pizarrín, Paredón, Oyameles, Zinapécuaro, Zacapu, and other unknown sources.

An indirect clue concerning color and the meaning of obsidian can be found in the attributes used to classify *chalchihuites,* or greenstone beads, in prehispanic times. The most valuable variety was called *quetzalitztli*, defined as "a green stone, the same green as the feathers from the quetzal bird's tail, transparent and dense like obsidian, without stain, gleaming, that sweats and attracts" (Thouvenot 1982:138–39). Based on the classification recorded by Sahagún, Marc Thouvenot (ibid.) finds that the most important characteristic was an intense, homogeneous, glossy green color, which corresponds to the *quetzalchalchihuitl*—the second-most valuable type after the quetzalitztli. The unique characteristic of the quetzalitztli variety was its transparency, which suggests that this was also a valued attribute for obsidian. Examining Aztec preferences for greenstone helps us understand why they gave the name *toltecalitztli* (obsidian of the masters) to green obsidian from Sierra de las Navajas, based on its green color—like that of the chalchihuitl—and its purity. Toltecalitztli would have been appropriate for making the most perfect instruments.

Obsidian and Medicinal Applications

Regardless of its actual biological effectiveness in treating illness, obsidian's medicinal uses were probably a result of the ideological importance ascribed to its physical properties. Doris Heyden's (1987:84–85) description of the affinity between obsidian and Tezcatlipoca (Lord "Smoking Mirror") illustrates its ideological importance:

> El betún o teotlacualli que simulaba la obsidiana, también tenía propiedades medicinales. Dice Duran, "que acudían de todas partes a las dignidades de

> este templo de Tezcatlipoca . . . para que les aplicasen la medicina divina, y así les embijaban con ella la parte y donde sentían dolor, y sentían notable alivio . . . parecíales cosa celestial" . . . las madres que ofrecían sus hijos a Tezcatlipoca procuraban que fueran embijados con el betún, "que era el mismo con el que embijaban a este ídolo y con que los sacerdotes y ministros de este templo se embijaban." Igual que los sacerdotes, con el betún negro se sentían invulnerables, ya que éste los convertía en imágenes del dios.
>
> [The paste, or teotlacuali, which represents obsidian, also had medicinal properties. Duran says that "they came from everywhere to the temple of Tezcatlipoca . . . to have the divine medicine applied, and they covered with it the part where they felt pain, and they felt noticeable relief . . . it seemed to them celestial" . . . the mothers who offered their children to Tezcatlipoca made sure they were covered with the paste, "which was the same with which they covered this idol and with which the priests and ministers of this temple covered themselves." Just like the priests, with the black paste they felt invincible because this turned them into images of the god.] (English translation by the authors)

In the second book of his trilingual vocabulary, Sahagún explains that obsidian blades were thought to have protective qualities:

> También decían que si una mujer preñada veía al sol o a la luna cuando se eclipsaba, la criatura que tenía en el vientre nacería mellado los bezos. Y por esto las preñadas no osan mirar el eclipse y para que esto no aconteciese, si mirade el eclipse, poníanle una navajuela de piedra negra en el seno que tocase la carne.
>
> [They also said that if a pregnant woman saw the sun or the moon when it eclipsed, the child in her womb would be born with a harelip. And that is why the pregnant do not dare look at the eclipse, and to prevent this from happening, if she looked at the eclipse, they would put a black stone blade in the breast touching the flesh.] (Garibay 1996:145; English translation by the authors)

In this case, obsidian serves to shield the woman from the harmful effects of the celestial battle, possibly because of a mythical attribution to the black Tezcatlipoca (figure 3.5). The fact that Sahagún's informants referred specifically to blades seems irrelevant, given that blades were the most common and widely distributed obsidian instrument. In a similar context where obsidian played a protective role, Sahagún explains:

> Tenían otra superstición decían que para que no entrasen los brujos en casa a hacer daño era bueno una navaja de piedra negra en una escudilla de agua

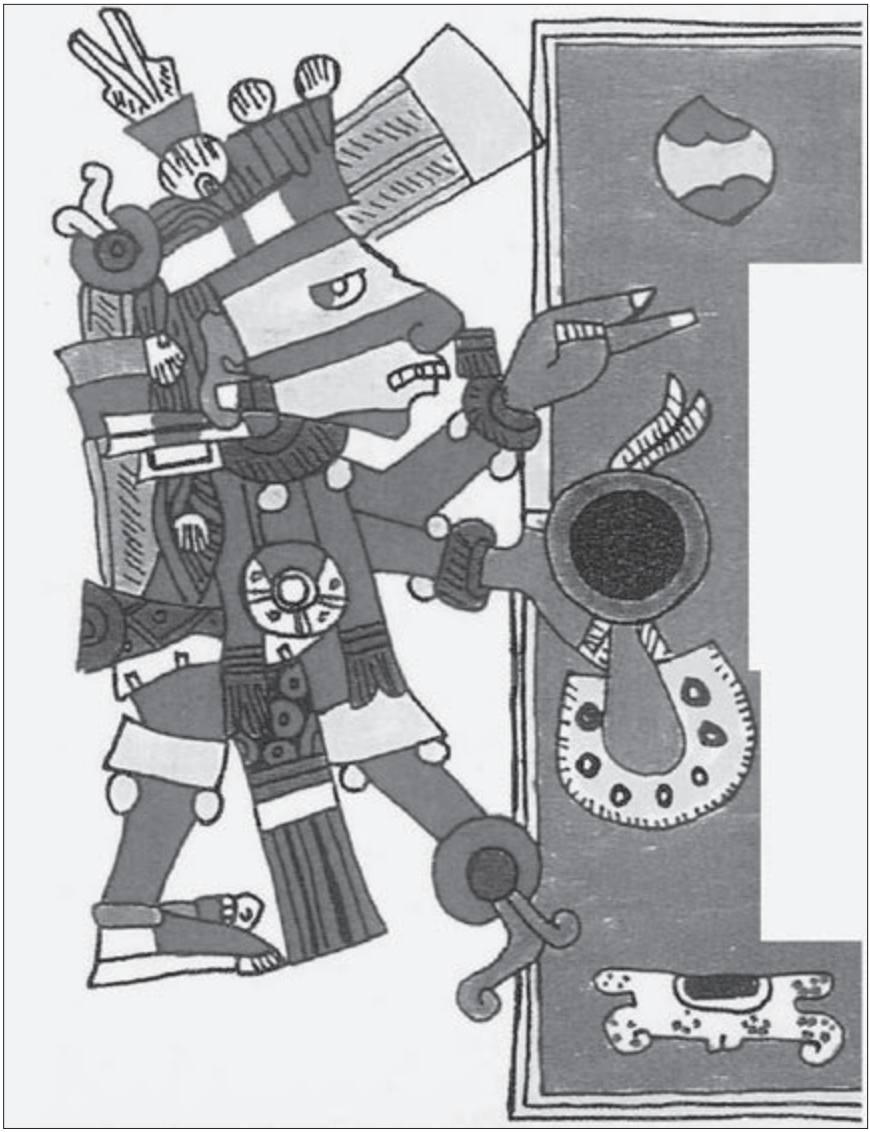

Figure 3.5. *Image of Tlatlauhqui Tezcatlipoca from the Codex Borgia (*Díaz and Rodgers 1993*:plate 21).*

puestas tras la puerta, o en el patio de la casa de noche, decían que se veían allí los brujos y en viéndose en el agua con la navaja luego huían.

[They had another superstition, they would say that to keep the sorcerers from coming into the house to do harm it was useful to place a black stone blade in a bowl of water behind the door or in the courtyard of the house at night, they said that the sorcerers would see themselves there and seeing themselves in the water with the blade they fled.] (Garibay 1996:146; English translation by the authors)

Here we see how obsidian's reflective properties, enhanced by water and evoking the attributes of Tezcatlipoca's mirror, are considered to serve as a shield against bad spirits. Also, obsidian mirrors could supposedly trap a person's image and soul (Eliade 1994). In the following passage, Sahagún explains how obsidian and other stones were ascribed healing properties:

Usaban antiguamente unos idólatras que se llaman *Tetlacuicuiliaque* para sanar a los enfermos sacarles del cuerpo fingidamente palpándoles los miembros unas piedrezuelas que se llaman Tecpatotontin otra que se llaman ascaxalli, otras que se llaman itztetl y hacíanles en creyentes que aquellos que causaba la enfermedad y que luego sanarían: úsanlo también ahora en algunas partes.

[In ancient times they used some idolaters called *Tetlacuicuilaque* to heal the sick, pretending to remove from the body touching the members (with) some stones called *Tecpatotontin* and others called *ascaxalli*, others called *itztetl* (obsidian), and they made them believers in those who caused the sickness and that they would later heal: they use it still now in some parts.] (Garibay 1996:151; English translation by the authors)

Hernández (1959:412) also noted the protective qualities ascribed to obsidian:

Tenemos una piedra traída de la Mixteca Alta, llamada Iztehuílotl y perteneciente sin duda a las variedades de iztli, de color nigérrimo y brillante, y sólo apreciable, que yo sepa, por esa razón. Tenemos también otra muy parecida a cristal y cuyo nombre no sé todavía, dotada, si es verdad lo que dicen, de virtudes admirables, pues ahuyenta los demonios, aleja las serpientes y cuanto es venenoso, y concilia el favor de los príncipes.

[We have a stone brought from the Mixteca Alta, called Iztehuílotl and belonging without a doubt to the varieties of iztli, very black in color and shiny, and appreciated only, to my knowledge, for that reason. We also have

another one, very similar to crystal and whose name I do not know yet, it has, if what they say is true, admirable virtues, as it scares away the demons, keeps away serpents and all that is poisonous, and conciliates the favor of princes.] (Hernández 1959:412; English translation by the authors)

It seems that obsidian cobbles, polished naturally through pluvial transportation, were used in a manner similar to greenstone pebbles commonly referred to as "kidney stones" or "liver stones" because of their formal similarity to these human organs. Like the organ-shaped greenstones, obsidian's black, polished, and gleaming qualities were associated with certain parts of the body and consequently used to cure ailments associated with those parts (Thouvenot 1982). Hernández (1959) recorded additional medicinal properties attributed to certain types of obsidian:

El Toltecaiztli o piedra de navajas abigarrada es una especie de iztli, del que antes hemos hablado, de colores negro bermejo, y cuyo polvo mezclado con el de cristal dicen que disuelve las nubes de los ojos, aclara la vista y consume las excrecencias de los mismos.

[The Toltecaiztli, or mixed blade stone, is a type of iztli (obsidian), of which we have talked about before, of black red colors and whose powder mixed with the powder of crystal is said to dissolve the clouds in the eyes, clarify sight, and consume the excrescences of the eyes.] (Hernández 1959:411; English translation by the authors)

In Mexico today, people continue to associate obsidian with certain powers and qualities, which probably stem from beliefs rooted in the prehispanic past. Some of these associations may be traced back to the state of Teotihuacan, where archaeological evidence indicates a great variety of practical and religious uses of obsidian. Regarding the latter, a minimum amount of information has been analyzed, even though there is an extensive archaeological record. Iconographic evidence from the Postclassic period indicates that deities such as Tezcatlipoca and Itzpapalotl were symbolically and physically related to obsidian.

In sum, obsidian's unique physical and aesthetic characteristics attracted the attention of many Mesoamerican cultures through time. A repeating archetype associated with obsidian is that of the mirror, a shield that generates and possesses the images it reflects; this is understandable because "primitive thought" has not altogether disappeared in modern society (Eliade 1963) (figure 3.6).

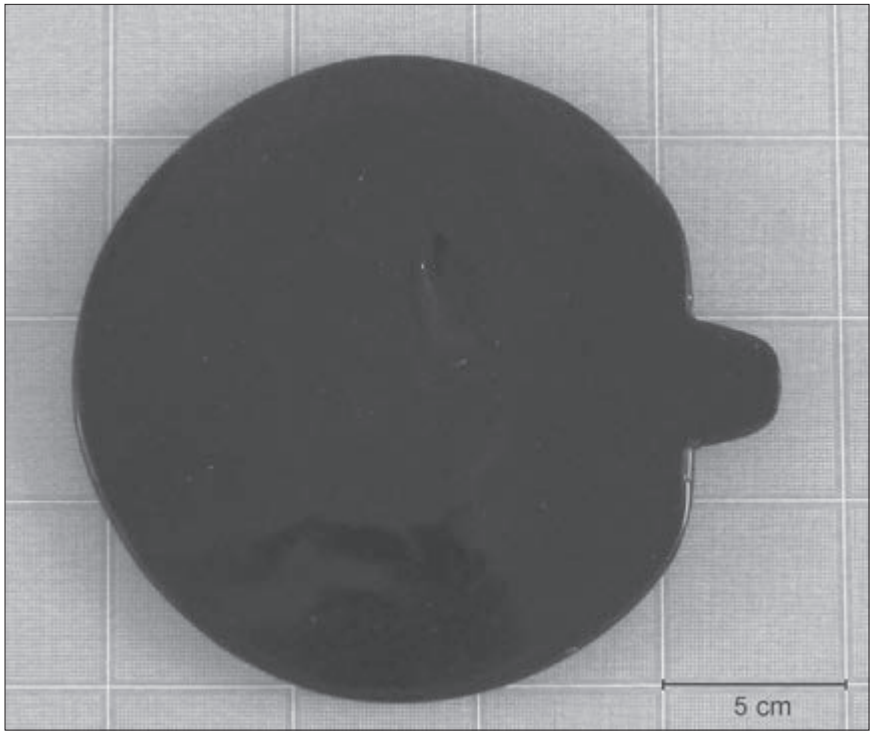

Figure 3.6. *Reproduction of an obsidian mirror associated with the Mexica culture and dating to the Late Postclassic (1300–1521 CE); an original can be found at the Museo Nacional de Antropología.*

Sounds of Obsidian

Considering that obsidian is a volcanic glass, it makes a distinctive sound unlike any other stone when fractured. While the sonority of glass "clinking" is common today, in prehispanic times it must have been a special sound, comparable only to that made by plumbate ceramics. The selection of raw obsidian, based on its purity and quality, is extremely important for the successful production of implements and tools. Obsidian quality can be determined by a master artisan, in part by the distinctive sound it makes when tested by a hammer. Obsidian's sonorous qualities therefore constitute a fundamental property of the stone (Jaques Tixier, personal communication, 2000). The Codex Mendoza also records these characteristics linking obsidian with sound:

Itzapan Nanatzcayan. (Itztli, obsidiana; atl, agua; pan, en; nanatzca, crujir; yan, donde: "Lugar donde crujen ó rechinan en el agua las piedras de obsidian") Mansión del dios de los muertos y el cielo de las tempestades en que vive la luna. Allí se forma el granizo. Comparaban los nahoas el ruido precursor de las tempestades de granizo con el sordo rumor que producirían los cantos de obsidiana arrebatados por una impetuosa corriente de agua.

Itzapan nanatzcayan, la terrible Morada de los muertos, donde el cetro
Mictlantecutli empuña majestuoso,
Es la postrer mansión de los humanos;
Allí mora la luna, y á los muertos
Melancólica fase los alumbra;
Es la región do piedras de obsidiana
Con gran rumor sobre las aguas crujen
Y rechinan y truenan y se empujan
Y forman tempestades pavorosas.

[Itzapan Nanatzcayan. (Itztli, obsidian; atl, water; pan, in; nanatzca, creak; yan, where: "Place where the obsidian stones creak or screech in the water"). Mansion of the god of the dead and the sky of storms where the moon lives. Hail is formed there. The Nahuas compared the auditory precursor of hailstorms with the dull sound produced by the obsidian cobbles being snatched by an impetuous water current.

Itzapan nanatzcayan, the terrible
Dwelling of the dead, where the staff
Is held majestically by Mictlantecuhtli,
It is the last mansion of humans;
The moon lives there and
A melancholic phase illuminates the dead;
It is the region where obsidian stones
Creak with great sound on the waters
And they screech and roar and are pushed
And form terrifying storms.] (Echeagaray 1979:214–15; English translation by the authors)

This poem includes a melding of religious beliefs concerning the underworld with a description of natural features present at the Sierra de las Navajas, Otumba, and Pico de Orizaba obsidian sources. At these sources, areas of pluvial erosion often provide a good geological indicator for locating areas of exploitation because the seasonal and annual water currents remove volcanic ash, thereby exposing obsidian flows and blocks in large areas. In some cases,

especially during the rainy season, low areas of the mines may become flooded, bringing large quantities of obsidian into direct contact with water and creating a special sound similar to that of thunder, thereby recalling obsidian's celestial origins.

Aztec-era mines at the Sierra de las Navajas source can reach depths of up to 30 meters (Acuña 1985). Here we observe areas where obsidian deposits have been fractured by the pressure of the rock and the cooling of the lava flows. Miners removed the stone by lever pressing, a prehispanic mining technique that produces distinctive low- and high-pitched sounds resulting from pressure where the lever tool came into contact with and flaked the edges of the raw material.

Another distinctive sound associated with obsidian can be heard at Sierra de las Navajas during storms, when hailstones strike the extensive heaps of discarded obsidian flakes and debitage associated with the workshop areas. It is probable that among prehispanic people, this sound signified that the ice and the obsidian were part of the same harmful nature associated with the punishment of the gods (Spranz 1933).

Volcanic Origin of Obsidian

Because obsidian was used throughout central Mesoamerica, it is important to review native concepts regarding its origin. To approach indigenous understandings of obsidian through myth, we need to determine whether Mesoamericans associated the formation of obsidian with volcanic activity. We know people witnessed several volcanic phenomena of varying nature and magnitude; for example, the eruption of the Xitle volcano that buried Cuicuilco (Hubp et al. 2001), several eruptions associated with Popocatepetl and Pico de Orizaba (Cantagrel, Gourgaud, and Robin 1984; Hoskuldsson and Robin 1993; Siebe et al. 1996), additional volcanic activity in the Tuxtlas region, and probably other volcanic events in the states of Jalisco, Nayarit, and Michoacán (Yarza 1971).

This excerpt from a Nahua myth known as the *Leyenda de los Soles* undoubtedly records the consecutive stages of a volcanic eruption of basaltic composition. It probably refers to the last eruptive stages of either the Xitle or Popocatepetl volcanoes:

> Se cimentó luego el tercer Sol.
> Su signo era 4-Lluvia.
> Se decía Sol de Lluvia (de fuego).

Sucedió que durante él llovió fuego,
los que en el vivían se quemaron.
Y durante él llovió también arena.
y decían que en él
llovieron las piedrezuelas que vemos,
que hirvió la piedra tezontle
y que entonces se enrojecieron los peñascos.

[Then the third Sun was founded.
Its sign was 4-Rain.
It was called Sun of Rain (of fire).
It happened that during (the third Sun) it rained fire,
the ones who lived in it were burned.
And during the sun it also rained sand.
and they said that in it
the stones that we see rained down,
that the tezontle stone boiled
and that then the crags turned red.] (León-Portilla 1961:15–16; English translation by the authors)

It appears that all of the volcanic eruptions that could have been recorded by prehispanic societies were of basaltic composition, which does not result in the formation of obsidian deposits. Therefore, the probability of a clear association between obsidian and volcanic events by direct observation is low. Véronique Darras (1999), however, considers it possible that prehispanic people associated the igneous origin of obsidian with volcanic phenomena and believes these in turn were related to mountains and, by extension, water. However, the eruptions that formed the main obsidian sources in Mexico correspond geologically to the end of the Tertiary Period (4.5 million to 7 million years ago), too early to have been observed directly by Mesoamericans. In addition, not all sources are located in mountains, nor do all volcanic phenomena form mountains. Thus, the association among volcano-obsidian-mountain-water is not likely to be direct.

CELESTIAL ORIGIN OF OBSIDIAN

Considering that there is "an important and irrefutable religious tradition with Mesoamerican roots" (López Austin 1992:32) in which we find many examples of continuity, we have recorded accounts in different localities in Mexico that explain the origin of obsidian as "pieces of stars." Theses accounts,

some recorded close to obsidian sources in the states of Hidalgo, Puebla, and Veracruz, are very similar to the widespread European tradition explaining the origin of chert and chalcedony (microcrystalline quartz) as having associations with stars or lightning stones. From the European perspective, meteorites were celestial phenomena that came from the sky above and had a masculine essence. Eliade (1977:20–21) explains that "certain silex [flint] and neolithic tools were subsequently given names like 'thunderstones,' 'thunderbolt teeth' or 'God's axes.' The sites where they were found were thought to have been struck by a thunderbolt . . . These axes, like the thunderbolt and the meteorites, 'cleaved' the earth, they symbolized, in other words, the union between heaven and earth."

In the vicinity of the extinct volcano Cofre de Perote, in the state of Veracruz, there are obsidian nodules and artifact fragments that come from the Jaltipan and Pico de Orizaba sources. We asked a local resident how obsidian was formed, and he answered, "You find that kind of stone when you dig under trees that have been struck by lightning." Rooted in legend, this explanation could also refer to the real existence of *tektites*, glass objects produced when lightning strikes the ground, raising the temperature to over 2,000°C and melting the siliceous minerals and aluminum present in the soil. Tektites are frequently confused with obsidian. In 1844, Charles Darwin carried out the first scientific research on tektites and concluded that they were glass of volcanic origin, volcanic bombs—in other words, obsidian (Bagnall 1991). At present, we know that tektites and obsidian have similar properties and are easily confused visually and chemically. However, compared to obsidian, tektites are harder, have a smaller proportion of water content, and were subject to different thermal conditions during their formation process (Heide, Heide, and Kloess 2001).

There are different types of tektites in addition to those formed by lightning. The majority of tektites are thought to have been formed by the impact of meteorites on the earth's surface, but another hypothesis suggests that they were formed by meteorites that impacted the moon's surface and were then attracted by the earth's gravitational field (Bagnall 1991:113). The origin of tektites, however, is not fully resolved (McCall 2001).

From our perspective, tektites and their link to the surficial impact of lightning or meteorites is an observation of natural phenomena between heaven and earth that could in part explain the archetype of the "lightning stone." The prehistoric conception that there is a celestial origin of vitreous rocks is common in many parts of the world and shows a certain connection between the celestial and terrestrial worlds. In the Mesoamerican tradition, obsidian and

chert have celestial and therefore divine origins. They are also seen as materials that leave residual evidence or "divine secretions," as is the case with beliefs about the existence of gold and other metals among other cultures (Eliade 1983). When Eliade was studying pre-scientific knowledge and the universality of archetypical conceptions, he cited Thomas A. Rickard who wrote: "When Cortez enquired of the Aztec chiefs whence they obtained their knives they simply pointed to the sky" (quoted in Eliade 1977:21). In this case, we do not know whether the knives in question were made from obsidian or flint.

Considering that Mesoamerican religions have a common foundation, it should not be surprising that the celestial origin of obsidian and flint is also present in Maya mythology, perhaps dating to the Late Classic period. In Karen Bassie-Sweet's (1991:117) study of Maya conceptions of caves, she writes: "In Maya mythology, flint and obsidian are said to be formed when lightning (*cauac*) strikes the earth. Axe heads, which are made of obsidian or flint, are marked with *cauac* elements to indicate that they are a manifestation of the lightning and by extension, Chac." Furthermore, in the Maya case, obsidian is a product of the union of a celestial element with the earth, like a type of seed from a divine copulation. The origins of obsidian are discussed in this passage from the *Annals of the Cakchiqueles*, which dates to the early seventeenth century:

> Entonces fue creada la Piedra de Obsidiana (Ri chay abah. La piedra de chay u obsidiana . . . Los cakchiqueles veneraban esta piedra como símbolo de la divinidad) por el hermoso Xibalbay, por el precioso Xibalbay (. . . Xibalbay como uno de los sitios dotados de riqueza y hermosura donde tuvo su cuna la piedra sagrada, Chay Abah. La indicación de que la piedra de obsidiana que como todo mineral, se cría en el interior de la tierra, provino del precioso Xibalbay, da a entender que los cackchiqueles se imaginaban a éste como reino subterráneo de gran poder y magnificencia.)
>
> [It was then that the Obsidian Stone was created (Ri chay abah. The stone of *chay* or obsidian . . . The Cakchiqueles venerated this stone as a symbol of divinity) by the beautiful Xibalbay, by the precious Xibalbay. (Xibalbay was one of the places provided with wealth and beauty where the sacred stone, Chay Abah, had its cradle. The indication that the obsidian stone like every mineral was raised in the interior of the earth, it came from the precious Xibalbay, seems to suggest that the Cakchiqueles imagined this to be an underground realm of great power and magnificence.] (Recinos 1950:49; English translation by the authors)

This quote establishes obsidian's clear terrestrial origin, coming from the underworld, the sacred and special place. Its formation goes back to before

humans settled down, to the origins of society, when the gods talk through an oracle to order what places should be settled (ibid.:52). Its origins go back to the moment when humans were created, like the stone that represents the beginning of a lineage, like a witness of the primeval reproduction.

A possible indirect link between the volcanic and celestial origins of obsidian is the common proposal in which the erupting volcano is conceived of as a creator of stars. In central Mexico, an active volcano is associated with Xiutecuhtli (god of fire) and red-mottled meca obsidian. Eric Thompson (1966:87) also notes that "Xipe, the god of flaying, was also an obsidian god, but apparently of the rare red obsidian or of the white flint."

In researching the origin of obsidian, we must also consider the mythical origins of flint, as in many cases the ethnohistorical accounts do not clearly distinguish among chert or flint, chalcedony, and obsidian. Normally, references to flint should be understood as a non-volcanic glass called *tecpatl* in Nahuatl. Another important concern is the apparently intentional alternation of the terms *tecpatl* and *itztli* in the written accounts. For example, various representations of Itzpapalotl, the obsidian butterfly, feature wings formed or adorned with "tecpatl" or chert knives. Michel Graulich (1990:106) retells a myth describing the birth of tecpatl in the celestial realm, from which other gods and people were born: "In an opulent and glorious city, located in the highest part of heaven, Omecihuatl or Citlalicue bore a flint knife (*tecpatl*). Frightened, their children, the gods, threw the flint knife from heaven, and it landed in Chicomoztoc ('seven caves'). Sixteen hundred gods sprang forth from it. Those gods, seeing that they were confined to the earth, implored their mother, through a falcon, for permission to create people who would serve them."

Obsidian and Mining

As they penetrate the earth, the miners' experience is a sacred one, since it coincides with symbolism linked to rituals of initiation. This is the *regressus ad uterum,* or the return to the beginning, with the "initiatory passage through a *vagina dentata*, or the dangerous descent into a cave or crevice assimilated to the mouth or the uterus of Mother Earth" (Eliade 1963:81). Because of this fundamental concept, it was important for miners to perform rituals prior to their excavations, as they descended, and when they removed raw material from the alien world below. The miners' guilds must have communed with the underworld gods to ensure a safe return to the surface of the earth with the precious minerals in tow. In other areas of the world, among the Bayeca (Africa) copper miners, for instance, "it is always the chief who decides where

to start to perforate a mine so as to not disturb or annoy the mountain spirits" (Eliade 1983:54). These rites are frequently accompanied by lullabies because the minerals are believed to be a kind of fetus whose sacred gestation time has been altered (Matos Moctezuma 1986).

Pre-modern groups that specialized in mining, regardless of their degree of development or the kind of metallic or non-metallic mineral they exploited, shared ancestral archetypical forms. Mining and artisanal groups related to mining preserved religious beliefs and technical knowledge in a stable manner through time and social development (Eliade 1983).

In the Late Postclassic, those who lived near the Sierra de las Navajas obsidian source would have shared the Nahua comsmovision common to Central Mexico. This is demonstrated by evidence for ritual offerings made to Tlaloc on the mountain summit where heaven and earth connect, in the presence of materials associated with Ehecatl-Quetzalcoatl in the mines, and images of Itzpapalotl appearing in the workshops. The miners at Sierra de las Navajas may have also shared the belief that the mountain was under the protection of the god Tezcatlipoca, under its advocation of Tepeyotl, the heart of the hill. In penetrating the skin of the earth, fundamental to mining, they penetrated the underworld.

The ancient Nahuas divided the cosmos into thirteen celestial levels and nine levels of the underworld. Each level was inhabited by multiple gods and other minor supernatural beings. The gods are frequently represented in couples as a projection of the cosmic duality (López Austin 1989:60). Based on his study of the Codex Vaticanus and the Florentine Codex, Alfredo López Austin (1988:55–56) defines the levels of the underworld as follows:

The 4th earthly level—Obsidian Hill—Itztepetl

The 5th earthly level—Place of the obsidian wind—Itzehecayan

The 8th celestial level—Place that has corners of obsidian slabs—Itztapalnacazcayan(?)

The 9th earthly level—The obsidian place of the dead, place with no outlet for smoke—Itzmictlan apochcalocan.

As conceived above, we believe that some of these terrestrial levels may make direct or indirect references to obsidian mines. We cannot help but think that Felipe Solís Olguín's (1994) description of the journey of the dead into the underworld has some parallels with the experiences and sensations one has when descending into a 30-meter-deep prehispanic mine.

According to Mesoamerican belief, mines are terrestrial, cold, humid, feminine, and located beneath. We believe that what differentiates caves from mines is that the latter are manmade constructions that reach deep into the earth and serve as a means to obtain a natural product, using conscious technical knowledge together with a magical, religious, and pre-scientific knowledge. If mines are different than caves, then it is necessary to locate them in the right myth.

The inferior, terrestrial, aquatic world was seen as the origin of rivers, creeks, wind, and clouds, which came from the mountains that rose from the surface of the earth. They released their loads on rivers or in caves on the mountains that broke clouds and winds. The inferior world was full of wealth (water, seeds, and metals), but at the same time it was conceived of as barren and cruel by peasants who depended on the often unreliable rainfall. They imagined that this aquatic and terrestrial world was polluted by death and guarded jealously by the dangerous "owners of springs and forests." Even today, places that are sources of wealth—springs, forests, and mines—are believed to be communication points between the world of humans and the underworld and are protected by the Ohuican Chaneque, the "owners of the dangerous places" (López Austin 1989:61).

As far as we know, Sierra de las Navajas and Otumba were the only obsidian sources in Central Mexico where deep mining operations were carried out. At Otumba, mines typically took the form of horizontal excavations, while mining activity was much deeper (over 30 meters) and more intensive at Sierra de las Navajas. Aztec-era native conceptions of mining and associations with the underworld might be rooted in earlier traditions from Teotihuacan, the first state in the central highlands to develop deep obsidian mines, which became an activity of great economic importance.

OBSIDIAN PRODUCTION PROCESS

The general process of obsidian production, including instruments (mainly blades and scrapers) and weapons (projectile points, knives, and blades), was carried out in two stages (Cobean 1991; Healan 1986; Pastrana 1998). The first took place at the source, immediately after the blocks were extracted from the mines, while the second was carried out in the communities. The objectives of the first stage were to select obsidian of good quality and to remove excess material by knapping and preparing preforms. In this way, the preforms were lighter but still impact-resistant enough to be transported. Archaeological materials derived from the first stage of production have been found at large

workshop areas close to the mines at the source. Once the preforms were transported and distributed among towns, the second stage of knapping took place in the *calpulli* (neighborhoods), market, and palace workshops to finish the tools or instruments.

Throughout the first and second stages of production, there was technical continuity that was standardized, since it was carried out by different groups of artisans. The craftspeople who carried out the first stage of production at Sierra de las Navajas came from Epazoyuca, a town 12 kilometers to the south. Since its foundation in approximately 1380 CE, Epazoyuca had been subject to Texcoco, which later became part of the Aztec Triple Alliance. Although its inhabitants were Otomi, they had adopted aspects of Nahua culture, and their rulers spoke Nahuatl (Reyes-Valerio 1978). At the Sierra de las Navajas source, the domestic ceramics used by the miners correspond to the Aztec III black-orange type, probably from Texcoco. All of these factors suggest that the dominant religion at the sources was that of the Triple Alliance. Working obsidian, both at the source and in the towns, was an important activity that required skilled specialists because any mistake would be a costly waste of raw material and effort.

The inherent danger of injury that can result from working with obsidian and its sharp edges must also be considered. In this quote, Fray Toribio de Motolinía (1973:44–45) describes the importance of religious piety among the obsidian artisans, or *itzcopenhquen*: "venían los maestros que sacaban las navajas, también ayunados y rezados, y sacaban muchas navajas . . . y si alguna se quebraba a el sacar, decíanles que no habían ayunado bien" [the masters who removed the blades came, having fasted and prayed, and removed many blades . . . and if one broke as he removed it, they were told they had not fasted well; English translation by the authors].

Archaeological evidence provides the only available information regarding deities that protected artisans who worked in workshops at the sources. Incense burner fragments are found throughout the workshops, while at the Sierra de las Navajas source, we found the remains of a ceramic box bearing the image of Itzpapalotl (Pastrana 1998, 2007). The ceramic fragments were located among the debris in a workshop where scrapers and blade cores were made, in an area dating to the Colonial period (1521–40 CE). This context shows that the deposit of ceramic material was contemporaneous with the accumulation of debris that formed the workshop. The presence of images of Itzpapalotl at the source, directly linked to a production context, led us to look for a connection between this deity and the knappers, who came from Epazoyuca, as mentioned earlier. This town was probably organized into four calpullis and one *tecpan*, or ruling house.

In the case of obsidian craft production, where different stages occurred in different places and were carried out by different groups of craftsmen, it is possible that they adopted a local or calpulli deity. Alternatively, there may have been a particular deity associated with obsidian crafting that was venerated by workers regardless of their particular place and cultural affiliation.

Deities Related to the Obsidian Production Process

Several researchers have discussed the prehispanic meaning of obsidian (Barjau 1991; Clark 1989; Graulich 1990; Heyden 1981, 1987, 1988; Nagao 1985; Olivier 1997) but without carrying out systematic studies, considering its multiple aspects, and drawing on both archaeological and ethnological data. Prehispanic conceptions of obsidian are found in several areas of Nahua culture, from the process of making basic tools and weapons to the important characteristics of both celestial and terrestrial deities. Obsidian's aesthetic properties and ideological significance are referred to in the magico-religious spheres, where these aspects merge with the attributes, functions, and myths associated with various deities within the Mexica pantheon.

Regarding the analysis of obsidian conceptions in the Nahua religion, we propose the following: if the main deities in a society exhibit formal or symbolic attributes with different degrees of abstraction, related to a raw material—in this case, obsidian—it therefore means that the material has been an integral part of its culture at an economic and ideological level since remote times because the organization of the gods is a reflection and abstraction of society itself. Formally, the deities directly related to obsidian are Tezcatlipoca, Itztlacoliuhqui, Itzli, and Itzpapalotl. Based on archaeological research at obsidian procurement areas, Ehecatl-Quetzalcoatl is directly associated with the divine couple Tezcatlipoca-Quetzalcoatl.

Tezcatlipoca

The cult of Tezcatlipoca was comparable in importance to that of Huitzilopochtli, the supreme deity of the Mexica. The festival dedicated to Tezcatlipoca, known as "Toxcatl" (what is dry), was celebrated on May 19 and was the fourth feast in the Nahua calendar. Tezcatlipoca was considered a lunar deity; during the festival in his honor, the darkness of night and wind were invoked. Luis Barjau (1991) points out that Tezcatlipoca was one of the few gods who had no partner and was also known by a great number of names. Tezcatlipoca also had a wide variety of functions, especially those associated with predictions about the future and uncertainty. In a way, Tezcatlipoca was the god in

charge of disrupting the human order in the sense explained by Eliade (1994); he disturbed the coexistence of the gods, humans, and nature. Tezcatlipoca is responsible for the commotion, the chaos, the interruption of human religiosity, and the world order itself.

Guilhem Olivier (1997) observes that among the different images of Tezcatlipoca as the god Itztli (obsidian instrument), representations of tecpatl (flint stone) are used instead of itztli ones. Unquestionably, two elements that are fundamental to making identifications of Tezcatlipoca are the obsidian mirror and knife, both of which are found in the archaeological record (ibid.). The direct link between Tezcatlipoca and obsidian is displayed in his distinctive characteristics: his obsidian mirror, sandals, and knife. The god's image was also made of obsidian in the main cities and from wood in smaller towns, painted in black. This is the reason black was the priest's color in Central Mexico, and it symbolized the protection and strength of the warrior.

Itztlacoliuhqui

A mythical reference to the celestial origin of obsidian is recorded in the description of Itztlacoliuhqui, the god that portrays a curved, jagged knife. The god's cap has an arrow, just like a star that fell from the sky after it was pierced by an arrow as a divine punishment (Seler 1988). This god's role is related to justice and human punishment. Itztlacoliuhqui may also be a metaphor for sharp white ice, a kind of frozen obsidian, comparable to the understanding of the fifth level of the underworld, where the cold wind cuts like an obsidian blade.

Itztli

The following description was recorded in the *Relaciones Geográficas* (Acuña 1985:255–56): in this text, a double function of obsidian can be observed within the same rite, as the representation and concretion of a deity and as the raw material used to make instruments for self-sacrifice. The same deity penetrates the flesh and is the recipient of the blood offering, since obsidian is the god and the instrument. The obsidian instrument is probably the symbol of the god Itztli, as an aspect of Tezcatlipoca when he exerted punitive justice.

Regarding military activity, we know the Aztec jaguar warriors were protected by Tezcatlipoca and the eagle warriors by Huitzilopochtli (Olivier 1997). According to Heyden (1974), obsidian's black color is related to invisibility, protection against night sickness, and protection against war enemies. It seems that in a similar way, the Chichimecs worshipped their patron god Mixcoatl in the form of a white flint.

In several physical anthropological studies of ritual sacrifice in Central Mexico, dating from the Middle Formative to the Late Postclassic, there is evidence that obsidian blades and knives were used to dismember and skin human bodies; furthermore, these instruments may have been made in ritual contexts (Pijoan 1997; Pijoan, Pastrana, and Maquívar 1989).

Itzpapalotl

The goddess Itzpapalotl is directly linked to obsidian because of the fact that her wings are made or ornamented by obsidian knives. Nevertheless, in some representations her wings appear to be composed of flint or chalcedony knives. This deity is of Chichimec origin and was the partner of the god of hunting, Mixcoatl.

Itzpapalotl is the black obsidian butterfly. This is a sacred raw material associated with creation myths, and it represents the heart of the earth and is the same deity among the Mexica. Tlalli Yioll —the Heart of the Earth—was one of the names of the "Mother Goddess." Itzpapalotl, Mother Goddess, represents the earth and the moon and is a warrior deity, protector of the Cihuateteo (women who died during childbirth), and a representative of the old Chichimec times. Later, the cult of Itzpapalotl was replaced by one dedicated to Mixcoatl (Heyden 1974). The obsidian butterfly, among other butterfly insignia, was also used as a military emblem (ibid.; Ojeda 1986; Sullivan 1972) in the warrior costumes paid in tribute to the Aztecs.

An image of Itzpapalotl, a Mexica warrior deity of possible Chichimec tradition, was found at the Sierra de las Navajas obsidian source and directly linked to a context of obsidian knapping at the time of Spanish contact. It was recovered in the vicinity of a Franciscan chapel dated to 1524–37 CE, possibly marking the participation of both indigenous and Spanish people in religious activities, with two different symbolisms and conceptions (Pastrana 1998).

CONCLUSION

Our discussion concerning Nahua conceptions of obsidian associated with certain rites and deities has been organized according to two aspects that are closely linked. On one hand, we have recovered archaeological data on ritual activities and images of deities in relation to different stages of mining and knapping. On the other hand, we have examined deities related to obsidian and their place within the religious structure that gives order to the world.

Obsidian is an element of celestial origin that resides in the underworld. Obsidian and humans share characteristics related to their creation, as both are generated by the contact of two worlds in the liminal space of caves; obsidian is physically and metaphorically located in the underworld but is also the product of the union between the sky and earth, which occurs when lightning penetrates the earth. Thus, obsidian is dark, cold, and humid but also lunar and celestial. The contact between the celestial and terrestrial worlds is described by Alfredo López Austin (1998:55):

> El descenso del semen fecundante parece adoptar tres formas principales: primero, el dardo que se clava en la tierra; segundo, la caída de alguno de los dioses, hijos de la pareja celeste, o tercero, la forma intermedia, el golpe de un navajón, parido por Citlalicue—consorte de Citlaltónac . . . La flecha, el navajón, o los dioses llegan al sitio femenino, que es una roca, una cueva, un lugar llamado Texcalco—"en el peñasco"—se hunde en el suelo.
>
> [The descent of the fertilizing semen seems to adopt three main forms: first, the dart that pierces the earth; second, the fall of one of the gods, children of the celestial couple; or third, the intermediate form, the blow of a blade, which was born from Citlalicue—Citlatónac's consort . . . The arrow, the blade, or the gods arrive at the feminine site, which is a rock or a cave, a place called Texalco—"in the crag"—it sinks in the ground.] (English translation by the authors)

According to this mythical conception, obsidian is understood as celestial semen in the matrix of the earth. Such an understanding shows its sacred and generative importance for humanity and for the creation of the world, since it is an intimate reminder of the primeval sex act, which in *illo tempore* remits us to the moment of creation, where the beginning of the world is clean and perfect (Eliade 1994).

The presence of a sculpture representing Ehecatl-Quetzalcoatl in the depths of an Aztec obsidian mine in Sierra de las Navajas suggests that this deity was associated with the protection of miners. The excavation and extraction of obsidian from the mines is a sacred act that must be propitiated by Quetzalcoatl-Xolotl; he protects the miners because he can access Mictlan (the underworld), since during a mythical venture he penetrated and stole the bones to regenerate humanity (López Austin 1998:32). At the same time, Quetzalcoatl's association with mining is consistent with this deity's function as creator of the arts and trades.

The presence of images of Itzpapalotl at the obsidian workshops may be explained by her possible role as the patroness of knapping. Itzpapalotl was a

Figure 3.7. *Deities incorporating butterfly imagery in their portraits: Papaloxáhual–Xochipilli (from* Franco 1961*).*

warrior goddess of Chichimec origin, nocturnal, and her image was used as an insignia by some Mexica warriors (Sullivan 1972). She is related to sacrifice, to mother earth, and possibly to obsidian's mythical origins.

Obsidian stoneworkers formed part of the lapidary trade, which included the working, finishing, and polishing of various types of stones. Sahagún (1992:524) mentions that lapidaries worshipped Papaloxáhual, the one who has butterflies as facial paint. This deity is also related to gods of noble arts, such as Tlapapalo, red butterfly; Macuil calli, five house; Macuil Xochitl, five flower; and Nahualpilli, prince magician (Franco 1961; figure 3.7).

The deity Itztli is represented as the obsidian knife when it exerted punitive justice; it is also possibly related to Itztlacoliuhqui, the curved obsidian knife. The direct association between obsidian and Tezcatlipoca is evident in the god's distinctive obsidian mirror, sandals, and knife. His main attributes are war, protection, prediction, justice, and punishment. In relation to Tezcatlipoca, Solís Olguín (1994) identifies the "smoking mirror" as one of the most fascinating elements in prehispanic mythology. Regarding Tezcatlipoca's place in the hierarchy of the Mexica pantheon, Solís Olguín (ibid.:223) explains: "It is clear that Tezcatlipoca and obsidian properties meld and embody the god itself, in the fundamental aspects of the origin of life, of government, of war, and of the destiny of people. The obsidian mirror is part of the power of prediction, and the knife is the one that judges the actions of men" (English translation by the authors).

To summarize the series of deities related to working obsidian, the source of the volcanic stone is located on a hill or mountain, where Tepeyolotl reigns; the deep mining pierces and penetrates into Mictlan, under the protection of

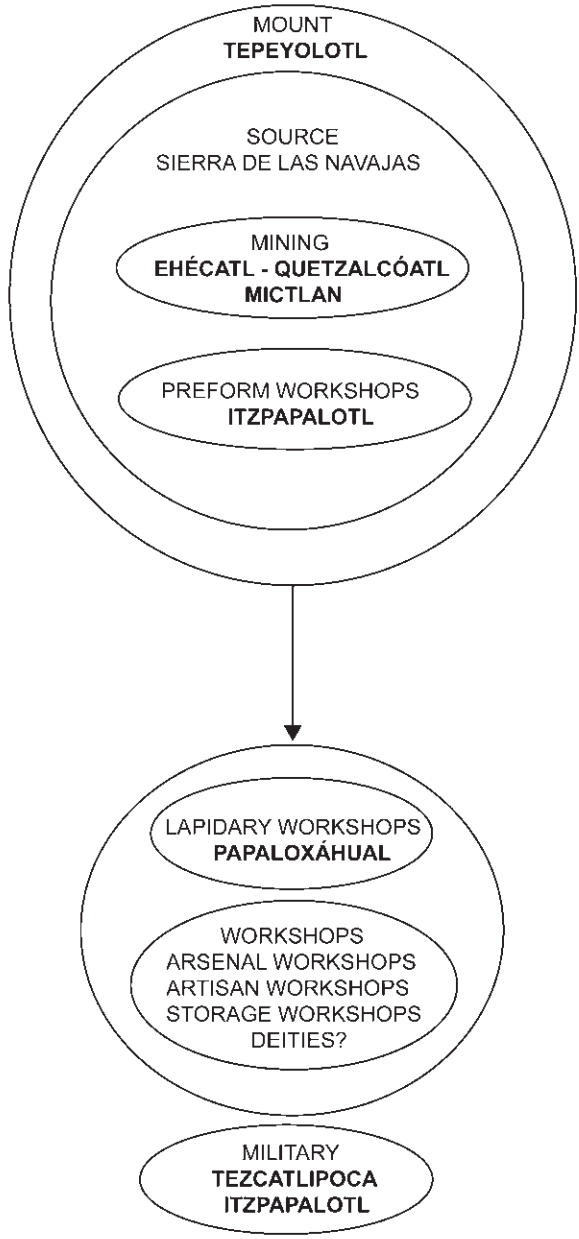

Figure 3.8. *Deities associated with the obsidian procurement and production process.*

Ehecatl-Quetzalcoatl; and the workshops located in the terrestrial level are associated with Itzpapalotl, who possibly served as the patron goddess of the obsidian crafters' guild (figure 3.8). After obsidian preforms were transported from the workshops to towns in Central Mexico, we only have knowledge that Papaloxáhual-Xochipilli was one of the patron goddesses of the arts. In military activities, Tezcatlipoca was manifest in various aspects as a protector, as in the case of Painal, another name for Tezcatlipoca—the speed warrior that hides in the night. In addition, Itzpapalotl was incorporated into military insignia exhibited on some of the shields of warriors.

The general ritual and functional attributes of obsidian that are an important part of religion are birth, death, the renovation of seasonal cycles, nocturnal elements, darkness, celestial elements, coldness, justice, war, protection, punishment, slavery, prediction, and knowledge. Obsidian was also appreciated because of its profound and polyvalent symbolic value. It was used in a multitude of Mesoamerican religious rituals and by all levels of society but was especially effective as a representation of power, as in the obsidian mirror and the Tlatoani's (ruler's) staff. Thus, the use of obsidian in civic-religious circles played an important role in reproducing the governmental structure of the Triple Alliance.

Studies of Mesoamerican religious beliefs concerning obsidian can help further define its multiple meanings and importance as a raw material and its use in producing various finished instruments and weapons. Obsidian transcended different fields of religious knowledge because it occupied both celestial levels and those of the underworld. It was a material and an instrument of the gods that was linked to death, the generation of humans, access to knowledge, and predicting the future.

It is interesting to observe how a raw material such as obsidian was implicated in productive activities such as the production of food, subsistence goods, and other artifacts and weapons. In the government's ideology, obsidian was incorporated into myths pertaining to the creation of the main deities and the seasonal cycles, as well as attributes of gods related to war, punishment, and prediction—all elements of the power structures of government institutions. The productive aspects reflected in the ideological sphere, even though not completely absent, are of secondary importance. We can conclude that in many ways, control over obsidian facilitated the concentration of power in Mesoamerica, not only because it was a fundamental raw material used in a diversity of productive contexts but because of its diversity of functions and its mythical and temporal depth in central Mesoamerica.

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CEMCA	Centro de Estudios Mexicanos y Centro Americanos
ENAH	Escuela Nacional de Antropología e Historia
INAH	Instituto Nacional de Antropología e Historia
SEP	Secretaria de Educación Pública
UNAM	Universidad Nacional Autónoma de México

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CHAPTER FOUR

Machetes and Meaning

Some Notes on Cutting Tools in a Contemporary Mixtec Community

John Monaghan

Marc Levine suggests that our understanding of lithic technologies in Mesoamerica can be expanded by examining the meaning obsidian had for the ancient people of the region. He also suggests that ethnographic studies might afford some interpretative leverage for advancing this understanding. Following his lead, my chapter draws on what people in the small Mixtec-speaking community of Santiago Nuyoo say about stone tools (and what can be shown to be their modern equivalents) and compares this to the way tools are depicted in prehispanic and Early Colonial indigenous manuscripts. In doing this, I will make two points. The first is that the way people talk about the dimensions of tools can shed light on the way tools are depicted in the manuscripts. The second draws on ethnographic data to show how tools function within a larger set of ideas having to do with morality, gender, purity, and pollution. In the conclusion, I suggest that the codices contain material that reflects what Nuyootecos have to say, so there is reason to believe similar ideas invested prehispanic tools with meaning.

When the Spanish arrived in Mesoamerica in the early years of the sixteenth century, several writing systems were in use. In the central part of Mexico, the Mixteca-Puebla artistic tradition and script was dominant. The illuminated screenfold books, or codices, produced by ancient scribes writing in this tradition are of special interest. These works contain epic sagas, such as the ones that tell of the Mixtec hero Eight Deer; biblical-style creation accounts, such as the one contained on the fifty-two pages of the Codex Vienna; calendrical and divinatory manuals; histories of specific kingdoms; and genealogies

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that extend back centuries. Only a handful of prehispanic-style books have survived, and most of these are in the Mixteca-Puebla tradition (Smith 1973). Nonetheless, the codices are of inestimable value, presenting as they do a picture of indigenous society unmediated by Spanish colonialism. Each has played a major role in advancing understanding not only of the region in which they were produced but also of ancient Mesoamerican culture, politics, religion, society, and even material culture. Mesoamerican people continued to write using their own scripts for almost eighty years after the Spanish Conquest. In this period they began to incorporate European pictorial conventions and script into their texts and began to compose them in a way that made them accessible to Europeans, in terms of both their content and the way they were read. These manuscripts have played a crucial role in our understanding of indigenous views of colonialism and the kinds of changes taking place in colonial society. Today, the indigenous people of the region, whose ancestors in some cases kept these invaluable manuscripts safe over the centuries, have turned to the codices and other prehispanic-style documents to recover their histories and explore what it means to be indigenous in contemporary Mexico.

Santiago Nuyoo is a Mixtec community in the ex-district of Tlaxiaco in Oaxaca. Mixtecs are the third-largest group of indigenous language speakers in Mexico and have traditionally made their homes in hundreds of communities scattered across a large region known as the Mixteca that spans western Oaxaca, eastern Guerrero, and southern Puebla. When I first started working in Santiago Nuyoo in 1983, nearly everyone spoke Mixtec as their first language, and most conversations were carried out in Mixtec. Today, like other indigenous peoples in southern Mexico, Nuyootecos of all ages spend a great deal of time outside the community, with large contingents living in Mexico City and the United States. Some of the young people no longer speak to one another in Mixtec, even though they understand the language, and few of the children of Nuyooteco migrants who grow up in cities speak Mixtec at all. Nonetheless, Nuyooteco Mixtec is still the language of everyday conversation in most homes in the community.

In the past, all Nuyootecos lived in farming households and grew the Mesoamerican staples of corn, beans, and squash, as well as bananas and coffee as cash crops. When I arrived in 1983, there were few Nuyootecos who did not farm, even when they practiced a profession. Most of those who live in the community on a full-time basis continue to farm, and they spend a great deal of time during the work week in the fields and forests, not only farming but also gathering firewood, hunting, and traveling on foot between different settlements.

MACHETES, STONE TOOLS, AND DIGGING STICKS

Obsidian does not occur naturally in the Nuyoo region, but in their travels, Nuyootecos occasionally find pieces of obsidian on the ground. These are, of course, fragments of tools that entered Nuyoo territory from the outside, probably hundreds of years ago. People distinguish several types of obsidian based on the colors seen when one holds bits of them up to the light: black, blue, green, and white obsidian. Nuyootecos call the obsidian they find on the ground *yuchi tiaca*. The only time people use obsidian is with teething babies. They will take a piece with a sharp edge and carefully make small cuts in the child's gums so the teeth erupt more easily. People say this cures a case of a delayed eruption of teeth. It is interesting that in the sixteenth-century vocabulary Reyes (1976) of metaphorical language used by the Mixtec nobility, the Lord's teeth are said to be "*yuchi*." We know that in central Mexican codices, gods are sometimes depicted with stone blades as teeth. The sharp back of the grasshopper's hind leg is also called yuchi.

The primary meaning of yuchi today, however, is "machete." Thus, yuchi tiaca, the term Nuyootecos use for obsidian, means, when translated into Spanish, *machete de chapulin*, or "the grasshopper's machete." One may wonder what the steel machetes used by contemporary Mixtec people have to do with the symbolic and ritual dimension of stone tool use in prehispanic times. In his sixteenth-century dictionary of the Mixtec language, Fray Francisco de Alvarado (1962 [1593]:59, 155) translated stone knife, in particular flint knife, as yuchi. In light of contemporary use of the word *yuchi* for machete, what seems to have happened is that as iron and steel replaced indigenous stone tools, the old name for stone knife was transferred to the machete. In some places, such as Santiago Yosondua, yuchi is used for metal knife (Beaty de Farris 2002:97). The name for knife in Nuyoo today is *cu'li*, which is probably from the Spanish *cuchillo*.

In addition to borrowing Spanish terms for newly introduced objects, Mixtecs extended terms that already existed in Mixtec to some of the things the Spanish introduced, as long as they appeared similar. In the latter case, the word for the new tool, product, or technology was frequently marked in some way, often by the addition of the term *caa* (metal) or the term *stila* (Spanish), at least in some dialects. Alvarado, who produced his dictionary late in the sixteenth century, by which time the Mixteca had been integrated into the Atlantic economy, documents a step in this process, since he lists as a type of yuchi the *yuchicaa* (metal yuchi) (Alvarado 1962 [1593]:59). At some point in the development of the language, the marking ceases for most terms, so distinctions between metal and stone or wooden tools are no longer made; nor is

the distinction made between items that are of local versus exotic origin. What is most significant in the context of this chapter is that Mixtec people saw substantial similarities between their stone blades and the iron and steel blades introduced by the Spanish. I believe this gives us some basis for comparing the meaning contemporary machetes have for Nuyootecos with depictions of implements made of obsidian, flint, or other materials in ancient times.

Machetes are a kind of all-purpose tool. I've seen them used in Nuyoo to clear brush to prepare swiddens, chop firewood, weed fields, shovel loose soil, open beer bottles and cans of sardines, kill rabid dogs, shave, and any number of other things. Both males and females use machetes, but only men wear them by looping a strap attached to a sheath over their shoulders; women simply hold the machete in its sheath when taking it to use somewhere outside the house.

The broad spectrum of tasks the machete is used for suggests that in addition to being similar to the stone knives of prehispanic times, the machete took on some of the functions of another Mesoamerican tool, the digging stick. According to central Mexican sources (Rojas Rabiela 1985), there were three types of digging sticks. First was the *uitzoctli* proper, a straight pole used for drilling a hole in the ground to plant. Nuyootecos do use something similar to this when they plant. The other two types, the *uictli* and the *uictliaxoquen*, are bladed, and some appear similar to the Andean foot plow. The uictli was made of one piece of wood, while the uictliaxoquen was made of two pieces tied together with a handle (see figure 4.1). In central Mexico, at least some of the blades would have been sheathed in copper (ibid.). The flared or bladed edge of the uictli made its useful for digging, weeding, and chopping, as well as shoveling and spreading soils. The images in the Florentine Codex indicate that the blades could be wide or narrow, which might mean they were adapted to specific tasks. Alvarado (1962 [1593]:47) lists three types of blades (*yata*) for the Mixtec.

The machete is comparable to the bladed uictli/yata in a number of ways. First, the forms the two take are broadly similar. When I showed some Mixtec friends the image of the man holding a yata from the Codex Nuttall, they all identified it as a machete (see figure 4.1a). Second, many of the tasks farmers such as Nuyootecos performed with the bladed yata in the past are now done with the machete. When Nuyootecos weed around their corn plants, for example, they grab a handful of weeds and slice down into the soil so they can pull them up with as much of their roots intact as possible. Finally, not only do the uictli/yata and machete have a similar form, but the handles of the uictliaxoquen and the machetes Nuyootecos use are also comparable.

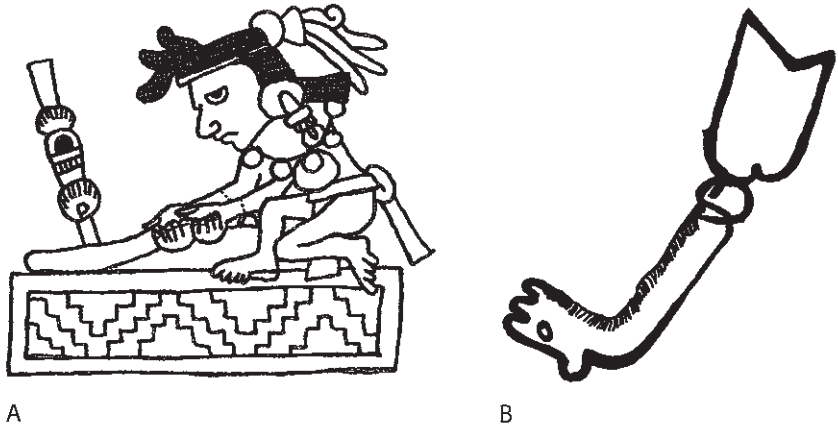

Figure 4.1. *Uictli/yata; (a) man holding a yata in the Codex Nuttall; (b) uictliaxoquen.*

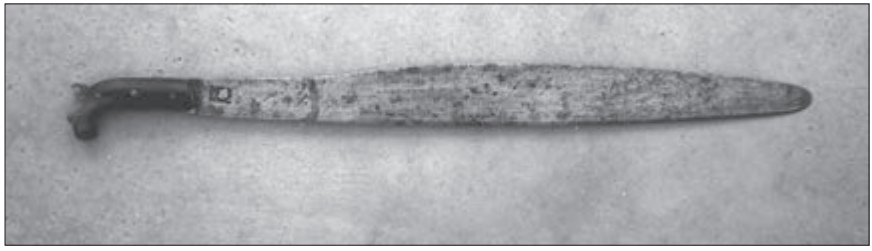

Figure 4.2. *Costa Chica machete purchased in the Sunday market in Santiago Nuyoo.*

According to the descriptions we have, the uctliaxoquen had carved handles, just like the machetes Nuyootecos use today. In both cases, the handles take the shape of the heads of animals, as can been seen in the case of an uictliaxoquen depicted in the Codex Huejotzingo (figure 4.1b) and the machete from the Costa Chica purchased in the Nuyoo market (see figure 4.2). According to this evidence, it appears that the machete is the modern descendent not only of the flint knife but also of some varieties of the uictli/yata.

Nuyootecos' preferred kinds of machete are those made on the Costa Chica, in the towns in the ex-districts of Jamiltepec and Abasolo, Guerrero. They are sold in markets throughout the Mixteca Alta. The blade of a Costa Chica machete is forged by hand and beaten into shape, and the hammer strikes can be clearly seen on the blade. Attached to the blade is a handle made of

steer horn, carved in the shape of an animal's head, with the eagle a favorite motif (see figure 4.2). Some of the Costa Chica blades have adages or witticisms etched on them, but I did not see many of this sort in the hands of Nuyootecos. Less desirable are the cheaper Collins-style machetes, originally produced in Collinsville, Connecticut, beginning in the nineteenth century. The machetes from the coast tend not to be used in farming or everyday labors when they are new but are more for display. When someone has a new machete of this type, passersby will stop to admire it, feel its balance, and ask about its price. Eventually, people do employ them as tools, and machetes in general are in such constant use and resharpened so often that after a few years they are reduced in size; old machetes and machetes whose blades have broken continue to serve as tools, but in this stage they become knives (cu'li). People say a machete in normal use will last about seven years before it is recycled as a knife.

Nuyootecos proudly point out that in town, they only carry their machetes when they are on their way to and from their fields. In other towns, where there are a lot of problems and one must constantly be on guard, men carry their machetes whenever they leave the house. Outsiders who come to the Sunday market in Nuyoo carry their machetes with them, and Nuyootecos do the same when they go to markets in surrounding towns, since there are so many boundary conflicts and one may need to defend oneself on the lonely trails between towns. In the wars of the nineteenth century, battalions made up of men recruited from towns in the Costa Chica specialized in machete fighting. For good reason, many men today say they would feel vulnerable if they went to another town and did not carry a machete.

MACHETES AND MEANING

One of the most striking things about the stone blades depicted in the codices is how many of them are drawn with mouths and eyes (see figure 4.3, which contains flint blades from selected codices). In the Templo Mayor excavations, actual flint knives were found with mouths and eyes formed out of inlaid shell (see Matos Moctezuma 1988:144). It is suggested that these blades represent the eighteenth day of the calendar, Flint, and the year-bearer, 1 Flint. It is also suggested that the blades are closely associated with Tezcatlipoca or that they represent the god Itzli. The idea, then, is that these blades are anthropomorphized because they represent a sacred being.

Without denying that some flint blades represent gods, the Nuyoo material presents a second possibility for these depictions. First, Nuyootecos distinguish

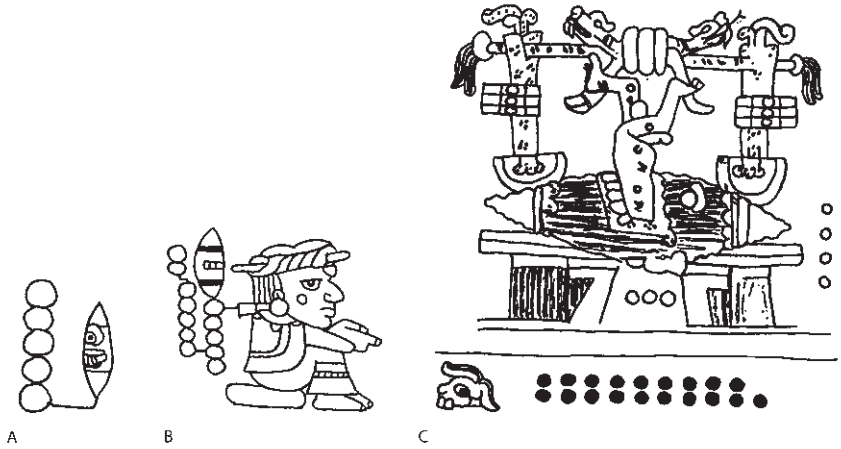

Figure 4.3. *Flint blades from selected codices: (a) Codex Vienna; (b) Codex Bodley; (c) Codex Vaticanus A.*

between the front and the back of the machete. The front, the cutting edge, is called *yu'u yuchi* in Mixtec, while the back, which remains unsharpened, is called *yata yuchi*. Mixtec, like many languages, employs body parts to describe the dimensions of objects and locations in space. This occurs in English as well, but Otomaguean languages do this to a degree not found in English; and Mixtec scribes made wide use of body parts in their writing to represent the positions of objects, their features, their elements, and so on. So, for example, to depict the town of Sachio, which translates as "at the foot of the hill," the Mixtec scribes would draw a hill with feet on it. This does not mean that what is depicted is a walking mountain and even less that they are depicting a god of some sort.

To return to the machete, the front of it is the yu'u yuchi, which translates literally as "the mouth of the machete." Thus, in Alvarado's dictionary, the Mixtec word for a metal knife with two sharpened edges can be translated as a knife with "two mouths" (Alvarado 1962 [1593]:59). This suggests that in at least some of the depictions of stone blades with faces on them, the scribe appears to want to highlight some of the dimensions of the blade, with the mouth indicating the cutting surface. This is probably the idea in the Codex Bodley, where blades are depicted without eyes and with just the mouth (see figure 4.3b). Also, in the Codex Vaticanus, the mouth of an obsidian blade is shown consuming someone, probably suggesting that the person is being cut (see

figure 4.3c). Depictions of blades as having mouths on them may thus have as much to do with the general way the dimensions of the tools are spoken of as they do with the iconography of a particular date or deity. Parenthetically, rarely is a blade depicted with a nose. However, in Nuyooteco conceptions, machetes have noses as well. The nose of the machete in Mixtec is the tip (the *sticuiñi* [thin nose]).

TOOLS, MORALITY, AND GENDER

Nuyooteco conceptions of the machete function within a larger set of ideas having to do with morality, gender, purity, and pollution. In Mesoamerica, male and female are complimentary and often matched; moral discourse is focused on actions and circumstances rather than interior states; pollution is as often caused by excess as by fault; and, even though negative, pollution can be a powerful state and something sought out and thus valued (see Monaghan 2000:35–36 for a review). Within this general scheme, machetes share much with digging sticks, axes, battens, and other tools that have a kind of edge or cutting surface (as well as the rifle, perhaps because they can all be lethal).

It has been noted that men often wear their machetes in a sheath strung over their shoulders, use them in their daily labors, and rely on them for defense. This close connection between men and their machetes can be seen on a conceptual level as well. Thus, if a man or woman dreams of a machete, it foretells the birth of a male child. Nuyootecos go on to associate machetes with a range of ideas and things that evoke potency, virility, and dominance. The Holy Rain (Nu'un Savi), which lives on mountaintops in special rain shrines out of which the clouds that carry life-sustaining moisture emerge, is said to carry a golden machete (or in some versions a golden ax), which it uses to punish wrongdoing. If a farmer finds that his corn has been damaged by a careless goatherd who allowed goats to enter the milpa, he can put the remains of the corn in a tree that was hit by lightning. The Holy Rain will then see the damage and punish the goatherd by hitting him or the flock with lightning. The lightning is the machete or ax, and there are stories of people who come across a tree just after it has been struck by lightning and find the golden ax or machete stuck in its trunk. The machete is so powerfully charged that there is great danger if the flat side is used to smack a misbehaving child. This kind of contact risks making the child sterile (some say it is safe to use the machetes on boys; it is girls one has to be careful with).

Machetes, axes, knives, guns, and other similar implements, for all the damage they can do, are also fragile. A good example is the special care one must

take if one uses any of them to kill a snake. Chance encounters with snakes are somewhat frequent for people who spend so much time outdoors, as the Nuyootecos do, and they can be as scary for them as they are for us. Where we perhaps differ is in the intensity with which Nuyootecos pursue the creature once their initial fright wears off. People will drop everything and tear into the brush, scooping up large rocks if nothing else is at hand to crush the fleeing serpent. Anyone who has witnessed this kind of reaction might conclude that people act as if their lives depend on killing the reptile.

Part of the reason for Nuyootecos passionate pursuit of fleeing snakes is the idea that if you kill enough of them, they will stop crossing your path (some people say you have to kill seven big ones for this to occur). Also, since snakes are sometimes a sign of a coming misfortune, killing a snake will allow one to avoid an undesirable outcome. But Nuyootecos want to avoid snakes not only because of the fright they give, the danger their venom poses, or because they foretell a run of bad luck but for moral reasons as well. Snakes, they say, are the "herd animals" of the Tachi, or Wind. The Tachi is the face of evil, and although it has many attributes of ancient gods, it is also the Christian Devil.

As the herd of the Tachi, snakes, Nuyootecos say, are drawn to sin. One woman from the community of Miramar, Yucuhiti, told the story of a man returning on horseback from an adulterous encounter. Four snakes slithered from the brush and wrapped themselves around the legs of his horse. Only when the man's sister came out of her house and put tobacco on the snakes did they let go and go back into the brush. People in Santiago Nuyoo say a snake will twist itself around a sinner and lash the man or woman with its tail. Eduard Seler pointed out examples in the Codices Borgia, Borbonicus, and Vaticanus B where adulterers are depicted as entwined by a snake with its head turned toward the sinner (Seler 1980:35–36, 44, 46). Nuyootecos say a snake is drawn to a sinner because it "knows" that a fault exists (*hiniiyo kuachi*). An encounter with a snake should therefore cause one to reflect on what might have brought it forth and change the way one comports oneself. By implication, those who never encounter snakes have succeeded in either killing the magic number or maintaining a high level of propriety and balance in their daily lives.

When killing a snake, one must take special care. Some say one should make a sign of the cross over it before killing it, although people seem so overwrought at the appearance of a snake that it is hard to see how anyone would have the presence of mind to stop and do this while trying to bash its head in. Most people try to kill snakes with a rock or a tree branch. If one uses an ax or machete to cut up the snake or shoots it with a gun, one runs the risk that the

instrument will break or misfire. A story was told in Nuyoo not long ago about a farmer who cut a snake into three pieces with his machete, only to have the machete break into three pieces afterward. The significance is that the farmer was doubly warned: first by the appearance of the snake, then by the loss of his machete. He was either doing something inappropriate or had ventured into a situation that was morally problematic. One of the best examples of this kind of moral calculus I have come across concerns the priest who complained to Eugenio Maurer-Avalos that his Tzeltal parishioners only consider confession when they have suffered some kind of misfortune (usually an illness). Moreover, the confession they seek is with a local curer, or *principales*, not the Catholic priest. If they are found to have committed a sin, the response is physical, generally a lashing. Otherwise, the priest grumbled, if they are in good health, they consider that they did not commit any sin (Maurer-Avalos 1984:107–8). A broken machete or rifle, like poor health or the appearance of a snake, is not the only index of moral status; so too are unblemished tools, good health, and walks through the countryside without seeing any serpents.

Just as moral action can be taken to preserve or restore health and avoid snakes, so too can measures be taken to keep one's tools whole. Some Nuyootecos say that if a person goes after a snake with a machete, he should chop down on it at an angle, since doing so damages it less than cutting it straight down. I was told by many people that after killing a snake with a machete, you should act immediately. Some say you can urinate on it, while others say you should wash it with holy water (some people keep containers of holy water in their houses; when a priest visits, he will sometimes bless buckets of water for people to take home). After killing a snake, people are concerned with how their health might be impacted. They may smoke tobacco if it is handy, since tobacco smoke cleanses, and wash themselves with holy water or alcohol. The point is that it is not enough to simply keep tools like machetes sharp and free from rust; there is a moral dimension to maintaining tools in good repair as well.

Much of the care and cultivation of sharp tools like the machete (and the rifle) takes place in the context of issues of purity and pollution. Thus, a machete, ax, or rifle can also break if a woman steps over it. Some even say that by allowing a woman to step over one of these tools, the user will be drawn into the same kind of situation that occurs when snakes appear. Once again, moral discourse focuses on actions and circumstances rather than interior states, and leaving one's tools in a position where they could be stepped over suggests irresponsibility because when not in use, tools should be stored out of the way, often by hanging them on a nail on a post in the house. Male and

female genital areas are equally polluting, and, as in other Mesoamerican communities, special states of cleanliness are achieved through bathing, sweeping, and sexual abstinence. However, Nuyootecos say women have an inordinate effect on machetes and other implements because they wear skirts, thereby allowing polluting emanations to escape—something that is not true for men. This pollution is similar to the kind of pollution released by killing a snake. There are reports of Mesoamerican women lining up alongside their men to expose their genitals to enemy forces, with the idea that this would cause damage to the opponents' weapons (Monaghan 2001).

All this does not prevent a woman from using a machete or other tool. In fact, there is a kind of tool, called machete in Spanish, that is closely associated with women: the batten used in the backstrap loom. The batten has some of the same effects as a steel machete. So if a woman uses a batten to smack a child, the child could be made sterile, just as if she had used a steel machete. As I have argued elsewhere, in the ethnographic evidence we have for Mesoamerica, producers—both men and women—bring together and manipulate charged items that are critically matched and integral to the creative process, and these matched items are usually gendered. So a woman who makes a cloth on the loom manipulates the female shed and the male batten; likewise, in farming a man uses the digging stick and the machete, but the earth and the corn plant are female (ibid.).

CONCLUSION

Can it be said that tools—including stone tools—in prehispanic times were, like Nuyooteco machetes, embedded in a complex of ideas about gender, morality, purity, and pollution? I conclude by arguing that based on images from the codices and Early Colonial manuscripts, there is good reason to suspect they were.

First, men are depicted much more frequently than women carrying edged tools and blades. Women also carry and use blades, but not nearly as frequently as men. For example, in a scene in the Codex Osuna, where people are engaged in a marriage negotiation, the future groom is associated with the uictli along with a tumpline and an ax. Like the dream of a machete foretelling the birth of a male child, the association of the groom with these implements suggests that tools are strongly gendered (figure 4.4).

Second, snakes may be depicted as damaging sharp implements, just as they damage machetes, axes, and rifles. This is probably what is depicted in the Codex Borgia, although the broken uictli is not directly associated with the

Figure 4.4. *Future bridegroom in the Codex Osuna.*

Figure 4.5. *Broken uictli from the Codex Borgia.*

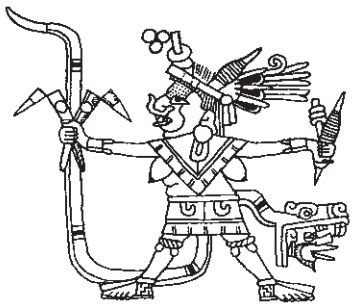

Figure 4.6. *Tlazolteotl, goddess of filth, holding broken tools from the Codex Laud.*

killing of a snake. It is on a page where several snakes have been decapitated and directly associated with one snake consuming another, for Nuyootecos an extremely bad omen (figure 4.5). This suggests that tools, like the modern machete, served as an index of moral context in the past as well.

This, as well as other sources, shows that the genital area was considered a source of pollution in ancient times, as it was in Colonial times and still is today (see Monaghan 2001). Again, the image in the Codex Laud is that of a powerful being, Tlazolteotl, who is associated with immoral conduct such as adultery and with pollution (figure 4.6). We know that pollution could be cultivated for the potency it could bestow (Burkhart 1989). What is interesting in the context of this chapter is that the goddess holds broken cutting tools in her hands. This suggests not only that the broken tools are characteristic of a highly polluted status but also that the purposeful breaking of the tools—they were, after all, whole at one time—may have been a means of achieving and maintaining this level of pollution. In other words, could certain tools have been instruments for achieving not only material results but also moral states and therefore been part of the cult?

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CHAPTER FIVE

Symbolic and Ritual Dimensions of Exchange, Production, Use, and Deposition of Ancient Maya Obsidian Artifacts

Kazuo Aoyama

In this chapter, I seek to complement political-economy approaches with agency approaches to examine contexts in which ritual shapes the organization and execution of economic pursuits (see chapter 1)—particularly those associated with obsidian artifacts. In this endeavor, I draw on the results of the analysis of more than 160,000 chipped-stone artifacts from the Copán region (Copán Valley and the neighboring region of La Entrada) of Honduras, as well as the Pasión and Petexbatun regions (Aguateca, Ceibal, and neighboring sites) of Guatemala, to discuss and elucidate the symbolic and ritual dimensions of ancient Maya obsidian artifacts (figure 5.1). The artifacts discussed here pertain to the Early Preclassic through Early Postclassic periods (1400 BCE–1100 CE). To better understand ancient Maya society, I follow the emerging "ritual economy" approach (Wells 2006) and examine exchange, production, use, and deposition of obsidian artifacts by which indigenous worldview and belief are embodied in material culture through religious ritual or other kinds of ritualized practices. I also look at certain chert artifacts associated with obsidian artifacts to better understand the diverse meanings of obsidian and its role in ancient Maya cultural practices.

The sources of the obsidian artifacts studied were identified by combining neutron-activation analysis and visual examination. The results of a blind test indicated a 98 percent accuracy rate (Aoyama 1999:29). Visual analysis of large, statistically meaningful samples allows a well-trained lithic analyst to study exchange networks more explicitly than do chemical source analyses of small samples selected by inappropriate sampling methods. More important,

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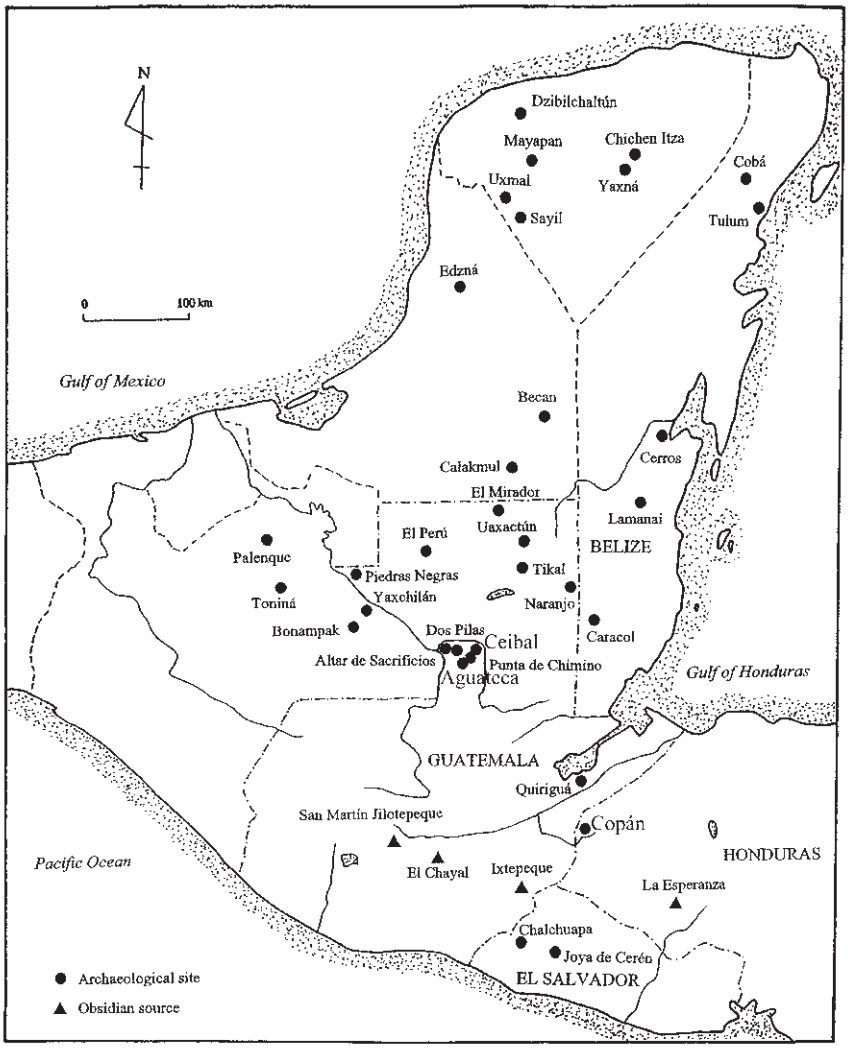

Figure 5.1. *Map of the Maya area, showing the locations of Copán, Aguateca, and Ceibal.*

independent scholars have demonstrated that, at least for certain collections of Maya obsidian artifacts, visual sourcing is both reproducible and accurate (Braswell et al. 2000).

I also analyzed microwear patterns on more than 7,000 stone artifacts using the high-power microscopy approach to stone tool use (Aoyama 1995,

1999, 2001a, 2004, 2007, 2008, 2009). In 1987, I conducted an intensive experimental study of use-wear on obsidian and chert in Honduras to establish a framework for the interpretation of Maya stone tool use (Aoyama 1989, 1999). The results of 267 replication experiments conducted with a range of worked materials permitted identification of use-wear patterns. The instrument used in the study was a metallurgical microscope (Olympus BX60M) with 50–500 × magnification and an incident-light attachment. Use-wear patterns were documented with an Olympus photomicrographic system PD–20 attached to a digital camera.

SYMBOLIC SIGNIFICANCE OF GREEN OBSIDIAN ARTIFACTS IN THE COPÁN VALLEY

The preshispanic occupation of the Copán Valley spans the Early Preclassic Rayo phase (1400–1200 BCE) through the Early Postclassic Ejar phase (900–1100 CE). Beginning in the Late Bijac phase (150–400 CE) and continuing into the Early Classic Acbi phase (400–600 CE), truly significant social changes took place in the Copán Valley (Fash 2001). Importantly, a royal dynasty was founded on 8.19.10.10.17 (426 CE) by K'inich Yax K'uk' Mo'. Through time, the ancient inhabitants of the Copán Valley imported obsidian from at least six geologic sources: Ixtepeque, El Chayal, and San Martín Jilotepeque in Guatemala; La Esperanza in Honduras; and Pachuca (Sierra de las Navajas) and Ucareo in Mexico (Aoyama 1999:15–19). During the entire preshispanic sequence, nearly all of the obsidian came from the closest source, Ixtepeque. The straight-line distance from the Copán Valley to Ixtepeque is only 80 kilometers, and it appears that the people of Copán may have had direct access to this source.

The results of my study suggest that the Yax K'uk' Mo' dynasty institutionalized the procurement and distribution systems (intraregional and interregional) of at least one utilitarian commodity (i.e., Ixtepeque obsidian blade cores) as part of the political economy (Aoyama 1999, 2001b, 2011a). In this respect, the Copán state took a managerial role in overseeing the exchange of some utilitarian goods, which may have been important for promoting the general welfare of the Copán community and for consolidating and legitimizing rulers' political authority. In fact, the administration of exchange systems may have eventually led to the Yax K'uk' Mo' dynasty's greater political power and economic wealth.

Microwear and contextual analyses indicate that prismatic blades of Ixtepeque obsidian were not luxury commodities but were mainly valued as utilitarian

goods. Both elites and commoners used them for a wide variety of everyday tasks, such as cutting, whittling, and grooving wood; cutting and scraping meat or hide; cutting, sawing, and whittling shell or bone; and, to a much lesser degree, for bloodletting rituals (Aoyama 1999:133). Apparently, all households had access to finished prismatic blades made from Ixtepeque obsidian during the Classic period. The great majority of these blades are found in domestic contexts and far fewer in ceremonial contexts.

While nearly all obsidian continued to be procured from Ixtepeque, as in the Preclassic period, Yax K'uk' Mo' may have started to obtain small numbers of finished artifacts (primarily prismatic blades, but also small quantities of bifacial points and sequins) made from Pachuca green obsidian at the beginning of the Early Classic period (Aoyama 2001b, 2011a:41). As Marc Levine suggests (chapter 1, this volume), green obsidian may have conjured associations with the powerful Central Mexican polity of Teotihuacan, which was involved in the procurement or distribution of green obsidian from Pachuca, located 50 kilometers northeast of Teotihuacan. The importation of green obsidian artifacts to the Maya area was a low-volume undertaking. However, the percentage of green specimens (9.8%) among the obsidian artifacts (n = 82) from the Yax Structure, which Yax K'uk' Mo' commissioned, is one of the highest in the Classic Maya lowlands. This percentage is lower than that found for some single deposits at Tikal (Laporte 1988:170, 172), the capital of one of the most powerful kingdoms of the Classic Maya, but higher than that of Guatemalan highland sites such as Kaminaljuyu (Kidder, Jennings, and Shook 1946:136, 138). Also notable is the near absence of green obsidian in regions neighboring Copán, such as Quiriguá (La Entrada (Aoyama 1994:140, 1999:105), and Chalchuapa (Sheets 1978:13).

A possible explanation for the high percentage of green obsidian found in the Yax Structure is that Yax K'uk' Mo' was from Teotihuacan or from a city such as Tikal or Kaminaljuyu, which had strong, and possibly direct, trade ties with Teotihuacan in highland Mexico. It is also possible that Yax K'uk' Mo' was a local inhabitant who used Teotihuacan-related green obsidian artifacts to legitimate his authority and political power. However, both archaeological and epigraphic evidence supports the hypothesis that Yax K'uk' Mo' was an outsider who arrived at Copán (Sharer et al. 1999:20; Stuart 2000:492). There is a significant difference in the green obsidian artifact assemblages at Copán compared with those at Tikal and Kaminaljuyu, especially the higher percentage of bifacial points from the latter two sites. At Copán, only 2.7 percent of bifacial points are represented by green obsidian during the Early Classic period, whereas higher percentages of green points have been reported from

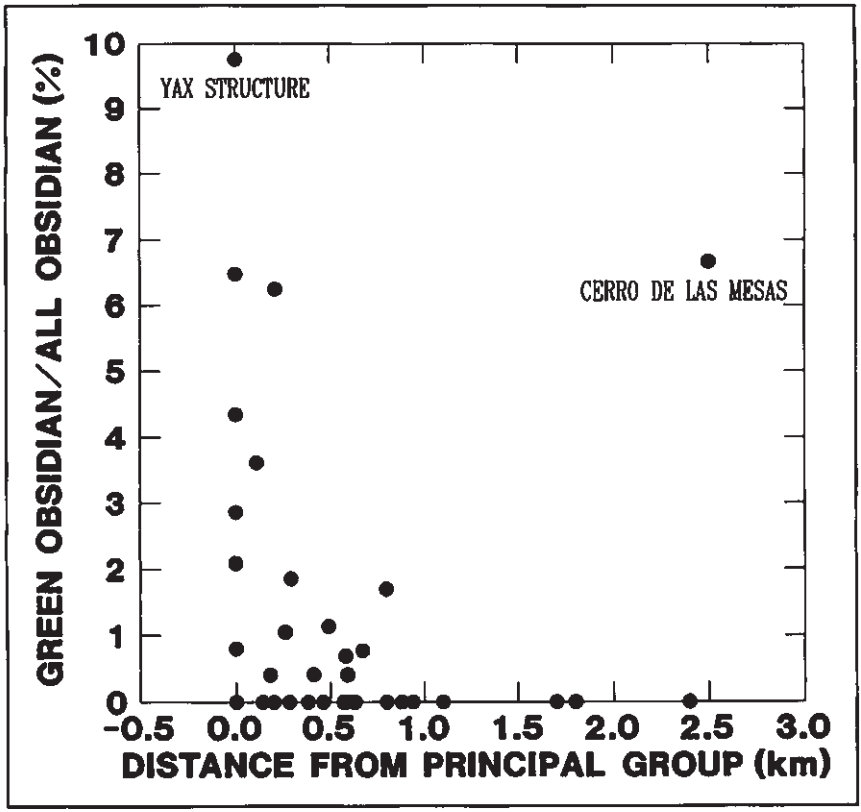

Figure 5.2. *Scatter plot of the percentage of green obsidian versus the distance from the Principal Group of Copán, Early Classic period.*

Tikal (13.8%; Moholy-Nagy, Asaro, and Stross 1984:table 1) and Kaminaljuyu (18.8%; Kidder, Jennings, and Shook 1946:136, 138). These data may indicate that the Yax K'uk' Mo' dynasty's exchange ties with Teotihuacan were somewhat different than those of Tikal and Kaminaljuyu.

Green obsidian artifacts are concentrated at Copán in the Principal Group and its immediate vicinity within the urban core but are virtually absent in the rural areas of the Copán Valley. In light of this relatively restricted spatial distribution during the Early Classic period, green obsidian tools may have been elite goods (figure 5.2). The Yax K'uk' Mo' dynasty may have distributed these objects as elite gifts to secure and solidify the allegiance of followers and allies. Importantly, imported polychrome vessels from other parts of the Maya area also had a limited distribution in the Copán Valley. Imported

basal-flange and basal-ridge vessels were rare in the urban core but were almost nonexistent outside this area (Bill 1997:543). This spatial distribution overlaps that of green obsidian tools and reinforces the hypothesis that the latter were elite commodities.

A notable exception is the Copán Valley hilltop site of Cerro de las Mesas. It was founded at the beginning of the Early Classic period 2 kilometers northwest of the Principal Group (Fash 2001:89). William and Barbara Fash (2000:447–48) speculate that Yax K'uk' Mo' and his followers established themselves on this fortress-like site as part of a strategy to unify several competing noble lines. They subsequently established the Principal Group in the center of the Copán Valley. Importantly, the percentage of Pachuca green obsidian tools among all obsidian chipped-stone artifacts at Cerro de las Mesas (6.7%) is the second-highest in the Early Classic Copán Valley (indicating its possible ties with Teotihuacan); only the Yax Structure of the Principal Group had more.

When we consider obsidian bifacial point production in the Copán Valley, the percentage of points among all Early Classic obsidian artifacts at the fortified center of Cerro de las Mesas (4.4%) is considerably higher than the mean percentage of obsidian bifacial points in the valley (0.4%, SD = 0.9). The existence of bifacial thinning flakes manufactured from Ixtepeque obsidian at Cerro de las Mesas indicates on-site production of bifacial points. This might be taken as evidence for intra- or inter-valley conflict or both. An important implication is that warfare may have played a significant role in the development of complex society in the Copán Valley during the Early Classic period (Aoyama 2005:300).

Both microwear and contextual analyses of green obsidian artifacts suggest that they were mainly utilitarian commodities used by elites in the Early Classic Copán Valley. The results of microwear analysis on green obsidian prismatic blades indicate that they were used for a variety of mundane tasks, such as cutting and scraping meat or hide and cutting, whittling, and grooving wood (Aoyama 1999:107). The majority of green obsidian artifacts occur in domestic middens and construction fill; frequencies are much lower in caches and burials. These contextual data regarding green obsidian artifacts at Early Classic Copán are exceptional in southern Mesoamerica. Almost all green obsidian artifacts in the Guatemalan highland and coastal regions, as well as other parts of the Classic Maya lowlands, have been found in special caches and burials (Spence 1996).

The use or display of such small quantities of long-distance exchange goods appears to have been primarily of social and symbolic, rather than economic, significance (e.g., Drennan 1991:281). The color of green obsidian itself may

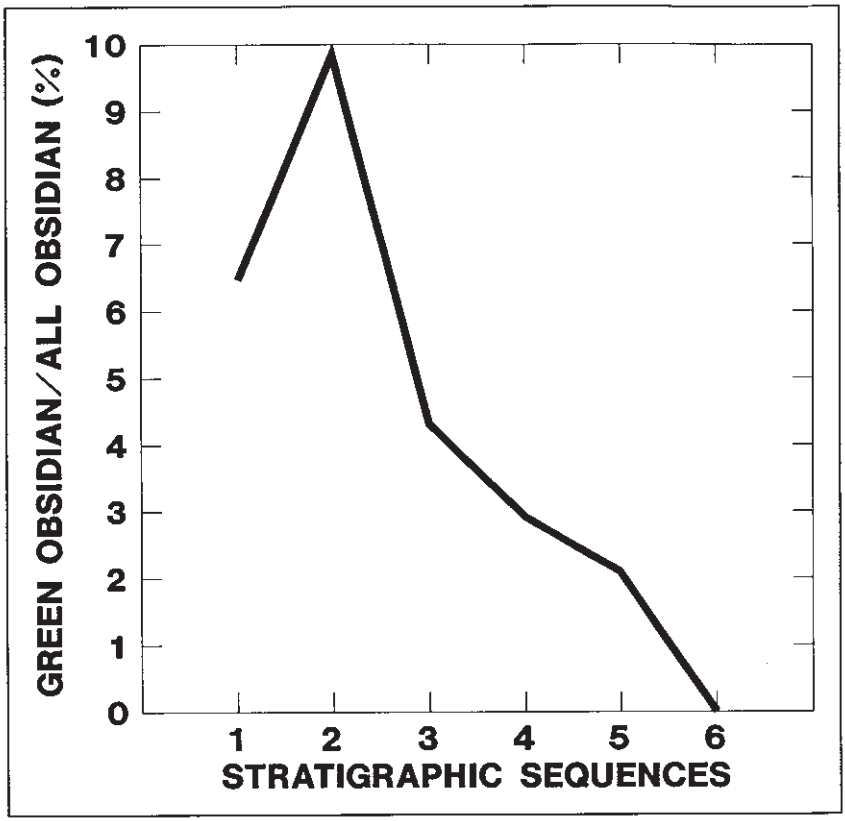

Figure 5.3. *Percentage of green obsidian among all obsidian artifacts through stratigraphic sequences of Structure 10L-26, Copán, Early Classic period.*

have had sociopolitical and even ceremonial significance analogous to certain Teotihuacan-style pottery vessels (Sharer 1983:255). In the Yucatec Maya codices, the color green is associated with the center of the world (Miller and Taube 1993:65). The control of exotic materials and esoteric knowledge from distant sacred places such as Teotihuacan may have been crucial in legitimizing the political authority and power of emerging rulers in the Copán Valley during the Early Classic period. Nevertheless, because the percentage of green obsidian among all obsidian artifacts decreased through the architectural sequence at the Copán Acropolis, the role of green obsidian seems to have diminished through time (figure 5.3). This pattern of decreased use may have resulted in part from a shift in elite connections. If Yax K'uk' Mo' had been an outsider, the decline

in green obsidian use may have also resulted from the assimilation of the Yax K'uk' Mo' dynasty to local culture through time. In any event, later rulers appear to have had less need for such external reinforcements of power, as local sociopolitical organization became more consolidated. By the Late Classic period, rulers with well-entrenched local power ceased to import green obsidian.

After the demise of centralized dynastic authority in the ninth century, the procurement and intraregional exchange system of Ixtepeque obsidian blade cores also broke down, resulting in a concomitant decline in prismatic blade production in the Copán Valley. Moreover, long-distance exchange of green obsidian from Pachuca reemerged, although Ixtepeque was still the most commonly used obsidian source (Aoyama 2001b:356). Mexican obsidian from Pachuca and Ucareo was imported exclusively in the form of finished prismatic blades. Hence the second "pulse" of Mexican obsidian reached Copán during the Early Postclassic period.

Both obsidian and ceramic data indicate that the Early Postclassic inhabitants of Copán were not isolated from other regions but participated in the development of long-distance exchange networks in Postclassic Mesoamerica. The presence of Mexican obsidian at the Early Postclassic center of Chichen Itza (Braswell 2003), as well as smaller coastal sites in the Maya lowlands (McKillop 1989), might imply that its distribution was decentralized and became more widespread at this time. Thus, the symbolic significance of green obsidian artifacts seems to have been diminished. The Early Postclassic inhabitants of Copán also used limited quantities of imported pottery vessels such as Tohil Plumbate, Fine Orange, and Las Vegas Polychrome, as well as Early Postclassic Ejar phase utilitarian ceramics (Manahan 2004). The scale of their participation in long-distance exchange was never large, however. Both contextual and microwear analyses indicate that Mexican obsidian blades were essentially utilitarian goods in the Early Postclassic Copán Valley. Even the reemergence of long-distance exchange, however, did not ameliorate the political and economic distress brought about by the collapse of the centralized dynastic authority of Copán.

IDEOLOGICALLY CHARGED OBJECTS PRODUCED BY CHIPPED-STONE TOOLS

Aguateca, a fortified Classic Maya city located in the Petexbatun region of Guatemala, was burned during an attack by enemies at the end of the Late Classic period (see figure 5.1). Elite residents from the central area of the site abandoned their homes so rapidly that they left most of their belongings

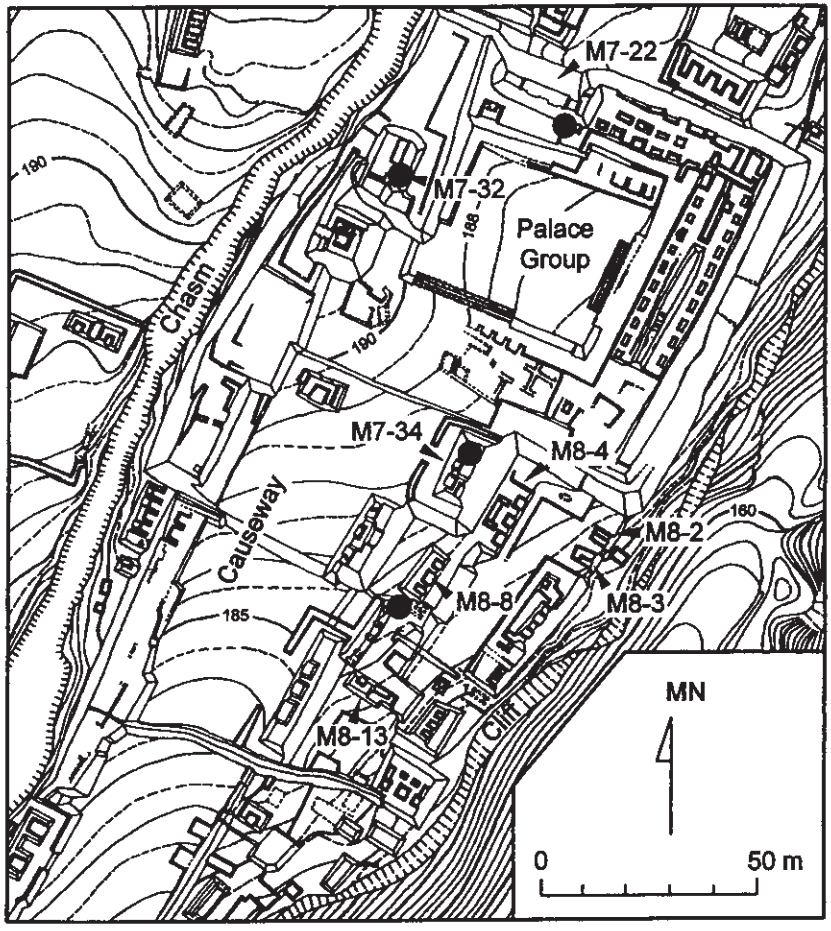

Figure 5.4. *Map of Aguateca's epicenter, showing the location of several structures and small concentrations of obsidian percussion flakes and blade manufacturing debris; Late Classic period.*

behind (Inomata 1997; Inomata and Stiver 1998). The investigations of the Aguateca Archaeological Project First phase (1996–2003), directed by Takeshi Inomata and colleagues, carried out extensive excavations of rapidly abandoned structures in the central area to examine the domestic and political lives of Classic Maya elites (figure 5.4). These excavations revealed the most extensive floor assemblages ever found at a lowland Classic Maya city (Inomata et al. 2002). Although most excavated objects were found in storage rather

than in active-use locations, their distribution patterns provide significant clues regarding the association of rooms and areas with specific activities and individuals. Lithic data and other lines of evidence indicate that a significant portion of Maya elites, including high-status scribes and even members of the royal family, engaged in artistic and craft production at Aguateca and that they were often involved in both independent and attached production (Aoyama 2009; Inomata 2001).

Multidisciplinary studies (Inomata and Triadan 2010) indicate that Structures M8-4 ("the House of Mirrors") and M8-8 ("the House of Axes") were residences of high-status scribes and their nuclear families. Structure M7-34 probably served as a communal house, while Structure M8-13 was a lower-status residence, and Structures M8-2 and M8-3 appear to have been low-status residences. Each residence was used for a wide range of domestic activities, including food storage, preparation, and consumption, with a relatively clear division—but not strict segregation—of male and female spaces. The north rooms of the structures, for example, which contained objects for food and textile production, were closely associated with females. The central rooms were used to receive visitors and hold meetings, among other uses. Structures M7-22 and M7-32 of the Palace Group most likely represent the royal residential complex of Aguateca, which was likely evacuated by the royal family before the final fall of the city. Afterward, the victorious enemy appears to have conducted termination rituals in the Palace Group at Aguateca (Inomata 2003).

The Aguateca Archaeological Project Second phase (2004–06) was designed to examine Aguateca's foundation as a dynastic regional capital (Inomata et al. 2009). Members of the project conducted extensive excavations of royal temples, the royal palace, and elite residences at the epicenter, as well as non-elite residences in the periphery of Aguateca. Investigations outside of Aguateca included extensive excavations at secondary centers in the South Transect and non-elite residences of the North Transect, with the objective of examining inter-dynastic politics and relationships between elites and non-elites involved in this social process.

During the Late Classic, Aguateca's inhabitants imported obsidian from at least three sources: El Chayal, Ixtepeque, and San Martín Jilotepeque—all located in the highlands of Guatemala. The great majority of obsidian came from El Chayal (96.1%, n = 2,084), while only eighty-five pieces were imported from Ixtepeque (2.7%, n = 59) and San Martín Jilotepeque (1.2%, n = 26) combined. El Chayal obsidian was imported to Aguateca primarily as polyhedral cores for prismatic blade production. Although precise blade

Figure 5.5. *Use-wear pattern b and parallel striations on an obsidian prismatic blade proximal segment made from El Chayal obsidian, used to cut wood from the elite residence of Structure M8-4 at Aguateca, Late Classic period.*

production locations are unknown, small concentrations of percussion flakes and blade manufacturing debris, including exhausted polyhedral core fragments, were found in the termination ritual deposits of Structures M7-22 and M7-32 in the Palace Group, on the south side of Structure M8-8, and in the north room of Structure M7-34 (see figure 5.4). Their distribution suggests on-site manufacture of prismatic blades and demonstrates elite access to blades. Some elite household members may have manufactured prismatic blades in or near their residences.

Following Patrick Vaughan (1985:56–57), the microwear analysis counted each portion of a lithic artifact with interpretable use-wear as an "independent use zone," or IUZ (see also Stemp and Awe, this volume). In total, 2,948 IUZs were identified during the analysis of Aguateca artifacts. Comparison of the results of microwear analysis of obsidian and chert artifacts shows clear differences between the assemblages. The analyzed obsidian artifacts (IUZ = 2,188), consisting mainly of prismatic blades (IUZ = 2,065), were used primarily for wood carving and meat or hide processing and to a much smaller degree for carving shell or bone (figure 5.5). The great majority of obsidian prismatic

blades from Aguateca were utilitarian tools used for a variety of craft production and domestic tasks. However, wooden objects carved by obsidian tools may have included both utilitarian and ritual items. In the sixteenth century, Diego de Landa stated that wood carvers and priests stayed in a special structure when they carved wooden statues (Tozzer 1941:159–60). Chert artifacts were employed for an even wider range of activities. Meat or hide processing was the most common activity, followed by bone or shell carving, stone working, wood carving, cutting grass, and digging in the soil.

Three nearly complete blades were found on the bench surface in the central room of Structure M8-8 at Aguateca (figure 5.6a–c). Because the blades exhibited micro-scars that lack polish and striations, they do not appear to have been heavily used and were likely stored for future use by the male scribe. Judging by their cultural context (the bench surface in the central room) and use-wear patterns, I suggest that the blades in question were intended for a single use in bloodletting rituals. Important supporting evidence for this interpretation comes from a similar context at elite residential Structure M7-35, where an imitation stingray spine made of bone was found in close proximity to a number of long obsidian blades on the bench of the central room (Inomata and Stiver 1998:442). This further suggests a connection between the obsidian blades and bloodletting in these locations. Moreover, some of the Ixtepeque obsidian prismatic blades with similar micro-scar patterns were identified in very small quantities at both elite and non-elite residences in the Copán Valley, suggesting their possible use in bloodletting rituals. Organic residue analysis on the blades is needed to further evaluate this hypothesis.

The results of lithic and other studies suggest that, although under the pressure of external threat, a significant portion of Maya elites—both men and women—worked as highly skilled artisans and crafters at Classic period Aguateca, often in both independent and attached contexts (Aoyama 2007, 2009; Inomata 2001). Artistic and craft production appears to have been a common occupation among Classic Maya elites at Aguateca, including courtiers of the highest rank and even members of the royal family. Both elite and non-elite households produced many craft items, including wood and leather goods, and engaged in food preparation. Consequently, several kinds of craft production occurred in various households. I agree with Kenneth Hirth (2009) who suggests that multi-crafting better categorizes the way domestic craft activity was structured in preshispanic Mesoamerica.

Particular households and individuals emphasized specific types of artistic production and craft activities. For example, the scribe who inhabited Structure M8-8 carved stelae for the ruler, and the high-status courtier/scribe who lived

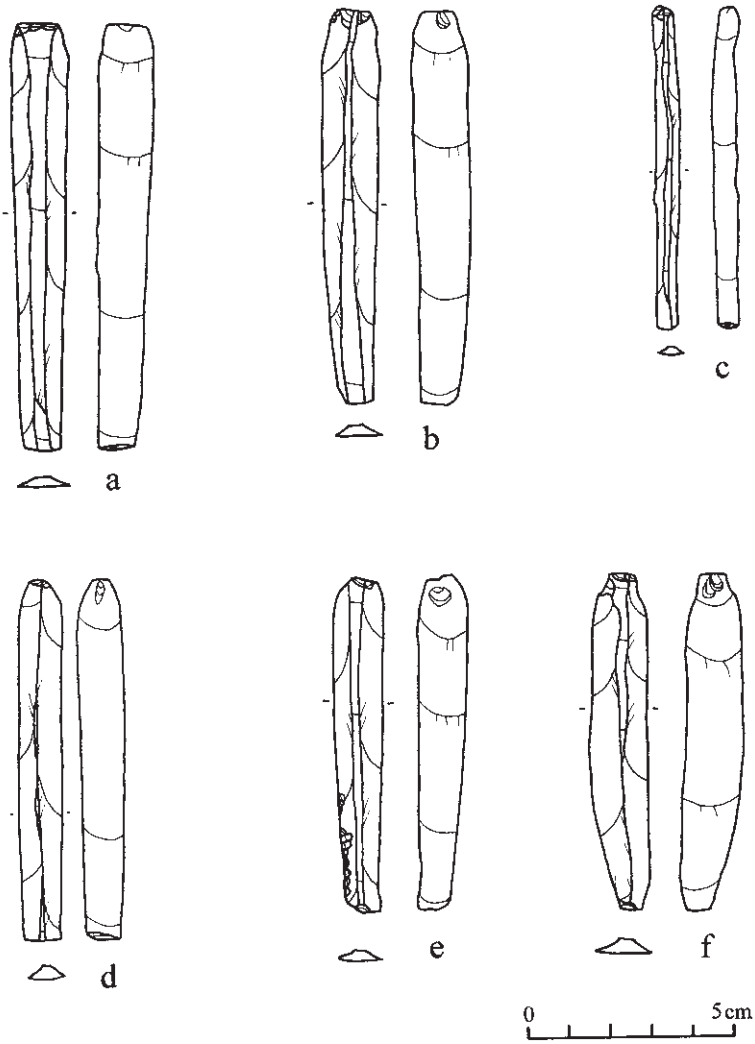

Figure 5.6. *Nearly complete prismatic blades made from El Chayal obsidian from the elite residence of Structure M8-8 at Aguateca, Late Classic period.*

in Structure M8-4, adjacent to the Palace Group of Aguateca, specialized in the production of shell and bone objects of high symbolic value (Aoyama 2007:21). The percentage of lithic artifacts exhibiting evidence of shell or bone microwear from the south room of Structure M8-4 (26.7%) is the highest in the present study. The high-status courtier/scribe carved bone or shell objects

using chert tools. Thus, it might seem surprising that some obsidian artifacts, including thick prismatic blades, macro-blades, and bifacial points, were evidently used for such tasks in the Copán Valley (see following discussion). The high-status courtier/scribe who was the household head of Structure M8-4 most likely used chert bifacial points, drills, bifacial thinning flakes, secondary flakes, tertiary flakes, and chunks from the south room for producing shell and bone objects. Consistent with this interpretation are the remains of shell ornament finishing and bone plaque reduction debris in the south room (Emery and Aoyama 2007). Shell production and finishing debitage was also found, along with chert tools used for cutting bone and shell, behind the south part of the structure.

Importantly, virtually no evidence of shell or bone carving has been found outside the epicenter of Aguateca. Moreover, none of the analyzed lithic artifacts from the royal palace of Structure M7-22 and Structure M7-32 show use-wear related to shell or bone carving, in spite of the numerous bone and shell artifacts recovered from this royal complex (Aoyama 2007:23). I argue that the royal family did not manufacture shell or bone objects but received finished artifacts from other households, such as the residents of Structure M8-4. As Inomata (2001:324) asserts, such objects made by a skilled elite craftsperson were probably highly valued; and the act of craft production itself, including some lithic production (Hruby 2007), was also an ideologically loaded political act, closely related to the elites' power and prestige. I argue that artistic production by elite craft producers was important as an exclusionary tactic and in constructing elite identity.

Lithic and other sources of evidence from Aguateca suggest that Classic Maya elite women may have also actively participated in artistic and craft production, in addition to food preparation and textile production (Aoyama 2007:24). As with the north room of Structure M8-8, food storage and preparation in the north room of Structure M8-4 is indicated by several ceramic vessels, including storage jars and a large plate, along with the presence of a large metate and nine manos. Excavators also unearthed a concentration of needles and spindle whorls in this room. A female household member, possibly the wife of the high-status courtier/scribe, likely produced and stored food as well as producing textiles both inside and in front of the room.

The lithic artifacts associated with the north room of Structure M8-4 include 130 obsidian artifacts, 376 chert artifacts, 4 hammerstones, 30 pebble smoothers, 12 faceted smoothers, and 4 polished greenstone celts. The obsidian artifacts include 114 prismatic blades, 3 initial pressure blades, 2 prismatic blade points, 5 polyhedral core fragments, and 6 flakes. The results of microwear

analysis, in addition to household spatial analysis, suggest that a female household member may have used some obsidian prismatic blades—as well as chert bifacial thinning flakes, drills, and secondary and tertiary flakes—for processing meat or other food preparation, as well as for hide or leather working. However, because male household members or servants appear to have shared the domestic space and participated in craft activities, we cannot rule out whether men or women (or both, in collaboration) crafted various objects using obsidian tools. Obsidian prismatic blades and polyhedral core fragments found in the north room were used for working wood, while chert bifacial thinning flakes, a drill, bifacial picks, and tertiary flakes served for carving shell or bone objects. Matching these observations, Kitty Emery recovered evidence of shell production and bone reduction in the north room, along with evidence of butchering a large mammal and skinning animals (Emery and Aoyama 2007:80–81). Therefore, I believe Classic Maya elite men and women participated collaboratively in many aspects of artistic and craft production, including the production of ideologically charged objects. Classic Maya elite women may have played a more important role in artistic and craft production than previously thought. Artistic production by noble men and women, as well as the control over ideological, religious, and esoteric knowledge associated with this production, were important exclusionary tactics and facets of elite identity at Late Classic period Aguateca.

I analyzed microwear on a total of 3,232 chipped-stone artifacts from the greater Copán area (Aoyama 1999). The results were extremely significant in providing evidence that skilled low-volume production of shell or bone ornaments was limited to three Early Classic period contexts. These contexts were located in the Principal Group of Copán, more specifically, the Gran Corniza Platform (Operation 37/5/287), the Chorcha Structure (Operation 37/5/266), and Structure 10L-3 (Operation V/118/3) and its immediate vicinity—including Group 10L-17 (Operation IV/121/35), only 60 meters west of the Principal Group in the El Bosque ward of the urban core (figure 5.7). This spatial distribution may suggest that rulers, local nobles, or both maintained political control over the production of such shell or bone ornaments of high symbolic value in the Copán Valley.

During the Late Classic period, a combination of lithic data and the presence of worked marine shell debris indicate that shell ornaments were manufactured in the West Court of the Principal Group (Aoyama 1995) and in an elite residence (Group 9N-8) in the Las Sepulturas ward of the urban core of Copán (Widmer 2009). The first marine shell ornament production workshop dump was uncovered in the West Court in front of Structure 10L-16

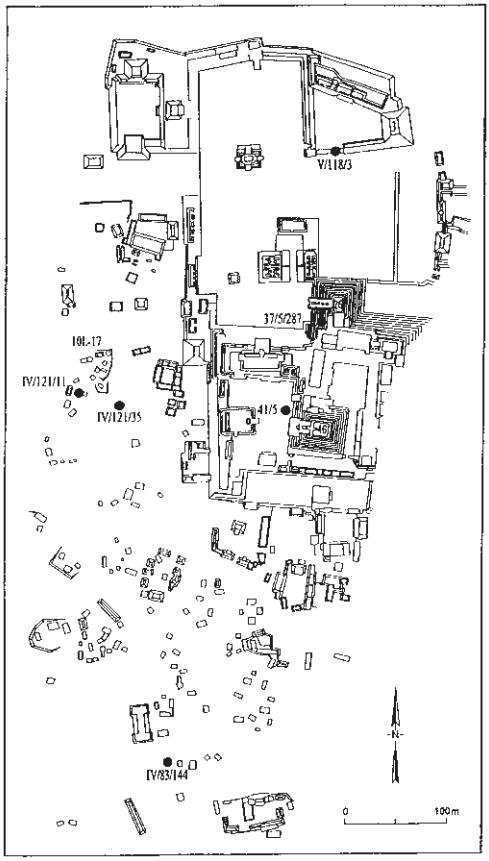

Figure 5.7. *Map of the Principal Group of Copán and adjacent areas, showing locations of workshop dumps and other lithic deposits, Classic period.*

(Operation 41/5), which represents a royal court setting. Based on stratigraphy as well as associated ceramics and glyphic texts, this deposit dates to the reign of the sixteenth ruler, Yax Pasaj Chan Yopaat (763–820 CE). The iconography of stone sculptures surrounding this locus relates strongly to sacrificial death and warfare, such as Tlaloc war images as well as a huge skull rack, a bound captive, and the dynastic founder—K'inich Yax K'uk' Mo'—emerging from a sun shield (Fash 2001:169).

The 20-centimeter-thick layer in the stratum contained numerous marine shell ornaments and debitage representing at least four species, together with 281 obsidian artifacts, 32 chert artifacts, and a small number of potsherds, jute snails, and animal bone. The obsidian artifacts include 269 prismatic blades, 3 prismatic blade points, 2 macro-blades, a bifacial point, and 6 flakes. The

inference that the materials were deposited near their original location of use may be supported by the excellent preservation of use-wear on the chipped-stone artifacts, although this evidence obviously bears primarily on the elapsed time between use and deposition. The deposit yielded neither metates nor manos, which would indicate food preparation activities as opposed to crafting. Examination of the shell ornaments and fragments indicates that they were modified through cutting, grooving, whittling, and boring.

The results of the microwear analysis suggest that specialized activities, such as ritual activities and skilled low-volume production of marine shell ornaments, took place in front of Structure 10L-16. Microwear analysis of some of the chipped-stone artifacts reveal that they were used for a range of production steps (i.e., cutting or sawing, grooving, whittling, and boring shell) that perfectly match the associated marine shell ornaments and debitage. Maya elites imported sea shells to inland cities, such as Copán. For example, they used spondylus shells to indicate water in their representations (Miller and Taube 1993:153). Hence, the high-ranking courtiers and members of the royal family most likely used some obsidian prismatic blades, macro-blades, prismatic blade points, and bifacial points as well as chert drills for producing ideologically charged marine shell objects. However, the analysis of the chipped-stone artifacts indicates that aside from working shell, the tools were also used for cutting, scraping, and piercing meat or hide; cutting or sawing and whittling wood; and cutting or sawing and whittling an undetermined material. It appears that some of the obsidian artifacts—such as prismatic blades, prismatic blade points, and macro-blades exhibiting use-wear patterns consistent with cutting, scraping, and piercing meat or hide—were used in a ritual context. In sum, the archaeological, epigraphic, and iconographic evidence suggests special uses of chipped-stone artifacts from Structure 10L-16, such as ritual and skilled low-volume production of marine shell ornaments, possibly in the hands of the royal family and other elite craft producers during the reign of Yax Pasaj Chan Yopaat.

At the Principal Group, apart from the artifacts found in the West Court, a relatively high percentage of the chipped-stone artifacts recovered from the middens associated with Structures 10L-26 2nd (Operation 37/5/219) and 10L-22 (Operation 39/1/372) were used for shell or bone working during the Late Classic period. Shell or bone working was also undertaken at three elite residences located in the urban core (Groups 10L-18 and 9N-8), as well as in the rural areas (Group 10E-6). This spatial distribution suggests that during the Late Classic period, rulers exerted less control over the production and use of shell or bone ornaments, which may have become more widespread

and decentralized in comparison to the Early Classic period. Such a pattern would corroborate the hypothesis presented by Barbara Fash and colleagues (1992:437) that the last rulers of Copán shared power with local nobles to support the Late Classic political organization.

OBSIDIAN WORKSHOP DUMPS IN COPÁN'S URBAN CORE

Excavations at the Principal Group and in the El Bosque ward of Copán's urban core have recovered chipped-stone workshop debris and other lithic deposits, including two Early Classic obsidian prismatic blade workshop dumps from within the construction fill of public architecture (see figure 5.7). These deposits resemble the "special-purpose dumps" reported from Tikal (Moholy-Nagy 1997:302), which are composed primarily of one kind of production waste, include little or no domestic trash, and present none of the offerings associated with caches or burials. Both of the fill deposits from Copán were composed primarily of production waste from Ixtepeque obsidian blade cores buried by later construction. The obsidian debitage consisted predominantly of irregular blades, rejected pressure blades, and manufacturing failures but also included fragments of macro-blades, small percussion blades, exhausted blade cores, and flakes removed from blade cores.

These special-purpose dumps may represent a management strategy for disposing noxious waste and debris associated with obsidian manufacture, similar to arguments made for obsidian dumps at Tikal (ibid.). At the same time, the essentially pure deposits of obsidian workshop materials placed in the most sacred area of Copán must have had some ritual significance. At other Maya sites, obsidian waste disposal has been associated with special construction events commissioned by rulers or other elites. Similar deposits of blade-workshop refuse have been found in the construction fill of public architecture at urban centers such as Tikal (ibid.), Quiriguá (Sheets 1983:96), and Nohmul (Johnson 1996), indicating elites' involvement in the disposal of obsidian manufacturing waste as part of dedication rites of public buildings at several cities in the Maya lowlands. Royal tombs from important Classic Maya cities—such as Tikal, Uaxactun, Dos Pilas, Tamarindito, Altar de Sacrificios, and Caracol—were covered with layers of chert and obsidian debitage, apparently part of their mortuary rituals (Moholy-Nagy 1997; Valdés 1997). Nevertheless, no such lithic debitage deposits have been found in association with royal tombs at Copán.

The first obsidian special-purpose dump from Early Classic Copán was deposited as part of a dedication ritual at the Gran Corniza Platform, built

under the Hieroglyphic Stairway of Structure 10L-26 (Operation 37/5/287). Although the deposit was small (only 0.2 m^3), obsidian density (4,835 pieces and 7,979 grams per m^3) as well as obsidian-to-ceramic ratios (483.5 pieces and 797.9 grams per sherd) are the highest for Early Classic contexts at Copán. Only one chert flake was found with the obsidian artifacts; obsidian thus constituted 99.9 percent of the total chipped stone. This is considerably higher than the mean percentage (75.2%, SD = 13.6%) from contemporary Early Classic domestic middens. John Clark (1991:258–60) observes that modern Lacandon Maya gather chert debris in a gourd and carry it away from their production areas to deposit in distant dumps. Similarly, the compactness of the Copán deposit suggests that a knapper may have dumped obsidian debris from a container into the construction fill.

The results of microwear analysis on a random sample of 68 artifacts from this deposit confirm that it represents a prismatic blade workshop dump. Only 4.4 percent of the obsidian sample was used for shell or bone working. The samples could have been used either to maintain knapping tools or to manufacture shell or bone products. If the latter was the case, the co-occurrence of these used artifacts with the core-blade debitage suggests the possibility that two producers manufacturing different goods contributed to the deposit. Alternatively, I entertain the hypothesis that a single artisan engaged in multicrafting may have produced both the obsidian prismatic blades and shell or bone goods on a part-time basis.

Excavations in the Principal Group at Copán (Cheek 1983:245) located a second prismatic blade workshop dump below the staircase of Structure 10L-3 (Operation V/118/3). The obsidian density (554.2 pieces and 652 grams per m^3) is much higher than the mean density for Early Classic domestic middens (82.5 pieces per m^3, SD = 63.4, and 132.6 grams per m^3, SD = 99.6) but lower than the first deposit from the Gran Corniza Platform. The results of microwear analysis on a random sample of 68 artifacts from the Structure 10L-3 deposit indicate that 14.7 percent of the obsidian artifacts were used for several different tasks, including cutting or sawing wood, cutting meat or hide, scraping hide, and cutting, sawing, or whittling shell or bone. These data indicate a greater degree of mixture of lithics associated with production with other used tools in this deposit compared with that from the Gran Corniza Platform.

Biface production was quite limited in the ancient Copán Valley. Members of individual households gathered local chert to make flake tools primarily but did not produce the large oval bifaces that were one of the most common Classic lowland formal tools. The chert workshops at Colhá, Belize, produced

largely utilitarian bifacial tools, including oval bifaces, from the Late Preclassic through Late Classic times (Roemer 1991; Shafer 1991). Instead, bifacial points of both obsidian (n = 378) and chert (n = 154) were the principal type of bifacially retouched artifacts at the Principal Group and throughout the Copán region. Fewer quantities of obsidian and chert eccentrics were also manufactured. Maya eccentrics were important ritual symbolic objects and are among the most difficult objects to make, reflecting their artisans' considerable skill.

A Late Classic obsidian bifacial production debris deposit in a secondary context was found in association with Structure 10L-168 of Group 10L-17, mentioned earlier, in the El Bosque ward of Copán's urban core (Operation IV/121/11; see figure 5.7). Apart from two chert flakes, obsidian comprises 99.4 percent of the chipped-stone sample from this context. At least 43 of the 144 obsidian flakes were identifiable as bifacial thinning flakes, and I was extremely conservative in my identifications of these particular artifacts. A bifacially retouched eccentric manufacturing failure was also recovered, indicating that a resident was producing obsidian eccentrics; although no bifacial points were found at this group dated to the Late Classic period, we cannot yet exclude the possibility that bifacial points were also produced here. Importantly, an Early Classic obsidian bifacial point production workshop dump was found 14 meters southeast of Structure 10L-176 of Group 10L-17 (Operation IV/121/35), indicating that the inhabitants of Group 10L-17 continued to produce obsidian bifacial artifacts for generations during the Classic period. The results of microwear analysis on a random sample of 68 artifacts indicate that 36.8 percent of the obsidian artifacts were used, although this proportion is considerably lower than the mean percentage of used obsidian from other Late Classic contexts at Copán (81.0%, SD = 26.2%). These tools appear to have been used for carpentry and hide working, as well as food preparation.

The small size of the deposit and the unconsolidated nature of the midden strongly suggest that the production area was not far from the debitage deposit. Thus, it seems likely that a knapper worked in or near Structure 10L-168. The obsidian debris was dumped into a household midden along with domestic trash, indicating that either rituals including obsidian objects or bifacial eccentric production took place in a domestic context. However, the data from postconquest Tlaxcala (Motolinía 1990 [1858]:44–45) and among modern Lacandon knappers (Clark 1991:251), as well as the cache of bifacial reduction debris found beneath the Late Classic Copán altar discussed in the next section, clearly indicate that chipped-stone knapping was more than a utilitarian activity and had some ritual components. Both postconquest Tlaxcalan and

modern Lacandon Maya fasted and prayed before knapping chipped stone (see Pastrana and Athie, this volume). Similar rituals may have been observed by the Classic Maya of Copán who produced important ritual and symbolic objects, such as eccentrics.

CHIPPED-STONE ARTIFACTS LOADED WITH IDEOLOGICAL MEANING

Caches of obsidian artifacts provide clues regarding the diverse meanings of obsidian and its role in Mesoamerican cultural practices (see Levine, chapter 1, this volume). At Copán, this is exemplified by a deposit (Operation IV/83/144) that includes a total of 283 chipped-stone artifacts found beneath and around an altar (CNP 1494) bearing hieroglyphic inscriptions in the El Bosque ward of the urban core (Fash 1983:311–15). The altar is located 150 meters south of the Principal Group and only 8 meters west of Structure 11L-72, part of a small residential group (Group 11L-8). All 272 of the chert artifacts were flakes, and 92 of them were identified as bifacial thinning flakes. Such flakes were quite rare in the Copán region and may also have had some symbolic significance.

Although the deposit is small, these flakes comprise the vast majority of chert bifacial thinning flakes recovered from Late Classic (84.4%) contexts at Copán. Moreover, the density of chert (1,360 pieces and 1,300 grams per m^3) is the highest known from Late Classic contexts. Several lines of evidence suggest that the chipped-stone artifacts from Operation IV/83/144 are a cache of bifacial reduction waste from either eccentric or projectile point manufacture. First, all the chert artifacts in the sample are unretouched flakes, a very unusual pattern for the urban core of Copán during the Late Classic period. Second, only 11 fragmentary obsidian artifacts were found with the chert flakes, so obsidian constitutes only 3.9 percent of the chipped-stone sample, much lower than the mean percentage for the urban core (81.2%, SD = 17.8%, n = 54). Third, the few obsidian artifacts recovered from Operation IV/83/144 are atypical. In comparison to the mean percentage of prismatic blades among obsidian artifacts from the urban core (76.9%, SD = 11.8%, n = 54), only 1 medial prismatic blade fragment (9.1%) and 10 small flakes were present in the obsidian assemblage. In fact, it is possible that this single aforementioned prismatic blade fragment became mixed into the altar deposit as a result of disturbance. The 10 small obsidian flakes from the deposit could be bifacial reduction debris. Fourth, the results of microwear analysis on a random sample of 68 flakes verify that neither the obsidian nor the chert flakes were used. Fifth, no household trash was found in the deposit with the chipped-stone debitage.

The number of lithics, their sources, and their colors may also suggest caching behavior. Based on color, texture, and translucency, I classified the chert artifacts into 19 distinct categories. If the obsidian artifacts are also counted (all from the Ixtepeque source), we have a total of 20 visually distinct groups, the base of the Maya vigesimal numerical system. Both 20 and the number of chert flakes are divisible by 4, suggesting an association with the cardinal directions. While these numbers might be pure coincidence, assuming that my cognitive categories correspond with those of the Classic Maya of Copán, all these lines of evidence lead me to suspect that a knapper working in a nearby workshop or someone else dedicated a part of his or her bifacial reduction flakes—from either eccentric or projectile point manufacture and possibly having symbolic significance—to the altar as a ritual cache.

Meanwhile, taking advantage of Copán's close proximity to the high-quality obsidian source of Ixtepeque, either its twelfth or thirteenth ruler deposited a cache of 700 unusually large macroflakes (as wide as 15 cm) and macro-blades (as long as 30 cm) of Ixtepeque obsidian in the middle of the Great Plaza of the Principal Group during the Late Classic period (Aoyama 2001b:354, 2011b). Such large quantities of very large macro-blades and macroflakes have not been discovered outside the Principal Group in the Copán Valley or in any other part of the Maya lowlands, suggesting that they were considered royal obsidian objects (figure 5.8). These artifacts were first-series macroflakes and macro-blades, that is, they were among the initial set of those detached through percussion from around the perimeter of unusually large obsidian macro-cores. They retain large percussion scars on their dorsal surfaces. As Don Crabtree (1968) noted, percussion preforming of macro-cores is the most difficult stage of core-blade technology. These initial macroflakes and macro-blades were the most common blanks used for obsidian eccentrics and large ceremonial bifacial points. John Longyear (1952:109), for example, reported a bifacially retouched eccentric measuring 25 × 8.5 centimeters, as well as a large bifacial point measuring over 50 centimeters in length. Caches and burials in public plazas and surrounding buildings provide significant clues regarding the nature of theatrical performances of ancient Maya rulers or other members of the elite.

Obsidian and chert artifacts from Cache 4 of Structure L8-5, located on the eastern edge of the Main Plaza of Aguateca, provide an opportunity to study the dedication of an important temple by a ruler and his followers (Aoyama 2006). The Main Plaza of Aguateca contains numerous stone monuments and provided an ideal environment for theatrical performance. Inscribed stelae associated with Structure L8-5 suggest that it was a royal temple commissioned by Ruler 3 (727–41 CE) of Aguateca (Houston 1993).

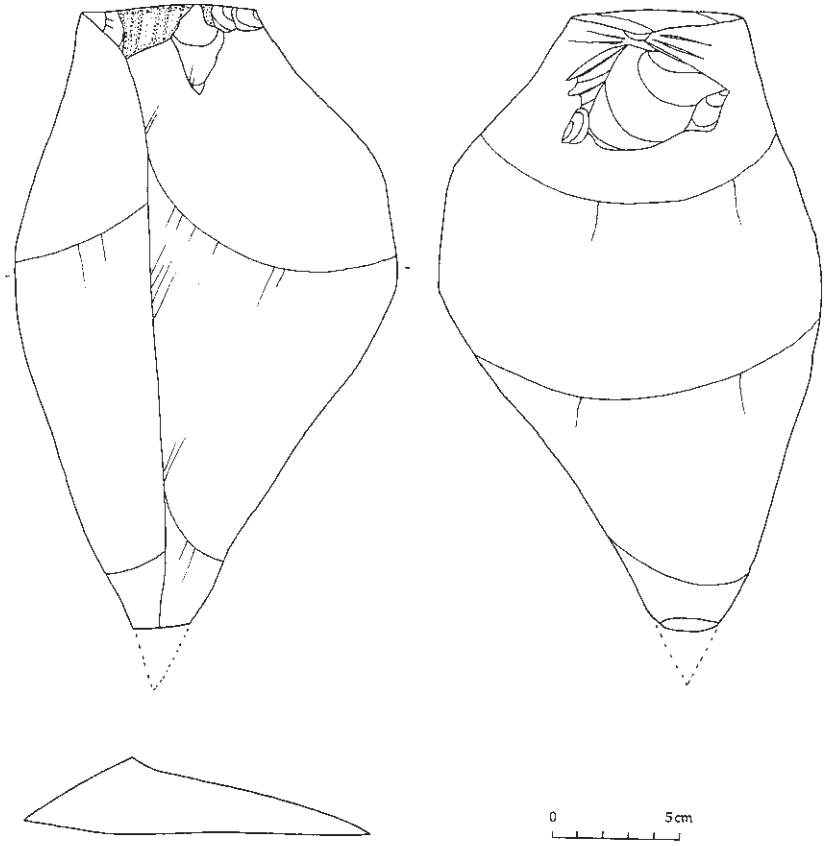

Figure 5.8. *A very large macroflake made from Ixtepeque obsidian from the Great Plaza of the Principal Group of Copán, Late Classic period.*

A total of 57 chipped-stone artifacts were recovered from Cache 4, including 49 pieces of obsidian and 8 chert eccentrics. The obsidian artifacts include a single complete blade, 11 nearly complete blades, 16 prismatic blade segments, 19 eccentrics, and 2 large flake scrapers. Five of the 19 obsidian eccentrics were made from macro-blade blanks. These eccentrics include 3 notched macro-blades, an incised macro-blade, and a macro-blade retouched to look like a reptile. A similar pattern of eccentric production was noted at Piedras Negras (Hruby 2007:74). No other eccentrics made from macro-blades were found among the total of 4,699 obsidian artifacts collected in other parts of the

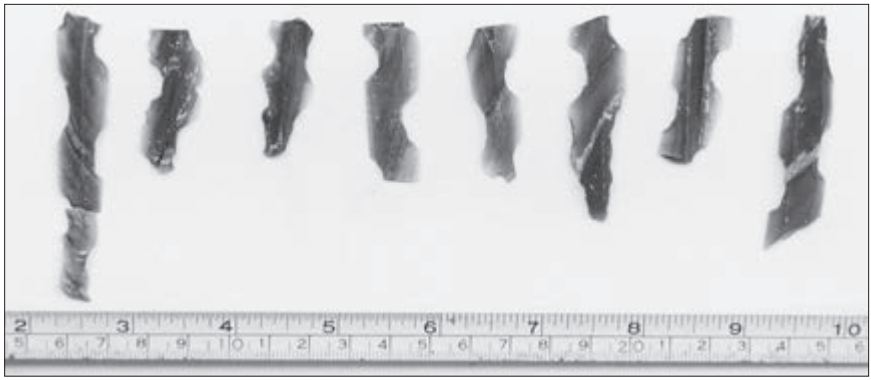

Figure 5.9. *Obsidian notched prismatic blades from Cache 4 of Structure L8-5, Aguateca, Late Classic period.*

Aguateca region during the years 1996 to 2006. Significantly, no macro-blades have been recovered outside the epicenter of the Aguateca region. These data suggest that obsidian eccentrics made from macro-blades were considered royal ritual objects.

The 13 notched pressure blades from Cache 4 of Structure L8-5 appear to symbolize "13 serpents" (Aoyama 2006:25). For the ancient Maya, the Waterlily Serpent symbolized the surface of water and was a supernatural patron of the number 13. Some Classic Maya rulers used the head of the Waterlily Serpent as a crown (Miller and Taube 1993:184). The 13 blades could also have other connotations, including the supposed 13 layers of heaven. Moreover, Chaak, the rain and storm god, was patron of the head-variant number 13 used in the 260-day calendar. In any event, the 13 notched pressure blades in Cache 4 were loaded with ideological meaning (figure 5.9). The dramatic performances and temple dedication rituals involved in the deposition of royal lithic artifacts in theatrical spaces at Aguateca and Copán must have reinforced the rulers' political and economic power.

In 2008, Takeshi Inomata uncovered Burial 104 in the Central Plaza of the neighboring site of Ceibal in the Pasión region and dating to the Mamom phase (700–400 BCE) of the Middle Preclassic period (see figure 5.1). Apart from a complete vessel, a piece of greenstone ornament, and worked marine shell objects, this distinguished male was buried with 13 obsidian prismatic blades, thus representing the earliest offering of 13 obsidian blades in Mesoamerica (Aoyama 2010:103). Five of the blades were complete, 2 were nearly complete, and the others included 2 proximal and 4 distal segments (figure

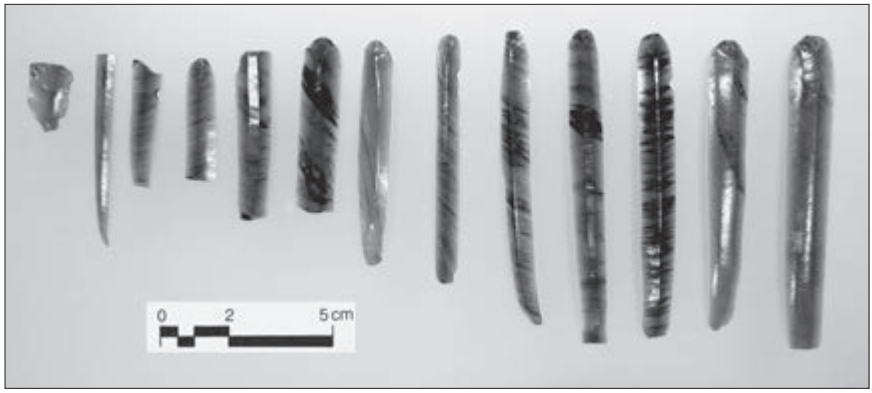

Figure 5.10. *The 13 obsidian prismatic blades associated with Burial 104 of Ceibal, dated to the Mamom phase (700–400 BCE) of the Middle Preclassic period.*

5.10). A complete blade and a nearly complete blade were made from San Martín Jilotepeque obsidian, while the others were manufactured from El Chayal obsidian. Hence, the 13 blades were not reduced from a single polyhedral core. Elsewhere, a Terminal Classic cache of 13 prismatic blade segments was deposited at the Acropolis of El Reinado in the southeast Peten region (Aoyama and Laporte 2009:37), while a late Late Preclassic (200 BCE–150 CE) cache of 13 whole prismatic blades ranging in length from 27.9 to 29.4 centimeters is reported from Tak'alik Ab'aj in the Guatemala Pacific coastal region (Prater 1989). The most important aspect of the find at Ceibal is that it demonstrates that this high-status individual managed sacred concepts associated with the number 13 during the Middle Preclassic period—much earlier than his counterparts at Tak'alik Ab'aj.

CONCLUSION

In this chapter, following the emerging "ritual economy" approach (Wells 2006), I have examined the exchange, production, use, and deposition of ancient Maya obsidian artifacts and paid special attention to the manner in which worldview and belief were embodied in material culture through religious ritual or other kinds of ritualized practices. Nearly all of the obsidian from the Copán Valley during the entire prehispanic sequence was imported from Ixtepeque, the closest source. Yet at the beginning of the Early Classic period, K'inich Yax K'uk' Mo' may have started to obtain small numbers of finished artifacts crafted from Pachuca green obsidian as part of a strategy of elite

gift exchange. The color of the green obsidian itself may have had a social and ideological significance associated with the center of the world. Because the distribution of green obsidian artifacts became more widespread during the Early Postclassic period, their symbolic significance seems to have diminished in the Maya lowlands by this time.

Classic Maya elite men and women may have participated collaboratively in many aspects of artistic and craft production, including the production of ideologically charged shell, bone, and wooden objects. The Early Classic obsidian blade workshop dumps recovered from construction fill contexts associated with public architecture at Copán suggest that elites were involved in depositing this ritual refuse as part of dedication rites. The production of obsidian ritual objects, or eccentrics, was organized as a household activity with possible ritual components in a section of the urban zone adjacent to the monumental core of Copán. Obsidian eccentrics were considered royal ritual objects at Late Classic Aguateca. The 13 notched pressure blades from Aguateca Cache 4 were loaded with ideological meaning, such as "13 serpents," the number 13 used in the 260-day calendar, and the supposed 13 layers of heaven. Moreover, a Late Classic ruler at Copán deposited a cache of royal obsidian objects, including 700 unusually large macroflakes and macro-blades, in the middle of the Great Plaza of the Principal Group. The theatrical performance and dedication rituals accompanying the deposition of these royal obsidian artifacts in theatrical spaces at Aguateca and Copán must have reinforced the rulers' political and economic power during the Late Classic period. Furthermore, a high-status male buried at Ceibal with 13 obsidian prismatic blades indicates that the number 13 may have held cosmological significance as early as the Middle Preclassic period. Finally, noble men and women who engaged in the production of ritual objects using obsidian tools had access to special ideological, religious, and esoteric knowledge. This knowledge, corresponding to the exchange, production, use, and deposition of obsidian artifacts, was an important facet of exclusionary tactics and the construction of elite identity among the ancient Maya.

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CHAPTER SIX

Obsidian Obsessed?

Examining Patterns of Chipped-Stone Procurement at Late Postclassic Tututepec, Oaxaca

Marc N. Levine

I first suspected that Tututepec may have been "obsidian obsessed" after reading a review of a paper that I had submitted for publication. The anonymous reviewer doubted my description of the chipped-stone assemblage, writing "I find it hard to believe that over 90 percent of the chipped-stone at these sites [Tututepec residences] was obsidian that came from considerable distances away." Although momentarily caught off-guard, I felt confident in my excavation methods and sampling strategy. Reflecting further, I realized that this reviewer had every right to his or her incredulity. While not uncommon for sites in highland central Mexico, the high percentage of obsidian seemed extraordinary for coastal Oaxaca, located more than 300 kilometers from the nearest obsidian source. In this chapter, I attempt to explain the relatively high quantity and proportion of obsidian discovered at Late Postclassic Tututepec households. I also address another striking pattern in lithic procurement at Tututepec: the near exclusive reliance on Pico de Orizaba and Pachuca obsidian in the Late Postclassic, whereas in earlier times, coastal Oaxacans had imported a more even proportion of obsidian from at least a half-dozen different sources.

In keeping with the goals of this volume, I consider a range of variables, including economic, political, sociocultural, symbolic, and religious factors that may have impacted obsidian procurement patterns at Tututepec. I also draw on both material and ideological considerations, examining the historical context and appreciating the materiality of obsidian and its role in relationships among people. In this endeavor, I draw on Ian Hodder and Scott

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Hutson's (2003:162–66) framework for addressing meaning in the archaeological record at three different registers. The first register concerns functional interrelationships, or what might be termed materialist approaches to explaining "objects as objects"—those that focus on questions of function, technology, and use. Studies addressing these fundamental questions have deep roots in Processual and Marxist archaeologies and remain absolutely vital today (Levine, chapter 1, this volume).

Hodder and Hutson's second register of meaning resides in the realm of cultural ideas and symbols reflected in, but also constitutive of, material culture. These are commonly held cultural understandings, or *mentalités,* that guide practice, even if people are not altogether conscious of their influence (ibid.:129).[1] Having emerged within historical traditions over the long term, some meaningful constructs are so enduring and pervasive that they may elude insiders' attention or appear incontrovertible (Hamann 2002). This second register demands that we consider obsidian's meaning from the emic perspective of those living at Tututepec in the Late Postclassic period.

These first two approaches inform a third, which Hodder and Hutson (2003:165, 236) term "operational meaning," drawing on a contextual analysis to ascertain subject-object relations, especially how people and their intentions are grounded in previous experiences that inform their decision making at any single point in time. As I discussed in chapter 1, theories of practice and materiality place objects in much greater proximity to subjects and social life. Thus, the operational meaning of obsidian is context-dependent, activated through its role in overlapping functional and sociocultural relationships. A close contextual study of obsidian, including a historical assessment, provides the best avenue for revealing the active nature of these objects and their interplay with people through practice.

Hodder and Hutson's (ibid.) tripartite treatment of meaning is intended more as a guide than a strict framework, and it is in this spirit that I draw on their work here. Meanings will often overlap one or more of the three registers outlined above and, furthermore, are not likely to be appreciated exactly as they would have been in the past. Rather, archaeologist-interpreters also bring their own subjectivities into the mix when translating data from archaeological contexts and will thus reach hybridized understandings of meaning (ibid.:161). Before presenting my interpretation of obsidian procurement patterns at Tututepec, I provide background information on the ancient center and discuss the chipped-stone assemblage recovered during excavations at three commoner households.

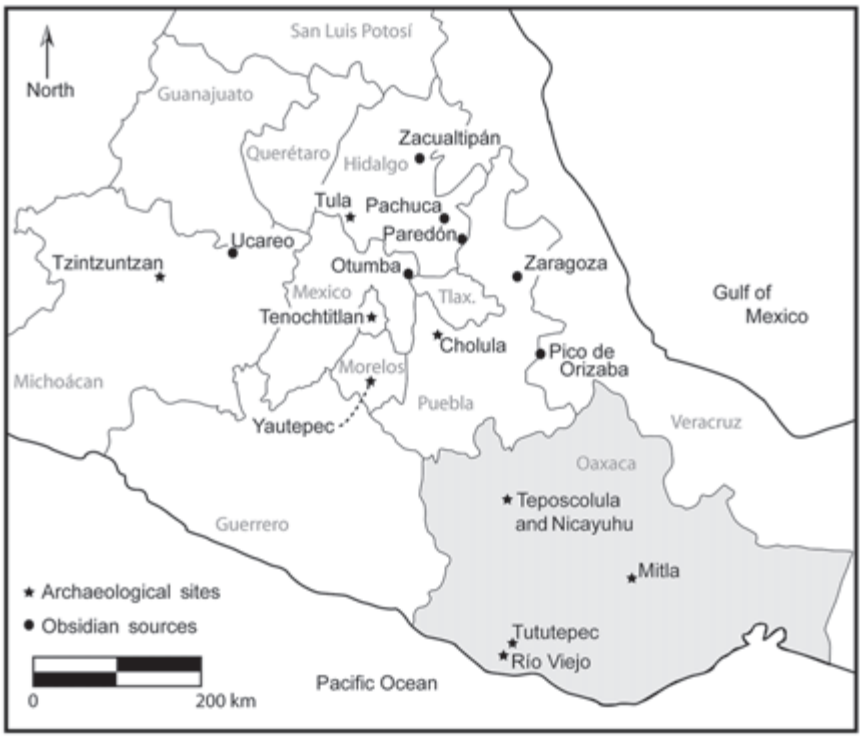

Figure 6.1. *Oaxaca and Tututepec in relation to Postclassic obsidian sources.*

RESEARCH AT LATE POSTCLASSIC TUTUTEPEC

The Late Postclassic (1100–1521 CE) Mixtec (Ñuu Dzahui) capital of Tututepec, known in the Mixtec language as "Yucu Dzaa" (Hill of the Bird), was located in the lower Río Verde region of Oaxaca, Mexico (figure 6.1). Nestled in the foothills overlooking the Pacific Ocean and fertile lower Río Verde Valley, Tututepec was an imperial capital that received tribute from dozens of subject communities spanning most of western coastal Oaxaca (Smith 1973; Spores 1993). Dating back to at least the Late Formative (400–150 BCE), large population centers flourished in the lower Río Verde region, taking full advantage of the agricultural productivity of the broad, wet floodplain (Joyce 2010:180). Ethnohistoric and codical data indicate that Tututepec was a formidable power in Late Postclassic Oaxaca and remained independent, even while much of what is present-day Oaxaca was conquered by the expanding Aztec Empire (Barlow 1992:203; Davies 1968; Joyce et al. 2004; Spores 1993:168). Arthur Joyce

and colleagues' (2004) survey of Tututepec found that the site covered nearly 22 square kilometers, though a significant portion of its settlement was relatively dispersed (see also O'Mack 1990). Joyce's survey also found little evidence of settlement during the Early Postclassic Yugüe phase (800–1100 CE), which preceded the Late Postclassic Yucudzaa phase (1100–1522 CE), and indicates that Tututepec was established as a new center circa 1100 CE. This timing fits well with narratives appearing in the Mixtec Codices Nuttall, Colombino, and Bodley, which tell of Lord 8 Deer "Jaguar Claw's" legendary sojourn from the Mixteca Alta to the coast and his eventual founding of Tututepec in 1083 CE (Jansen and Pérez Jiménez 2007; Joyce et al. 2004).

Based on a diachronic study of regional settlement pattern data, Joyce and colleagues (ibid.) found that much of the lower Verde region population moved to the new capital soon after its founding. Furthermore, Tututepec's large size represents a significant increase in the region's population, most likely in part the result of an influx of highland Mixtecs to the coast around the time of its establishment. Thus, Tututepec's population included a combination of highland Mixtec immigrants and lowland coastal peoples—probably Chatinos and others who had long occupied the lower Río Verde region (Barber 2005; Joyce 1991, 2005, 2010; King 2003; Workinger 2002).

In 2005, the Tututepec Archaeological Project (TAP) carried out excavations at three household areas to garner information on Tututepec's domestic and political economy (Levine 2006, 2007, 2011). The three areas investigated—Residences A, B, and C—were located 1.25 kilometers northwest of the site's civic-ceremonial core and were determined to be commoner households based on a comparative analysis of associated artifacts and architectural remains (Levine 2011; figures 6.2 and 6.3). Extensive excavations at Residences A and B revealed household architecture and associated features, examined the duration of occupation at each residence, and investigated exterior activity areas. Radiocarbon dates, artifact analyses, and stratigraphic studies demonstrate that Residences A and B date respectively to the fourteenth and fifteenth centuries.[2] The absence of superimposed occupation surfaces or evidence for substantial architectural remodeling indicates relatively short occupations of a few generations or more at Residences A and B. Time constraints limited work at Residence C, but excavations in associated midden areas yielded artifacts nearly identical to those of Residences A and B, indicating that it, too, dated to the Yucudzaa phase. While a lighter scatter of artifacts was found in contact with the household occupation surfaces, the vast majority of domestic debris, including chipped-stone material, was recovered in well-dated stratified midden deposits.

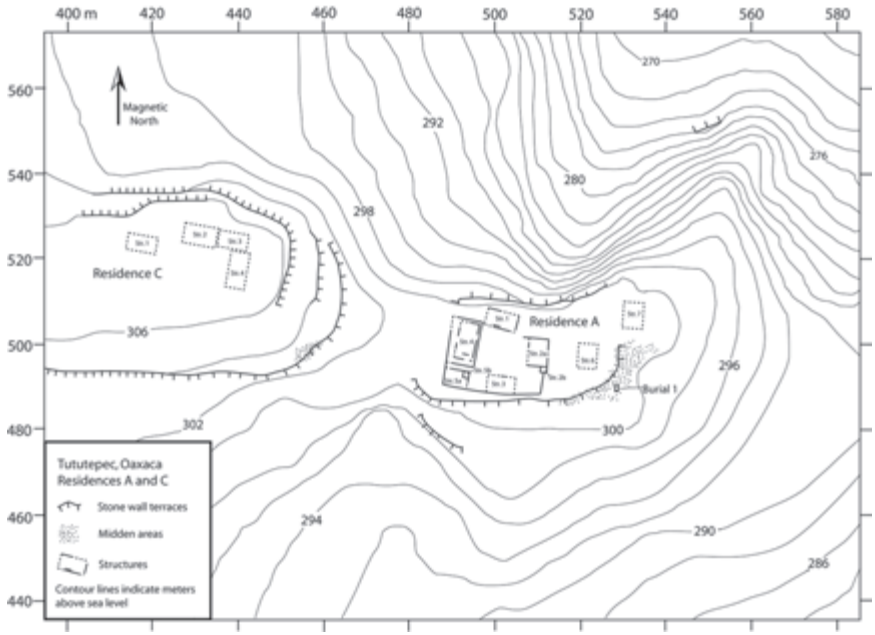

Figure 6.2. *Plan map of Tututepec Residences A and C.*

CHIPPED-STONE ASSEMBLAGE FROM TUTUTEPEC

Obsidian constituted over 96 percent of the chipped-stone assemblages from all three Tututepec households, with the remaining amount composed of chert and small traces of poor-quality local quartz (table 6.1). Approximately 90 percent of the obsidian artifacts were blades, with a small number of retouched tools made from blade blanks, flakes, and debitage (table 6.2). At Residence A, we found six exhausted polyhedral core fragments and a small number of probable core rejuvenation flakes, suggesting low-level blade manufacture (figure 6.4). The blademaker appears to have worked with already well-trimmed and prepared polyhedral cores with pecked and ground platforms (Levine 2007:353). It is unclear whether this evidence for blade manufacture can be attributed to a resident of the household or possibly an itinerant specialist who visited periodically. Little to no evidence of blade manufacture was found at the other Tututepec residences. Among the very limited number of non-utilitarian obsidian artifacts recovered at the households were two bifacially flaked lancets, probably used for bloodletting, and a finely ground earspool fragment from Residence B.[3] The chert artifacts included small projectile points, blades,

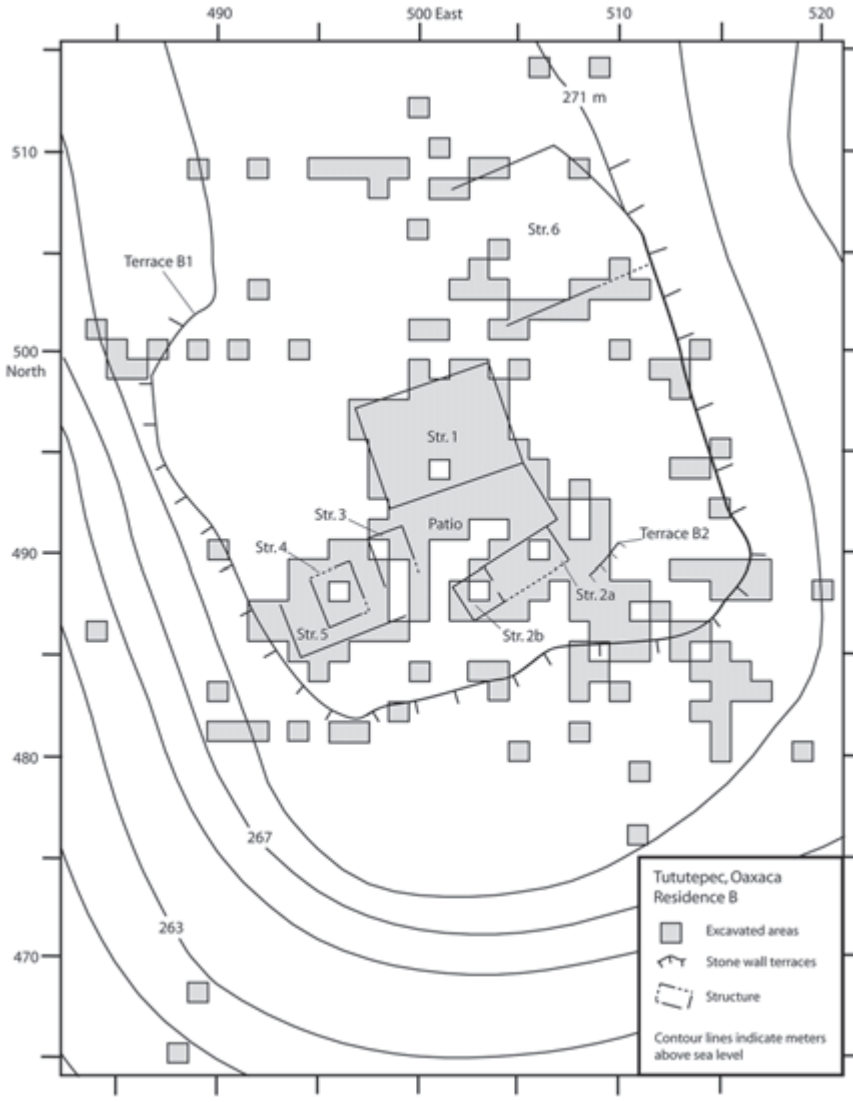

Figure 6.3. *Plan map of Tututepec Residence B.*

bifacial discs, and small traces of debitage (table 6.3).[4] Most of the chert was either opaque or translucent white, and the precise origin of these materials remains undetermined. Relatively small chert nodules of variable quality can be found in the riverbed of the lower Río Verde and also occur in deposits

Table 6.1 Frequency of chipped-stone material from Tututepec

	Obsidian		*Chert*		*Quartz**	
Tututepec	*Count*	*%*	*Count*	*%*	*Count*	*%*
Residence A	836	96.4	23	2.7	8	0.9
Residence B	281	97.2	8	2.8	0	0.0
Residence C	71	97.3	2	2.7	0	0.0
Total	1,188	96.7	33	2.7	8	0.7

*Poor-quality quartz that occurs naturally in the local bedrock.

Table 6.2 Obsidian artifact frequencies from Tututepec residences

	Obsidian Artifacts											
	Blades		*Bifaces and Unifaces*		*Projectile Points*		*Cores*		*Flakes and Debitage*		*Earspool*	
Tututepec	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
Residence A	752	89.7	11	1.3	14	1.7	7*	0.8	54	6.4	0	0.0
Residence B	248	88.3	5	1.8	6	2.1	0	0.0	21	7.5	1	0.4
Residence C	70	98.6	0	0.0	0	0.0	0	0.0	1	1.4	0	0.0
Total	1,070	89.9	16	1.3	20	1.7	7	0.6	76	6.4	1	0.1

*Includes 6 polyhedral core fragments and 1 bifacial reduction core fragment.

within the granodiorite bedrock below Tututepec. Nonetheless, no substantial high-quality chert deposits are yet known from the region.

An interregional comparison of obsidian artifact frequencies at Postclassic commoner households, measured in proportion to total potsherds, demonstrates that Tututepec consumed more than twice the amount of obsidian as its peers in the Mixteca Alta at urban capitals like Teposcolula (Yucundaa) and more than 10 times that of rural commoners at sites such as Nicayuhu (table 6.4). Even though these Postclassic sites in the Mixteca Alta are much closer to all highland obsidian sources (see figure 6.1), their chipped-stone assemblages are dominated by more locally available chert. The proportion of obsidian from Tututepec is in fact more similar, though not nearly as high, as

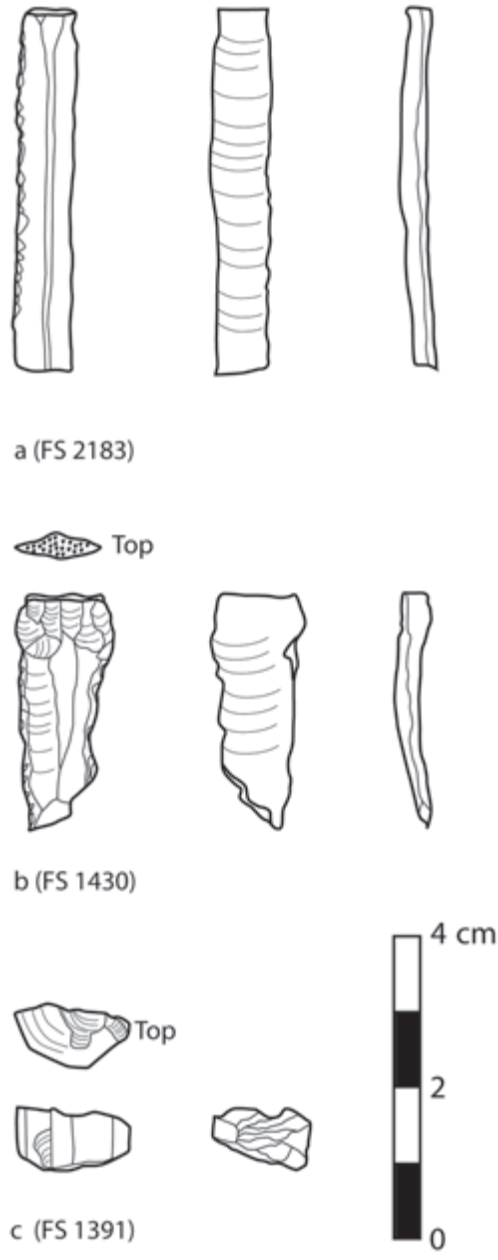

Figure 6.4. *Obsidian blades (a and b) and a polyhedral core fragment from Ucareo (c) from Residence A.*

Table 6.3 Chert artifact frequencies from Tututepec residences

	Blades		*Bifaces and Unifaces*		*Projectile Points*		*Flakes and Debitage*	
Tututepec	*Count*	%	*Count*	%	*Count*	%	*Count*	%
Residence A	3	13.0	7*	30.4	3	13.0	10	43.5
Residence B	1	12.5	0	0.0	1	12.5	6	75.0
Residence C	0	0.0	0	0.0	0	0.0	2	100.0
Total	4	12.1	7	21.2	4	12.1	18	54.5

*Includes 4 disc-shaped artifacts, possibly scrapers.

that reported for Aztec sites in Morelos (table 6.4). A simple distance-decay model of obsidian distribution would never predict that the highest proportion of obsidian artifacts in Late Postclassic Oaxaca would be at Tututepec—one of the sites farthest removed from all sources. Thus, the high proportion and quantity of obsidian at Tututepec merits further explanation.

When we combined a conservative visual analysis of all obsidian with X-ray fluorescence (XRF) analysis of 99 samples from Residences A and B, nearly all of the obsidian artifacts were sourced (table 6.5; Levine, Joyce, and Glascock 2011). The sample of artifacts sent for XRF analysis was selected by random (n = 66) and non-random means (n = 33) from all excavation contexts at Residences A and B. The non-random sample was selected to include the full range of visually discernible variability and also included specimens that could not be identified by visual means alone. The results of the sourcing study indicate that during the fourteenth and fifteenth centuries, Tututepec imported over 96 percent of its obsidian from either Pico de Orizaba or Pachuca (Sierra de las Navajas), with the remaining 4 percent from Otumba, Paredón, Ucareo, and Zaragoza combined. From the fourteenth to the fifteenth century, minor permutations occurred in obsidian source frequencies: Pachuca imports dipped (46.1% to 32%), while there was a surge in the proportion of Orizaba (51.4% to 63.3%) and a minor increase in Otumba (1.7% to 4.3%) imports. Nonetheless, the overall pattern during the Yucudzaa phase was a near complete reliance on Orizaba and Pachuca obsidian. This marks a clear shift in procurement patterns in comparison to the earlier Yugüe phase, when obsidian was imported in much more even proportions from at least six sources (table 6.6; Levine, Joyce, and Glascock 2011; see also King 2008:table 8.1). In the Yugüe phase, the largest quantity of obsidian came from Ucareo (31.5%) and Zaragoza (22.2%), followed by Zacualtipan (14.8%), Pico de Orizaba (11.1%), Otumba (9.3%), and

Table 6.4 Comparison of obsidian artifact frequencies from Postclassic commoner residences

Commoner Residences	*Total Obsidian Artifacts*	*Total Sherds*	*Obsidian Artifacts per 1,000 Sherds*
Tututepec, Oaxaca			
Residence A (1300s CE)	838	60,816	13.8
Residence B (1400s CE)	281	17,090	16.4
Residence C (1100–1522 CE)	71	5,835	12.2
Mixteca Alta, Oaxaca			
Teposcolula, Units J-1 and J-2*	75	13,891	5.4
Nicayuhu, House 1 (1491–1527 CE)†	27	40,061	0.7
Nicayuhu, House 2 (800–1521 CE)†	15	6,658	2.3
Yautepec, Morelos‡			
Atlán phase (1300–1430 CE) Units 501, 502, 503, 504, 505, 506, 507, 508, 509, 512, and 517	4,952	191,585	25.8
Molotla phase (1430–1521 CE) Units 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, and 517	20,126	751,564	26.8

* Teposcolula data combine two households: J-1 and J-2 (see Spores 2006:582; Spores and Robles García 2005:629, table 2).

† Nicayuhu data based on Pérez Rodríguez (2003:tables 4.5, 5.3, and 5.4).

‡ Yautepec data include totals from 11 Atlán and 13 Molotla phase houses (see Norris 2006:tables C4-3 and C4-4).

Pachuca (9.3%). This shift in procurement from a broad reliance on several obsidian sources in the Yugüe phase to a narrow reliance on Pico de Orizaba and Pachuca obsidian in the Yucudzaa phase is the second major pattern of interest I return to later in this chapter.

Why So Much Obsidian at Tututepec?

Tututepec's apparent role as a coastal entrepôt is critical to understanding why its people imported and used so much obsidian. Ethnohistoric, codical, and archaeological evidence supports the notion that Tututepec pursued a highland-lowland trade strategy that took advantage of its access to valuable lowland resources, such as feathers, cotton, shell, salt, cacao, and other goods (Joyce et al. 2004; Levine 2011; Monaghan 1994; Spores 1993). The Relaciones Geográficas,

Table 6.5 Obsidian source frequencies from Tututepec residences

	Residence A (cal 1298–1372 CE)		*Residence B (cal 1399–1484 CE)*		*Residence C (1100–1522 CE)*		*Total*	
Source	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
Otumba	14	1.7	12	4.3	0	0	26	2.2
Pachuca	386	46.1	90	32	48	44.1	524	44
Paredón	1	0.1	1	0.4	0	0	2	0.2
Pico de Orizaba	431	51.4	178	63.3	21	53	630	52.9
Ucareo	1	0.1	0	0	0	0	1	0.1
Zaragoza	1	0.1	0	0	0	0	1	0.1
Undeterm.*	4	0.5	0	0	2	2.9	6	0.5
Total	838	100	281	100	71	100	1190	100

*The "undetermined" category consists of obsidian samples that could not be identified visually; nor were they submitted for XRF analysis.

responses to a questionnaire distributed by the Spanish Crown to indigenous communities in 1577, provides useful information concerning prehispanic sociopolitical relationships and life in general. Relaciones from a handful of towns in the Valley of Oaxaca and Mixteca Alta, for instance, indicate that they imported salt from Tututepec (Acuña 1984 [ca. 1580]:37, 323). In the Early Colonial period, the rulers of Tututepec laid claim to nearly a dozen coastal saltworks (Fernández de Recas 1961:194), and preliminary archaeological work at some of these *salinas* suggests they were also used during the Late Postclassic (Grove 1988).

Surplus cotton production was also of central importance to Tututepec's economy. Joyce and colleagues' (2004) surface survey found small ceramic spindle whorls dispersed throughout Tututepec's settlement. Furthermore, the TAP household excavations recovered dozens of similar whorls, strongly suggesting that people had spun a surplus of cotton thread—much of it probably exported to highland areas (Heijting 2006; Levine 2011). Lowland commodities such as salt and cotton would have been traded from Tututepec to the highlands in return for goods such as obsidian, unavailable on the coast. But it turns out that high frequencies of obsidian consumption constituted a long-standing pattern in the lower Río Verde region; obsidian composes the majority of chipped-stone artifact assemblages dating back to Early Formative (1200–800 BCE) times (Hepp 2011). Lower Río Verde people had long maintained

Table 6.6 Obsidian source frequencies from Postclassic commoner residences in the lower Río Verde region (Levine, Joyce, and Glascock 2011)

	Río Viejo, Oaxaca, Residence RV0A, Yugüe phase (800–1100 CE)		*Tututepec, Oaxaca, Residences A, B, and C, Yucudzaa phase (1100–1522 CE)*	
Source	*Count*	*%*	*Count*	*%*
Otumba	5	9.3	26	2.2
Pachuca	5	9.3	524	44
Paredón	0	0	2	0.2
Pico de Orizaba	6	11.1	630	52.9
Ucareo	17	31.5	1	0.1
Zaragoza	12	22.2	1	0.1
Zacualtipan	8	14.8	0	0
Undetermined*	0	0	6	0.5
Unknown†	1	1.9	0	0
Total:	838	100	1,190	100

*The "undetermined" category consists of obsidian samples that were not submitted for XRF analysis and could not be identified visually.

†The "unknown" category includes obsidian analyzed by XRF that was not matched to any known sources.

durable interregional trade links with highland regions that supplied obsidian, although the variety of sources shifted considerably through time (Joyce et al. 1995; Levine, Joyce, and Glascock 2011). Thus, part of the explanation of why Tututepec imported so much obsidian must be understood in this historical context, in which lower Verde people had engaged in highland-lowland trade for approximately two millennia. Notwithstanding the economic and political benefits of this exchange, over time, trading coastal goods for highland materials such as obsidian would have become axiomatic, an entrenched and customary practice nearly beyond question. Regular exchanges of goods and information with highlanders, and the inevitable social and political relationships that ensued, are also likely to have figured in the construction of a distinct lower Río Verde social identity.

Yet the sheer quantity of obsidian imports appears to have reached new heights in the Late Postclassic. Tututepec commoners used two to three times the amount of obsidian in comparison to their earlier Yugüe phase counterparts from Río Viejo (table 6.7). An upswing in the volume of obsidian trade in the Yucudzaa phase could reflect what some scholars have identified as

Table 6.7 Obsidian artifact frequencies from Early and Late Postclassic commoner residences in the lower Río Verde region of Oaxaca

Commoner Residences	*Total Obsidian Artifacts*	*Total Rim Sherds*	*Obsidian Artifacts per 1,000 Rim Sherds*
Late Postclassic Tututepec			
Residence A (1300s CE)	838	6,297	133
Residence B (1400s CE)	281	1,740	161.5
Residence C (1100–1522 CE)	71	639	111.1
Early Postclassic Río Viejo*			
RV0A, middens F14, F23, and F24 (800–1100 CE)	54	2,457	22

*Data from Hedgepeth (2009:table 5–10).

broader trends associated with the Postclassic period, including an intensification of trade, commercialization of the economy, and greater economic integration (Smith and Berdan 2003). But were there more locally rooted factors that may have contributed to the demand for, and near total reliance on, obsidian at Tututepec?

The fact that trade provided a medium for negotiating political relationships both abroad and at home may have motivated Tututepec to intensify its highland-lowland strategy, resulting in greater obsidian consumption. By becoming a vital trade partner with influential highland polities, even adversaries such as the Aztecs, Tututepec may have asserted its importance as a regional power and used its standing as a lowland goods supplier to negotiate its political position with its peers. In the second half of the fifteenth century, when the Aztecs conquered much of Oaxaca, Tututepec may have fended off the central Mexicans not through a stout defense alone but also by threatening to cut off vital lowland supplies (e.g., cotton thread) in the event of hostilities. The Aztecs may have spared Tututepec as a strategy to avoid the risk of overextending their military and political apparatus and simultaneously ensure the uninterrupted flow of lowland goods to highland areas, where they were in constant demand (see Berdan et al. 1996). In terms of political machinations at home, Tututepec elites may have highlighted their roles as effective leaders by spearheading interregional trade to garner valued items such as obsidian (see Pohl 2003a; Terraciano 2001:245). Yet detailed archaeological evidence from elite contexts at Tututepec is needed to further evaluate this proposition.

Tututepec may have also augmented obsidian imports in the Late Postclassic to arm its warriors. Obsidian was an integral component of weapons, including *macana* swords, spears, darts, and arrows—all of which were required in great numbers to arm Tututepec's forces (see Darras, this volume; Pastrana and Athie, this volume; Taube 1991). The Codices Colombino and Nuttall depict Lord 8 Deer "Jaguar Claw," the founder of Tututepec, conquering roughly 100 settlements—each denoted by a distinct toponym—during his lifetime (Smith 1963:277, cited in Spores 1993:169). Ethnohistoric sources further attest to Tututepec's conquests and bellic nature, warring with neighbors and raiding communities as far away as Mitla, in the highland Valley of Oaxaca (Acuña 1984 [ca. 1580]; Joyce et al. 2004; Smith 1973; Spores 1993). Tututepec's military operations were, as far as we know, more ambitious than any mounted by previous lower Verde region political centers. If Tututepec's military organization was similar to that of the Aztecs, units were organized by residential ward, and commoner warriors would have been largely responsible for arming themselves (Pastrana 2007:126–27). Thus, some portion of the obsidian projectile points and blades from the TAP households may have been armaments, although distinguishing them from hunting gear or other tools remains problematic (see table 6.2). Tututepec's imperial program would have supported its highland-lowland trade strategy in a number of ways. Conquests led to greater revenue in the form of tribute, some of which would have been exported for profit or coalition building, while these military operations also served to secure critical trade routes and dissuade competition.

Within the Tututepec realm, there is evidence for the adoption of new religious cults celebrating central Mexican deities strongly associated with obsidian and warfare. Referred to as *Itztli* in Nahuatl, obsidian pervades the essence of the goddess Itzpapalotl, or "obsidian butterfly," whose wings were tipped with obsidian or chert knives (ibid.:186; Pastrana and Athie, this volume). According to John Pohl (1999:184), the imposing Tututepec Monument 6—measuring approximately 2 meters tall—was carved in a quasi–central Mexican style and probably depicts Itzpapalotl (figure 6.5). Celebrated as a warrior goddess, Itzpapalotl may have also been revered as a patron of obsidian production (Pastrana 2007:175). Written records also report that Itzpapalotl was worshipped regularly in Pochutla, a tribute-paying vassal of Tututepec (Acuña 1984 [ca. 1580]:193). In addition, Tututepec's subjects at Tonameca and Pochutla reportedly made blood and human sacrifices to Tezcatlipoca, "Lord of the Smoking Mirror," whose amputated foot was replaced by an obsidian mirror that emitted smoke (ibid.:198; see also Faust 2009:217–20; Heyden 1988; Olivier 2003:25–28).[5] The adoption of central Mexican cults at Tututepec

would have supported its ideology of military conquest and indirectly contributed to demand for obsidian weapons and implements used to make ritual offerings to these deities.

Why So Much Gray and Green Obsidian at Tututepec?

The most dramatic change in Postclassic obsidian trade patterns occurred during the Yugüe to Yucudzaa phase transition, when the obsidian supply shifted from a broad reliance on six types to a pattern dominated by Pico de Orizaba and Pachuca imports (see table 6.5). Here I examine why Late Postclassic Tututepec relied almost exclusively on translucent, gray streaked obsidian from Pico de Orizaba and the distinctive chatoyant green variety from Pachuca.

From a supply-side perspective, the intensive and extensive mining efforts at Pachuca and Orizaba during the Postclassic appear unparalleled, suggesting that these varieties of obsidian were in greater circulation than others and thus traded to Tututepec at higher frequencies (Cobean 2002; Pastrana 1998). But this intensification of mining activity must also be considered a response to increasing demand. Furthermore, why Orizaba and Pachuca obsidian as opposed to other varieties? Both were of relatively high quality, but other serviceable obsidian types with similar flaking characteristics were also available. Examining obsidian procurement in terms of least-cost, one might surmise that Orizaba was most common at Tututepec because it was closest and thus cheapest to transport. While relative proximity as it relates to cost cannot be discounted as a contributing factor, this logic alone fails to explain the high proportion of Pachuca, which is located farther from Tututepec than other sources, such as Otumba (see also Carballo, this volume). Furthermore, an economizing logic fails to explain oscillations in obsidian procurement patterns in the lower Río Verde region through time (cf., Joyce et al. 1995; Levine, Joyce, and Glascock 2011). For instance, in the Early Postclassic (800–1100 CE), Pico de Orizaba is still the closest source, but its imports trail those from Ucareo, Zaragoza, and Zacualtipan.

Another supply-side perspective, here focusing on macro-regional political change through time, suggests that the broad reliance on six obsidian sources in the Yugüe phase narrowed to only two in the Yucudzaa phase as a result of major shifts in political geography during the Postclassic. These shifts included a relative consolidation of power, most clearly illustrated in the establishment of the Tarascan and Aztec Empires in the Late Postclassic, both of which exerted influence over obsidian resources and may have effectively pushed independent

Figure 6.5. *Tututepec Monument 6.*

obsidian merchants who had operated during the Early Postclassic out of business. While these broad-scale political changes remain critical to our understanding, the almost complete reliance on Pachuca and Orizaba obsidian at Tututepec in particular requires a consideration of local demand and why coastal Mixtecs may have expressed a preference for these types.

Ethnohistoric data confirm that Mesoamericans were keen on obsidian's diverse visual attributes, especially color, and that certain varieties carried symbolic connotations distinct from broader associations common to all obsidian (Pastrana 2007:164–65; Pastrana and Athie, this volume). Nonetheless, it is no easy task to determine how different types of obsidian invoked variable meanings and how those meanings were manifest among different cultural groups through time. For coastal Oaxacans of the lower Verde region, located far from highland areas, obsidian in general would have carried strong associations with the distant mountainous landscape from whence it came. This sacred landscape, crowned by volcanic mountains that often corresponded to obsidian deposits, was also associated with powerful gods and political centers (e.g., Broda 1991; Broda, Iwaniszewski, and Montero 2007; Darras, this volume; López Austin 1997:217–18). My discussion now turns more speculative, as I attempt to discern the more specific symbolic connotations of Pico de Orizaba and Pachuca obsidian for the people of Tututepec and how they may have led to preferences for these types.

Archaeological evidence suggests that in some contexts—but by no means all—Mesoamericans expressed preferences for certain types of obsidian that cannot be explained by performance characteristics alone (e.g., Aoyama 1999:811; Pastrana and Athie, this volume). Evidence from both central Mexico and the Maya area suggests that at times, tool makers and ritual specialists carefully selected the type of obsidian appropriate for a given class of tool or offering (Carballo, this volume; Chase and Chase 2011:9–13; Moholy-Nagy, Asaro, and Stross 1984:116; Spence 1996:23; Sugiyama 1989:95). For instance, Hattula Moholy-Nagy (2003:307) reports that among the green and gray varieties of obsidian used to produce thin utilitarian bifacial knives and "ceremonial lithics" from the Maya region, the vast majority were made from central Mexican material. At Teotihuacan, obsidian from Pachuca was apparently preferable for making blades, while Otumba material was more often used for bifaces (Carballo, Carballo, and Neff 2007:38). While some argue that obsidian utilization patterns stem from variability in the performance characteristics of different types, we should also consider how symbolic associations may have figured in the selection process, especially for instruments used in ritually charged contexts.

There is little doubt that Pachuca obsidian was appreciated at Tututepec and throughout Mesoamerica for both its quality and its translucent, dazzling green color (Spence 1996). Its color would have evoked associations with fertility, regeneration, and the rain god Tlaloc—or its Mixtec cognate "Dzahui." Alfredo López Austin (1997:209–10) explains that among the Nahua, Tlaloc was known as the "the Green One" and was credited with the budding, greening, flowering, and growth of edible plants and trees. Fray Bernardino de Sahagún's (1950–82, 2:7) Early Colonial period informants referred to Tlaloc as "the provider" but also acknowledged his terrible power, attributing "to him the drowning of people, the thunderbolts." The volcanic peaks of the central Mexican highlands, shrouded in rain clouds, were the home of Tlaloc. A survey atop Mount Tlaloc, where pilgrims made offerings to the rain god, identified multiple green blade fragments from Pachuca that were probably used during ritual activities, including sacrifice (Townsend 1992:29). In fact, archaeological features, such as shrines and ancient footpaths, are present at all of Mexico's major volcanic mountains (e.g., Popocatepetl, Iztaccihuatl, Cofre de Perote, and Nevado de Toluca), although most remain incompletely explored (Lorenzo 1957; Montero García 2009; see also Plunket and Uruñuela 1998). Even today, Mesoamerican indigenous groups make traditional pilgrimages to volcanic peaks to make ritual offerings of blood, food, prayers, and other materials (Sandstrom 2001; see also Glockner 1996). The overlapping associations among obsidian, volcanic mountains, rain, and the color green raise the possibility that Pachuca obsidian expressed notions of fertility and rejuvenation as propagated by Tlaloc (see also Darras, this volume).

There is reason to believe that Mixtec people also associated green Pachuca obsidian with the rain god Dzahui. In times of drought, the Mixtec petitioned the rain god by piercing their skin with obsidian blades and making blood sacrifices (Terraciano 2001:265). This ritual, common throughout prehispanic Mesoamerica, demonstrated the direct relationship between obsidian tools and sacraments associated with rain and fertility. Ritual sacrifice was a structuring principle in Mesoamerican belief that persisted over the *longue durée*, indeed for millennia, and was carried out as a means of fulfilling a sacred covenant between people and the gods (Hamann 2002; Joyce 2000, 2008; Monaghan 1995).

Ethnographic information further sustains the connection between obsidian and rain; John Monaghan (1995:109) reports that the Mixtecs of Santiago Nuyoo refer to obsidian as "fossilized lightning," which represents the power of the "rain saints" (Nu'un Savi) (see also Miller and Taube 1993:88; Monaghan, this volume; Pastrana and Athie, this volume). The Mixe people of northern

Oaxaca also associate obsidian with thunderbolts and, furthermore, maintain that these powerful strikes can leave signs of blood on the ground (Lipp 1991:29). These ethnographically documented beliefs are consistent with the ethnohistoric record from the conquest era. In the Codex Borgia, in the top register of page 20, Tlaloc hurls lightning bolts toward the ground where corn plants sprout (Byland 1993:xx; Díaz and Rodgers 1993:plate 20). Similarly, the *Leyenda de los Soles*, written in Nahuatl around 1558, relates the story of how the "hill of sustenance" containing maize was cracked open with a thunderbolt (Graulich 1997:115). In the Maya area, obsidian eccentrics knapped in the form of K'awiil, the god of lightning, are reported from ritual caches at Piedras Negras, while blades incised with the same deity's image have been found at Tikal (Hruby 2007:figures 5.5–5.8; see also Moholy-Nagy 2007:figures 42–54). In a more immediate way than black or gray varieties, green obsidian used in bloodletting rituals or dedicatory offerings would have conjured associations with Tlaloc/Dzahui, fertility, and new growth. A carved stone boulder from Tututepec depicting the goggled visage of Dzahui could mark one location where bloodletting rituals took place at the Mixtec capital, but further investigations are needed to examine this proposition (figure 6.6; see also McCafferty 1996:figure 14; Pohl 1994:figure 9). The only bifacially flaked bloodletters recovered from the TAP excavations (n = 2) were fashioned from Pachuca obsidian, suggesting that Tututepequeños preferred green obsidian implements above all others for making ritual offerings.

Green obsidian may have also conjured associations with powerful places, such as Teotihuacan, Tula, and Tenochtitlan—all of which were involved to varying degrees in the procurement or distribution of Pachuca obsidian. Apart from obsidian imports, ceramic and iconographic data attest to long-term exchange linking the lower Verde region to highland Mexico (Hedgepeth 2009; Joyce 1991, 2003, 2010; Joyce, Bustamante, and Levine 2001; King 2008; Levine 2007). Lower Río Verde people may have appreciated Pachuca obsidian as a materialization and touchstone of their relationship with prestigious highland Mexican centers. Although difficult to demonstrate conclusively, Pachuca obsidian may have symbolized tangible connections with powerful highland capitals such as Tenochtitlan, which may have provided a foothold for expressing social differences that distinguished the people of Tututepec from their peers (Helms 1988; Schortman 1989). What is more difficult to explain is why Pachuca obsidian's enduring symbolic associations would have come to the fore during the Late Postclassic, as opposed to earlier periods such as the Early Classic, when high proportions of Pachuca imports in the lower Verde region are also reported (Joyce 2003:65–67).

Figure 6.6. *Carved stone boulder at Tututepec, known by locals as "el sapo del dios de la lluvia" (toad of the rain god).*

The highest proportion of obsidian imported to Tututepec in the Late Postclassic was from Pico de Orizaba (see table 6.5). At an elevation of 5,610 meters above sea level, Pico de Orizaba is Mexico's tallest peak and on a clear day can be seen from hundreds of kilometers away—including areas of Oaxaca. Over the last 9,000 years, volcanic activity at Orizaba has produced smoke and ash ejecta, as well as pyroclastic and lava flows that would have gained attention throughout much of Mesoamerica (De la Cruz-Reyna and Carrasco-Núñez 2002; Holmberg 2013; Montero García 2010; Rossotti et al. 2006). Orizaba's massive size and volcanic eruptions help explain why it was often depicted in native manuscripts, such as the Codex Vindobonensis (page 39) and Mapa de Cuauhtinchan 2 (Anders et al. 1992:107; Carrasco and Sessions 2007). Ancient Oaxacans would likely have understood that the distinctive gray obsidian they used regularly was mined in the vicinity of Pico de

Orizaba, a towering presence on the northern horizon. This assertion rests not only on Orizaba's visibility in Oaxaca but also on the likelihood that visiting traders from the north would have communicated the stone's origin place. Furthermore, a small number of pilgrim-merchants from Tututepec probably ventured into the highlands of Puebla and beyond, in the process learning first- or second-hand the origin of gray Orizaba obsidian.

In Nahuatl, Pico de Orizaba is known as "Citlaltepetl," or "star mountain." Ethnohistoric accounts suggest that the name Citlaltepetl refers to the legend of Topiltzin Quetzalcoatl (Nicholson 2001:266). The Codex Chimalpopoca relates the story of Quetzalcoatl, who was the celebrated ruler of Tula until he was deceived by his rivals and exiled from the capital after committing grave indiscretions (Bierhorst 1992:31–36).[6] After departing from Tula in shame, Quetzalcoatl later immolated himself on a funeral pyre, only to be reborn as Tlahuizcalpantecuhtli, the morning star or Venus (Miller and Taube 1993:166). In another variation of this legend, Quetzalcoatl leaves Tula and travels across the highlands, where many members of his retinue perish in the cold-mountain pass between the Popocatepetl and Iztaccihuatl volcanoes (Townsend 1992:51). Yet another iteration, recorded in the present-day town of Orizaba, recalls that Quetzalcoatl was cremated on the peak of Citlaltepetl and that the resulting ash and smoke stimulated a full-scale volcanic eruption (Crausaz 1993:43). Quetzalcoatl later reappears in the sky as the morning star; for this reason, the volcano is known as Citlaltepetl. A carved stone depicting the plumed serpent at the site of Maltrata, on the southern slopes of Citlaltepetl, provides supporting archaeological evidence for this connection between Orizaba and Quetzalcoatl (Medellín Zenil 1962).

The Mixtec were likely aware of the central Mexican lore linking Quetzalcoatl with Citlaltepetl/Orizaba (Nicholson 2001:253). Quetzalcoatl's Mixtec cognate was the deity Lord 9 Wind, who played a seminal role in the origin of the cosmos and the Mixtec people, as recounted in the Codices Nuttall, Vienna, and Selden (Boone 2003:211–12; Jansen and Pérez Jiménez 2007:72–82; Nicholson 1978). Direct links between the historical personage of Topiltzin Quetzalcoatl and the coastal Mixtec may also be found in the codices. Maarten Jansen and Gabina Aurora Pérez Jiménez (2007:210–24) draw on codical sources to argue that Lord 8 Deer formed an alliance with Lord 4 Jaguar, who may have represented the Toltec king Topiltzin Quetzalcoatl. With 4 Jaguar looking on, 8 Deer's nose was pierced in an elaborate ceremony that cemented his legitimacy as a ruler, sanctioned by the Tolteca-Chichimeca royal house and the authority of Quetzalcoatl (Joyce et al. 2004:285–86; Pohl 1994:89–93).[7] Although direct evidence is

admittedly lacking, the Mixtecs may have associated gray, streaked obsidian not only with Orizaba but also with the legend of Topiltzin Quetzalcoatl and Tlahuizcalpantecuhtli (Venus).

Taking these connections one perilous step further, we can extend the linkages between Quetzalcoatl and Orizaba to Cholula, which was also the center of a religious cult dedicated to Quetzalcoatl (Durán 1971 [1576–79]:128–39). Ethnohistoric and codical sources suggest that following his ouster at Tula, Topiltzin Quetzalcoatl founded a new capital at Cholula (Jansen and Pérez Jiménez 2007:213–16). Located in the heart of Postclassic Cholula, the Temple of Quetzalcoatl attracted pilgrims from throughout Mesoamerica, including Oaxaca (Rojas 1927 [1581], cited in McCafferty 1996). The fact that Cholula was a bustling mercantile center located relatively close to Pico de Orizaba raises the possibility that it could have been a convenient distribution point for Orizaba obsidian. Geoffrey Braswell (2003:146) has suggested a connection between Cholula and Orizaba obsidian based on the presence of Cholula-style polychrome pottery in the Orizaba region (see also Daneels 1997:245). If the Mixtec of Oaxaca received the bulk of their Orizaba obsidian by way of markets at Cholula, then it is possible that they would have also come to associate this distinctive gray obsidian with the "home" of Quetzalcoatl in the capital to the north. In sum, Orizaba obsidian would have conjured associations with a number of interrelated elements, including features on the sacred landscape (Citlaltepetl), religious deities (Quetzalcoatl and Tlahuizcalpantecuhtli), and a regional center of great power and prestige (Cholula). Without a doubt, future archaeological research from multiple sites, including Tututepec, Cholula, and Pico de Orizaba, will be needed to shore up the proposed linkages set forth here.

CONCLUSION

In the preceding pages, I examined obsidian procurement patterns at Late Postclassic Tututepec in light of a range of economic, political, sociocultural, and symbolic factors. I argued that the high quantity and proportion of obsidian at Tututepec was the result of a history of vigorous highland-lowland trade, a long-standing pattern dating back to the Early Formative period (1200–800 BCE). Yet Tututepec ramped up this trade strategy by the Late Postclassic (ca. 1100 CE) to take even greater advantage of the economic payoffs, to bolster its political clout, and to provide leverage in negotiating its political position among its peers. Importing obsidian material for weaponry was also a concern for Tututepec, given its imperial aspirations. Tututepec's martial program may

have also been expressed in part through the adoption and reverence of central Mexican deities, such as Itzpapalotl and Tezcatlipoca, who were associated with warfare and directly linked to obsidian. I also argued that by using large amounts of valuable obsidian in their everyday practices, including the ritual observance of cults associated with highland deities, the people of Tututepec may have emphasized a distinct social identity.

I also argued for a conjunction of variables resulting in preferences for Pico de Orizaba and Pachuca obsidian at Tututepec. Intensive mining at both sources suggests they were in high demand during the Late Postclassic, probably in part because of their fine quality and accessibility. Furthermore, the consolidation of political power from the Early to Late Postclassic, particularly in highland Mexico, may have led to an attendant decrease in the diversity of obsidian types traded earlier by a greater variety of independent polities.

Taking a more speculative turn, I then argued that the preference for green obsidian at Tututepec was in part an outgrowth of symbolic associations with the Mixtec rain god Dzahui and the sacrificial rites made unto this deity. Green Pachuca obsidian would have been especially appropriate for making ritual offerings, as its color made direct reference to the greening of the land that depended on rain. Indeed, the only finely flaked obsidian lancets used for bloodletting found at Tututepec were fashioned from green Pachuca obsidian. I also suggested that green obsidian carried associations with powerful highland polities (of the Late Postclassic and earlier) involved in the Pachuca trade, such as Teotihuacan and Tenochtitlan, and that these highland connections may have played a part in constituting local identities. In regard to translucent, gray streaked obsidian, I argued that people from Tututepec would have associated this distinctive type with Pico de Orizaba (Citlaltepetl), which carries associations with Quetzalcoatl and, by extension, Cholula. The codices indicate that the royal dynasties of Tututepec, polities of highland Oaxaca (e.g., Tilantongo), and Cholula were closely related through elite intermarriage (Johnson 1997; Pohl 2003b). Pressure from Aztec military incursions into Oaxaca may have encouraged even closer relationships between these polities.

The use of Hodder and Hutson's (2003) three registers of meaning as a general guide has encouraged a more expansive investigation of Tututepec's "obsidian obsession." I analyzed obsidian procurement patterns in terms of the function and technology of obsidian objects, how their acquisition and use was understood through enduring elements of belief that structured decision making in the past, and by considering obsidian in its historical and cultural context—relying on archaeological data from households at Tututepec. I argued

that Tututepec imported great quantities of obsidian, indeed more than we would expect given its distance from all sources, as part of a lucrative highland-lowland economic strategy but one that cannot be divorced from other factors. Obsidian tools and implements were undoubtedly in high demand because of their great utility, but they were also used to fulfill religious obligations to deities through ritual sacrifice. The notion of a sacred covenant binding people to deities of the earth and sky was one axis of meaning that undergirded indigenous thought in Mesoamerica. From the perspective of Tututepec, obsidian was an exotic material associated with powerful highland polities, volcanic landscapes, and deities responsible for the creation of the world and its continued sustenance. Tututepec commoners enjoyed access to obsidian at higher levels than any other comparable Late Postclassic site yet reported from Oaxaca. This conspicuous consumption of obsidian may have contributed to the expression of a distinct local identity, perhaps emphasizing Tututepec's role in commerce and its connection to influential highland polities.

Braiding these economic, political, social, and religious elements together has created a more complete explanation for Tututepec's obsidian obsession. Surely, elements of this explanation need additional archaeological data for verification and future refinement, but this approach acknowledges that explanations of archaeological phenomena are too complex and dynamic to reduce to a single variable or perspective. In terms of scale, intensity, and time depth, obsidian exchange in prehispanic Mesoamerica is unparalleled in the ancient world, and a complete understanding of this occurrence will require more holistic interpretations in the future.

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NOTES

1. It is not the idiosyncratic musings of individual actors that are of interest here but instead more widely held cultural ideals.

2. Radiocarbon (accelerator mass spectrometry) dates from Residence A included sample AA69823, returning a calibrated 2-sigma range date of 1298–1372 CE (uncalibrated 579+/–38 BP), and sample AA69824, yielding a calibrated 2-sigma range date of 1291–1405 CE (uncalibrated 615+/–38 BP). Sample AA69825, from Residence B, yielded a calibrated 2-sigma range date of 1399–1484 CE (471+–38 BP). All calibrations calculated based on Stuiver and Reimer (2006).

3. Seven complete blades with no macroscopic signs of use were found discarded at Residence A and could have been utilized for bloodletting, though this remains highly conjectural.

4. These discs were very small, averaging 1.4 centimeters in diameter and 0.3 centimeters thick. Their specific function remains undetermined.

5. Guilhem Olivier (2003:264–65) suggests that Tezcatlipoca's foot was severed as a result of his entering Popocatepetl, an act that represents his impregnation of the earth and creation of fire. Popocatepetl continues to smolder as a result of Tezcatlipoca and derives its name from the "Lord of the Smoking Mirror" as well.

6. Additional relevant accounts of Quetzalcoatl's exile appear in the *Historia Tolteca Chichimeca* and *Anales de Cuauhtitlan* (Graulich 1997:202–3).

7. "Tolteca-Chichimeca" refers to an ethnically mixed group with roots in central (Toltec) and northern (Chichimecs) Mexico that ruled a number of important Postclassic city-states in the greater Puebla-Tlaxcala region.

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CHAPTER SEVEN

Obsidian Symbolism in a Temple Offering from La Laguna, Tlaxcala

David M. Carballo

Offerings intended to consecrate or terminate temple structures were an integral component of religious practice in prehispanic Mesoamerica. Temple offerings in central Mexico often included obsidian artifacts that possessed symbolic value in their own right and, more important, as part of an associated complex of materials. In this study I discuss a cache offering from La Laguna, Tlaxcala, containing fifteen large obsidian bifaces, including knives and eccentrics, deposited along with other symbolically charged materials. The offering is currently without close precedent for the Terminal Formative period, the primary occupation of the temple (ca. 100 BCE–150 CE). I interpret the broader social and symbolic significance of the offering by drawing on semiotic and semantic theory, informed by comparative analysis of related deposits and iconography from other parts of Mesoamerica. I argue that the offering formed part of a termination ritual that indexed themes relating to liminality, warfare, sacrifice, death, and the underworld, which represented novel symbolism associated with the abandonment of the community and regional political reconfigurations of central Mexico during the second century CE.

SYMBOLIC DIMENSIONS OF OBSIDIAN AND TEMPLE OFFERINGS IN CENTRAL MEXICO

The range of contributions to this volume exemplifies how obsidian symbolism may be assessed at various levels. Among them, prehispanic Mesoamericans might have valued obsidian from particular quarries because of its

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physical attributes, such as color, translucence, or homogeneity, together with social attributes, such as its rarity within a certain region or its association with a powerful cultural center. These attributes were valued in addition to, or perhaps more than, a stone's value based on technological properties (Levine, chapter 1). Mesoamericans also fashioned obsidian into items with an iconic significance exceeding that of a utilitarian tool, as is the case with the anthropomorphic, zoomorphic, and other symbolic forms termed "eccentrics" by lithic specialists.

Analysts recognize the difficulties inherent in distinguishing between utilitarian and non-utilitarian lithic implements but note that they may be offset by considering archaeological context to determine use practices (e.g., Parry 1987:119–32). As explicit symbols, eccentrics may be productively analyzed semiotically or semantically, in an attempt to comprehend the conceptual "grammar" (i.e., meaning and logical coherence) of ritual activities. Though challenging, such analyses are bound to be more successful when obsidian implements can be connected to a specific archaeological context and a comparative corpus of related pieces and symbols. Such is the case in this study, where I consider context in both the spatial and iconographic configuration of the offering (which I refer to as its symbolism), as well as its temporality during a particular moment in central Mexican history when cities such as Teotihuacan grew and expanded their influence and La Laguna was abandoned (which I refer to as its social significance).

As the studies of signs and meaning, semiotics and semantics have been incorporated into archaeological interpretations of classes of material culture as diverse as architecture, stone monuments, petroglyphs, and pottery designs (e.g., Lewis and Stout 1998; Nash and Children 2008; Preucel 2006; Robb 1998; VanPool and VanPool 2009; Watts 2008). If applied rigorously, semiotic and semantic theory is of heuristic value to archaeology in helping to consider material culture as a communicative system with conventions of order and association akin to grammar (emphasized more in semantic theory), varied connotation or nuance conveyed through relations (emphasized more in the semiotic approach championed by Charles Peirce), and continued evolution through practice and performance (applicable to both types of frameworks).

Peircian semiotics considers how the meanings of signs are generated through relations, particularly between people and objects, which Peirce parsed into a number of triads including object-sign-interpretant (sign processes) and symbol-icon-index (sign classes) (Watts 2008). While the linguistic focus of semantic theory (e.g., Kempson 1977) requires that archaeologists analogize how the construction of meaning through words relates

to material symbols, Peirce wrote broadly about both linguistic and physical signs. For example, in his illustration of how a sign may serve as an index, Peirce noted that the direction a weathercock points communicates to an interpretant which way the wind blows (Peirce 1932:161 [CP 2.286]).[1] In this same example, the cock also serves as an icon of a living bird, while physical properties of the assemblage as a whole possess other, context-specific symbolic dimensions; for instance, in our society a painted wooden weathercock is considered more rustic than a gilded metal one, and the latter would be more appropriate for a civic building, such as a town hall, or a ceremonial building, such as a church.

Peirce's attention to the varied fields within which physical signs convey meaning as symbols, icons, and indexes is relevant to archaeological analyses, while his notion of indexes is particularly valuable for studying ritual as a form of differential communication saturated with signs and generated through performance (Kreinath 2006). I use the concept of an index in two ways in this study. In a more direct sense, an index is something that focuses the attention of an observer, such as pointing with an (index) finger (Peirce 1932:161 [CP 2.286]). In a more abstract sense, the index is "dynamically connected" (ibid.:171 [CP 2.305]) with the object it indexes and with the broader symbolism conveyed through multiple sign classes and sign processes.

In prehispanic central Mexico, symbolically saturated temple offerings were made as part of rituals of consecration, renewal, and termination. The interpretation of offerings associated with the Mexica Templo Mayor is facilitated and enriched by Colonial texts and the elaborate iconography of the Postclassic period (López Luján 2005). Texts are absent for Classic period Teotihuacan, but the analysis of temple offerings (e.g., Sugiyama 2005; Sugiyama and López Luján 2006, 2007) draws on a rich corpus of pictorial signs found on murals, ceramics, and other media (e.g., Langley 1991; Taube 2000a). For the preceding Formative period, the symbolism of temple offerings must be interpreted with a significantly reduced corpus of contemporaneous signs (e.g., Barba de Piña Chán 1956), leaving analysts to grapple with the applicability of signs used by later societies to these earlier contexts.

In some cases, central Mexican temple offerings were arranged as cosmograms that served as representations of the perceived order of the world. This is particularly clear in the attention to cardinal directions and layering of aquatic, terrestrial, and sky symbols in many of the Templo Mayor offerings (López Luján 2005). In other cases, offerings exhibit characteristics of a carefully composed scene, with some deposits involving objects oriented to directly index a specific piece or group of pieces by pointing toward or

radiating out from them. Such offerings were deposited in the three largest temples at Teotihuacan, and all involved obsidian.

Within the Sun Pyramid, René Millon and Bruce Drewitt (1961:375–76) encountered an offering consisting of an anthropomorphic obsidian figure positioned vertically, with miniature obsidian points arranged horizontally and pointing toward the figure at the ground surface, corresponding to a Tzacualli phase (1–100 CE) construction episode. Two contemporaneous deposits beneath the Sun Pyramid have recently been unearthed by Alejandro Sarabia and Saburo Sugiyama (2011), who note the coupling of anthropomorphic eccentrics, points, and blades with pyrite-covered slate "mirrors," strombus shell, and greenstone.

Temple offerings known from later periods at Teotihuacan became more elaborate, incorporating pits or walled enclosures containing sacrificed humans and animals, cosmograms, and standing figures also directly indexed by obsidian, as in Moon Pyramid Burials 2 and 6 (see Sugiyama and López Luján 2006, 2007). In Burial 2, a central group of associated pieces included a greenstone figure standing on a pyrite-covered slate-disc mirror, with a series of large bipointed obsidian knives pointing outward and forming a radial pattern. To the east, a similar radial arrangement of knives had figures made of obsidian and greenstone at its center, while two other obsidian figures to the south were deposited with knives and points oriented toward their heads. In Burial 6, a mosaic greenstone figure and an anthropomorphic obsidian figure were set on the center of a pyrite mirror, from which radiated eighteen expertly crafted undulating obsidian serpents and knives. While the central personages in these offerings remain open to interpretation, they are directly indexed by obsidian knives and eccentrics; Sugiyama and López Luján (2006, 2007) recognize them as parts of some of the most important state rituals to have taken place at Teotihuacan, involving sacrifice and the symbolic indexing of the city's military expansion. This new political order forged during the Classic period by individuals from Teotihuacan, whom I refer to hereafter as Teotihuacanos, had significant repercussions for other communities in central Mexico, including those in the adjacent Puebla-Tlaxcala region, such as La Laguna.

LA LAGUNA AND THE FORMATIVE TO CLASSIC TRANSITION IN CENTRAL MEXICO

La Laguna is located in northern Tlaxcala, where it was a midsized (100-ha) regional center during the Middle to Terminal Formative periods (ca. 600 BCE–150 CE) (figure 7.1). The largest centers of this period—such as Amalucan,

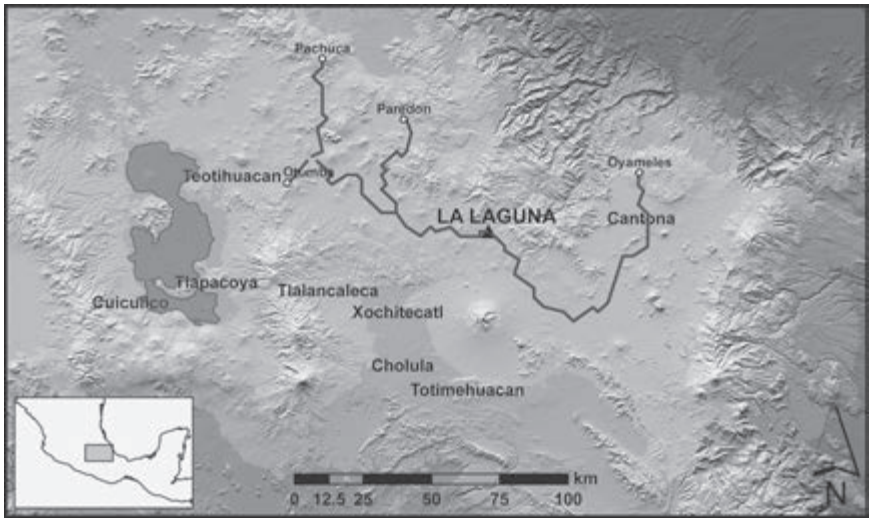

Figure 7.1. *Location of La Laguna, selected central Mexican sites, and obsidian sources documented at the site. Paths to sources reflect estimated least-cost path using ASTER 30-meter DEM and* Tobler (1993) *hiker function. ASTER GDEM is a product of METI and NASA.*

Cuicuilco, Tlalancaleca, Tlapacoya, Totimehuacan, and Xochitecatl—were in wetter portions of southern Puebla-Tlaxcala and the southern Basin of Mexico. However, La Laguna's more northern geography situated the community in closer proximity to the obsidian sources of the eastern Mesa Central and along the Tlaxcala Corridor, a strategic exchange route connecting the Basin of Mexico with the Gulf of Mexico (Carballo and Pluckhahn 2007). La Laguna's inhabitants appear to have successfully exploited the exchange potential of their geographic positioning, but during the Terminal Formative they were impacted by the rapid urbanization of the period, finding themselves in the more rural center of a triangle composed of the three largest Classic period cities: Teotihuacan, Cholula, and Cantona.

Recent investigations have elucidated La Laguna's occupational history, demonstrating that the community developed into a sizable town during an initial occupation of approximately 600–400 BCE, after which population declined precipitously for a few centuries before growing to a peak population around 100 BC–150 CE (Borejsza et al. 2008; Carballo 2009, 2012). The site's ceremonial center consists of approximately six temple platforms and a formal rectangular plaza flanked by a ball court and the largest temple, Structure 12L-1. Though all

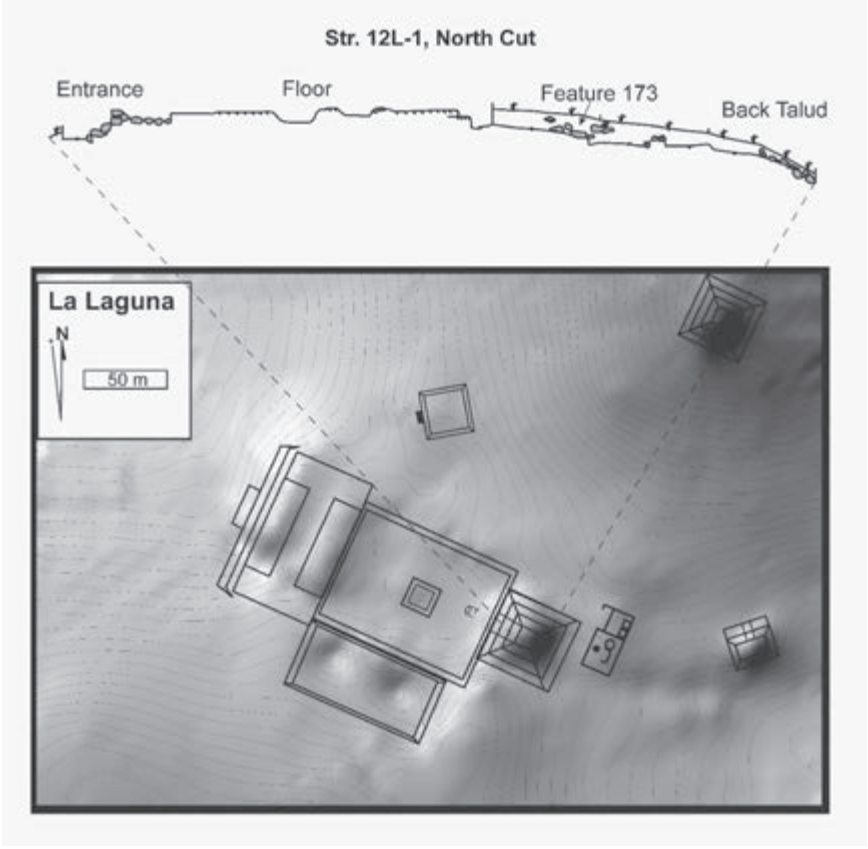

Figure 7.2. *Central structures at La Laguna and profile cut of excavations on top of Structure 12L-1, showing location of offering (Feature 173).*

of these structures were in use during the Terminal Formative period, it is currently unclear whether any have predecessors dating to earlier periods.

Excavations in 2009 focused on structures in the Central Plaza and were guided by the results of a remote-sensing project directed by Luis Barba, Agustín Ortíz, and Jorge Blancas in 2008 (Barba et al. 2009). The prospection indicated that the upper floor of Structure 12L-1 was preserved 10–20 centimeters below the modern surface, making it possible to plan excavations with an understanding of the shallowness of deposits. Figure 7.2 depicts the location of the offering that is the focus of this study, designated Feature 173, found along the back wall of the temple superstructure that once crowned the

platform. Two sequential floors were preserved in the center of the mound, each of which was associated with basin-like depressions that would have been positioned within the entrance of the wattle-and-daub temple superstructure and which were potentially used in water rituals similar to the temple basins of other contemporary sites (see Manzanilla 2000). Radiocarbon dates from these basins and the burning of the superstructure span a range of approximately 100 BCE–150 CE. The possible symbolism and social significance of Feature 173 are detailed in the following sections.

FORMAL AND CONTEXTUAL ATTRIBUTES OF THE OFFERING

The upper pieces of Feature 173 were encountered only a few centimeters below the modern ground surface, and excavations proceeded in three layers to clear, draw, and photograph all pieces in situ (figure 7.3); yet the deposit was made in a single event. The uppermost eccentric was positioned vertically, while a second eccentric and thirteen bifaces were positioned diagonally or horizontally, and at least half of them were oriented pointing toward the vertical eccentric (figure 7.4). The second eccentric was snapped in three pieces, with one of them deposited in the central cluster near the vertical eccentric and two others deposited off to the side. The smooth breaks on the second eccentric, lack of impact scars on its fragments, and their spatial disarticulation within the offering indicate that the piece was purposefully snapped prior to interment.

The lowest layer of the offering contained a circular arrangement of five slate discs and one slate pendant, all of which were covered with a powdery yellow sediment characteristic of decomposed pyrite (Bray 1951; Carlson 1981). These pieces would have served as the backs of pyrite mirrors, similar to the examples from Teotihuacan's temple offerings but smaller. Together with a Gulf of Mexico oyster shell near the center, the arrangement of the stratigraphically lower components of the offering aligned roughly east-west with the central axis of the temple and plaza, and the location of pyrite-covered elements at four directions and the center may symbolically convey a quincunx (four directions plus center). Two radiocarbon assays from the shell and a fragment of carbonized wood within the fill of the offering both indicate a mid- to late-second-century deposit.[2] These dates place the deposit temporally at the moment of the community's abandonment or immediately thereafter; accordingly, the offering was likely part of a termination ritual for the temple.

The fifteen obsidian pieces can be classified into four categories (figure 7.5). Nine are bipointed knives with large serrations running along one side, giving

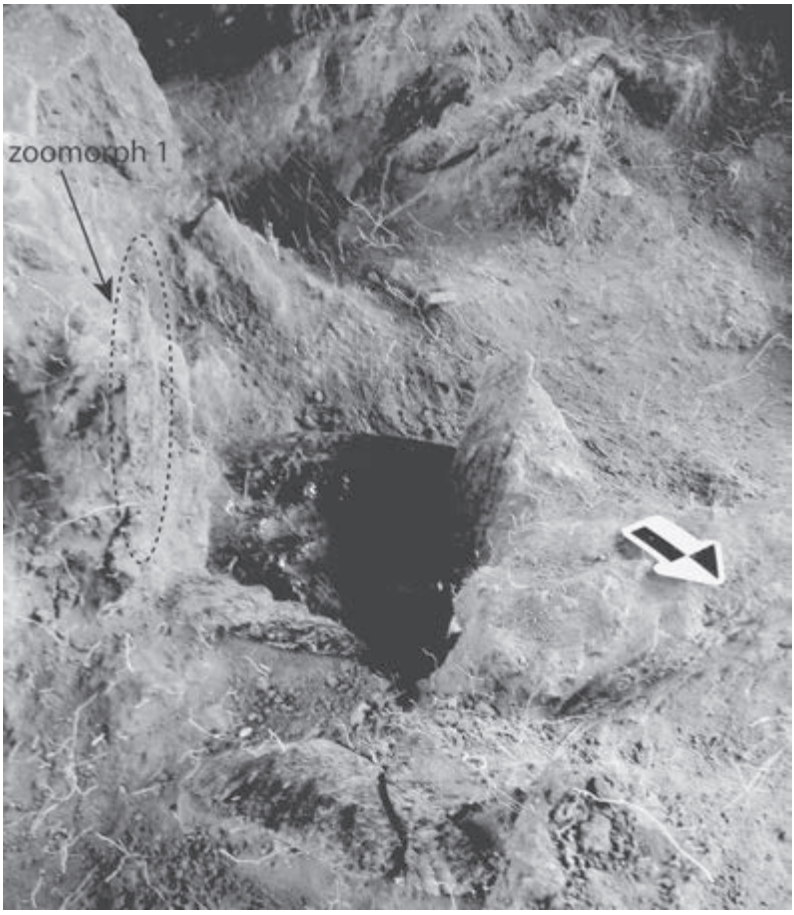

Figure 7.3. *Upper layer of offering showing the vertical positioning of the complete zoomorphic eccentric.*

them "teeth" or a "comb" shape. While the size and form of the teeth vary, all nine knives have exactly four serrations. Three other knives have straight sides, with two possessing a rounded base while the third is bipointed. Two zoomorphic pieces feature four protrusions on each side, possibly representing legs, and two or three on the top, possibly representing antennae or venom claws (figure 7.5a), of which more is said later. A singular piece possesses the form of a stemmed point with four teeth (figure 7.5b, top right).

The four categories show coherence based on size. The three knives are the largest, with the largest measuring close to 50 centimeters when complete,

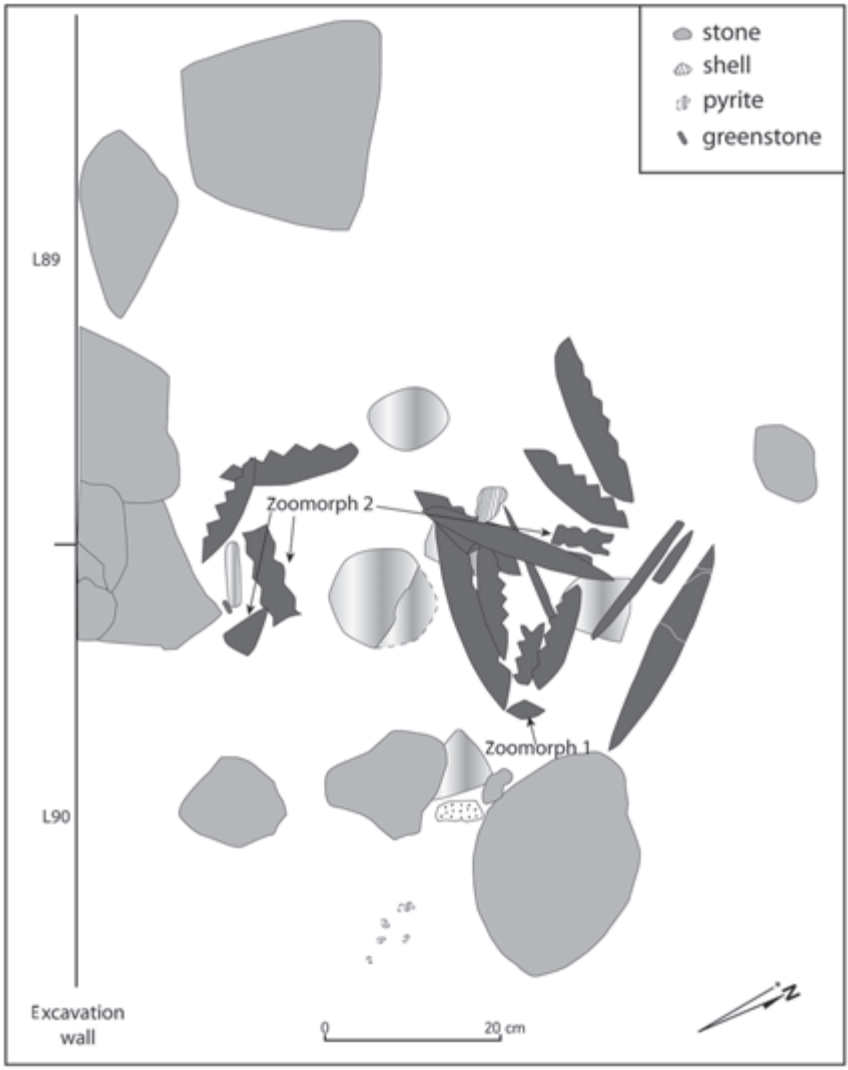

Figure 7.4. *Plan illustration of offering.*

comparable to the largest examples found in temple offerings from Teotihuacan and Tenochtitlan (c.f., Athié Islas 2006; Sugiyama and López Luján 2007). Two of the knives were formed by percussion only, while the bipointed knife was finely finished, exhibiting the controlled transverse-parallel pressure flaking similar to examples from Teotihuacan. The two zoomorphic pieces are

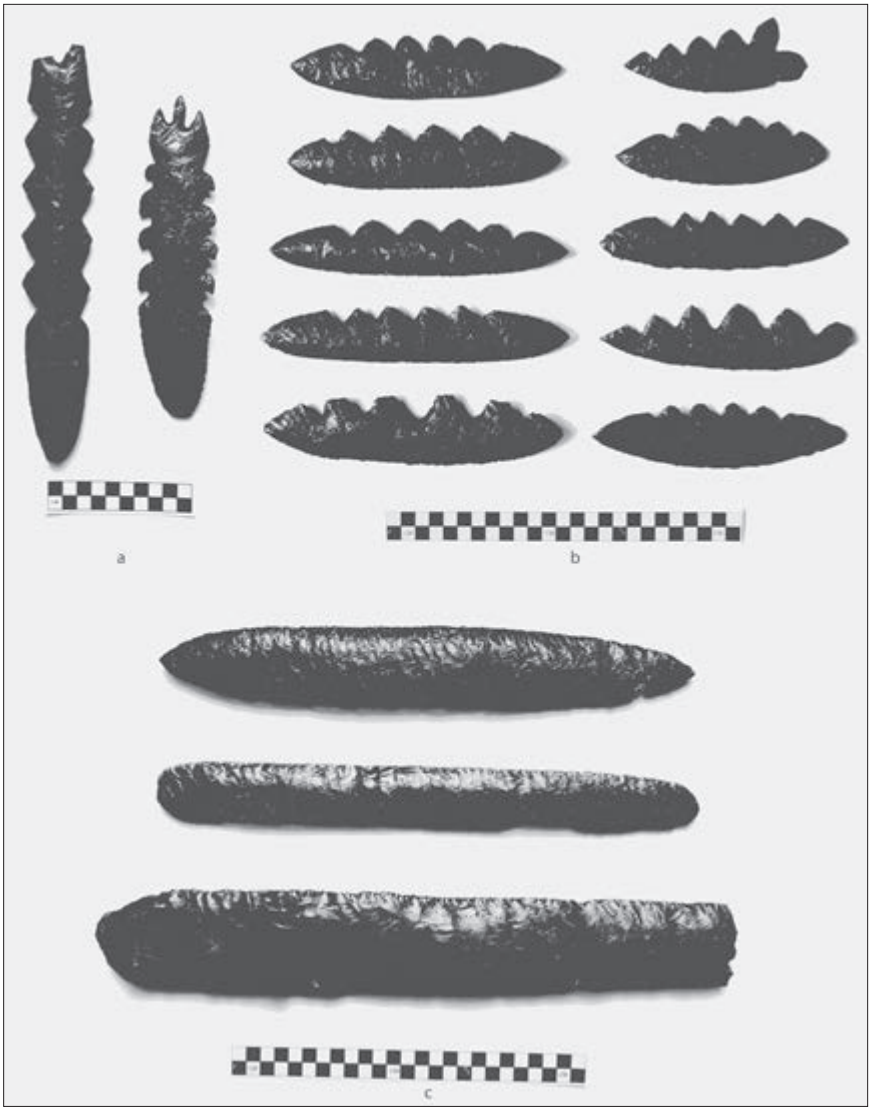

Figure 7.5. *Obsidian bifaces from offering: (a) zoomorphic eccentric 2 (left) and zoomorphic eccentric 1 (right), (b) toothed knives and toothed point (top right), (c) bipointed (top) and curved-base knives (middle and bottom).*

Table 7.1 Obsidian source exploitation at La Laguna

	Paredón	*Oyameles*	*Otumba*	*Pachuca*
Euclidian distance (km)	51	56	72	85
Travel time (as 4 km/hr)	12.75	14	18	21.25
Path cost (hr)	14.98	19.28	13.24	19.82
Sourcing analyses (n = 50)	68%	12%	4%	16%

Notes: Values for travel time reflect a walking speed of 4 km/hr along the shortest path by Euclidian distance, while path-cost values reflect the cost of slope travel over the paths depicted in figure 7.1. All fifty samples were sourced at CSULB-IIRMES using LA-ICP-MS, and twenty-five of the same samples were also sourced using XRF.[4]

smaller, the nine serrated knives are relatively standardized in size (ca. 18 cm), and the serrated point is the smallest of the assemblage.

The pieces are novel for La Laguna in two respects: (1) based on visual inspection, ten of fifteen are made from green obsidian, which is relatively scarce at the site; (2) the size and form of the pieces are unlike anything in the lithic assemblages excavated from domestic contexts or elsewhere during the course of six field seasons. In terms of source exploitation, Paredón is the closest quarry both in linear distance and calculated as least-cost path using digital elevation models (see figure 7.1). Since obsidian from Paredón is of high quality for knapping, particularly for making prismatic blades, it is not surprising that this most proximate source dominates the site assemblage, representing over 80 percent of all obsidian based on visual classification and 68 percent of fifty samples sourced using LA-ICP-MS (table 7.1). The inhabitants of La Laguna produced their own blades from Paredón obsidian at the site, while the much lower quantities of blades made from green or other gray obsidian usually arrived as completed tools.

Within the Mesa Central, green obsidian is found only at the Pachuca and Tulancingo sources (see Pastrana and Athie, this volume), which are located in relatively close proximity to one another and are two of the four most common sources found at Teotihuacan (Carballo, Carballo, and Neff 2007). Pachuca is the only green source represented in the fifty chemically provenienced artifacts from La Laguna, and based on visual inspection, the ten green pieces in the offering appear consistent with this source designation.[3] Pachuca is the farthest source of those documented at the site, yet two-thirds of the eccentrics were made from this material. Accordingly, its green color or association with Teotihuacan may have been valued over acquisition costs. Green obsidian was used almost exclusively in the offerings of the Templo Mayor (Athié Islas

2006) and was used disproportionately in temple offerings at Teotihuacan, but significant variability within deposits is apparent, with some having primarily gray obsidian and others primarily green (Parry and Kabata forthcoming).

ICONIC AND INDEXICAL ATTRIBUTES OF THE OFFERING

The composition of the deposit and the obsidian sources represented in it offer points of departure for evaluating symbolic significance. One of the two zoomorphic pieces appears to represent the protagonist in the scene; as with temple offerings at Teotihuacan, it is positioned vertically with many of the knives oriented pointing toward this piece. The vertical piece is also positioned to the east with the others spread before it, which mimics the axis of the ceremonial center itself, with the temple to the east (see figure 7.4). This orientation serves as a direct index, in that the knives focus attention toward the vertical piece. The knives likely also have more abstract indexical qualities in their relation to the vertical piece and all others within the multi-component offering, as well as to the built environment of which it was a part. These qualities are explored subsequently.

The second zoomorphic eccentric was broken into three pieces, likely as a symbolic act of termination. Intentional breakage relating to termination is also suggested for La Laguna's second-largest temple, Structure 13M-1. In this case, however, a large, complete strombus shell was deposited in a cist within the floor of the penultimate construction episode, while a second strombus shell was broken within the stone fill placed on top of the floor to raise it to its final level. Ritual acts of termination often involve caching and smashing materials in Mesoamerica (Mock 1998), and it is possible that the material symbols of greatest symbolic significance for particular structures at La Laguna were deposited in duplicate: one left complete and another ceremoniously broken. As the central pieces in the Structure 12L-1 offering, what exactly may the obsidian eccentrics represent, and what might their symbolic value have been?

In terms of their iconicity, the zoomorphic pieces appear to represent the fusion of a knife and a biting animal, likely a centipede (figure 7.6). Eccentrics with similar attributes from the Maya region are commonly interpreted as centipedes or scorpions (Coe 1959; Kettunen and Davis 2004; Taube 2003) but have not been reported from sites in central Mexico to date. Semantic and iconographic data from central Mexico support this interpretation and provide further insights into the symbolism and social significance of the offering. I begin by analyzing the ethnosemantics and folk taxonomies of possible

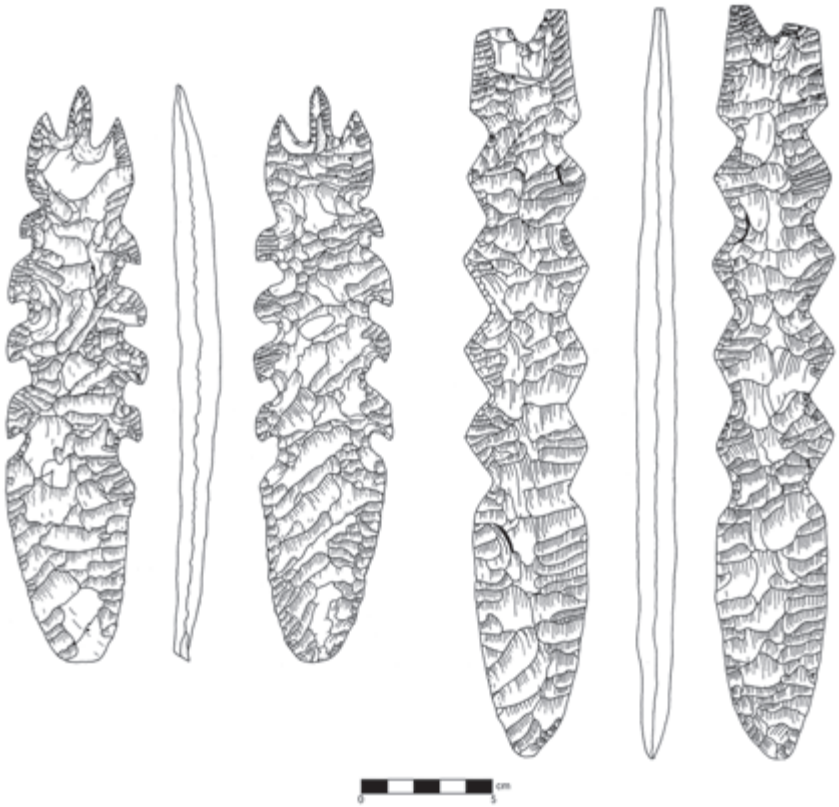

Figure 7.6. *Illustration of zoomorphic eccentric 1 (left) and zoomorphic 2 (right).*

iconic representations of the zoomorphic pieces before addressing the symbolism of the offering as a whole.

Christine and Todd VanPool (2009:532) note that folk taxonomies represent the local knowledge of individuals interacting with their environments and often differ from Linnaean taxonomy; yet underlying semantic connections and conceptual structures can be reconstructed through careful evaluation of archaeological context, symbolic associations, and analogy: "Linguistic ethnosemantic studies typically start by identifying semantic domains using a list of useful words, building a taxonomy reflecting how the words relate, and then performing a componential analysis to show how the words are associated within and among domains. When applied to folk taxonomies, such an approach easily allows the identification of taxonomic groups such as game

animals, non–game animals, predators, edible and inedible plants, pests, and so on."

Early Colonial semantic domains for living creatures in Nahuatl-speaking central Mexico can be gleaned from Book XI of Bernardino de Sahagún's (1963) Florentine Codex, on "earthly things," a volume that also classifies types of obsidian (see also Clark 1989; Pastrana Cruz 2007). Although Sahagún was certainly not a modern ethnographer and his encyclopedic works followed many existing western templates, including Book XI's likeness to the natural histories of Classical scholars (Browne 2000), semantic domains—including the taxonomic groupings of animals—are apparent in the terms and order used by Sahagún's Nahua scribes and informants. These semantic classes are made amenable to semiotic analysis by the illustrations that accompany the text. Several illustrations that accompany the fifth chapter, which is partitioned on the basis of describing serpents and other creatures that live on the ground, share formal similarities to the two zoomorphic eccentrics from La Laguna's offering, including elongated bodies, legs, and forked protrusions emanating from the head (e.g., Sahagún 1963:plates 282–308).

Nahua taxonomy represented in Book XI of the Florentine Codex differs from the Linnaean system in several important respects, including forms of under- and over-differentiation, when either fewer or a greater number of species are designated (VanPool and VanPool 2009:534–35). An alternate logic to the Linnaean system is apparent in the Nahua differentiation of animals based on their forms, attributes, habitats, and other criteria. The organization of Book XI's fifth chapter proceeds from serpents to small arthropods and insects, most of which are defined by dwelling on the ground and biting, including scorpions, spiders, and ants. Taxonomic designations then move to flying insects such as bees and butterflies before returning to ground dwellers that do not bite—grasshoppers, caterpillars, worms—but might sting or burn.

Stuck between semantic domains is the centipede, which ends the seventh paragraph on serpents before the eighth continues with small, usually biting, arthropods and insects (figure 7.8c). The Nahuatl term for centipede is *petlacoatl* (Molina 2008:35), or "mat serpent," which highlights their elongated form, many legs, and segmented bodies as defining attributes (rendered *petlaçolcoatl* in Sahagún 1963:86–87).

> Its name comes from *petlaçolli* and *coatl*, because it is almost like a serpent. And it is called *petlaçolli* because it is wide and very many are its legs—400, they say—like a straw mat, one whose edges are frayed; which has many of its rolled edges coming out. They are taken for its legs . . . This *petlaçolcoatl* is wide, wide-

> headed; it has teeth; it has antennae . . . And as it bites someone, it is also an inflicter [*sic*] of pain, though not deadly. Nevertheless, it is said that their poison implants suppuration. In order to alleviate, when a *petlaçolcoatl* bites one, there is sucking, there is pricking with an obsidian point.

This description of a centipede matches the zoomorphic eccentrics in its references to the serpent-like body, multiple legs, teeth/venom claws, antennae, and association of its bite with an obsidian point, used as a remedy. Nevertheless, unlike Maya eccentrics interpreted as centipedes, the examples from La Laguna lack protrusions that cover their entire sides, like the legs of actual centipedes. The examples from La Laguna have protrusions that stop roughly at the midpoint and more exaggerated protrusions from the head. Another possibility for their iconic subject is a scorpion, for which Sahagún's (ibid.:87) informants note: "Four are its arms, four are its feet. It has small horns; the tail is forked." Scorpion bites are more threatening than centipede bites, and the informants comment on their treatment with fine tobacco, depicted in plate 284 (figure 7.8c). The eight appendages noted for scorpions are matched by the examples from La Laguna, and the pinchers ("small horns") are similar in Maya eccentrics designated scorpions. Yet these same eccentrics share the formal attribute of a recoiled ("forked") tail described by Sahagún's informants, which is absent in the completely linear forms from La Laguna.

No other documents from sixteenth-century Mesoamerica treat indigenous conceptualizations of local fauna as comprehensively as Book XI of the Florentine Codex. This is unfortunate, as it introduces a Nahuatl bias to ethnosemantic analyses, and the time depth of Nahuas in central Mexico remains a topic of spirited debate. We know little concerning what the second-largest ethnolinguistic group in central Mexico during the sixteenth century, the Otomi, thought about centipedes because dictionaries compiled during the period appear to have been made with the assistance of Nahua translators. This resulted in what linguists term a *calque*, meaning the semantic but not phonetic borrowing from another culture—in this case, the concept of "mat serpent" from Nahuatl to Otomi (e.g., Smith-Stark 2009:68). Nevertheless, iconographic analysis of prehispanic images of centipedes and other biting, subterranean species across Mesoamerica demonstrates certain points of conceptual overlap that are widespread, if not pan-Mesoamerican. In particular, these animals are portrayed as nasty (likely because of biting and their appearance) and earth-underworld related (likely because of their ability to move between the terrestrial and subterranean realms).

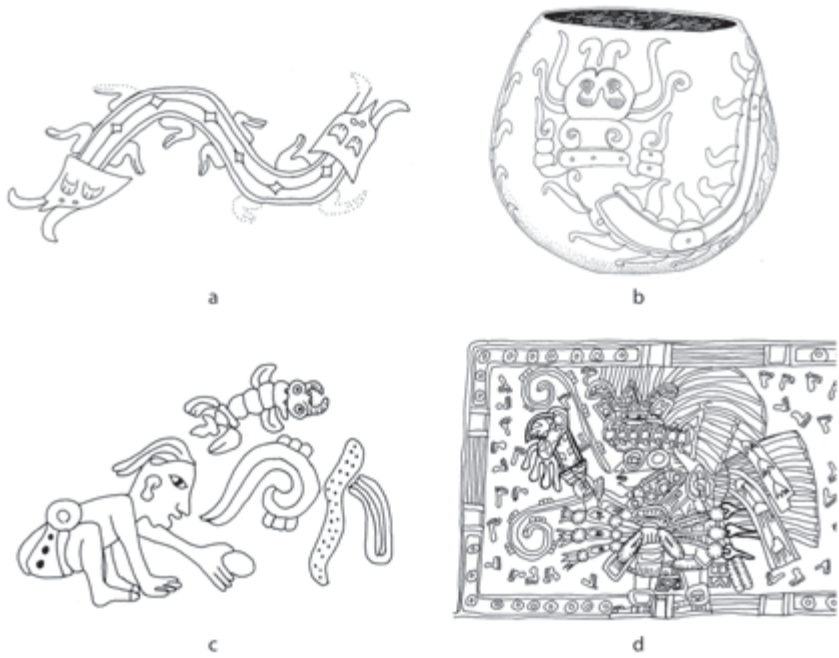

Figure 7.7. *Formative and Classic iconography of centipedes or other biting, subterranean creatures: (a) bicephalic centipede on Early Formative pot from Las Bocas, Puebla (redrawn from* Kettunen and Davis 2004*:figure 15); (b) centipede on Late Classic pot from Veracruz, in Museo Nacional de Antropología (based on author's photo); (c) possible centipede on mural from Tepantitla compound, Teotihuacan (redrawn from* Angulo 1995*:figure 429); (d) possible centipede element in headdress of warrior from Atetelco compound, Teotihuacan (redrawn from Cabrera* Castro 1995*:figure 18.7).*

Iconographic depictions of centipedes include the designs on certain decorated ceramics (figure 7.7a-b) and images in codices, such as on plate 47 of the Codex Borgia (figure 7.8a-b), plates 13 and 19 of the Codex Borbonicus, plate 27 of the Codex Fejérváry-Mayer, and plates 13 and 15 of the Codex Vaticanus B, to name a few examples. Although these depictions span two millennia of artistic styles in the Basin of Mexico, Puebla-Tlaxcala, Oaxaca, and Gulf Coast, they display remarkably consistent stylistic elements: elongated form, multiple legs, markings on the body designating segments, and forked protrusions from the head and mouth, likely representing antennae and venom claws. These depictions of centipedes are the only icons on the two pottery vessels, therefore little more can be said about them; however, they temporally

Figure 7.8. *Postclassic and Colonial iconography of centipedes or other biting , subterranean creatures: (a) Cihuateteo grasping knife, with centipede emanating from mouth,* Codex Borgia (1993), *plate 47 (© Gisele Díaz, Alan Rodgers, and Dover Publications; used with permission); (b) centipedes and serpents emerging with Cihuateteo,* Codex Borgia (1993), *plate 47 (© Gisele Díaz, Alan Rodgers, and Dover Publications; used with permission); (c) centipedes (plates 282–83) and treatment of scorpion bite (plate 284), Florentine Codex (© University of Utah Press; used with permission).*

bracket the eccentrics from La Laguna, demonstrating that these stylistic elements were salient at the time the offering was made. The Early Formative example, from Las Bocas, Puebla, is bicephalic, demonstrating how centipede elements can be conflated to create supernatural images.

Later depictions of centipedes from the Codex Borgia are associated with other rich iconography dealing with the birth of the Cihuateteo, the spirits of women who died during childbirth (Byland 1993:xxvi–xxvii). In one image a centipede emanates from the mouth of a Cihuateteo who appears to be grasping a bipointed obsidian knife in her right hand (figure 7.8a), while in another a Cihuateteo emerges from a mirror within a composite image consisting of four centipedes, five serpents, and dual faces: one fleshed and one skeletal (figure 7.8b). The images thereby couple materials in the La Laguna offering (obsidian knives, centipedes, and mirrors) and index themes relating to emergence or passing from somewhere, likely the subterranean underworld (see Taube 1992 on the symbolism of mirrors). Karl Taube (2003) discusses the examples from the Codex Borgia in detail, along with similar examples from the Codex Borbonicus and Vaticanus B, and argues that centipedes and serpents were juxtaposed as subterranean and ethereal symbols, respectively, but both were perceived as conduits to their portions of an earth-sky dualism. Taube connects centipedes in Mexico and the Maya region with part of a complex relating to the underworld realm of death and darkness, which also includes spiders and ants (creatures that pass between the surface of the earth and below it), feminine earth deities, and a mythical temple called the bone house of darkness, or White Bone House.

Henry Nicholson (2006:375–76) also noted the association of spiders, scorpions, centipedes, and serpents with feminine earth deities such as the Aztec goddess Tlaltecuhtli, who may be depicted with a tangled mass of such creatures as her hair. Cecelia Klein (2000) explains how such creatures related directly to liminal realms and gendered ritual practices in their use by Aztec curers, including midwives, in potions designed to induce visions and mediate the process of childbirth (see also Monaghan, this volume). In accordance with these interpretations, both Taube (2000b, 2003) and Kettunen and Davis (2004) emphasize the importance of liminality in the symbolism associated with this group of biting, semi-subterranean creatures and the fact that their attributes can be conflated with others to create complex, composite symbols. Their comparisons between disparate sub-regions of Mesoamerica show that certain shared conceptualizations crosscut ethnolinguistic boundaries.

Although serpents are common in the iconography of Teotihuacan, including ophidian obsidian eccentrics, centipedes are rare or even nonexistent. Taube

(2000a:31–32) interprets an image from a mural at Tepantitla as a centipede, while Jorge Angulo (1995:86) interprets it as an ant (see figure 7.7c). Centipede attributes of the image include forked protrusions from the head and an elongated body with multiple segments, unlike the more bulbous bodies seen in depictions of ants elsewhere in Teotihuacano art. Further, this creature appears to be a glyphic representation of speech voiced by a seated individual before a chain of individuals holding hands passed through their legs in a fashion that Taube (2000a:31–32) notes is evocative of a human centipede. Another possible reference to centipedes in Teotihuacano art is the segmented elements in the headdresses of certain warriors, such as those appearing in murals from Atetelco (see figure 7.7d). The headdresses combine what may be a headless centipede body, obsidian points and knives (which puncture bleeding hearts), and the back mirrors commonly worn by central Mexican soldiers—presenting a suite of symbols that parallel those in the La Laguna offering, evoking more martial and sacrificial themes. Yet Taube (personal communication, 2010) believes this headdress element represents a string of beads or shells.

The other thirteen obsidian bifaces in the offering deserve comment, but their martially themed formal attributes, as knives and a point, are clearer than any potential iconic attributes. If the serrations on nine of the knives and the single point had an intended iconic value of teeth, they might be analogous to the chert knives from Templo Mayor offerings, which were animated with inlayed teeth and eyes (López Luján 2005). Eduardo Matos Moctezuma and Felipe Solís Olguín (2002:468) suggest that the Templo Mayor knives abstractly index Mictlampa and Mictlan (places of the dead)—the former presided over by the black Tezcatlipoca, whose symbol was an obsidian knife. An underworld or place of the dead association may be indexed in the La Laguna offering since there are nine toothed knives, potentially analogous to the nine levels of Mictlan (Sahagún 2000:327–30). More broadly, the toothed knives may have indexed biting or eating in a manner consistent with themes relating to warfare, sacrifice, or both.

While the solitary point shares the toothed protrusions of nine of the knives, the other three knives possess the conventional forms of weapons but may have been too large to have actually served in sacrifice or combat. The bipointed piece is the only one that could have successfully punctured anything or anyone, as the tips on the other complete example are rounded and the point on the largest example is missing; even if it were pointed, the size of the piece would have made it extremely unwieldy.

I argued earlier that the temple offering from Structure 12L-1 at La Laguna is arranged to directly index two zoomorphic pieces, the first having many of

the obsidian knives pointed at it and the second by being broken in a ritual act that symbolized termination of the structure. The iconicity of these pieces is consistent with other known iconographic depictions from Mesoamerica of biting, semi-subterranean creatures. Their forms and stylistic attributes are most consistent with centipedes, but the precise identification is unnecessary to a broader interpretation of the offering since other iconic possibilities—such as scorpions, spiders, and ants—were connected semantically and symbolically in central Mexico, related by their abilities to inflict pain on humans and to move between the terrestrial plain and the underground. The symbolism of a biting, liminal creature is of greatest relevance, as it is consistent with the primary types of materials in the offering: weapons and mirrors. Mirrors and centipedes may be an appropriate coupling in the La Laguna offering because both were conceptualized as portals or intermediaries to other worlds—such as the fleeting glimpses we get of centipedes before they scurry under rocks or into the earth. The coherence of the symbolism is evidenced by the fact that the centipede-like attributes were conflated with obsidian knives, and the wider semantic domain of which this class of creatures was conceptualized as a part shares the power of movement between realms with mirrors (see Taube 1992). Accordingly, the offering was most likely intended to abstractly index themes relating to death and the underworld in a manner not seen so explicitly during earlier phases of La Laguna's occupation and likely relating to its broader social significance.

BROADER SOCIAL SIGNIFICANCE

I will now evaluate two sets of possibilities for the offering's social significance: (a) termination of the temple by La Laguna's inhabitants because of significant influence of Teotihuacan or undertaken by Teotihuacanos themselves, or (b) termination by La Laguna's inhabitants completely independent of Teotihuacan.

Evidence in favor of possibility a includes the observations that the eccentric forms are currently unknown for Formative period Tlaxcala, no fragments remotely similar to these pieces have been recovered in six seasons of excavations at La Laguna, and the deposit dates to the large-scale abandonment of the community—which involved the burning of temples and elite residences—and coincides with dramatic settlement changes suggestive of Teotihuacano expansion (Carballo 2009; Carballo and Pluckhahn 2007). Evidence in favor of possibility b includes the observations that many of the eccentrics differ in form from eccentrics discovered at Teotihuacan thus far, and it was common

practice for Mesoamerican peoples to terminate their own religious structures without any form of external threat (as excavations at La Laguna's Structure 13M-1 [Carballo 2012] and contributions in Mock 1998 show).

The placement of the offering on top of the main temple at La Laguna and its dating to the community's fiery abandonment are important variables to consider. The termination of the temple took place during a period of intense upheaval in central Mexico, which resulted in La Laguna's important buildings being burned and its inhabitants moving elsewhere. This dramatic demographic shift in the mid-second century coincides with the foundation of a new dominant center that exhibits close ties to Teotihuacan, strategically positioned within the Tlaxcala Corridor linking that city with the Gulf of Mexico (Carballo and Pluckhahn 2007; Merino Carrión 1989). Not only are the zoomorphic eccentrics and toothed knives novel for La Laguna, but there are no large bifaces from other domestic or ceremonial contexts at the site. They have not been documented in temple offerings at Cholula during this period (Solís et al. 2006), and recently reported sacrificial knives from Cantona differ in form, being lancet-shaped with squared bases (INAH 2012). The preponderance of green obsidian in the offering is similarly aberrant for La Laguna, and although toothed knives and centipede-like eccentrics are currently unknown for Teotihuacan, the composition featuring a vertical object indexed by knives and the conflation of obsidian symbolism is firmly within the canons of offering complexes at the city (Carballo 2011; Sugiyama 2005; Sugiyama and López Luján 2007). Such conflation in the La Laguna offering includes not only the obsidian knives with centipede forms but also a typical Teotihuacan stemmed dart point with large tooth-like serrations.

For these reasons, possibility a—termination relating to Teotihuacan—is the more likely option. Nevertheless, it is currently unclear whether the termination was done by Teotihuacanos or the inhabitants of La Laguna. Since the symbolism of the offering is different enough from those known from Teotihuacan and we see a broadly analogous termination ritual involving caching and smashing in the earlier deposit of Structure 13M-1, an intermediate position for the social significance of the offering would be that inhabitants of La Laguna created it within a milieu of Teotihuacano expansionism, with an awareness of the symbolic grammar of that growing cultural system.

CONCLUSION

Semantic and semiotic analyses are productive venues for interpreting the symbolism of temple offerings in the archaeological record, as they assist us

in considering the grammatical conventions of sign arrangement and the conceptual domains of icon classes. By combining an analysis of temple offerings at Teotihuacan and Tenochtitlan, pan-Mesoamerican iconography, and ethnosemantic domains from Colonial central Mexico, I propose that the symbolic, iconic, and indexical qualities of obsidian symbolism of Feature 173 from Structure 12L-1 at La Laguna represent part of a termination ritual that abstractly indexed themes relating to warfare, death, sacrifice, and the underworld. The twelve large knives and single point in the offering possess a martial component not seen in the earlier symbolism at the site. Their ritual deposition during the abandonment of the community was associated with the increased militarism that accompanied Teotihuacan's political expansion during the second century CE. The specific symbolism of the offering appears to relate to centipedes, death, and the underworld in a manner consistent with the termination of the most important religious structure at the site. Whether the offering was left by actual Teotihuacanos or a faction of individuals from La Laguna with knowledge of Teotihuacano ritual practices is difficult to determine, but the development of a new symbolic grammar is apparent during this pivotal period in the history of central Mexico.

ACKNOWLEDGMENTS

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NOTES

1. When citing the work of Peirce, I follow both standard social science format and the convention of Peircean scholars to use two initials for the work and a decimal number indicating volume and paragraph. I do not use the spelling "semeiotic," as Peirce did.

2. Beta Analytic 2 sigma calibrated date ranges are as follows: shell 100–280, carbon 120–330. 1 sigma ranges of these same materials, using Calib 6.1 to coincide with seven other dates from the ceremonial center run at the University of Arizona AMS Laboratory, are as follows: shell 142–250, carbon 137–253.

3. Green obsidian can also be found in west Mexico, but the visual characteristics of the obsidian from the offering are most consistent with the Pachuca source. If some examples are from the Tulancingo source, their distance to La Laguna is essentially the same. It seems highly unlikely that any would be from the much greater distance of west Mexico.

4. CSULB-IIRMES refers to the Institute for Integrated Research in Materials, Environments, and Society at California State University Long Beach. LA-ICP-MS stands for Laser Ablation Inductively Coupled Plasma Mass Spectrometry, and XRF refers to X-ray fluorescence.

REFERENCES CITED

Key to Acronyms

CONACULTA	Consejo Nacional para la Cultura y las Artes
INAH	Instituto Nacional de Antropología e Historia
UNAM	Universidad Nacional Autónoma de México

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CHAPTER EIGHT

Ritual Use of Obsidian from Maya Caves in Belize

A Functional and Symbolic Analysis

W. James Stemp and Jaime J. Awe

With the exception of Kazuo Aoyama's (2001) use-wear analysis of obsidian from Gordon Cave no. 3 at Copán in Honduras, there has been no detailed discussion among Maya archaeologists of the specific uses of this material in caves or rock shelters, although many have noted the presence of obsidian in caves (see Brady 2005:127, supplement 4, for a long list). Some researchers list what was found with little additional elaboration, while others generally argue obsidian's connection to ritual, specifically bloodletting and sacrifice, with minimal discussion of the obsidian artifacts themselves (e.g., Brady 1989, 2005; Brady and Stone 1986; Colas, Reeder, and Webster 2000; MacLeod and Puleston 1978; Pendergast 1971, 1974). This argument is typically built on two basic premises. The first is that caves are locations of religious significance (Bassie-Sweet 1991:77–90; Brady and Prufer 2005; Prufer 2005:186–87; Prufer and Brady 2005:9–11; Thompson 1959). The second is that obsidian, primarily in the form of blades, was used in rituals for bloodletting and sacrifice.

What we know of Maya ritual in caves comes from archaeological discoveries, glyphic texts, iconography, ethnohistoric evidence, and ethnographic work (e.g., Adams and Brady 2005; Awe, Gibbs, and Griffith 2005; Colas, Reeder, and Webster 2000; Helmke 2009; Ishihara 2007; Moyes 2006, 2007; Peterson 2006; Petryshyn 2005; Prufer 2005; Rissolo 2005; Stone 1995, 2005; Tozzer 1941; Vogt 1969; Vogt and Stuart 2005). However, very little functional analysis has been performed on obsidian artifacts recovered from subterranean contexts (Peterson 2006; Reents-Budet and MacLeod 1997); nor has the relationship between those who perform the rituals in caves and the objects themselves

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as powerful symbols received much scrutiny. A better understanding of the relationship among people, objects, and places provides a more holistic view of obsidian as a component of ritual and a symbol of power (Hodder and Hutson 2003:106; Levine, chapter 1, this volume). In this chapter, we discuss the complexity of obsidian use in caves and cast some light into the dark recesses of ancient Maya ritual behavior in these subterranean locales.

OBSIDIAN AS RITUAL TOOL AND SYMBOL

Archaeologists have traditionally viewed obsidian as a long-distance trade good that was vital to the political and economic systems of elites and nonelites alike (e.g., Aoyama 2011; Braswell 2002, 2003; Hammond 1972; Levine, chapter 1, this volume; McKillop 1996; Spence 1996; see also Hirth 2008; Rice 2009); however, obsidian's symbolic and ritual significance to the ancient and modern peoples of Mesoamerica is undeniable (e.g., Aoyama, this volume; Heyden 1981, 1988; Hruby 2007; Monaghan, this volume). Nicholas Saunders (2001:223–24) summarizes the complex symbolic, ideological, and economic value of this material: "Obsidian's peerless utility in a world without metal tools, together with its occurrence only at particular geological locations, generated an enduring Mesoamerican aesthetic which saw the controllers of obsidian sources and the makers of obsidian blades connected to cosmic forces. This in turn endowed subsequent acts of obsidian use with potency and significance, whether in acts of sacrifice and bloodletting, or in producing a web of regional exchange networks throughout Mesoamerican prehistory."

The use of obsidian as a tool cannot be divorced from its role as a special resource imbued with economic, ideological, and ritual value. Ritual and ceremonial objects clearly fit this approach to understanding function, value, and power dynamics in Maya society, as well as influencing the creation of Maya identity (Levine, chapter 1, this volume; Wells 2006; Wells and Davis-Salazar 2007). A key to understanding the role of obsidian in Maya society is a consideration of agency (Sørenson 2005:172; see also Dobres and Robb 2000). It concerns Maya ritual specialists not only as individuals but also as dynamic performers in a larger social system, as well as the observers of ritual performances (Rappaport 1999:37). As such, a "recursive relationship" of ritual practices that shape cultural norms and these norms that mold the rules of ritual performance and the roles of ritual performers must be explored (Bourdieu 1990; Giddens 1984; see Joyce 2005 for "embodiment"). Obsidian artifacts, as ritual paraphernalia, shape the performance and outcome of rituals, as well as influence aspects of cultural development and power relations. As John Watanabe

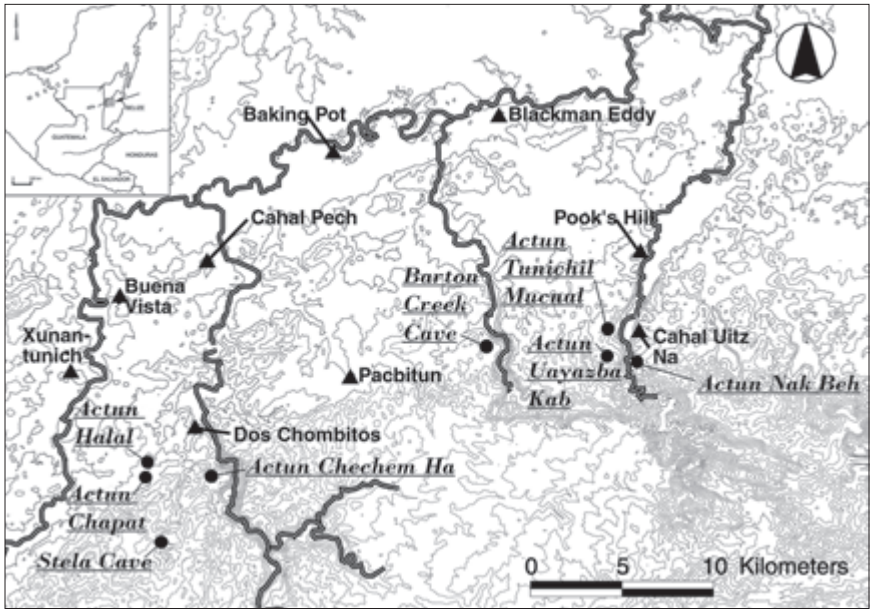

Figure 8.1. *Map of cave locations in the Belize and Roaring Creek Valleys of western Belize (modified from* Morehart and Helmke 2008*:figure 5.1).*

(2007:303) states, "Precisely as material things, these objects become tangible proof ('materializations') of the moral order ('values and beliefs') that ritual and all the production associated with it at once presuppose and perpetuate" (see also Monaghan, this volume). How obsidian was used and what obsidian means in Maya cave rituals are the foci of our investigation (see Appadurai 1986; DeMarrais, Castillo, and Earle 1996; Rappaport 1999).

CAVES IN WESTERN BELIZE

The obsidian included in this study was recovered from five caves in the Macal River and Roaring Creek Valleys of western Belize (figure 8.1). The caves in question are all located in proximity to at least one medium-sized surface site that was occupied when the caves were in use. Stela Cave, Actun Chapat, Actun Halal, Actun Uayazba Kab, and Actun Tunichil Mucnal represent somewhat different physical spaces. Stela Cave, Actun Halal, and Actun Uayazba Kab are relatively small underground spaces, whereas Actun Chapat and Actun Tunichil Mucnal are very long, deep cave systems with many

passages and chambers. Stela Cave is generally small, with a large open central chamber and a few small passages that lead to small side chambers. Actun Halal can be accessed by two entrances to the north and east of the cave and consists of a small main chamber with two smaller chambers off to the west. Actun Uayazba Kab can be accessed by two entrances on the east side, each of which leads to interconnected open chambers. Each chamber also provides access to other small chambers or passages deeper underground. Actun Chapat has a sinkhole entrance to the southwest and a horizontal (main) entrance to the northeast and is a long, deep cave with a series of passageways and chambers on multiple levels. Actun Tunichil Mucnal is accessible by five entrance points; however, the main entrance, through which one swims into the cave, is located to the east. Like Chapat, this cave is long and deep, with numerous passages on different levels.

They are all "wet caves" in that they contain standing water in the form of pools or lakes, flowing water such as a stream, or active drip water from the ceiling. But the cave spaces can be further subdivided into dry zones and wet zones. Although Andrea Stone (1995:239) has demonstrated that there are differences between ritual activity and Maya art in the wet versus dry zones of caves, our research does not focus on the placement of petroglyphs or pictographs in caves.

With the exception of Actun Halal, all of the caves in this study contain both dark and light (transition and twilight) zones (see Brady 1989; Prufer 2005), within which various activities were performed. Light zones are considered to be those spaces in the transition zone near entrances illuminated by natural, specifically indirect, daylight and spaces in the twilight zones that typically receive lower levels of daylight. Daylight never penetrates dark zones; therefore, they are in perpetual darkness save for artificial illumination (e.g., fire). Most dark zones are tunnels, passages, or chambers located deeper in the cave systems. James Brady's (1989:402; Brady et al. 1992; see also Prufer 2005) interpretation of artifact distribution patterns within cave zones at Naj Tunich, Guatemala, suggests that obsidian use in dark zones can be correlated with more private ritual performance, whereas obsidian use in light zones is connected to more inclusive public rituals.

Contexts of Recovery

The locations from which obsidian has been recovered in the five caves are quite varied, which may be the result of sampling of these spaces. Obsidian artifacts have been found on floor surfaces, in looters' fill, near cave art, on

Table 8.1 Contexts of recovery from Actun Chapat, Actun Halal, Actun Tunichil Mucnal, Actun Uayzaba Kab, and Stela Cave

	Actun Chapat	*Actun Halal*	*Actun Tunichil Mucnal–Stelae Chamber*	*Actun Uayazba Kab*	*Stela Cave*
Surface finds	1 (100%)	0	0	6 (4.5%)	0
Looters' fill	0	0	0	3 (2.4%)	0
Stratigraphic excavations	0	6 (100%)	2 (100%)	114 (90.5%)	9 (100%)
In ollas	0	0	0	3 (2.4%)	0

ledges, in old pools, and also placed inside other artifacts, such as the *ollas* (jars) from Uayazba Kab. Very few obsidian blades were recovered from burials (Ferguson and Gibbs 1999; Gibbs 2000); as such, they do not seem to constitute grave goods, for the most part. Nevertheless, some blades did come from areas where skeletal remains were found, but specific associations are difficult to ascertain based on some disturbance of the bones, as seen in other caves in the region (see Gibbs 2000; Halperin 2005:80). In general, no strong spatial associations exist between cave sculptures or carvings, but some, like the two blades from Actun Tunichil Mucnal, were connected to meaningful sculptural monuments (Awe, Gibbs, and Griffith 2005).

Although there may have been some movement of artifacts within cave locations, the sub-assemblages recovered are clearly not the product of deliberate surface clearing, midden disposal (Hayden and Cannon 1983), alluvial action, or other natural processes (Schiffer 1987). Despite the fact that a small number of blades were recovered from looters' fill, disturbed burials, or as surface finds, the majority of the obsidian artifacts from the five caves were excavated from in situ deposits (table 8.1). Based on the stratigraphic evidence, the obsidian tools are believed to have been deposited by the Maya in essentially the same locations from which they were recovered and thus are considered primary refuse (see Schiffer 1972:161). Artifacts excavated from the soil matrices in light or dark zones are believed to have been originally used and deposited there.

Dating of Deposits

Investigations conducted in the Roaring Creek, Barton Creek, and Macal River Valleys by the Western Belize Regional Cave Project (WBRCP) report that the Terminal Classic (830 – 950 CE) is the period of most intense cave

Table 8.2 Obsidian tool types from each cave

	Actun Chapat	*Actun Halal*	*Actun Tunichil Mucnal–Stelae Chamber*	*Actun Uayazba Kab*	*Stela Cave*
Bifaces	0	0	0	0	1
Blades–percussion	0	0	0	2	0
Blades–prismatic	1	6	2	111	6
Blocky fragments	0	0	0	5	0
Core fragments–polyhedral	0	0	0	2	0
Eccentrics	0	0	0	1	0
Flakes	0	0	0	5	2

use in this sub-region of the Maya lowlands (Awe 1998; Awe, Gibbs, and Griffith 2005; Awe and Helmke 2007; Moyes 2001). Based on the ceramic surface finds and pottery recovered from stratified deposits, the Maya were using these five caves primarily from the end of the Late Classic into the Terminal Classic periods, which corresponds to the transition from the Early Facet (700–830 CE) to the Late Facet (830–950 CE) of the Spanish Lookout Complex. Pottery affiliated with the Spanish Lookout Complex (see Gifford 1976) recovered in these caves includes specimens affiliated with the Cayo, Chunuitz, Vaca Falls, Belize, and Mount Maloney Ceramic Groups (i.e., Cayo and Alexanders Unslipped, Benque Viejo Polychrome, Roaring Creek Red and Kaway Impressed, Belize Red and Platon Punctated Incised, and Mount Maloney Black, respectively). The contextual associations between obsidian artifacts and pottery from in situ deposits are used to argue that Maya rituals involving blades for bloodletting and sacrifice were performed in these caves in the Late to Terminal Classic around the time of the Maya collapse.

OBSIDIAN TOOLS, TOOL USERS, AND TOOL MAKERS

The overwhelming majority of the obsidian artifacts recovered from the caves in western Belize are prismatic blades (table 8.2 and figure 8.2) (Clark 1988; Crabtree 1968). Based on available evidence in the form of a few cortical and non-cortical flakes, two percussion blades, and two very small polyhedral core fragments from Actun Uayazba Kab, there is minimal evidence that the prismatic blades were produced in the caves themselves; rather, they were brought in already finished. Only one formal tool, a small stem fragment from

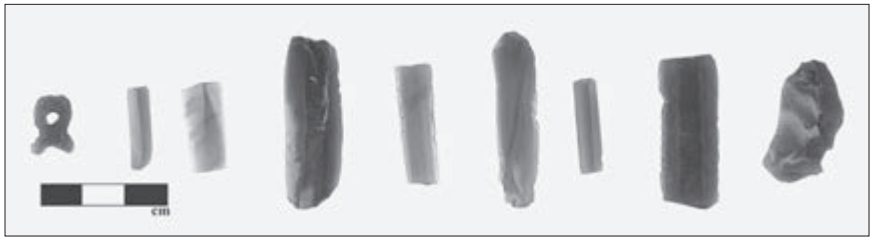

Figure 8.2. *Obsidian from Actun Uayazba Kab—green obsidian eccentric (far left), blade segments (middle), and flake (far right).*

a stemmed blade or biface, was found in Stela Cave. The only other obsidian artifact of note is a small green obsidian eccentric made on a blade segment recovered from Actun Uayazba Kab (Stemp et al. 2012). It is only the second lithic eccentric recovered from a Maya cave, as far as we are aware.

One question to consider is whether the people using the blades were the ones who made them. If yes, it seems likely that ritual is important in the process of manufacture, particularly for symbolically or ritually significant objects—as Zachary Hruby (2007:80–81) argues for obsidian eccentric production at Piedras Negras—and possibly for blades in general (see also Clark 1989:301 for Lacandon knappers). If no, then perhaps production and use stages of stone tools do not demonstrate ritual continuity. This may mark a disjunction not only in both space and time but also of ritual manufacture and ritual use. Perhaps one person makes a tool imbued with ideological or ritual significance based on the process of manufacture or the knowledge connected to its intended use (Meadows 2001; see also Dobres and Hoffman 1994). Then another person employs it in ritual performance, thus enacting the symbolic value of use (Godelier 1999), but the two are not connected through a common person, place, or time. This form of "multiply authored" object may link individuals in complex ways that transcend time and space yet emphasize the collectivity of their contributions to fulfilling the intended use of an obsidian blade as a ritual item (Gosden and Marshall 1999:173).

CAVE RITUALS, SYMBOLISM, AND OBSIDIAN

We acknowledge that many different types of rituals were performed in caves and that they varied in terms of the participants and their objectives (Bassie-Sweet 1991:77–80; see also Prufer 2005). Based on the results of our analyses, in conjunction with contextual information, we focus our interpretations on

the use of obsidian in the light and dark zones of caves. In these locations, it appears that caves were used for rituals and ritual performances involving the sacrifice of blood with obsidian blades. Such rituals may have involved animal sacrifice, human sacrifice, and autosacrifice. Although we suspect that other ritual activities occurred in caves, specifically involving the processing of plants and wood, we will not concentrate on these in this chapter.

Critical to our understanding of the power of obsidian in cave contexts is the meaning of ritual in such places. Caves, akin to Xibalba, are places of both birth and death. The Maya believed caves were made from maize that originated in the underworld and that they would be transported back through caves into the underworld when they died. Caves are places of fertility, from which water for people, crops, and rituals can be obtained (Prufer and Kindon 2005:26–28; see also Moyes 2007; Moyes et al. 2009). Caves have strong sexual connotations based on iconographic, mythological, and ethnographic evidence (Brady 1988, 1989:47, figure 3.2; Brady and Prufer 2005:368; Moyes 2005:190–91; Stone 1995:100, plate 12). For the Maya, the earth is female. According to James Brady and Keith Prufer (2005:369; see also Brady 1988), caves "are associated with the female earth, particularly the generative aspects: the womb and the vagina." Ethnographic support for this concept exists among the contemporary Maya (Guiteras-Holmes 1952:103; Holland 1963:108–9). In addition, powerful symbolic connections to fertility and reproduction may have been incorporated in the body parts of the male practitioners who would pierce or cut the foreskin of the penis with an obsidian blade as an act of autosacrificial bloodletting (Joyce 2000:274; Stone 1988:75, 1995:224–25, figure 8-76). In certain circumstances, obsidian blades may have been "gendered" and matched to men, specifically when associated with some ritual bloodletting activities (see Monaghan, this volume). Such ritual use of obsidian in caves exclusively by men is supported by both ethnographic and ethnohistoric evidence, as women, who were viewed as "ritually impure," were often prohibited from entering these underground locations (see Brady 1989:417–20).

We see old Maya ideas that connect caves with the Creation Myth of the Popol Vuh (Tedlock 1996). In this myth, the Hero Twins eventually prevail over the lords of the underworld and help resurrect the corn god and ensure the creation of humans from maize. Maize is a primary source of nutrition and essential life for the Maya. Symbolically, caves are the places of fertility and reproduction in the form of humans from maize and the places where religious practitioners go to petition the gods and ancestors to ensure the successful production of maize to feed humans (Bassie-Sweet 1991:79; MacLeod and Puleston 1978:73; Thompson 1970:268; Vogt 1969:387). Religious practitioners

performed bloodletting using obsidian blades to cut themselves, other people, and animals (Tozzer 1941:162 for dogs and other animals). Given that fertility and the earth are also connected to rain and agriculture, this gives ritual specialists some control over the creation of the necessities of life in the form of water and food, specifically maize. Because the Maya believe rain and clouds are formed in caves and that the gods of rain, wind, thunder, lightning, rainbows, clouds, and corn live in caves, these underground spaces were no doubt perceived as the best locations to undertake rituals to both communicate with and assuage the forces that controlled the natural world (see Bassie-Sweet 1991:79; Brady and Prufer 2005:369; Heyden 1981:27; Petryshyn 2005:330; Saunders 2001:223; Thompson 1970:267, 269, 273; Vogt 1969:387; Vogt and Stuart 2005:164–65).

Given the complex web of symbolism discussed thus far, how can sacrificial blood be likened symbolically to water, specifically rain? A decorated tripod plate from Ch'en P'ix cave depicts a king on a throne with blood dripping from his right hand and being caught in a vessel in his left hand. An obsidian blade was also found in the vicinity (Colas, Reeder, and Webster 2000). Drops from the hand or fingers may be associated with a motion for scattering blood, incense, maize seed, water, or possibly some combination (Stone and Zender 2011:20). Linda Schele and Mary Miller (1986:101) refer to "the scattering of what looks like pellets or streams, which are now recognized as blood." Blood beads are discussed by Linda Schele and David Freidel (1990:302, figure 7:19b, 406) and appear on Lintel 2 at La Pasadita, in which Bird-Jaguar scatters blood, and on Stela 22 at Tikal (Jones and Satterthwaite 1982:figure 33). Surface sites may also provide support for symbolic connections among caves, rain or water, and blood sacrifice. At Yaxchilan in Mexico, a very large speleothem carved with several male figures engaged in acts of bloodletting was erected as a stela (Tate 1992:132). Because a speleothem forms as water drips from or onto it and mineralizes, an object such as this with depictions of bloodletting would be a powerful public representation of sacrifice specifically connected to water in a cave.

Ritual sacrifice in dark zones would be valuable to elites or other religious practitioners who required communion with the gods and ancestors. However, such private rituals would not provide opportunities to display power; nor would the performances act as spectacles in which rulers could reaffirm positions of authority as conduits to the supernatural through sacrifice with obsidian blades. Nevertheless, a dark zone like the Stelae Chamber in Actun Tunichil Mucnal, with its contextual associations among cave, water, and two obsidian blades in a place with stone sculptures representative of bloodletting

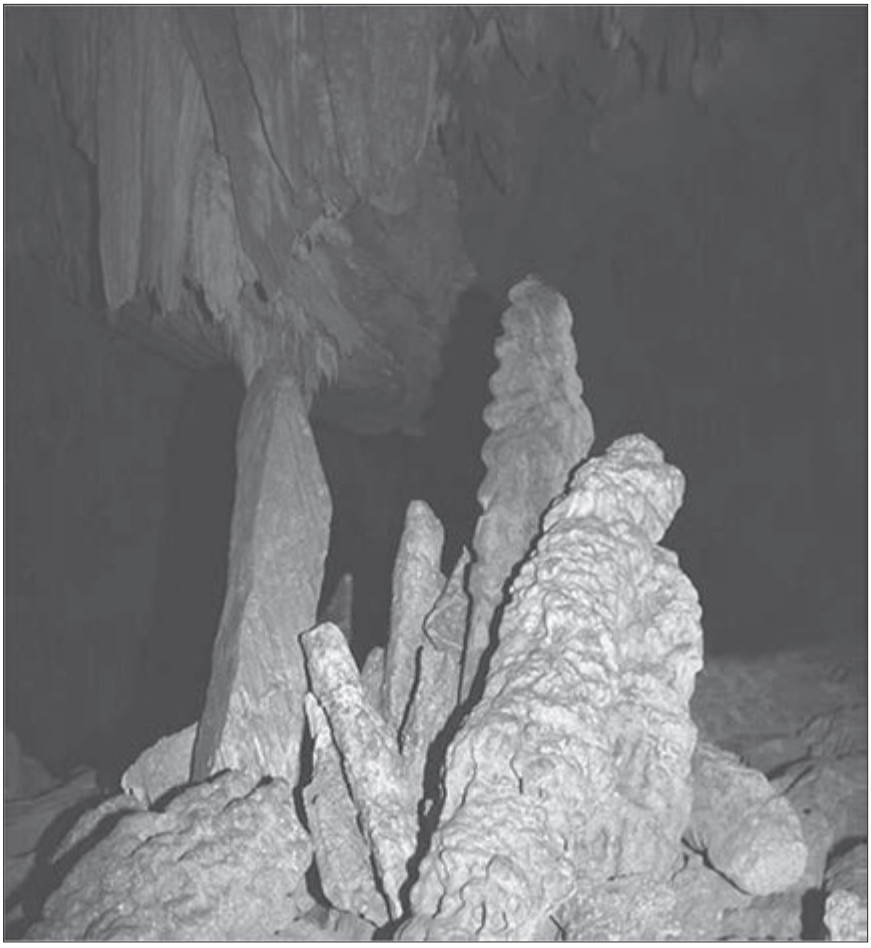

Figure 8.3. *Slate obsidian blade monument (left) and slate stingray spine monument (right) in Stela Chamber, Actun Tunichil Mucnal.*

implements—a slate obsidian blade and a slate stingray spine (figure 8.3)—would be a very powerfully charged private ritual space (Awe, Gibbs, and Griffith 2005:227–29, figures 9.5–9.7). The two slate megaliths in the form of the implements most often associated with autosacrifice demonstrate clearly that the ledge on which they were placed is a special place for Maya ritual specialists to let their own blood. A similar relationship is duplicated by the obsidian prismatic blade and stingray spine discovered in a wooden box in Alcove 1 at Actun Polbilche, Belize (Pendergast 1974:48–52, figure 11). These

objects recovered from a dark zone are both symbolic of and employed in bloodletting rituals in an effort to ensure fertility associated with the earth as a place of reproduction through connections to rain, food, and the cycle of life.

Ritual performance in the light zones of caves, however, provides a stage on which powerful figures can demonstrate their authority and legitimacy as priests or shamans and leaders. In more public locations, closer to cave entrances, audiences can witness and experience through a variety of sensory media the act of sacrifice to the gods or ancestors. These performances are important for numerous reasons. First, they show spectators that obsidian blades are used for sacrifice through butchery, bloodletting, and autosacrifice. This action not only confirms the actual use of blades but also affirms the symbolic connection between obsidian blades and sacrificial rituals through "direct association with elite or sacred individuals, ancestors, and deities" (Wells and Davis-Salazar 2007:5; see also Helms 1993). This assists in reinforcing the proper or appropriate use of obsidian blades within the context of cave-based ritual activity (Wolf 1990:587).

Second, these public ceremonial spectacles identify the practitioner as host or sponsor of the rites, which confers power and authority through the organization and management of "social dramas" that demonstrate the control and materialization of sacred knowledge (Wells 2006:286). In caves, sponsors of ritual performances establish a form of "organizational power," in which they create "the ability to control a setting in which power is displayed and enacted" (Wolf 1990:586). They determine both when and where ritual performances occur; as such, observers and participants are beholden to them in terms of initiation or enactment of rituals to access supernatural forces that control the Maya universe.

Finally, caves may represent natural sites for pilgrimage where pilgrims participate in enacting the "social drama" of the ritual or ceremony itself (Wells and Nelson 2007:139). Obsidian blades were the tools that permitted the completion of many of the ritual activities that drew pilgrims to the caves. Without the blades, sacrificial rituals were not possible and the pilgrims might not come. Moreover, use-wear analyses of the obsidian blades recovered from the light zones of caves like Actun Uayazba Kab suggest that communal feasting may have taken place at these locations (see Hendon 2003; Tozzer 1941). In these instances, obsidian blades may have been employed in activities in which pilgrims would have directly participated.

These types of pilgrimages are not only powerful mechanisms to mobilize people and influence their ways of thinking about or seeing the world in which they live, but they may also serve to draw people to significant

economic events, as argued for the island of Cozumel (Freidel 1981; Patel 2005; see also Adams and Brady 2005; Kubler 1985; Wells and Nelson 2007). In addition to witnessing important religious or political spectacles, a group of people in a common location at the same time creates the ability to exchange goods with one another, as well as share information that may be more esoteric or profane. Pilgrims may have also purchased offerings or exchanged goods at various points along the pilgrimage route to the caves (Brady 2005; Patel 2005). Thus, religious specialists invariably play a role in facilitating socioeconomic interaction in local, regional, and possibly interregional communities by attracting pilgrims who combine their more sacred, religious duties or responsibilities with more mundane or practical matters at or on their journey to sacred locales such as caves (Wells and Davis-Salazar 2007:9; Wells and Nelson 2007:140, 152).

USE-WEAR ANALYSIS OF OBSIDIAN

Experimental Methods

The obsidian blade has the potential to be a ritually meaningful tool. However, exactly how blades were used must be understood to more accurately reconstruct their function in underground spaces. Microscopic use-wear analysis provides the best method to reconstruct how each blade was specifically used in caves based on the patterns of edge chipping, striations, and abrasive polish present on its surfaces. To determine obsidian artifact function, James Stemp performed both low- and high-power use-wear analysis on all of the pieces recovered from Actun Chapat, Actun Halal, Actun Uayazba Kab, and Stela Cave (Hurcombe 1992; see also Aoyama 2009). Unfortunately, the obsidian from Actun Tunichil Mucnal was unavailable for analysis. The obsidian artifacts were examined at 40× and 200× magnification for damage related to use in the form of edge microchipping, striations, and abrasive wear using a metallurgical microscope (Unitron Series MS-2BD) under both oblique and incident light (Keeley 1980; Stemp 2001). Used areas on the tools were recorded using an IUZ (independent use zone) system similar to that of Patrick Vaughan (1985; see also Aoyama 1999, 2009; Stemp, Helmke, and Awe 2010). The program of use-wear analysis relied on the experimental production and use of obsidian flakes and blades for various tasks to document functional criteria and determine tool use on the obsidian artifacts recovered from the caves.

In particular, close attention was paid to wear associated with cutting meat or flesh as a basic comparator for possible sacrifice or bloodletting by the caves' tool users. In some of the replicative experiments, two obsidian blades and one

flake were used to cut fresh domestic pig and chicken flesh. After twenty-five minutes of cutting, Stemp noted that polish-pitting and striations very rarely developed. When surface wear did occur, it was represented by minor pitting, some brightness, and long, narrow, and very faint striations parallel to the cutting edge that were restricted to the tool margin. There was almost no edge attrition (see also Shafer in Reents-Budet and MacLeod 1997:64); flake scars were very small (< 0.2 millimeters) and tended to be discontinuously bifacially distributed along the used edges. These flakes were typically scalar in outline with feather terminations (see Tringham et al. 1974:188–89). After the first four to five strokes with the experimental obsidian tools, no use-wear was observable on their surfaces under high magnification (200×). These tools, used for very short periods of time, essentially appeared unused.

John Clark (1988:245, experiments 53–56, table 167) also carried out experiments to simulate bloodletting by cutting, slicing, and piercing meat. After 230 strokes on an uncooked beef roast, there was no noticeable edge or tip damage after examining the experimental tools under 10× magnification. For cutting meat, Aoyama (2009:13, table 1.4, pattern i) describes use-wear at high magnification as "weakly developed, rounded, and smooth, and it is limited to a small portion of the tool's edge. Neither striations nor tiny pits are observable." Linda Hurcombe's (1992:43–44) observations on stone tools used for working animal carcasses are very similar to those of Aoyama. Under high magnification, she observed very weak polish development on tool surfaces. Moreover, striations were "exceptionally rare," and there was very minor edge rounding and almost no edge attrition. Where use-wear was observed, polish on flint and obsidian tools tended to be bright to fairly bright and greasy, and striations were usually narrow and deep. Hurcombe notes that April Sievert (1992:71, table 8.3) did not perform experiments with obsidian to simulate bloodletting but did use a retouched chert flake to cut beef tongue in an effort to replicate this activity. Sievert (ibid.:34) notes that animal cutting or butchery for subsistence and ceremonial reasons cannot be distinguished based on use-wear alone but that use-context may be the most predictive criterion in recognizing bloodletting activity. Curiously, hematological traces on a tool from the Cenote of Sacrifice at Chichen Itza may point to sacrifice of rodents as a form of ritual offering (ibid.:89). Unfortunately, organic residues, like blood, tend to preserve rather poorly in the humid tropics; therefore, archaeologists rarely test their obsidian blades for traces of blood (see Aoyama, this volume). Suzanne Lewenstein (1987:179, 194) mentions that bloodletting likely occurred at Cerros using obsidian blades, but she did not perform specific use-wear experiments to replicate this activity or residue analyses.

Table 8.3 Number of obsidian blades by number of used edges from each cave

	Actun Chapat	*Actun Halal*	*Actun Uayazba Kab*	*Stela Cave*
1 edge	0	0	5	0
1 edge and distal	0	0	1	0
2 edges	1	5	95	5
2 edges and distal	0	0	10	1

Obsidian from the Caves: Use-Wear Analysis Results

Microscopic examination of the obsidian artifacts indicates that almost all prismatic blades (97.6%) were used to some degree, with both edges on a blade typically used (table 8.3). For scraping, the distal ends of some blades were also used. Although obsidian blades used for cutting, sawing, scraping, or whittling were found in the caves, there is no reliable microwear evidence for piercing, drilling, or boring (figure 8.4). The majority of tools with identifiable use-wear from the four caves were used to cut or slice meat, fresh hide, or skin (table 8.4 and figure 8.5a). We believe this is associated with animal or human sacrifice of some sort (see Sievert 1992:tables 4.2 and 4.3); however, the damage seems too well developed to be associated with human bloodletting through autosacrifice. More severe treatment of animals or possibly humans may be represented by a small quantity of blades with heavier damage connected to butchering activities (i.e., contact with soft tissue and bone) that incorporates asymmetrical flaking and abrasion patterns as a result of cutting and evidence for transverse motions based on perpendicular and diagonal striations (see Lewenstein 1987:105–9, table 12).

Human skeletal remains, particularly those of children, found in caves or rock shelters throughout the Maya world may provide corroborating evidence for sacrifice (e.g., Awe, Gibbs, and Griffith 2005; Brady 1989; Gibbs 2000; Halperin 2005; MacLeod and Puleston 1978; Owen 2002, 2005; Owen and Gibbs 1999; Prufer 2005; Scott and Brady 2005). Human sacrifice in caves has been interpreted based on context of burial, atypical burial position, the absence of grave goods, and age at death. However, direct evidence in the form of cut marks on bone, for example, is extremely rare. Both ethnohistoric sources (Tozzer 1941) and ethnographic accounts (Petryshyn 2005) mention human sacrifices in caves, the use of caves as repositories for the victims, and the presence of human remains in these locations.

These use-wear patterns may also represent ritual butchery of animals, possibly connected to feasting activity in some instances. Faunal remains indicate

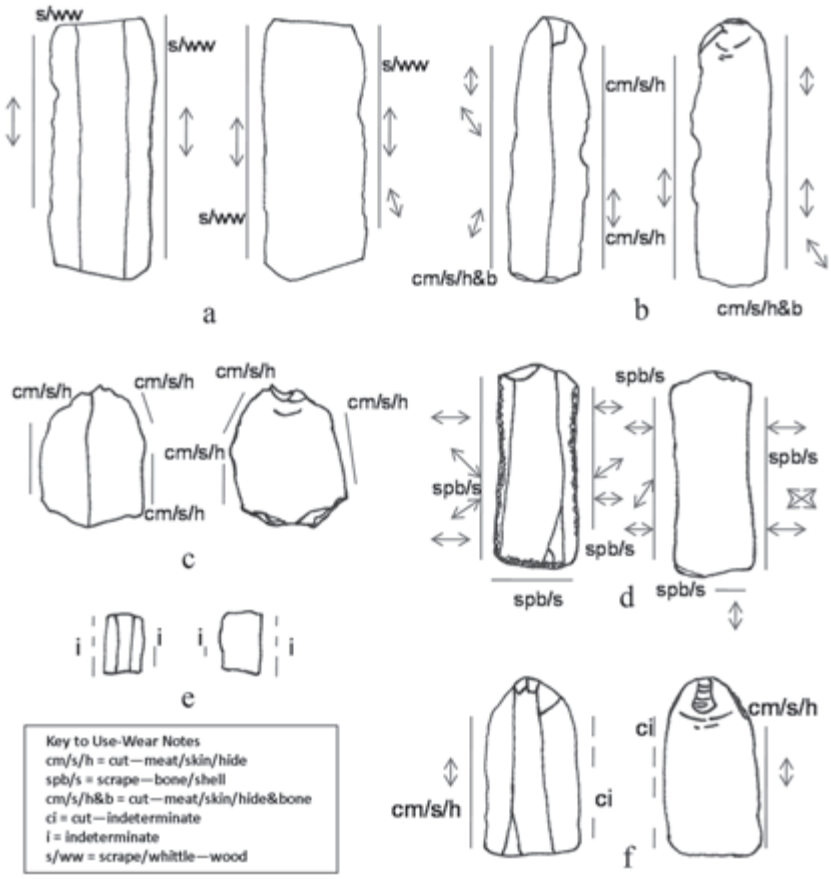

Figure 8.4. *Examples of use-wear on blades from caves: (a) medial blade segment (UK-Pool1–380), (b) proximal blade segment (UK97-BA-282a), (c) medial blade segment (UK98-BA-241), (d) medial blade segment (STC03–005–01–057), (e) medial blade segment (AHL00-Ent.1–132), (f) proximal blade segment (AHL00-Ent.1–136). The length of blade segment (a) is 41.9 millimeters.*

that animals were brought into caves, and some, such as the jaguar and deer (e.g., Awe, Gibbs, and Griffith 2005; Brady 1989; Helmke 2009; Pendergast 1969, 1971, 1974; Peterson 2006; Pohl 1983), clearly held important ideological and ritual value for the ancient and modern Maya (see Bricker 1986; Tozzer 1941; Tozzer and Allen 1910; Vail and Bricker 2004). Evidence for scraping hides may be connected to sacrifice of animals or the processing of hides for

Table 8.4 Number of IUZs on the obsidian tools from four caves

	Actun Chapat	*Actun Halal*	*Actun Uayazba Kab*	*Stela Cave*
Cut meat/skin/hide	2 (100%)	2 (20%)	83 (33.1%)	2 (15.4%)
Cut meat/skin/hide and bone	0	0	9 (3.6%)	1 (7.7%)
Cut plant	0	0	19 (7.6%)	1 (7.7%)
Cut indeterminate	0	2 (20%)	22 (8.8%)	1 (7.7%)
Cut/saw bone	0	0	7 (2.8%)	1 (7.7%)
Cut/saw wood	0	3 (30%)	17 (6.8%)	0
Scrape bone/shell	0	0	9 (3.6%)	3 (23.1%)
Scrape hide	0	0	5 (2%)	0
Scrape indeterminate	0	0	20 (8%)	0
Scrape/whittle wood	0	0	10 (4%)	0
Indeterminate	0	3 (30%)	50 (19.9%)	4 (30.8%)

some ritual reason (figure 8.5b), such as making cloaks, capes, or other garments like those worn by kings, scribes, and other ritual specialists.

Based on the very light damage on many of the blades, it is difficult to determine some of the activities performed with them. Many blades classified as "indeterminate" in terms of function possessed little to no edge microflaking, extremely few striations, and little to no surface abrasion (figure 8.5c). We suspect that some of these blades and perhaps others that have no identifiable use traces at all may have been used to let blood (see Aoyama 1999:131, 2001:14, this volume; Clark 1988:245, experiments 53–57; MacLeod and Puleston 1978:75; Reents-Budet and MacLeod 1997:101).

Some tools were used for other functions, including cutting and sawing harder materials like bone, shell, and wood (figure 8.5d) and what appears to be scraping and whittling wood and bone. In many Maya caves (e.g., Andrews 1970; Brady 1989; Helmke 2009; Pendergast 1969, 1971, 1974; Peterson 2006; Stanchly 2003), shell ornaments and other worked bone objects have been recovered, and the possibility exists that shell or bone pieces may have been made in caves, given the recovery of unworked and minimally worked shells (e.g., Pendergast 1969, 1971, 1974; Prufer 2002; Rissolo 2005). Cutting and scraping of wood could be associated with torch making or possibly the production of fuel for fires connected to cave rituals. The recovery of burned torches,

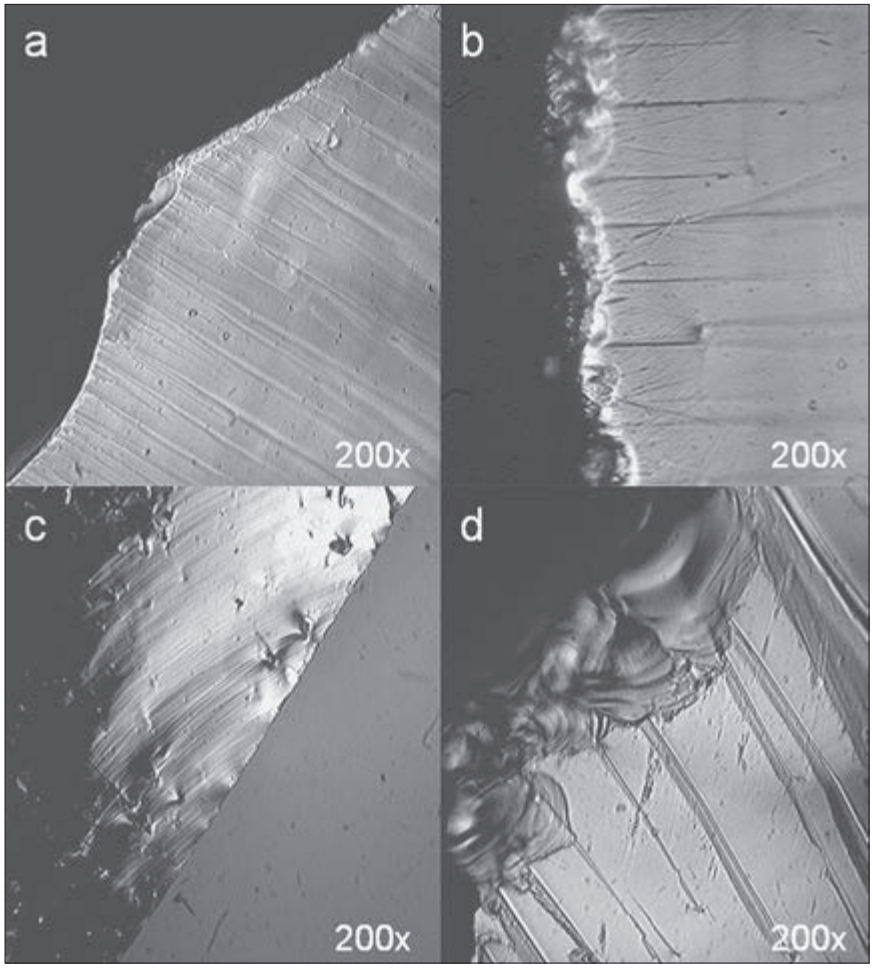

Figure 8.5. *Photomicrographs of use-wear on obsidian blades: (a) cutting meat/skin, (b) scraping dry hide, (c) indeterminate (bloodletting? [note minimal edge attrition]), (d) sawing wood.*

charcoal, and the presence of scorch marks in caves indicate that this is likely (e.g., Graham, McNatt, and Gutchen 1980:169; Morehart 2005; Morehart, Lentz, and Prufer 2005; Moyes et al. 2009; Pendergast 1974:59, 82; Peterson 2006:218; Reents-Budet and MacLeod 1997:58). Possibly, this use-wear represents the manufacture and use of wooden artifacts such as boxes, idols, or spears in caves (e.g., Pendergast 1974:48–54, figures 11a, I, 95–96, plates 6–8, 97,

plate 9; Prufer, Wanyerka, and Shah 2003). However, it seems more likely that these objects were brought into caves already finished.

Use-wear evidence for cutting of fibrous material indicates that plants were probably also processed in some of these caves. Whether fibrous plants were connected to food preparation or other activities is difficult to determine at this time (Morehart 2005). The plant fiber could be connected to ritual weaving (see Halperin 2008; Hendon 2006), which may have symbolic connections to the idea of the virginal daughters of the mountain gods who fluff cotton to transform it into rain clouds. The clouds leave the mouths of caves at the start of the rainy season to bring water to Maya farmers' fields (Vogt and Stuart 2005:177).

There is some similarity of obsidian use in the four caves studied here, but there is also notable variation. This may be biased in part by the different sample sizes from the caves (see table 8.2). However, use-wear evidence suggests that no singular activity occurred in caves using obsidian blades. A number of different functions connected to rituals seem to have been occurring, which may be indicative of the performance of various rituals to accomplish different ends, possibly by different types of ritual specialists (see Prufer 2005). It is also possible that obsidian blades used outside caves were subsequently brought into caves for inclusion in rituals and were then deposited in the caves. This clearly requires further investigation on our part. The results of our use-wear analysis also reveal some similarities to those of Aoyama (2001:12, table 6) for artifacts from Gordon Cave no. 3 (figure 8.6). However, a much higher percentage of tools was used to cut meat, skin, or hide at Gordon Cave no. 3, and a wider range of tasks was clearly performed with obsidian blades at Uayazba Kab.

At Uayazba Kab, most blades come from spaces in light zones (n = 91), with fewer from penumbral or dark zones (n = 35) (figure 8.7). This distribution, however, could reflect the fact that more excavation units were placed in the light zones of this small cave. Although obsidian blades may have been used for similar tasks in both light and dark zones (table 8.5), the specific nature of the rituals and their associated meanings may have differed considerably. Based on Brady's (1989; see also Halperin 2005:78; Prufer 2005:186–87, 210) work, we believe some private sacrificial rituals were performed deeper in the caves in the dark zones and other, more public sacrifices occurred in light zones or near entrances where the performances were intended to be seen. Although performance of religious rituals in both zones likely served valuable roles in terms of communicating with the supernatural and ensuring fertility and fecundity, public rituals in light zones likely also served additional purposes, including demonstrating power, authority, and legitimacy and attracting pilgrims for both ritual and economic reasons.

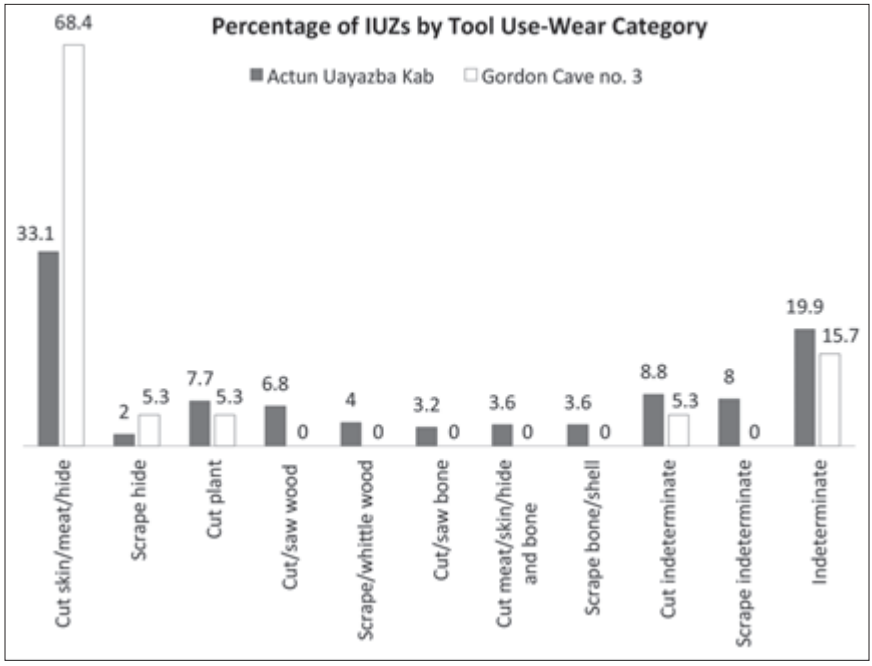

Figure 8.6. *Percentage of use-wear by category type based on IUZs for Actun Uayazba Kab and Gordon Cave no. 3.*

CONCLUSION

In some ways, we have only begun to scratch the surface of understanding the complex ritual and symbolic uses of obsidian in Maya caves. Evidence indicates that activities associated with butchery and sacrifice were performed in caves, likely by high-status individuals, but other activities, such as ritual craft production, were also occurring that have not received attention in our chapter. Based on use-wear data, religious specialists performed some similar activities in both light and dark zones of caves. However, butchery, animal and human sacrifice, and autosacrifice likely occurred more frequently in the dark zones deeper in the caves. More animal and human sacrifice in darker zones is interpreted based on the relative frequencies of tools used to cut skin, hide, or meat; to scrape hide; to cut and saw bone; or to cut meat and bone, as well as the high frequencies of "indeterminate" IUZs (at least some of which were likely connected to autosacrifice).

More inclusive public rituals involving sacrifice of various types took place in light zones. Based on use-wear evidence, it seems a wider range of activities

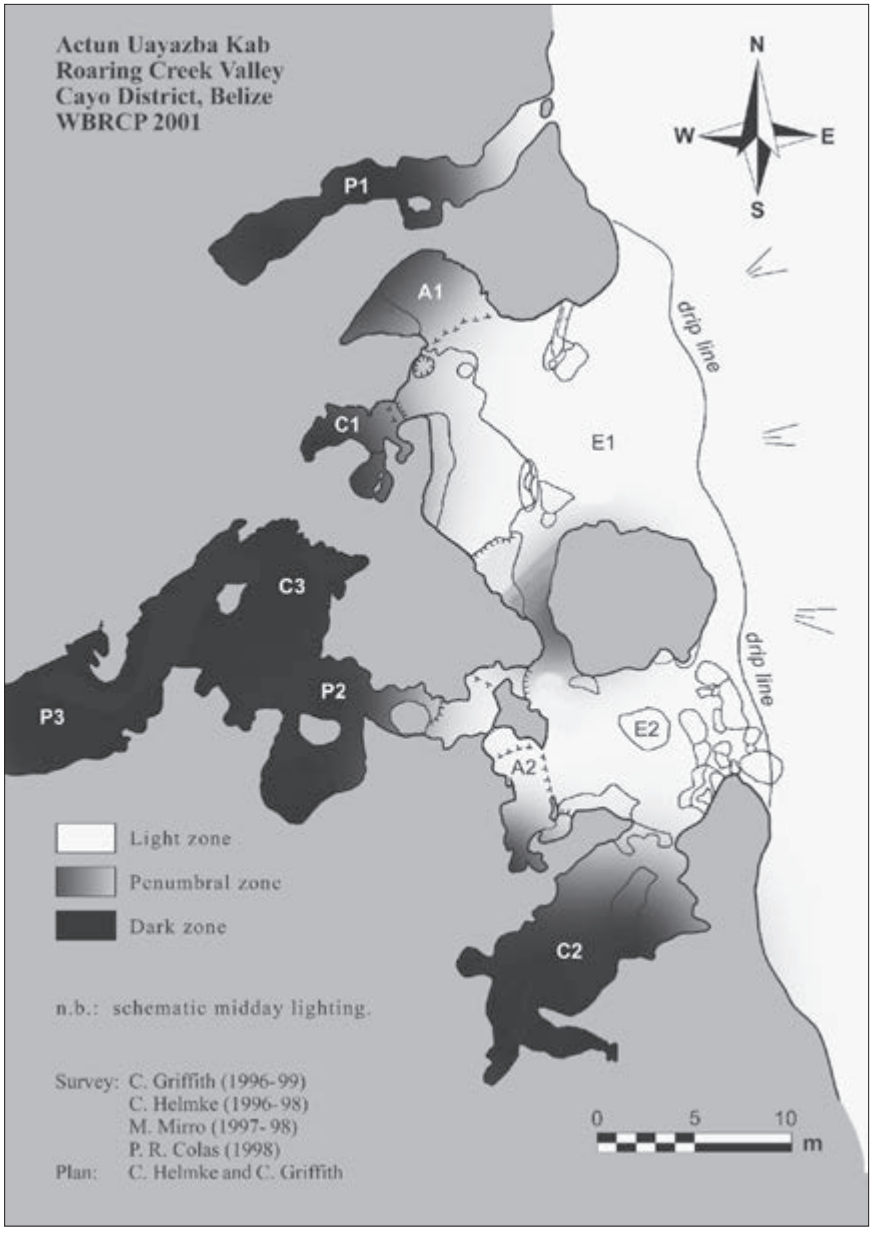

Figure 8.7. *Map of light, penumbral, and dark zones in Actun Uayazba Kab; courtesy, C. Helmke.*

Table 8.5 Number of IUZs by tool use-wear category for the obsidian artifacts from the light and dark zones in Actun Uayazba Kab

	Dark Zone	*Light Zone*
Cut meat/skin/hide	25 (33.3%)	58 (33%)
Cut meat/skin/hide and bone	5 (6.7%)	4 (2.3%)
Cut plant	0	19 (10.8%)
Cut indeterminate	8 (10.7%)	14 (8%)
Cut/saw bone	1 (1.3%)	6 (3.4%)
Cut/saw wood	0	17 (9.7%)
Scrape bone/shell	4 (5.3%)	5 (2.8%)
Scrape hide	3 (4%)	2 (1.1%)
Scrape indeterminate	7 (9.3%)	13 (7.4%)
Scrape/whittle wood	2 (2.7%)	8 (4.5%)
Indeterminate	20 (26.7%)	30 (17%)

was performed using obsidian blades in more publicly oriented spaces, particularly involving wood and plants; however, butchery and sacrifice also clearly occurred in light zones as well. Rituals in these locations were likely performances to be viewed and experienced by others. As such, they likely conferred upon those conducting them powerful roles as conduits to the gods and ancestors (Rappaport 1999) and established their legitimacy as ritual practitioners who could access the appropriate implements necessary for sacrifice in caves (Helms 1993; Watanabe 2007; Wolf 1990). As sources of power for elites or rulers engaged in ritual performance, which drew the Maya to pilgrimage locations such as caves, obsidian blades served critical roles in Maya religious systems.

There is support for the hypothesis that some cave rituals were connected to fertility rites and the production of rain to ensure that a good crop would be produced. It was the religious specialist's responsibility to communicate with the gods or ancestors, and one primary method of accomplishing this was blood sacrifice. It seems reasonable to suggest that during times of drought, the Maya intensified ritual activity to promote the production of the rain they needed for food production (Moyes et al. 2009). Hence, drought cults may have increased in times of increased desiccation and, with them, bloodletting and sacrifice in caves. In so doing, those performing rituals with obsidian blades in caves also reinforced their positions of authority and power because they could acquire the appropriate materials.

From this perspective, the life history of an obsidian blade transcends the purely technological world of reduction sequence or long-distance trade to take on an identity associated with intended use or perception in a larger cultural framework (Appadurai 1986; Kopytoff 1986). Although an obsidian blade may only completely fulfill its role as an implement for sacrifice when actually put to use, it can serve as a powerful symbol of sacrifice and connection to the supernatural when depicted in iconography or included in ritually meaningful contexts. In this sense, obsidian takes on a complex role as a significant object in the maintenance and control of Maya destiny (Wells and Davis-Salazar 2007:15; see also Davis-Salazar 2007) by creating identity for individuals, establishing power for them, and shaping the future of the Maya world through cave rituals that engage the supernatural to encourage creation or fertility, particularly in relation to maize (Gosden and Marshall 1999; see also Giddens 1984:257; Levine, chapter 1, this volume). As both implement for and symbol of sacrifice, the obsidian blade was a powerful object necessary for Maya religious rites in caves.

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CHAPTER NINE

Obsidian and Household Ritual at Xochitecatl-Cacaxtla

Mari Carmen Serra Puche, Jesús Carlos Lazcano Arce, and Mónica Blanco García Méndez

The use of obsidian in domestic, ritual, and administrative spaces encapsulates the embeddedness of particular artifact types and raw-material sources within systems of meaning generated by the particular communities studied archaeologically, including the ways technological values may differ from ideological ones. Ascriptions of value depend on the temporal and spatial context in which objects were used and deposited, as well as the individual actors who reflexively produce and refashion systems of value through practices involving such objects. In this study, we demonstrate how obsidian varies from serving as a common tool in domestic contexts to an important symbol in ritual contexts. We are interested in those activities we suppose had the objectives of creating or reproducing systems of knowledge and values for mastering social relations and regulating or constraining their developmental trajectories.

Archaeological research carried out in a residential sector of the Xochitecatl-Cacaxtla archaeological site in the Mexican state of Tlaxcala (figure 9.1) has allowed us to recreate the ritual spaces and objects involved in activities undertaken in various dwellings. Our argument is based on the presence of specialized obsidian artifacts associated with ceremonial ceramics found in significant quantities and concentrated in specific areas of a residential complex. Ethnographic and ethnohistoric information associated with central Mexican festivals is also an important line of interpretation.

We focus on research carried out at residential Terraces IV and V, situated to the east of the Xochitecatl-Cacaxtla ceremonial complex (figures 9.2 and 9.3). These investigations examined an Epiclassic period (650–900 CE) residential

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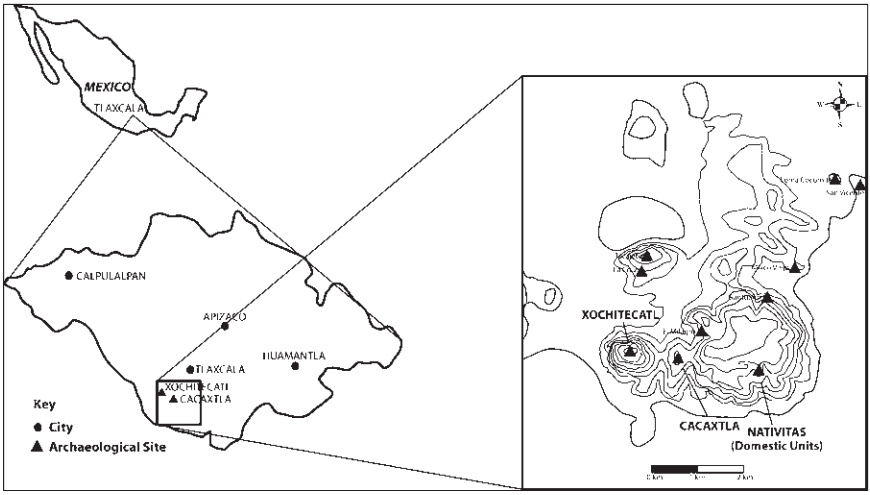

Figure 9.1. *Map of research area in Tlaxcala, Mexico.*

complex constructed on top of a large platform built of several layers of earth and packed gravel and retained by boulders and river cobbles (Serra Puche et al. 2009). The associated pottery is indicative of an Epiclassic settlement and a later occupation during the Postclassic period (900–1519 CE). Given that most of the material relating to the ritual use of obsidian corresponds to the Epiclassic settlement, we focus on this earlier occupation here. The analysis of these archaeological data provides information on several craft activities that supplemented a subsistence economy based on agriculture (Hirth 2009a) and also elucidates how domestic ritual fostered a sense of group unity within residential contexts in which obsidian, along with other materials, played an important role.

DOMESTIC UNITS AND ARCHITECTURAL CONTEXT

To describe the ritual activities that took place within this setting, we must first describe the residential area. The term *domestic unit* has been defined in many different ways, and here we consider it to be composed of a group of people, linked by kinship ties and a shared identity, who cooperate in productive and reproductive activities required for their survival (Wilk and Rathje 1982). The remains of artifacts, the physical structures that accommodate these individuals, their environment, and the interactions among these many

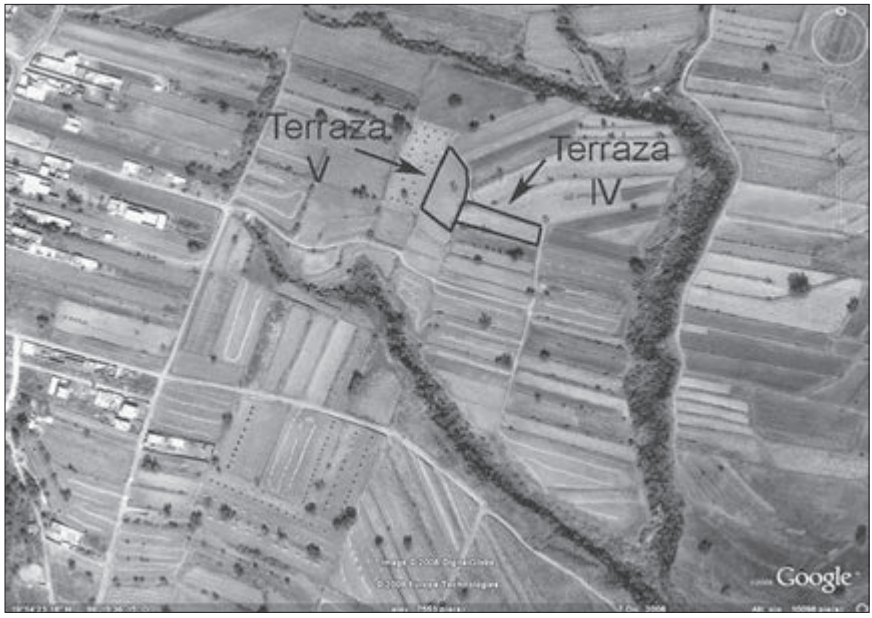

Figure 9.2. *Satellite image of Terraces IV and V, Xochitecatl-Cacaxtla.*

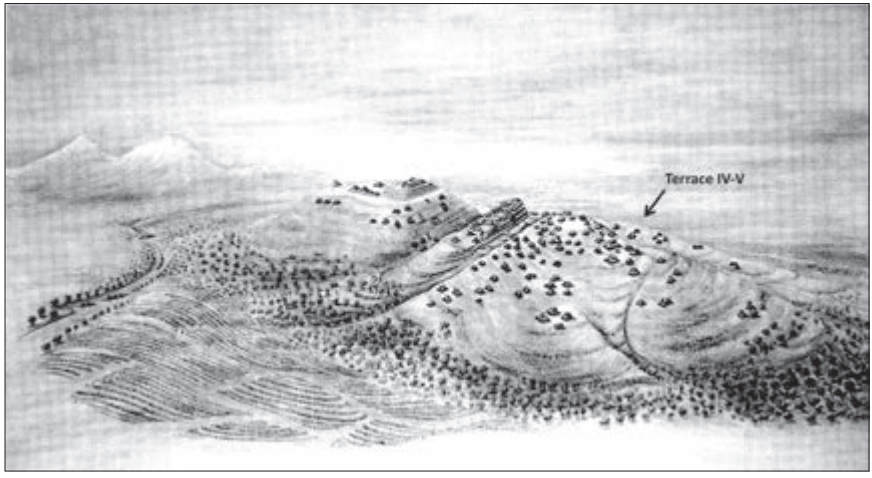

Figure 9.3. *Plan map of Terraces IV and V, Xochitecatl-Cacaxtla.*

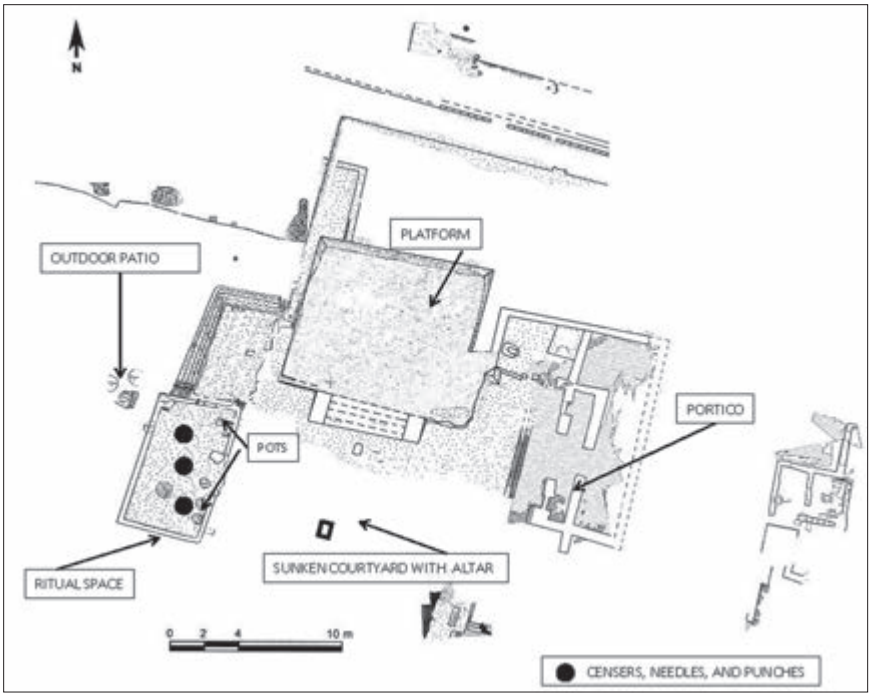

Figure 9.4. *General plan map of residential area.*

dimensions lead to the understanding of the domestic unit as the basic unit of society (Clarke 1977). Accordingly, the domestic unit is representative of the primary cell of social organization (Serra Puche 1986).

The domestic unit we are interested in analyzing to better understand the social organization and collective ideology of its members is part of a larger architectural complex composed of several spaces, which we refer to as the residential area (figure 9.4). The first space is a residential quarter made up of three rooms, each with its own hearth, which surround a sunken courtyard with a central quadrangular altar. This location is where most of the evidence of activities related to the social and biological reproduction of the inhabitants was found. To the east, a larger space we identified as a portico is divided by a small wall into two rooms. Access to the portico is provided by three steps, and next to it, to the northwest, is another small space whose function we have yet to determine. Within this space, before the "bench" or "seat" that spans the width of the room, is a very well-preserved clay hearth, or *tlecuil*. Next to this room, a larger construction—a platform with its main facade

Figure 9.5. *Photo of altar found in sunken courtyard of residential area.*

running southward—can be accessed by a five-step staircase at whose summit the traces of an extremely deteriorated room were found. To the west of this structure is a small courtyard bounded by a three-step staircase in the form of an inverted L, and to the south is the room on which our analysis is centered; we refer to this as the "ritual space" (figure 9.4).

Several burials were discovered in the larger residential area within which the domestic unit was located, some contemporary with the residential structures and others dating to the Postclassic period. Two burials were placed at the foot of the quadrangular altar (figures 9.4 and 9.5); they faced the dwellings and possess several noteworthy characteristics. The two individuals were deposited separately, and both were part of a complex burial ritual whose analysis and interpretation are still in progress. The ritual space composed of both the altar and the two burials denotes a deep symbolism that was part of the ideology of the inhabitants of this residential unit. One of the interments (figure 9.6) contained only a skull, one hand, and one foot, as well as an onyx vessel covered in cinnabar, which was ritually "killed." The second is a primary burial of an individual found in a seated position. The

Figure 9.6. *Burial 4, Terrace V.*

teeth exhibit evidence of intentional modification (in the central incisors, lateral incisor, and left canine), as well as an inlay of circular disks made of pyrite (figure 9.7). Several offerings of ceramic vessels were also part of the mortuary ritual.

Within the domestic unit, to the west, we located what we believe is a ritual space (see figure 9.4). The room measures 9 meters × 4.5 meters, has adobe walls and a stucco floor, and contains a small, low platform (20 centimeters high). Here we discovered a circular altar, a high quantity of ceramic censers, artifacts produced from fine prismatic obsidian blades (likely for self-sacrifice), and three clay vessels buried at ground level.

Based on the spatial distribution of these vessels within the room and on the analysis of their contents, we suggest that this space was formally organized and was the locus of important ritual activities. Two of the vessels were found on the southeast side of the room, close to the circular altar, and contained carbonized seeds (presumably from *capulín* trees, a Mexican cherry). The third vessel, located at the northeastern end of the room, contained two bone instruments, one clearly showing evidence for use as a punch (see figure 9.9e), a

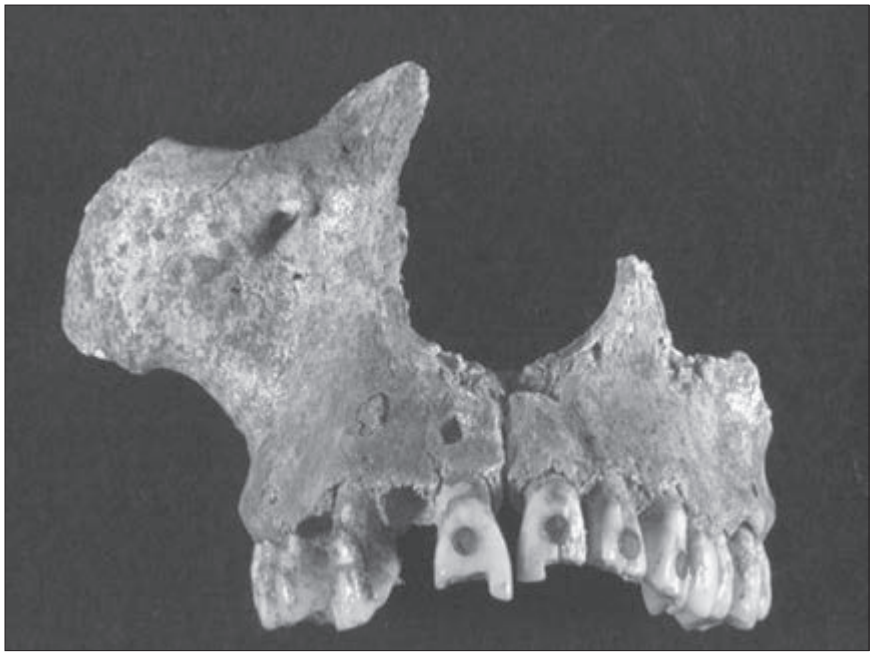

Figure 9.7. *Individual with dental modification and pyrite disc inlays.*

greenstone bead, an obsidian eccentric, as well as three fine, third-series obsidian blades—the last to be removed from a prismatic core.

In addition to these items, two artifacts are worthy of further attention. Both are made of bone: the first one was located inside the room, and the second was found in the vessel. The artifacts bring to mind certain instruments reported in the literature on Mesolithic European microlith tool production. Sergei Semenov (1957:128–31, figure 16.2) notes that the production of these artifacts "could only be performed with a fine pressure retouch . . . To retouch theses type of segments with the correct pressure they had to be placed in a fixed and immobile position during the process . . . The segments were set and lodged within the cuts or grooves on the bone to keep them from moving." One of the artifacts from the domestic unit (see figure 9.9d) shows a longitudinal groove that would have been suitable for holding a small blade; through pressure retouch, its surface could have been modified. The second artifact is burned (see figure 9.9c) and also exhibits a deep longitudinal groove, as well as several small and finely traced longitudinal lines, perhaps evidence of use

as a vice or a haft for holding fine blades. We believe this device was used in a manner similar to what appears in Semenov's (ibid.:258–59, figure 70.1-10) report.

DOMESTIC RITUAL

Certain objects recovered during the excavations carry deep symbolic significance, including decorated ceramic types, such as Templo Blanco y Rojo sobre Café Pulido,[1] and exceptionally high quantities of incense burners found in association with fine obsidian blades (Serra Puche et al. 2004, 2009; Serra Puche, Lazcano Arce, and García Méndez 2010). Such material remains are closely related to rituals and festivals that took place within domestic units, which operated in the context of both a social environment (interactions among and between units) and a natural environment (in association with lakes, mountains, seasons, or droughts). The more we refine the way we derive social interpretations through the analysis of these relationships, the better we will understand the mechanisms or creative strategies individuals pursued in adapting to new circumstances.

The existence of social stratification in Epiclassic central Mexico is well-known, and archaeological features at Xochitecatl-Cacaxtla provide evidence that its inhabitants were of relatively high socioeconomic status (Serra Puche and Lazcano Arce 2011). This high status was materialized in complex architectural features and the leveling of a terrace to build a residential platform. These landscape modifications provided the residence with an expansive view of surrounding environmental features, including volcanoes, and created a connection with the surrounding sacred landscape. Other architectural characteristics also suggest relatively high status: stucco and plaster floors in both interior spaces and exterior courtyards, perfectly square masonry retaining walls, and buttresses and surfaces covered by mud and volcanic stone (*tezontle*).

Archaeological evidence from two of the open courtyards (a sunken courtyard with altar and an outdoor patio; see figure 9.4) provides information regarding the activities that occurred therein. The outdoor patio contains a granary (*cuexcomate*) with two related burials, several hearths, and evidence that suggests the production of obsidian implements. Pottery analysis indicates the presence of a dense concentration of domestic vessels, indicative of food preparation or cooking in this area. The sunken courtyard with the altar and associated burials (of which two were mentioned earlier) strengthens the interpretation of ritual uses of the space and helps us recreate the mortuary and ritual context.

Interior spaces with a range of associated features and artifacts on their plastered floors suggest the presence of domestic ritual. They include a circular altar, large vessels for storing food (presumably related to celebrations or festivals) or various household implements and ritual items, a high concentration of ceramic censers (more than sixty), and fine obsidian blades, ceramic flutes, and elaborate pottery. Several obsidian artifacts produced from small, third-series prismatic blades, which we have classified as needles or lancets (likely for self-sacrifice), were discovered in direct association with ceremonial vessels, including a large number of long-handled censers similar to those diagnostic of Coyotlatelco phase ceramics. These artifacts were found in an interior residential setting. Flutes and whistles as well as ceramic types diagnostic of the Epiclassic period were also identified, including Bloque Rojo sobre Café, Celosía Café Sellado, Foso Esgrafiado Pared Gruesa, and Templo Blanco y Rojo Sobre Café Pulido—the latter of which possesses profound iconographic significance. Excavations recovered other elite or ritual paraphernalia as well, including jade beads, obsidian lip plugs, and marine shells.

OBSIDIAN FOR RITUAL USE

Although we are still in the process of analyzing the complete obsidian assemblage, we have documented 175 obsidian artifacts (lancets and punches) from this residence. Here we present information on the 35 artifacts studied to date, which allows us to establish a general overview of the ritual use of these implements at Xochitecatl-Cacaxtla.

The artifacts recovered average 4 millimeters wide and 4 centimeters long; the majority include the distal-medial or proximal-medial portion of the blade. Their ends were sharpened by means of microflaking, processed on the percussion bulb (proximal end), the distal end, or both. These attributes allow us to identify the blades the artifacts were made on as third-series blades: the last blades that could be removed from a small prismatic core prior to its exhaustion. Such microflaking may have been done on the bone-vice implements discussed earlier. In the sample, seven artifacts stand out for their fine workmanship: two are complete (one green and one gray) and five are nearly complete (missing a very small portion of one of their ends). Artifacts taken from the rest of the sample are more fragmentary but also exhibit evidence of skilled workmanship.

The specialized nature of these instruments must be emphasized. They were produced on prismatic blades corresponding to the third series, a process that requires great dexterity and skill. Regarding the size and form of blades in

relation to the overall production sequence, John Clark (1990:116) states: "The nature of this process makes blades more standardized during the reduction of a large polyhedral core. Thus the fineness of blades can be used as an indication of their sequence of removal . . . The inner rings, or series of blades, reduced from a nucleus will comprise fewer blades in relation to the previous series." Elsewhere, Clark (1989) points out that Fray Toribio de Motolinía makes a distinction between blades and lancets. Motolinía (1973:45) writes, "Y sacaban de una piedra más de dos cientas navajas, y a vuelta algunas lancetas para sangrar [And they removed from one stone more than 200 blades and finally some lancets to bleed themselves]." We believe the blades he describes are those that came from small, nearly exhausted polyhedral cores.

These artifacts were part of a process that no doubt required great mastery and expertise. When speaking of obsidian instruments and the manufacture of obsidian blades in particular, we must consider more than the specialized aspects of their manufacture. Other factors should also be considered, including (1) the process involving the selection, extraction, and early stages of reduction; (2) the exchange or distribution of this precious raw material; (3) the techniques used to reduce the nodule by percussion and the later reduction of the polyhedral core by pressure; and (4) the manufacture of artifacts on prismatic blades, which could have been done by the same individual who produced the blades themselves or by another individual who then uses the implement.

Of the thirty-five obsidian artifacts elaborated from fine prismatic blades, three were found in the interior of one of the ceramic vessels, while the remainder were located in a room we have identified as a ritual space (see figure 9.4). Six of the artifacts included in the analyzed sample were instruments made of green obsidian exhibiting outstanding technical qualities, while the remainder (n = 29) consisted of gray and black obsidian. The raw material used—green, gray, and black obsidian, exploited from at least two or perhaps three different sources—suggests that more green blades were acquired finished, while others, mostly gray that appear to be from the Paredón source, were produced at the site. The possession and use of such implements appears to have been reserved for high-ranking individuals. We believe these artifacts were used in the context of festivals or rituals and that their possession and use was a sign of status.

The following ethnohistoric data provide a framework to establish, to a certain extent, a correlation between our findings at the residential unit at Xochitecatl-Cacaxtla and ritual obsidian use in sixteenth-century Tlaxcala. Motolinía, in his *History of the Indians of New Spain*, describes a celebration:

De una muy gran fiesta que hacían en Tlaxcala de muchas ceremonias y sacrificios . . .

e idos aquellos venían los maestros que sacaban las navajas, también ayunados y rezados, y sacaban muchas navajas con que habían de abrir las lenguas, y así como sacaban las navajas, poníanlas sobre una manta limpia, y si alguna se quebraba a el sacar, decíanles que no habían ayunado bien. Nadie que no vea cómo se sacan estas navajas podrá bien entender cómo las sacan, y es de esta manera: primero sacaban una piedra de navaja, que son negras como azabache y puesta tan larga como un palmo algo menos, hácenla rolliza y tan gruesa como la pantorrilla de la pierna y ponen la piedra entre los pies y con un palo hacen fuerza a los cantos de la piedra, y a cada empujón que dan, salta una navajuela delgada con sus filos como de navaja; y sacaban de una piedra más de doscientas navajas, y a vueltas algunas lancetas para sangrar; y puestas las navajas en una manta limpia, perfumábanlas con su incienso, y cuando el sol se acababa de poner, todos los ministros allí juntos, cuatro de ellos cantaban (a) las navajas con cantares del demonio, tañendo con sus atabales; y ya que habían cantado un rato, callaban aquellos y los atabales, y los mismos, sin atabales, cantaban otro cantar muy triste, y procuraban devoción y lloraban; creo que era lo que luego habían de padecer. Acabado aquel segundo cantar estaban todos los ministros aparejados, y luego un maestro bien diestro como cirujano horadaba las lenguas de todos por medio, hecho un buen agujero con aquellas navajas benditas; y luego aquel viejo y más principal ministro, sacaba por su lengua de aquella vez cuatrocientos y cinco palos, de aquellos que los carpinteros ayunados y con oraciones habían labrado; los otros ministros antiguos y de ánimo fuerte, sacaban otros cada cuatrocientos cinco palos, que algunos estaban tan gruesos como el dedo pulgar de la mano, y otros algo más gruesos; otros había de tanto grueso como puede abrazar el dedo pulgar, y el que esta par de él, puestos en redondo; otros más mozos sacaban doscientos, como quien no dice nada. (Motolinía 1973:44–47)

[At a very large festival they celebrated in Tlaxcala involving many ceremonies and sacrifices . . . then the masters who made blades arrived, also having fasted and prayed, and they produced many blades with which they would pierce their tongues; and they removed the blades, putting them over a clean blanket, and if one of them were to break upon removal they would say that they had not fasted well. No one who has not seen how they removed these blades could understand how they remove them, and it is thus: first they take a stone for blades, which are black like jet and as long as a palm or a little less, and they make them plump and as thick as the calf of the leg, and they put the stone in between the feet and with a stick they apply force to the edges of the stone, and

> with each push they give they make a thin blade jump off with its edges like a razor; and they will take off more than 200 blades from a stone and then turn some into lancets for bloodletting; and with the blades placed on a clean blanket, they would perfume them with incense, and when the sun set all the priests there together, four of them would sing to the blades with their devil songs, beating their drums; and having sung for a while, they would fall silent with the drums, and the same singers without drums would sing another, very sad song, seeking devotion and crying; I think it was because of what they would have to suffer next. Having finished that second song, all the priests had their tongues pierced by a master skilled like a good surgeon, making a big hole with those blessed blades; and then the oldest and head priest pulled through his tongue 405 sticks, of the sort carpenters, who had fasted and prayed, had made; the other elder priests of strong spirits pulled their own 405 sticks, some of which were as thick as the thumb and others a little thicker; others were as thick as what a thumb can wrap around; other younger ones pulled through 200, as if nothing.](translation by David Carballo)

We argue that the obsidian instruments—punches or needles—and ceremonial vessels we recovered were used for ritual activities and not in other craft activities. We base this on the results of excavation, analysis, and comparison of several contexts and activity areas related to craft production in the different households of Xochitecatl-Cacaxtla, dating to both the Formative and Epiclassic periods. In other settings at the site we have documented three specialized economic activities, including the production of jade beads, carved bone artifacts, and maguey processing (Serra Puche and Lazcano Arce 2011). The differential usage of obsidian and the absence of ceremonial vessels in these three contexts allow us to identify the activities discussed here as ritual rather than crafting activities. In no other area of Xochitecatl-Cacaxtla have we seen this unusual association between ceremonial vessels (censers) and artifacts made from prismatic blades (needles and punches). Furthermore, we found no other cultural material indicative of economically oriented activities. Our example may therefore represent what Takeshi Inomata (2001:321) calls "attached specialization" as "the production of goods for elites or governing institutions by specialists contractually bound to such patrons." In our case, we do not have the production in situ (at least for the censers), but the use of implements related to goods for elite rituals is present. We therefore also believe the depositional contexts are consistent with a ritual mode of production defined by authors such as Patricia McAnany (2011) and John Monaghan (1998).

IMPLEMENTS MADE ON PRISMATIC BLADES FOR SELF-SACRIFICE

A differentiation must be made between a punch/awl (*punzón)* (figure 9.9a and b) and a lancet (*lanceta*) or needle (*aguja*) (figure 9.8), which can be used to perform self-sacrifice (figure 9.10).

Our sample included a total of fourteen punches/awls, ten gray and four green, produced from fine third-series prismatic blades. Their width does not exceed 3 millimeters, and they average 3.2 centimeters in length. Both ends are very sharp, whereas the body is entirely microflaked, providing it with a rounded cross-section that would have allowed it to better puncture skin or some other substance. This fine flaking began on the dorsal surface, forming the system of ridges (*aristas*) that give volume to the piece (either trapezoidal or triangular). In some instances the blade's original ventral surface is no longer visible, as it has been completely flaked and rounded. The small percussion bulb was also thinned to sharpen the instrument, and the distal end was sharpened as well.

Lancets/needles are sharpened at both ends and are also made from fine third-series blades. Unlike the punches/awls, these instruments were flaked only at the ends, leaving both sides of the blade's body with a natural edge; they were reworked bilaterally on the dorsal and ventral sides at the ends of each blade. The twenty-one lancets or needles included in our sample, including nineteen gray and two green objects, averaged 4 millimeters in width and approximately 5 centimeters in length—making them larger than the punches/awls.

Of the total number of obsidian artifacts analyzed and reported here, 82 percent (n = 29) were located inside the common area or ritual space (see figure 9.4), in association with the ceremonial vessels, whereas only 18 percent (n = 6) were located outside the room (specifically in sector south 490 east 95 square 25).[2] This is relevant, as the association of the obsidian with the ceremonial vessels is not incidental or fortuitous; they were probably used together during some kind of ritual or festival.

RITUAL POTTERY

Incense burners and censers are widely reported in literature on the Epiclassic period (Cobean 1990; García Chávez and Martínez Yrízar 2006; Manzanilla, López, and Nicolás 2006). Our closest local examples are found at the ceremonial center of Xochitecatl-Cacaxtla itself, where several complete incense burners have been unearthed (Serra Puche, Lazcano Arce, and Mendoza 2004). Figure 9.11 depicts ladle-handled incense burners (*sahumadores*) from

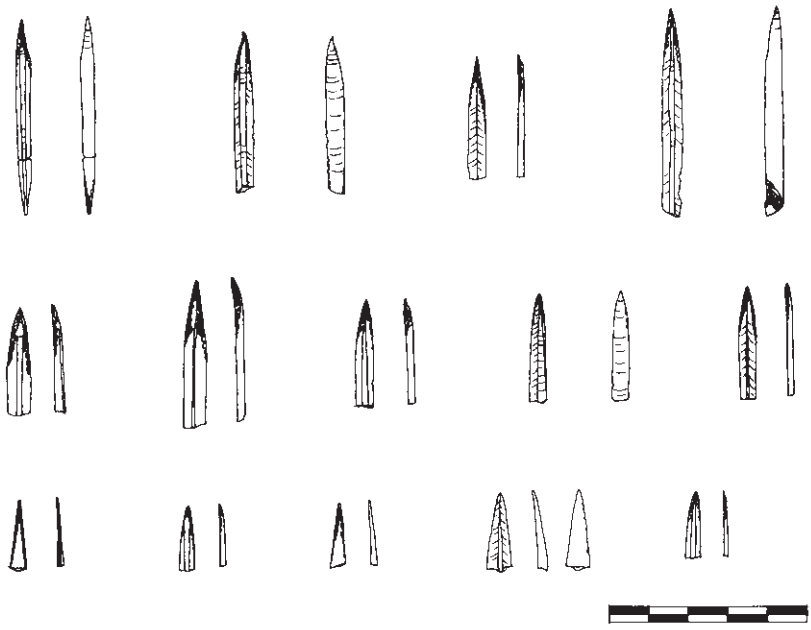

Figure 9.8. *Fine obsidian lancets or needles made from prismatic blades.*

the Xochitecatl ceremonial center and the residential unit. The incense burners from the residential area have long handles and a pan-shaped receptacle. The handle is a long, modeled hollow cylinder that is sealed at one end, and at the other end it merges into the concave receptacle. We emphasize the uniformity in manufacturing process, which suggests to us that they came from the same workshop.

All of the long-handled incense burners show traces of use, with the receptacle marked with dark black spots or entirely covered with burn marks, indicating exposure to fire. These examples are similar to those reported and described as "pan censers" of the Rojo Sobre Café Burdo type, corresponding to the Corral phase at Tula (Cobean 1990:257). Yoko Sugiura Yamamoto (2009) reported similar findings from the upper Lerma lacustrine area.

Within the domestic units, a total of 1,406 incense burner fragments were registered, including 66 percent found in the ritual space or common area (see figure 9.4) and 15.5 percent outside that room[3] (Units S490E96C1,2; S490E96C25; and S491E95C22). Even though no single complete censer was

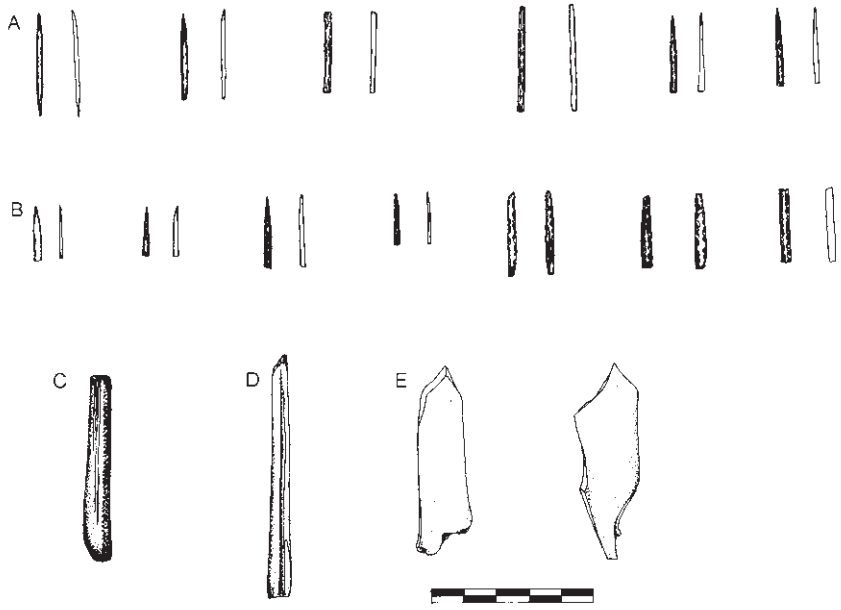

Figure 9.9. *(a and b) Obsidian punches (punzones) made from prismatic blades; (c, d, and e) bone implements.*

found within the residential excavation area, the large sample of fragments allows us to reconstruct their spatial association and breakage as relating to ritual activity in these locations.

Important distinctions can be made between the domestic incense burners and those unearthed at Xochitecatl's ceremonial center (Serra Puche, Lazcano Arce, and Mendoza 2004), especially differences in raw material and form. Both show a coating of white paint applied after firing that was easily chipped away. The clay used to make the censers found in the domestic unit is much thinner, more fragile, and more porous; the handle is sealed, and the concave pan has holes and cut-out shapes. The censers located at the ceremonial center are more resistant and made with coarser clay. The handle is hollow to allow for ventilation. We judge these differences to be important, as they may be associated with different use contexts. Incense burners from the residential unit were used within ritual spaces in domestic contexts, where ceremonies or festivities took place. Censers used at the ceremonial center of Xochitecatl, in contrast, were used in the context of public rituals.

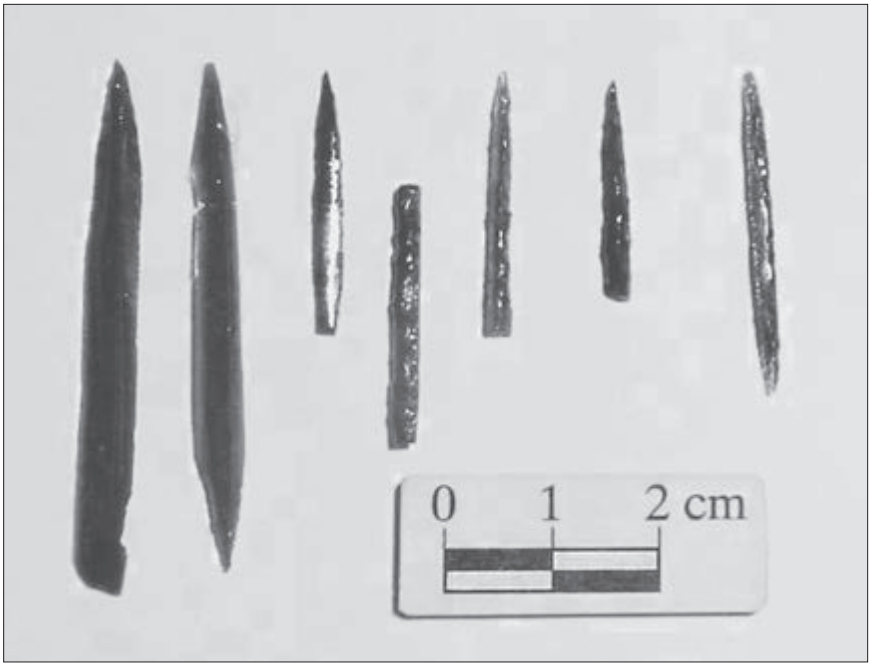

Figure 9.10. *(first two, left) Fine obsidian lancets or needles; (last five, right) punches (punzones) made from prismatic blades.*

SIGNIFICANCE OF THE RESIDENTIAL RITUALS

The relevant meanings of rituals that take place in the context of a residential unit, whatever the occasion for celebration, rest on the fact that they involve the presence of individuals of high rank or who have acquired a differential status in the community (Carballo 2011). In regard to the relationship among rituals, daily life, and social differentiation, we must consider concepts such as "domestic economy" and "ritual economy." The first describes what housing units do and how they are organized to meet their social and physical needs (Hirth 2009b). Christian Wells (2006:284) refers to ritual economy "as representing a newly emerging analytical trend that considers the varied economic pathways by which worldview and belief are embodied in material culture—sometimes by way of religious ritual but also through other kinds of ritualized practices."

Rituals to attract rain in times of drought or to end rains when floodwaters rise are well-known among contemporary Mexican communities. Ceremonies

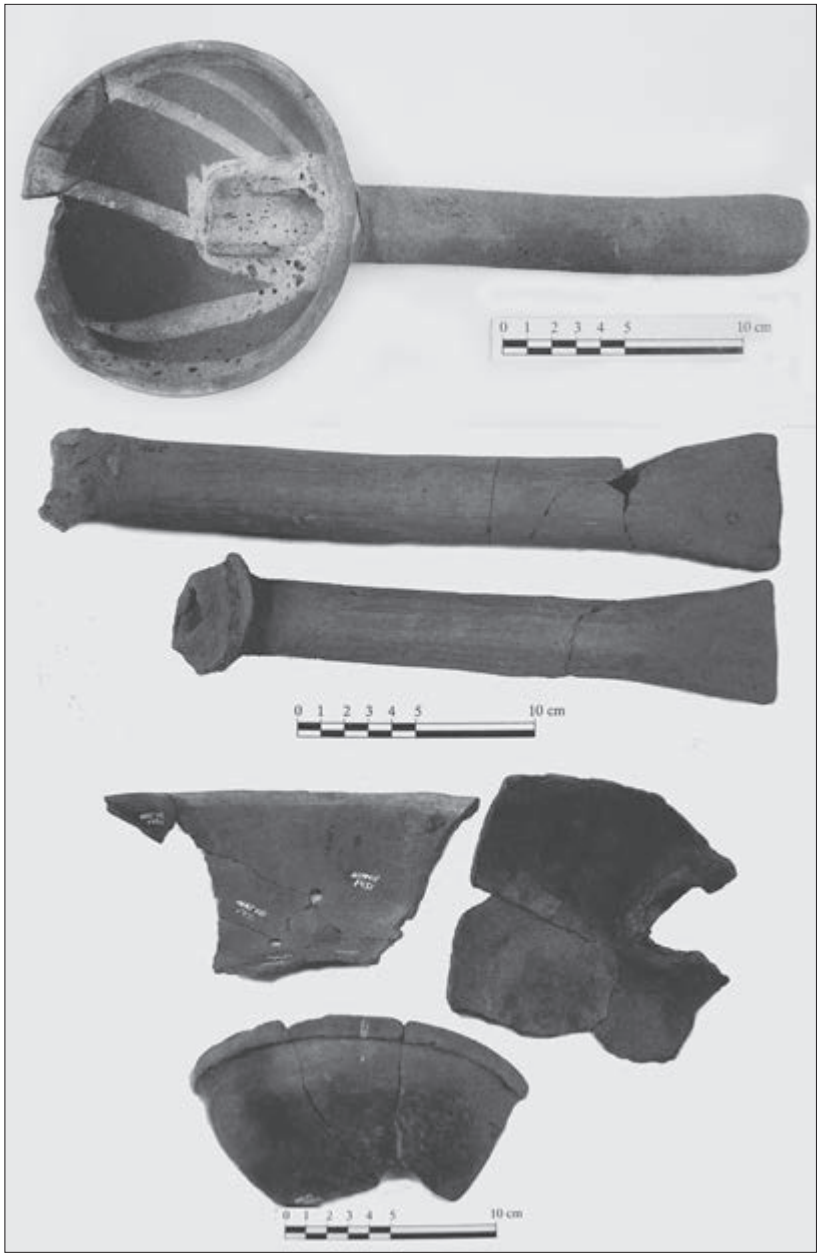

Figure 9.11. *(a) Incense burner from Xochitecatl ceremonial center; (b–c) incense burner fragments from Xochitecatl-Cacaxtla residence.*

and rituals were implemented for a variety of circumstances, not only for basic subsistence. Other ceremonies were tied to the commemoration of relevant dates, such as those associated with trade, alliances, and other celebrations (as in the Tonalámatl de Aubin, a sixteenth-century divinatory codex). Contemporary native peoples of the region ascribe symbolic meaning to the cyclical festivals (or rituals) that structure and regulate their communities. Ethnoarchaeological work undertaken in contemporary Mexican communities provides a wealth of information regarding the way symbolic thought is applied to structures of daily life: for example, offerings during the Day of the Dead or the personification of Popocatepetl, an active volcano also known as Don Gollo, as well as ceremonies directed toward patron saints, among many other activities. Thus, each element that comprises part of a ritual holds an important cultural logic whose origins can often be traced through ethnohistoric or ethnographic sources.

Associated material culture (e.g., incense burners, obsidian, bark or *amate* paper, sculptures, ceramics) is a fundamental component of these ritual events, through which they assume increased significance. These elements were often hidden and preserved for veneration from generation to generation by shamans or *mayordomos*, individuals who undoubtedly possessed a distinctive social rank among their people and in their communities. We consider the identification and knowledge of the use of any or all of the elements tied to ritual practice—precious and necessary elements such as obsidian, censers, feathers, ceramics, *copal* incense, sculptures, and paintings, among many others—highly relevant to our research. They serve as ritual components that acquire significance not solely from the objects or materials themselves but rather because of the value ascribed to them through ritual practice and religious meaning.

The material culture associated with the inhabitants of the domestic unit studied here is important because of the links and connections it creates among worldview, daily life, and environment. These artifacts exist in the community's social context and as such acquire a special value or meaning, to the point that they become fundamental to the inner workings of the mechanisms that keep the social and economic spheres functioning.

The fact that obsidian artifacts were deposited in close association with ceremonial censers in a residential context, and the slight variation in their manufacture in relation to the censers found at the ceremonial center, serve as evidence that ritual activities were carried out with relative frequency and specificity as part of daily life in the residential area. We also emphasize the ritual character of these contexts by underlining the fact that we are referring to high-status housing, which is essential to our analysis. It shows the degree

to which diversification of social status is an essential factor in the elaboration of ritual celebrations.

CONCLUSION

Archaeological research carried out at the residential units of Xochitecatl-Cacaxtla has documented activity areas related to craft production at several levels pertaining to different periods. These activities include the production of both jade beads and carved bone instruments and the use of ovens for processing maguey (Serra Puche and Lazcano Arce 2011). Alternatively, the evidence presented here concerning the spatial relationship between obsidian instruments (lancets and punches) and ceremonial pottery informs us about ritual activities. This information has allowed us to identify the ritual spaces and associated artifacts in the residential unit at Xochitecatl-Cacaxtla.

Ceremonies and rituals were undertaken for a variety of circumstances, not only those dedicated to basic subsistence (e.g., rain, health, food). Other ceremonies were tied to the commemoration of relevant dates, such as those associated with trade, alliances, fertility, and other celebrations. Based on archaeological evidence, associated analyses of artifacts, and ethnohistoric data, we have provided a hypothetical reconstruction of activities that provided a sense of unity to a high-status residential group through ritual in which obsidian, along with other objects, played an important role. These lines of evidence suggest that ceremonies were carried out in the residential unit within designated ritual spaces and were led by an important member or members of the household's broader sphere of interaction—perhaps elders and people of elevated social rank or status. In this regard, we believe the concept of ritual production is useful for understanding the activities and instruments described here.

A reconstruction of what we interpret as the ritual and funerary area within the residential complex is presented in figure 9.12. This area includes a sunken courtyard and a quadrangular altar associated with two important burials. The vast majority of incense burner fragments, obsidian lancets, and punches were also found in this area. In this ritual space, long-handled white pan censers and obsidian needles were used in ceremonies. The censers impregnated the air with the smell of copal smoke, while bloodletting rituals were performed with obsidian needles. These activities had the objective of creating or reproducing systems of knowledge and values relating to social relations, regulating their forms, or organizing them in a particular, culturally appropriate way.

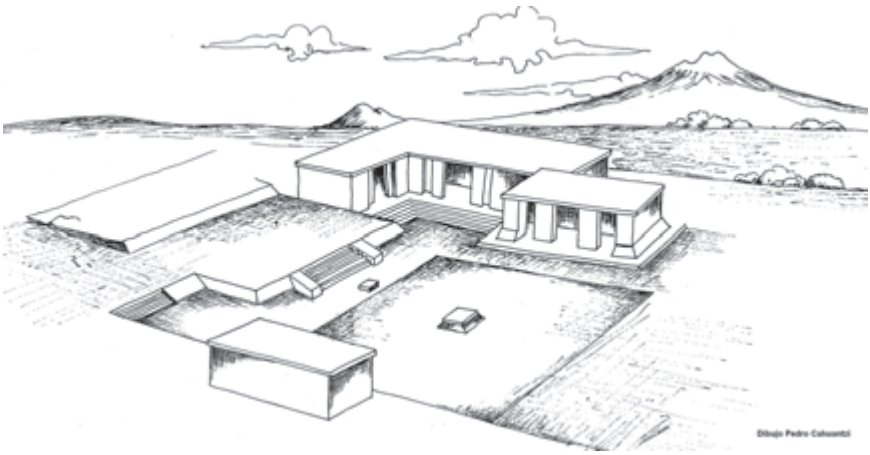

Figure 9.12. *Artist's reconstruction of Xochitecatl-Cacaxtla residence, including areas reserved for domestic ritual.*

NOTES

1. The Templo Blanco y Rojo sobre Café Pulido ceramic type includes four motifs: sectioned shells or serpents, descending and ascending, that frame a five-petal flower or star—a symbol related to water and Venus; thin braided bands; a symbol related to war; and vertically aligned triangles.

2. Needles or punches were also found in non-ritual areas within the residential unit but in lower proportions.

3. Censers were also found in non-ritual spaces within the residential unit but in lower proportions.

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UNAM	Universidad Nacional Autónoma de México

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CHAPTER TEN

Reflections on Reflections

William J. Parry

The title of this volume, *Obsidian Reflections*, evokes one of the most iconic prehispanic Mesoamerican artifacts, the polished obsidian mirror. Examples can be viewed at major museums in several cities, including Mexico City (Day 1992:figure 64; Serra Puche, Solís Olguín, and Zabé 1994:194, 197; see also figure 3.6, this volume) and New York (AMNH 2012:cat. 30.0/6253), but the obsidian mirror in the British Museum in London has a particularly interesting history (figure 10.1). This Aztec mirror was taken by a Spanish conquistador and found its way from Mexico to England during the sixteenth century. It became a prized possession of Dr. John Dee (1527–1608), court astrologer to Queen Elizabeth I (Tait 1967). Dee, aided by his assistant John Kelley, used this obsidian mirror in the same way he used his crystal ball (figure 10.1). He was not looking for reflections of his own image and surroundings; rather, he was seeking views into alternate realities, other times, and supernatural realms.

It seems likely that the Aztecs sometimes employed these mirrors in a similar way (Saunders 2001). According to the Florentine Codex, shortly before the Spaniards' arrival, Aztec fowlers captured a strange water bird with a circular mirror in its forehead. They brought this bird to Emperor Moctezuma, who gazed into the mirror, looking for a vision. Instead of a reflection of the midday sky, the stars of night were seen in the mirror, followed by the appearance of a mass of people. The emperor "took it as a most evil omen" (Sahagún 1954:18).

The Florentine Codex reminds us that the Aztecs made mirrors from more than one type of stone. "White mirror stone" (*tezcatl*) was preferred for

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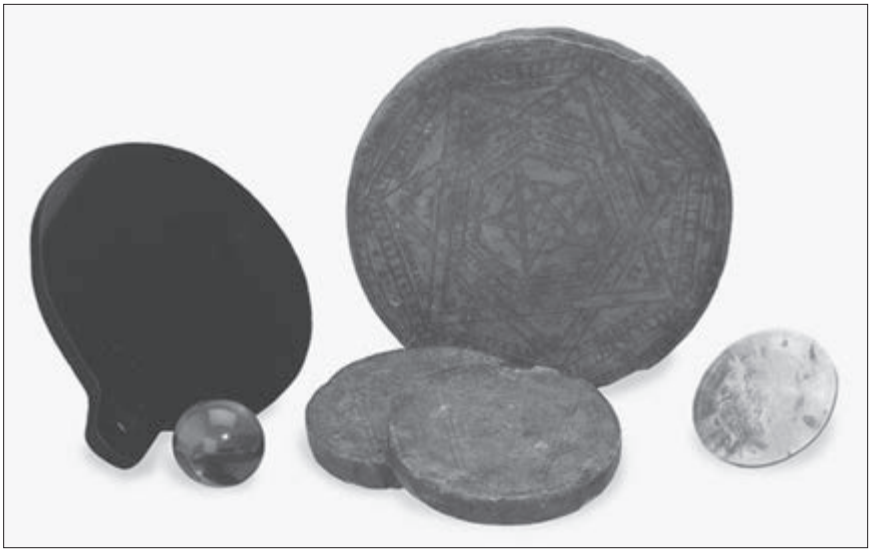

Figure 10.1. *Dr. John Dee's divination tools, including an Aztec obsidian mirror and a small crystal ball. The mirror was placed atop the large wax disc (amulet) during use.* British Museum 2012a, © *Trustees of the British Museum.*

self-admiration; this stone was almost certainly iron pyrite, or "fool's gold" (Sahagún 1963:228–29, 238). All known archaeological mirrors from Teotihuacan are faced with a pyrite mosaic, and the American Museum of Natural History has a beautiful specimen made from a single large (4 centimeters × 3 centimeters) pyrite crystal (AMNH 2012:cat. 30/9769).

Although we cannot verify the use of obsidian for mirrors at Classic Teotihuacan, it appears that Classic Maya people may have had obsidian mirrors that they used for divination. Linda Schele and Jeffrey Miller (1983) identify a glyph pair they interpret as "obsidian mirror" and note that seventeenth-century Tzotzil Maya words for "prophesy" and "diviner" incorporated the word for obsidian. It is clear that Classic Teotihuacanos viewed mirrors (of any material) as portals into sacred realms (especially the underworld), as the facade of the Feathered Serpent Pyramid shows that deity passing through circular mirrors in transit from one world to the other (Taube 1992a, 1992b).

Unlike pyrite mirrors, "black mirrors"—made from obsidian—were not used for vanity by the Aztecs. "The black [mirror] . . . is not good to look into; it does not make one appear good . . . When someone uses such a mirror, from it is to be seen a distorted mouth, swollen eyelids, thick lips" (Sahagún 1963:228).

Perhaps the obsidian mirror reveals the inner self; it is open to debate whether the alternate image one views in the obsidian mirror is more or less valid than our ordinary perceptions of reality.

I have gazed into obsidian mirrors but have never succeeded in viewing the other side; I only see a blurred and distorted reflection of myself. "For now, we see through a mirror, darkly" (I Cor. 13:12).

The authors of this volume have approached the mirror from various directions and viewed its surface at different angles. As a result, they have seen different aspects of the enigmatic reflections. We may not be ready to pass through the looking glass, but the authors have made a commendable effort to search out approaches that might at least give a glimpse of what lies on the other side.

I will not attempt to systematically summarize the contents of this volume here; I think that would be unnecessary repetition. Rather, I present my own somewhat random reflections on the search for ancient ideologies, symbols, and meanings, as viewed through the medium of the reflective surface of obsidian artifacts. In the course of discussing different approaches to this problem, I will comment on how the chapters in this volume reflect these different approaches.

MEANINGS OF OBSIDIAN INFERRED FROM ETHNOHISTORIC SOURCES

The most direct way to obtain insights into the meanings assigned to obsidian by ancient Mesoamericans is through the ethnographic record. A small amount of ethnographic information is available on obsidian (or flaked glass) among contemporary populations (e.g., Clark 1989a, 1991; Hayden 1987; Monaghan, this volume; Saunders 2001), but unfortunately they are far removed in time (and perhaps in ideology) from their prehispanic counterparts. Ethnohistoric sources are closer in time but present their own problems and biases.

Obsidian is mentioned in a number of sixteenth-century Spanish documents; useful summaries and commentaries can be found in Clark (1989b), Feldman (1971), Fletcher (1970), Hester (1978), Isaac (1986), and Pastrana (2007). Véronique Darras (this volume) presents a particularly thorough analysis of the *Relación de Michoácan*, relating to the meanings assigned to obsidian by sixteenth-century Tarascans.

It is important to remember that nearly all of the ethnohistoric records were written in Spanish by Spaniards. Strictly speaking, they do not represent

first-person insider views but rather secondhand reports at best. A notable exception is the Florentine Codex (Sahagún 1579), which includes parallel (but dissimilar) Spanish and Nahuatl texts. However, even the Nahuatl text was most likely edited by Bernardino de Sahagún, so we cannot be certain that it always reflects the viewpoints of the Aztec informants. (It is unfortunate that most of Sahagún's Spanish text has not been translated into English, while the Nahuatl text has never been translated into Spanish, so Mexican and North American archaeologists tend to read different halves of this document.)

Of course, the farther removed our archaeological data are in space and time from the sixteenth-century central Mexican highlands, the more problematic are the analogies drawn from Aztec ethnohistory. Mesoamerica was not a single uniform culture, but there was considerable internal variation over both time and space—especially in areas such as language, ideology, and the specific meanings assigned to particular symbols. Therefore, we must be careful not to assume that analogies derived from sixteenth-century highland Aztec culture are entirely relevant to an archaeological study of fourth-century lowland Maya, for example.

A superficial reading of the sixteenth-century records is disappointing. Although obsidian utilitarian implements have high archaeological visibility and must have been a significant commodity, there are surprisingly few references to obsidian in Aztec ethnohistoric documents. Obsidian was almost never listed as an item of tribute, for example (Clark 1989b; Isaac 1986). The *Florentine Codex* informs us that merchants carried obsidian blades and ornaments (such as earspools) for long-distance exchange but only as low-status commodities intended for consumption by commoners, not valued by elites (Sahagún 1959:8, 17). Obsidian artifacts were grouped with materials such as bone, fur, and shell and explicitly distinguished from valuable materials such as embroidered cotton garments, feather work, gold, jade, and rock crystal. Based on the documents, it would appear that obsidian, as a raw material, was assigned relatively little intrinsic value. This seems to contradict some of the archaeological evidence, which suggests that, in some times and places, obsidian's quality may have been an important component in the symbolic value of a ritual object.

Aztec mythology contains few overt references to obsidian, although Alejandro Pastrana and Ivonne Athie (this volume) have uncovered some interesting associations. While objects made from obsidian are occasionally mentioned, it is not obvious (from the documents) that the raw material itself had any inherent symbolic significance independent of the objects manufactured from it. For example, the god Tezcatlipoca ("Smoking Mirror") had a

mirror as one of his insignia or attributes (Serra Puche, Solís Olguín, and Zabé 1994:52, 184–86). Although most archaeological examples of Aztec mirrors are made of polished obsidian, the most important image of Tezcatlipoca in the Aztec capital held a mirror made of gold (Durán 1971:99). The body of this same image was carved from obsidian, but most other images of Tezcatlipoca were carved from wood, painted black (ibid.:98). Thus, although obsidian possessed properties that matched the desired symbolic attributes (such as having a reflective surface or black color), other materials with the same properties could be substituted without changing the symbolic values vested in the manufactured object.

In the case of obsidian (*iztli*), the Aztecs sometimes substituted flint (*tecpatl*) as a symbol of sharpness or paired the two in complex ways (sometimes in opposition), as observed by Pastrana and Athie and by Darras in this volume. The Aztec (calendar) glyph for "flint" was specifically a bipointed knife (see Monaghan, this volume; figure 4.3), not a nodule of raw stone, and it may be that the attributes of "knife" were more significant than the raw material. I am not aware of any distinctive Aztec glyph for obsidian (the Florentine Codex usually represents obsidian as a cylindrical blade core; for example, see Taube 1991). Also note Monaghan's discussion (this volume) of the symbolic meanings modern Mixtec people have assigned to steel machetes, which may well be similar to the meanings assigned to prehistoric stone knives—their significance relates to their use as cutting tools, weapons, and masculine symbols, independent of their materials.

"Toltec Obsidian"

Almost the only mentions in the Aztec ethnohistoric documents that indicate that obsidian (as a raw material) was sometimes a valued commodity are a few references to one particular variety of obsidian regarded as a precious or semi-precious stone. This was called "Toltec obsidian," or, as Pastrana and Athie translate it in this volume, "obsidian of the masters."

Ethnohistoric documents tell us that the Aztecs were aware that earlier civilizations had once flourished in central Mexico; they referred to these legendary ancestors as the "Toltecs" and credited them with inventing all of the civilized arts and possessing superior, almost supernatural, qualities and abilities (Bierhorst 1992; Davies 1980; Sahagún 1579:lib. 10, fol. 114–19).

Aztec elites frequently identified themselves with the Toltecs, often appropriating Toltec symbols to enhance their own status (Gillespie 1989). We know from archaeological evidence that the Aztecs conducted relatively

large-scale excavations at the ancient sites of Teotihuacan and Tula and that a large number of antiquities (specifically jades and stone carvings) from these sites, as well as Aztec imitations of these objects, found their way into offerings at the Aztecs' most important religious and political center: the Templo Mayor (López Luján 1989; Matos Moctezuma and López Luján 1993; Umberger 1987). "Toltec obsidian" seems to represent a related category of objects.

As I have argued elsewhere (see Parry 2002b), it appears that objects were classified as "Toltec obsidian" solely on the basis of their claimed archaeological provenience and that they possessed no inherent characteristics or qualities that distinguished them from ordinary utilitarian products. I am not convinced by the suggestion (Pastrana and Athie, this volume) that this variety was equivalent to the green Pachuca obsidian that was also used for about 90 percent of Aztec utilitarian tools (see Parry 2001b). I'm sure that the green color of Pachuca obsidian was symbolically important to the Aztecs, but I don't believe "Toltec obsidian" was necessarily green.

One mention of "Toltec obsidian" (*Tolteca iztli*) is found in a compendium of natural history by Francisco Hernández, written about 1575 and probably modeled after the work of Classical authors such as Pliny. Hernández classifies obsidian by color (perhaps reflecting European categories rather than Aztec ones): common obsidian is blue, white, or black; Toltec obsidian is black and vermilion in color (Hernández 1615:306–7; see the extended quote in Pastrana and Athie, this volume). No doubt he is referring to the mottled red and black variety called "meca" obsidian by archaeologists (not green Pachuca obsidian). He says nothing more about its sources or its characteristics.

A more informative account is found in the Florentine Codex (Sahagún 1579). This manuscript includes two parallel texts: a Spanish text by Sahagún and a Nahuatl text obtained from his informants. The Spanish text is not a literal translation of the Nahuatl text but rather more of a commentary. Immediately following a discussion of common obsidian, the Spanish text continues (my translation): "In antiquity there existed in this land, and still yet in the same way one finds in various ancient buildings, pieces of transparent green stones that are called *tolteca itztli*; they are precious and thought to be more virtuous than those from above [ground]" (ibid.:lib. 11, fol. 209).

This account provides two new pieces of information. First, Sahagún's description of the appearance of Toltec obsidian disagrees with that of Hernández. The translucent green obsidian described by Sahagún is not the "meca" variety but rather the green obsidian from the Pachuca source. Second, the defining characteristic of Toltec obsidian was *not* its appearance but rather

its provenience. Toltec obsidian was found by excavating beneath ancient ruins, and this association is what made it precious and virtuous.

The Nahuatl text provides still more details: "*Tolteca Itztli*: This is blue, somewhat matte, somewhat green, blue-brown. It was really the property, the possession, the lot of those who were Toltecs, who came [here] to live . . . They were perhaps their earrings, perhaps their bowls, or whatever they were. They really used it, for which reason it is named *tolteca itztli*. It appears beautiful; it is held in regard; it is desired" (Sahagún 1963:227).

This text indicates that the category "Toltec obsidian" referred specifically to manufactured objects. From archaeological specimens, we know what sorts of objects are meant: polished earspools and lip plugs (Serra Puche, Solís Olguín, and Zabé 1994:128–29, 145), "bowls" such as the famous obsidian monkey pot in the National Museum of Anthropology in Mexico (ibid.:162–63), the obsidian cup in the Brooklyn Museum (figure 10.2), and so on. However, all such polished pieces that exist today are believed to be of Aztec manufacture. Although most finished objects lack provenience, in a few cases the locations of the actual Aztec workshops, with manufacturing debris, are known (Otis Charlton 1993; Otis Charlton and Charlton 2002).

As far as I know, no comparable polished obsidian objects have been found in modern excavations at Tula or Teotihuacan (Sempowski and Spence 1994:155n14), except for a few small polished disks used as inlays (Day 1992:figure 101) and some chipped (not polished) eccentric figurines (Berrin and Pasztory 1993:cat. nos. 169, 171). Thus, it is extremely unlikely that the Aztecs could have found ancient obsidian "earrings, bowls, or whatever" at these same sites, and it is much more probable that the objects Sahagún's informants believed to be of Toltec origin were actually of recent Aztec manufacture.

Thus, it appears from the documents that "Toltec obsidian," so called, possessed no inherent characteristics or qualities that distinguished it from the products of later Aztec manufacture. The same varieties and colors of obsidian (predominantly green) were used by the Aztecs and their predecessors for utilitarian tools, such as blades. The Aztecs continued to make the same forms of implements as the Toltecs and in fact added a range of new types of polished obsidian objects. Even if the "Toltec obsidian" objects were authentic antiquities, they could not be distinguished from more recent Aztec objects by the Aztecs themselves, much less by modern archaeologists.

The moral here is that the most important meanings assigned to obsidian artifacts may not always be based on objectively discoverable attributes (such as their color). Rather, meaning may be endowed indirectly, through abstract associations.

Figure 10.2. *Obsidian cup, probably Aztec. Brooklyn Museum, A. Augustus Healy Fund, 37.400; Creative Commons-BY-NC.*

An ethnographic example from the Western Desert of Australia provides a similar case of arbitrary but meaningful associations. Different individuals tend to prefer stones of different compositions and colors for tool making: "These preferences have little to do with the actual working qualities of the different materials . . . Rather, these preferences appear to be a reflection of the close totemic ties each man has to the particular place he was born and from which he claims totemic descent. Thus, a man may have a sense of kinship with some of these localities, and he will value the stone material from them as part of his own being. Stone materials thus acquired are not sacred in any strict sense but are nevertheless valued highly enough to be transported over long distances by the owners" (Gould, Koster, and Sontz 1971:161–62).

When behavior was strongly influenced by such symbolic considerations, we might detect this through the appearance of a seeming anomaly in the archaeological record. A striking example is provided by Marc Levine in chapter 6 of this volume. Stone tools in household refuse from Tututepec, Oaxaca, are 96 percent obsidian, even though the closest source of obsidian is more than 300 kilometers away and suitable substitutes (such as chert) are available from closer sources. Any materialist explanation of this behavior must dismiss

it as uneconomical, if not irrational, so it is reasonable to seek social or symbolic reasons. In addition to the symbolic value that may have been assigned to green color (in the case of Pachuca obsidian), possibilities Levine suggests include the symbolic association of obsidian with sacred landscape features (strato-volcanoes), with deities, or with the powerful polities (either contemporary or ancestral) of the Basin of Mexico.

A similar situation arises in the eastern Teotihuacan Valley (within the Basin of Mexico), where the Aztec city-state center of Otumba (TA-80), located only a few kilometers from a major source of gray obsidian, was producing huge quantities of obsidian blades. The anomaly in this case is that only about 10 percent of the blades were made from the local gray obsidian; the other 90 percent were produced from blocks (macro-cores) of green Pachuca obsidian, imported from more than 50 kilometers away (Parry 2001b). Again, this seems uneconomical—but is the reason symbolic? Social? Political? In this case, I think we can rule out the association with powerful foreign polities, as this site was part of the same polity associated with the obsidian source, but I would not want to rule out political factors entirely. We must remember that obsidian was only one commodity within a complex economic system and should not be viewed in isolation. Perhaps the "uneconomical" distribution of obsidian was offset by gains in political integration or regional interdependence resulting from state manipulation of exchange, and any symbolic justification may have been only a rationalization for a practical, political end.

Likewise, there is the curious use of green obsidian weaponry by Late Postclassic Mixtec soldiers in Oaxaca (Levine, chapter 6, this volume; Parry 1990). They must have obtained the green obsidian from their Aztec enemies. Is the reason symbolic? Did they associate the green obsidian with the temporal or supernatural power of their enemies, or is there a more mundane explanation?

A similar case can be found in early modern northern Europe. A series of bloody wars were fought between 1618 and 1815, employing flintlock muskets as the primary weapon. At any given time, gunflint production was monopolized by a single locality (each using a distinctive color of flint), which supplied gunflints to combatants on both sides: Swedish, Dutch, British, French, Austrian, and German. John Witthoft (1966:40) comments that "gunflints . . . were an item of international commerce. It made little difference where the flints came from, as long as they were the best available. An army in the field often used flints made by the nation it opposed . . . These peoples may have been implacable enemies before the world, but we suspect they were blood-brothers in the privacy of the counting-house."

MEANINGS OF OBSIDIAN ARTIFACTS INFERRED FROM USES

Archaeologists seeking to discover the symbolic meanings and associations of artifacts usually go beyond their physical attributes. It is also necessary to consider their uses (known or inferred), especially evidence of use outside of domestic contexts for "nonutilitarian" purposes (Parry 1987:119–32; 2002a). The archaeological contexts also provide important clues to meanings.

John Clark (1989b), in his overview of ethnohistoric accounts of obsidian, reports uses of obsidian tools that are often overlooked by archaeologists (see also Pastrana 2007). Many of these uses represent non-domestic activities that are likely to have included significant symbolic content.

Body Modification

Clark observes that the most commonly mentioned domestic use for obsidian was for shaving (ibid.:311–12). As most of the descriptions involve shaving the tonsures of Spanish priests, one could question whether this was strictly a domestic, "utilitarian" activity, lacking symbolic content. Related activities requiring obsidian (or flint) cutting tools might include hair cutting, tattooing (ibid.:315), and scarification—sometimes done in a ritual setting, with symbolic meaning. Darras (this volume) notes that the Tarascans associated obsidian with the cutting of hair or shaving and that hair cutting was performed in a ritual context.

In the case of the Andaman Islands of South Asia, shaving and tattooing are not only the most important uses of chipped-stone tools but are reportedly the *only* uses. Onge and Arioto hunter-gatherers in those islands make all of their utilitarian cutting tools (including axes, knives, and arrowheads) out of pieces of ground *Tridacna* shell, not stone. "The only . . . stone implements are the splinters of quartz or obsidian which are carried in the hair, and used as razors or . . . for primitive tattooing. These splinters, which are in no way shaped after being broken off, are thrown away as soon as they become blunt, and a new piece of quartz is crudely struck from a lump, by men or women indiscriminately" (Cipriani 1966:147).

A more extreme form of body modification is circumcision. (While this is not discussed in the Mesoamerican documents, certain autosacrificial practices were similar.) An interesting account from the Western Desert of Australia describes flake knives, which range from 2 centimeters to 5 centimeters in length:

> Within this range, variation is continuous, with the smaller knives being mainly reserved for use in circumcising male novices . . . These small knives are kept

> hidden until they are actually used. After one use, they are generally thrown away in some secluded spot, though some men have been known to keep them for a time as "souvenirs" of the event. Under no circumstances should women, children, or uncircumcised men ever see these small knives. The larger flake knives . . . may serve more mundane functions such as cutting up game, cutting sinew, and a variety of domestic chores. They can appear openly in camp and involve no restrictions concerning who may use or see them. (Gould, Koster, and Sontz 1971:155–56)

In this hunter-gatherer society, the use of certain flake knives for ritual surgery endowed them with sacred properties, resulting in a distinctive disposal pattern that might be detectable by archaeologists. Based on their contexts, we could perhaps correctly infer a ritual use for these small knives, although we would be hard-pressed to discover the specific meanings and associations.

Another example can be found in the Hebrew Bible, which informs us that, at the end of the exodus from Egypt, "Joshua made flint knives and circumcised the Israelites" (Joshua 5:3 NIV). Here, it appears that the raw material was the significant attribute and that flint was chosen over iron for unstated symbolic reasons. (The son of Moses was also circumcised with "a sharp flint"; Exodus 4:25.)

Although shaving was undoubtedly a common and widespread activity, I know of no attempts to identify razors archaeologically. John Clark has shaved (experimentally) with an obsidian blade, but I don't know of anyone who has attempted to identify specific microwear patterns that might be associated with shaving—to say nothing of scarification, circumcision, or bloodletting (a good project for a graduate student, no doubt).

The approach taken by James Stemp and Jaime J. Awe (this volume) is, I suppose, the only reasonable one for researchers who wish to remain in compliance with ethical regulations governing human subjects. They experimented with cutting raw flesh of dead animals and assumed that the results would match those from cutting living human skin. Unfortunately, this precludes any use of microwear for distinguishing utilitarian butchering tools from sacrificial (or autosacrificial) implements.

I suspect (or at least hope) that skillful use of an obsidian blade for autosacrifice would result in minimal use-wear, but we don't know this from experience. Examples I have observed from offerings in the Moon Pyramid at Teotihuacan do not show any obvious use-wear. However, one large (20 centimeters) bipointed knife of green obsidian associated with sacrificial victims in the central burial (Burial 14) of the Feathered Serpent Pyramid (Sarabia 1996;

Sugiyama 2005:figure 56a) exhibits heavy use-wear on both edges and impact fractures on its tips, which raises some disturbing questions.

A possible untapped source of data on use-wear resulting from human sacrifice is represented by the obsidian blades used to perform surgery on a number of individuals (most famously, Don Crabtree) in the late 1970s and early 1980s (Buck 1982; Sheets 1993). I don't know if any of these blades have been preserved; as far as I know, no one has examined their microwear. There's a better project for a graduate student—seek out these surgical blades, and put them under a microscope.

Payson Sheets (2002) has reported the identification of human hemoglobin residue on an obsidian blade from the Maya site of Ceren. If correct, this would provide another line of evidence for sacrifice or autosacrifice. I am a bit skeptical of the methodology, but I think this approach deserves further investigation.

A related topic is the use of obsidian for less invasive medical procedures—most commonly, in the form of powdered obsidian or glass, applied either externally (for cataracts) or internally (Clark 1989b:315–16; Pastrana and Athie, this volume). John Monaghan (this volume) mentions that modern Mixtec people use archaeological obsidian blades to cut the gums of teething babies so the teeth will more easily erupt—another medical use not considered by archaeologists and hard to test experimentally. Archaeologically, we might add trephination to the list of more serious operations that might employ obsidian tools but again defy experimentation (Velasco-Suarez et al. 1992).

In 1979, I observed a healer in southern Negros Island, Philippines, who used obsidian for medicinal purposes. She collected small pebbles of obsidian (probably tektites) in the jungle, smashed them into small flakes (that she called "black diamonds"), and soaked them in water (together with red and white "diamonds"—the latter appeared to be calcite). This was used to treat *barang*, a form of witchcraft in which a sorcerer would cause a harmful insect to grow in the victim's stomach. The victim would drink the water (but not the obsidian!) as a cure. I am not sure how such meanings could be identified archaeologically.

I might also mention the use of obsidian in protective amulets. Pastrana and Athie (this volume) suggest that obsidian mirrors might serve such a purpose, acting as shields that magically reflect (and deflect) evil. A Mexican obsidian pendant in the American Museum of Natural History (figure 10.3) similarly would have served to protect the wearer by reflecting evil back on its purveyor. This amulet depicts the "mano fico," a traditional south European obscene gesture that simultaneously wards off the evil eye and insults the viewer. As the

Figure 10.3. *Obsidian pendant shaped like a human hand; Mexico, nineteenth century or earlier. This amulet depicts the gesture known as "mano fico." Collected by Dr. Carl Lumholtz in 1897. American Museum of Natural History, cat. 30/1726.*

imagery is European, this postconquest piece represents an interesting fusion of European and indigenous symbolism—the material (obsidian) serves the same deflective purpose in native thought that the form (gesture) does in European tradition.

Warfare and Sacrifice

I have cited the use of obsidian for sacrificial implements and warfare; ethnohistoric documents frequently mention (or depict) weapons edged with obsidian (Clark 1989b:313–14; Pastrana 2007:125–28). The Aztecs used a type of sword or club in the form of a wooden paddle with obsidian blades mounted on its two edges, sometimes called a *macana* (ibid.:74). This weapon made a profound impression (literally) on the Spanish conquerors. However, no actual specimens have been preserved, and I know of only one archaeological candidate. A group of ten burials (mostly young adult males) and a tomb at Huitzo, Oaxaca, are believed to include the remains of Mixtec or Zapotec soldiers killed while fighting the Aztecs about 1486 CE (Flannery 1983). One burial included four arrow points and a bifacial knife, all of white chert; another

burial included a green obsidian dart point and a copper ax head. Yet another had four gray obsidian blades with bifacial marginal retouch on all of their edges; these edges were not particularly sharp, and I suspect this weapon was more like a club then a sword. Finally, the tomb contained a number of large green obsidian blades, including six with retouched truncations and seven backed and truncated by unifacial retouch (Parry 1990). These have been identified as macana blades. I have never seen blades with similar retouch from any other context; blades from domestic refuse were always segmented by snapping them, not by retouch.

The most common weapon elements encountered archaeologically are projectile points (Serra Puche, Solís Olguín, and Zabé [1994:34]; and Spence [1996] illustrate typical examples from Teotihuacan). Examples found in domestic refuse may have been used for hunting deer, but those found in ritual contexts were more likely military weapons. For example, a group of burials around the Feathered Serpent Pyramid at Teotihuacan includes obsidian projectile points along with other distinctive costume elements and insignia (such as "back mirrors"—protective amulets?) associated with warriors (Sugiyama 1989). Whether the sacrificial victims were actual soldiers or merely dressed for the occasion is an open question. But in either case, the projectile points were certainly intended for use in warfare, not hunting.

Projectile points from the central offering (Burial 14) in the Feathered Serpent Pyramid, as well as several large offerings in the Moon Pyramid, include a few specimens that are extremely finely flaked (figure 10.4). They do not appear to have been used in combat but perhaps were intended only as symbolic weapons, representations, or prestige objects. The same is certainly true of nonfunctional miniature points, discussed subsequently.

Obsidian tools were also frequently employed for human sacrifice, as well as bloodletting or autosacrifice (Clark 1989b:314–15). Numerous accounts describe the Aztec use of bifacial knives to remove the hearts of sacrificial victims (Durán 1971:91–92). These Aztec knives were almost always made from flint (chert); obsidian specimens are uncommon. They are bipointed but not symmetrical—one end is usually wider than the other. Ample evidence indicates that they were hafted, although the wooden handles are rarely preserved (figure 10.5).

Bifacial, bipointed (or "laurel leaf") knives also occur earlier at Teotihuacan. They are often found in offerings, associated with sacrificial victims. However, they differ in several respects from Aztec sacrificial knives: they are always obsidian and symmetrical, and they show no evidence of hafting (figure 10.6; Serra Puche, Solís Olguín, and Zabé [1994:34] and Spence [1996] illustrate

Figure 10.4. *Bifacial projectile points of gray obsidian. Some (but not all) of these points from offerings are much more finely finished than points from contemporary domestic contexts. Terminal Formative period, Burial 3, Moon Pyramid, Teotihuacan. Photo by Shigeru Kabata.*

Figure 10.5. *Aztec sacrificial knife, with a bifacial bipointed blade of flint (or chalcedony) and a carved wooden handle, covered with a mosaic of turquoise, malachite, and four colors of shell. Fifteenth or sixteenth century, from Mexico.* British Museum 2012b, © *Trustees of the British Museum.*

Figure 10.6. *Three bifacial, bipointed knives of obsidian (two gray and one meca). The edges and tips are sharp and effective but show no obvious use-wear. There is no evidence of hafting. Terminal Formative period, elements 6, 149, and 159, Burial 2, Moon Pyramid, Teotihuacan. Photo by Shigeru Kabata.*

typical examples). Specimens from offerings in the Moon Pyramid show no obvious use-wear, but I have seen examples from other contexts with extreme wear and totally dulled edges, including one from the central offering (Burial 14) of the Feathered Serpent Pyramid and another excavated from a burial near the Moon Pyramid by the Teotihuacan Mapping Project (unpublished, Site 21:N5W1, pit 9).

Curiously, bipointed knives are not depicted in Teotihuacan art. Instead, a different form of knife is shown, with a curved or hook-shaped blade (often piercing a human heart), interpreted as a sacrificial knife (Carballo 2007:figure 7, 2011:figures 6.1–6.4). The artistic depictions suggest that these artifacts had important symbolic values, so their rarity in the archaeological record is puzzling. The few known examples of curved knives are either slender and fragile (such as the fragmentary specimens from the Feathered Serpent Pyramid) or massively thick and up to 50 centimeters long (Berrin and Pasztory 1993:268;

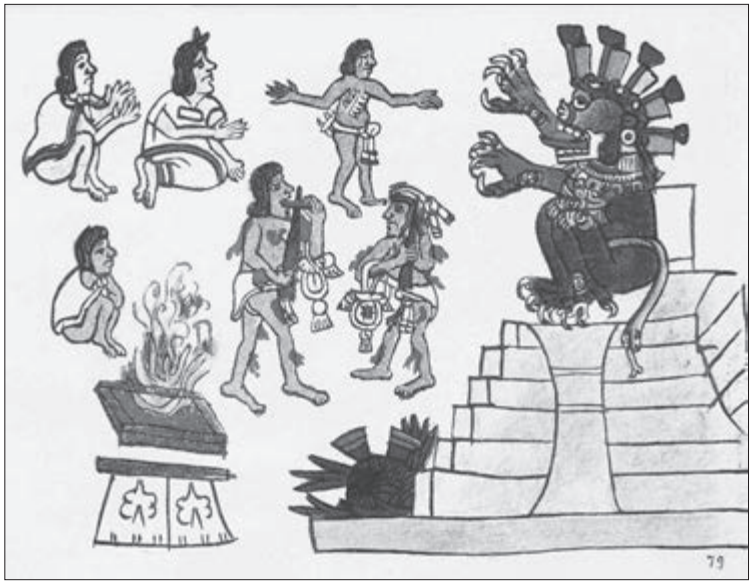

Figure 10.7. *Aztec depiction of ritual bloodletting or autosacrifice. The two central figures use oversized pointed green perforators (obsidian blades? Agave spines?) to pierce their tongues and ear lobes; a third figure above them seems to be skewered by a giant stingray spine. Late sixteenth century, from the Codex Magliabechiano;* Nuttall 1903*:67.*

Carballo 2007:figure 5) and in either case do not appear to have been practical cutting implements, so they could not have served as the actual sacrificial knives. But we have no proof that the bipointed knives were substituted for curved knives for heart extraction at Teotihuacan.

In addition to human sacrifice, autosacrifice was an important practice in Mesoamerica. Pointed implements (including obsidian blades, stingray spines, bone awls, and Agave spines) were used by worshippers to pierce their own ear lobes, tongues, and other body parts, to yield flowing blood that was offered to the gods (figure 10.7). It appears that the most common tools used in this activity were obsidian prismatic blades with sharply pointed tips. The Aztecs explicitly distinguished such pointed obsidian blades (used for bloodletting) from more rectangular "obsidian razors" (Motolinía 1950:80; Sahagún 1959:8).

Pointed obsidian blades are often included within sacrificial offering contexts (Berrin and Pasztory [1993:27] illustrate examples from the Feathered Serpent Pyramid at Teotihuacan). Prismatic blades from offerings at Teotihuacan are

typically intact and narrow; they taper to a pointed tip and lack visible use-wear. By contrast, blades from domestic refuse (presumably utilitarian implements) tend to be wider, are broken into segments, and often have heavy use-wear or retouch (Parry 2001a). These differences suggest that the blades from offerings served different purposes than those from domestic contexts. Their pointed tips would have made them suitable for ritual bloodletting. Several offerings include sequential blades detached from a single core (ibid.; Sarabia 1996), suggesting that the blades were specially manufactured for deposition in the offerings and were not reused utilitarian implements.

Pointed blades included within sacrificial offering contexts sometimes have tips enhanced by very fine retouch, making them more suitable for use in bloodletting (figure 10.8). In other cases, fine parallel pressure retouch covers one or both faces of the blade. I have called such retouched specimens *lancets* (Parry 1987:125, 131), to emphasize both their distinctive form and their presumed function. Other researchers have used more ambiguous terms, including "needles" (Spence 1996), "perforators" (Ruiz Aguilar 1981:lamina 35), "piercers" (Sugiyama 2005:133), "spines" (Gallenkamp and Johnson 1985:101), "bloodletters" (Carballo 2011:figure 5.28), or "finely flaked knives" (Linné 2003b [1942]:131). Examples from Tlaxcala (termed "punches," "needles," and "lancets") are discussed and illustrated by Mari Carmen Serra Puche and her colleagues in this volume.

In considering the symbolic values of the obsidian artifacts used for warfare and sacrifice, it is important to remember that most of them were originally attached to other elements made of perishable materials. Arrowheads, spear points, and bifacial knives would have had wooden shafts or handles; the few surviving examples (as well as artistic depictions) show that they were sometimes elaborately carved with iconographic motifs (AMNH 2012:cat. 30/1855) and ornamented with jades, shells, feathers, fur, or other precious materials (see figure 10.5; Day 1992:figure 74).

Obsidian artifacts were sometimes attached to costumes. One Aztec manuscript shows a ritual textile that incorporates obsidian projectile points as a design element (Nuttall 1903:7; see also figure 3.1, this volume), while wall paintings from Teotihuacan depict elite individuals with what appear to be projectile points attached to their headdresses (Berrin and Pasztory 1993:198–99; Millon 1973). Offerings associated with sacrificial burials in the Moon Pyramid at Teotihuacan include numbers of small, pointed obsidian blades with tiny notches near their platforms (Parry 2001a; Sugiyama and Cabrera Castro 2004:figure 110). These notches are too small for the attachment of hafts or handles, and it appears that they were for the suspension of the blades

Figure 10.8. *Two lancets and eighteen prismatic blades with fine retouch at their pointed tips, Early Classic period. Found in association with an altar in a ceremonial cave near the Sun Pyramid, Teotihuacan. On display in the Teotihuacan Site Museum; photo by the author.*

from strings or cords. Perhaps the blades were strung on lanyards or necklaces or attached to costumes.

Ornaments

The Aztecs used obsidian to manufacture a variety of polished ornaments, including earspools, lip plugs, pendants, and beads (Otis Charlton 1993; Otis Charlton and Charlton 2002; Serra Puche, Solís Olguín, and Zabé 1994:44, 128, 145, 147). As mentioned, some more elaborate polished obsidian objects included vessels of various forms (see figure 10.2), masks, figurines, and similar items. In the central highlands of Mexico, it appears that nearly all such polished forms were manufactured during the Late Postclassic period (Sempowski and Spence 1994:155n14).

Obsidian ornaments (or symbols) from earlier periods in the central highlands were shaped by flaking instead of polishing. The most common types, termed *eccentrics*, take the form of silhouettes of humans, serpents, and animals (Berrin and Pasztory 1993:268–69; Carballo 2007:figure 6, 2011:figures

Figure 10.9. *Large (50 centimeters) bifacial human figurine of meca obsidian. The edges are not sharp. Terminal Formative period, element 44, Burial 2, Moon Pyramid, Teotihuacan. Photo by Shigeru Kabata.*

4.1, 4.5, 6.7a, 6.8a, 6.9a; Gallenkamp and Johnson 1985:101; Serra Puche, Solís Olguín, and Zabé 1994:103, 108–9; Spence 1996). The symbolism of these forms has been discussed by David Carballo (2011:chapter 6). Other, more abstract forms also occur, some shaped like a letter "C," others like a number "3." The latter have been termed *trilobals*; specimens from Teotihuacan and Tula are believed to symbolize drops of blood (Carballo 2007:figure 7; Stocker and Spence 1973, 1974).

Eccentrics from the earliest offerings in the Moon Pyramid at Teotihuacan (Burials 2 and 6) are very large (20–50 centimeters) and mostly made of red

Figure 10.10. *Miniature eccentrics made from green obsidian blades with marginal retouch: human figurine, bipointed knife, serpent figurine, and point. All lack functional edges. Terminal Formative period, part of element 1545, Burial 5, Moon Pyramid, Teotihuacan. Photo by Shigeru Kabata.*

("meca") obsidian (figure 10.9). Slightly earlier large eccentrics (of the same size but different form) from Tlaxcala are described by Carballo in this volume. Later eccentrics from Teotihuacan (and elsewhere in central Mexico) are mostly miniatures, made from fragments of green obsidian blades (figure 10.10). The edges of the eccentrics are not particularly sharp, and they could not have been used as cutting tools, so they must have been entirely symbolic objects.

Chert and obsidian eccentrics of various forms, some quite spectacular, also occur at lowland Classic Maya sites. An additional type, not reported from the highlands, includes incised obsidians. These obsidian pieces (mostly flakes of irregular shape) are engraved on their ventral faces with incised iconographic designs. Examples of eccentrics and incised obsidians from Tikal, Guatemala, are illustrated and described in detail by Hattula Moholy-Nagy (2008).

A related category of artifacts includes giant and miniature specimens in the forms of bipointed knives and projectile points. Like the eccentrics, the bipointed knives from the earlier offerings in the Teotihuacan Moon Pyramid (Burials 2 and 6) included a number of very large (25–45 centimeters) specimens of red obsidian (Parry 2001a; Parry and Kabata forthcoming; Sugiyama

and Cabrera Castro 2004:figure 88). Although these specimens have sharp and functional edges, they seem far too large and heavy to have been practical cutting implements. Later offerings include miniature bipoints, as well as miniature projectile points (see figure 10.10). They are clearly nonfunctional and, like the associated miniature eccentrics, must have served purely symbolic or decorative purposes. Presumably, these miniatures served as symbolic surrogates for their life-sized counterparts.

Even some of the normal-sized points and knives may have been symbolic, not intended for functional use. One example is the famous Aztec sacrificial knife on exhibit in London (see figure 10.5). According to the British Museum (2012b), "Radiography has revealed that the hafting is far too shallow for the knife to have been fit for practical use so its ceremonial purpose must have been symbolic rather than functional."

Music

Almost all archaeologists emphasize the visual characteristics of obsidian artifacts—their shape, color, reflectivity—but few have considered their sound. Knappers know that the sound made by a hammer blow is an important clue to the success of a flake removal, as well as the quality of the material. Homogeneous raw material will produce a pleasant ring, while flaws are betrayed by a discordant clack. As Pastrana and Athie note in this volume (see also Pastrana 2007:168–69), other sounds may be associated with obsidian working, including the unique sound of hail falling on piles of obsidian debitage. Such sounds may have had strong emotional associations for obsidian workers but perhaps not for persons outside that fraternity.

Sheets (2002) has suggested that the sound-producing properties of obsidian may have been intentionally exploited. At the 2002 Society for American Archaeology meetings, he exhibited an object somewhat like a wind chime, made by suspending a group of obsidian blades from strings; they made lovely tinkling sounds as they struck each other while at the same time reflecting patterns of light. If this seems like a farfetched idea, I refer again to the small blades with tiny notches (apparently for suspension) from the offerings in the Moon Pyramid at Teotihuacan. In at least one of the offerings (Burial 2), groups of these notched blades were directly associated with groups of perforated *Oliva* shells (Sugiyama and Cabrera Castro 2004:figure 85). North American archaeologists call these shell pendants "tinklers" (Moholy-Nagy 2008:73). Worn on bracelets or anklets, they would have rattled as the wearer moved or danced. Clusters of obsidian blades attached to costumes would

have produced a similar musical effect, in addition to their visual symbolism.

There are a number of documented cases in the Old World of stones used as musical instruments. Certain types of crystalline rock will chime like a bell when struck with a hammer. In some instances, unmodified slabs or boulders are played as "rock gongs"; in other cases, the stones are shaped and tuned to create "lithophones" (Fagg 1997). Admittedly, obsidian is too fragile to be used in this way.

My late colleague at Hunter College, Francis Conant, was fascinated by the rock gongs he observed in ritual use in Nigeria (Conant 1960) and sought out examples in other regions of the world. He was intrigued to discover that the Aztecs sculpted life-sized representations of wooden drums, carved from stone (probably basalt). After lengthy negotiations with a certain museum, he had the opportunity to gently strike one of these Aztec basalt drums to see if it could produce sound. In this case, the stone drum had a dead tone and would not have been functional as a musical instrument. It appears that the symbolic value of the raw material (stone) outweighed its functional attributes.

MEANINGS OF OBSIDIAN ARTIFACTS INFERRED FROM THEIR CONTEXTS

The most common approach to the identification of non-utilitarian artifacts and to understanding their symbolic meanings involves careful consideration of their depositional contexts (Parry 1987:119–32). Artifacts associated with burials, caves, or monuments and public buildings—in caches, in primary contexts on their floors, or (more ambiguously) in their fill—can be assumed to have been placed there in the context of ritual events. This conclusion is strengthened if the artifacts differ in their forms or inferred functions from artifacts deposited in contemporary domestic refuse. Likewise, contexts that have an anomalous assemblage of non-utilitarian artifacts can be hypothesized to have been the scene of ritual or ceremony.

Monuments, Public Buildings, and Public Spaces

The largest monumental constructions at Teotihuacan all contain substantial ritual deposits (in pits or chambers within their fill), evidently placed as dedicatory offerings during construction or enlargement of the buildings. These offerings contain sacrificed humans and animals, together with pyrite mirrors, jade and shell ornaments, and hundreds of obsidian artifacts (Sugiyama and Cabrera Castro 2004; Sugiyama and López Luján 2007). As Carballo discusses

in this volume, each offering can be interpreted as a cosmogram—a symbolic depiction of the world and its sacred surroundings—and the arrangement of different elements within the offering may convey deep meanings. The obsidian artifacts should not be studied in isolation; rather, their relation to other parts of the offering is paramount. Unfortunately, the offerings may have included important perishable components we can no longer observe.

As Kazuo Aoyama observes in this volume, the artifacts placed in an offering may not be the main focus of the ceremony. Rather, they are props employed in the context of a theatrical performance. Most of the symbolic meanings in a ceremony will be conveyed by the words and actions (and perhaps regalia) of the celebrants. The objects placed in the ground may be visible only briefly and their details perhaps soon forgotten by the participants. What is most important is what doesn't go into the ground but will be the least accessible to the archaeologist.

In rare cases, ceremonial structures were buried intact during termination rites, with artifacts left in situ on their floors. For example, Structure 35, a Terminal Formative temple at San José Mogote, Oaxaca, had fifty obsidian artifacts on its floor. They are nearly all green obsidian blades, together with one lancet and two fragments of Teotihuacan-style bipointed knives (Parry 1987:123, 126–31), most likely used in sacrificial or autosacrificial rituals within the temple.

More commonly, the floors of public buildings were cleaned or demolished at the end of their use. Even so, these structures may contain offerings or caches within their fill or in adjacent ceremonial spaces, deposited during dedication or termination rites. An excellent example is described by Carballo in this volume. A Terminal Formative temple at the site of La Laguna, Tlaxcala, contained a cache of fifteen large obsidian bifaces and eccentrics, evidently placed during a termination ceremony. They differ dramatically from artifacts in contemporary domestic contexts.

Another example is provided by Aoyama in this volume. A cache in the middle of the Great Plaza at the Classic Maya site of Copán, Honduras, contained 700 very large obsidian macroflakes and macro-blades. It is highly unusual to find such large flakes at a distance from the obsidian source; typically, they are reduced to bifacial preforms at the quarry (Pastrana 2007). The transport of such a large quantity of raw obsidian to Copán must have been extremely costly, so this cache represents a sacrifice of a large amount of value—materially as well as symbolically.

Yet another example described by Aoyama is more ambiguous. A cache beneath an altar at Copán (seemingly a dedicatory offering) was composed

of chert bifacial reduction waste. This material would not appear to possess inherent symbolic value. Aoyama suggests that it might represent waste from production of ritual objects such as eccentrics, thereby deriving meaning through association. Still more ambiguous are the cases of obsidian workshop debris intermixed with the construction fill of major buildings. Two platforms at Copán incorporate dumps of obsidian blade production debitage (Aoyama, this volume), while the Moon Pyramid at Teotihuacan has large quantities of biface production waste throughout the western half of its fill, identical to refuse found in adjacent workshops (Carballo 2007, 2011; Parry and Kabata forthcoming). It is not clear if such deposits had symbolic meaning or simply represent an expedient way to dispose of hazardous industrial waste.

A more complex case is provided by the Classic Maya site of Tikal, Guatemala. Large quantities of workshop debris from production of both chert bifaces and obsidian blades are incorporated into pyramid fill. This debris is not scattered throughout construction fill; rather, it is concentrated directly on top of royal burial chambers or in cached offerings (Moholy-Nagy 1997). This circumstance suggests that the material may have had some sacred or symbolic associations. In contrast, other deposits of lithic debitage at Tikal were not cached but instead dumped into pits, and they probably reflect expedient clearing of hazardous waste without sacred significance (Moholy-Nagy 2008:68).

Tikal, like Copán, presents some ambiguous cases. Moholy-Nagy (ibid.) makes a useful distinction, defining "special deposits" whose contexts (cached offerings or burials) and contents ("special-purpose artifacts") clearly identify them as the residue of ceremonial activities. By contrast, "problematical deposits" have either special context or special contents but not both and therefore require additional analysis. Such ambiguous situations are common and raise special analytical challenges.

In addition to identifying ritual artifacts based on their deposition in public buildings or spaces, in some cases ritual spaces may be identified through the presence of distinctive non-utilitarian artifacts. Serra Puche and her colleagues present an example in their chapter in this volume. A residential dwelling in an Epiclassic site near Cacaxtla, Tlaxcala, included a room with an altar. This room contained thirty-five obsidian lancets, as well as numerous fragments of incense burners. Both lancets and censers are uncommon in other rooms at this site, and it is clear that the room with the altar served as a ritual space, where bloodletting rites were performed.

In their chapter in this volume, Pastrana and Athie note that incense burner fragments have been found in deposits of workshop debris at the Pachuca

obsidian source, and a small statue of an Aztec god was found in a mine. Although these locations do not represent dedicated ritual spaces, it is clear that rituals were frequently performed in this potentially hazardous workplace. Interestingly, such rituals continue today—I have observed card-sized pictures of Catholic saints in contemporary mines (supplying obsidian for tourist souvenirs) at the Pachuca source.

Caves

Caves are obvious locations for ritual activity (specifically, deep caves with dark chambers rather than habitable rock shelters). Ethnohistoric accounts tell us that caves were regarded as sacred sites, laden with symbolic meaning, throughout Mesoamerica. There are a number of archaeological examples of caves with clear evidence of ritual activity, including rock art, altars, standing stones, burials, and offerings. Obsidian artifacts found inside such ritual caves can be presumed to have been used in a ceremonial context.

A number of ceremonial caves have been investigated at Teotihuacan, including one directly under the Pyramid of the Sun (Taube 1986). Another small cave located southeast of the Pyramid of the Sun is particularly interesting. It contained an altar supporting an upright slab of stone. Within the altar was a cache of twenty green obsidian artifacts; two of these were finely flaked lancets, and the other eighteen were prismatic blades with fine retouch at their pointed tips. They were all intact, ranging from 6 centimeters to 15 centimeters long, and they show no obvious use-wear (see figure 10.8; Soruco Saenz 1985). They were certainly used in a bloodletting ritual inside this cave.

The best-documented ritual caves are located in the lowland Maya region (Brady and Stone 1986). Stemp and Awe (this volume) describe obsidian blades from a series of caves in Belize. Based on the context, it is reasonable to assume that these blades were used in some way during rituals. They are mostly in the form of broken blade segments, some with heavy use-wear, and they show evidence of use in a variety of tasks (most commonly, meat cutting, butchery, and hide working but also cutting plants and working wood, bone, or shell). In these respects, they resemble blades found in domestic refuse at Teotihuacan and differ from those found in ritual contexts at that site (such as the cave mentioned earlier).

Stemp and Awe (this volume) reasonably argue that these uses could reflect activities connected to rituals. In addition to autosacrifice, the blades could have been employed in sacrifice and ritual butchery (of humans or animals), preparation of communal feasts, or the manufacture of ritual paraphernalia.

I suggest another possibility. Perhaps these blades were originally mundane household tools that were subsequently repurposed as votive offerings. Their role in the rituals may have been as purely symbolic tokens, placed in the cave without serving as actual cutting tools during the ritual. This would also seem to be true of the one miniature eccentric found in one of the caves.

Mortuary Contexts

Mortuary features are among the more obvious ceremonial contexts encountered by archaeologists. Human remains, deliberately interred, were almost invariably accompanied by performance of ritual. This holds true regardless of whether the remains represented a revered ancestor or a sacrificial victim. I am surprised that none of the contributors to this volume focused on obsidian from mortuary contexts, so I will take the opportunity to offer my own contribution here.

OBSIDIAN IN MORTUARY CONTEXTS AT TEOTIHUACAN

I conclude with a small-scale case study of presumed non-utilitarian artifacts (defined by form and context), with some speculations about their possible meanings (see Parry 2002b). I focus on mortuary contexts—obsidian artifacts directly associated with human skeletons—presumably representing offerings placed during a ritual event.

There is an abundance of information on mortuary contexts at the site of Teotihuacan, Mexico. Obsidian artifacts were placed as grave goods in numerous human burials in residential apartment compounds, nearly all dating to the Early Classic period (Early Tlamimilolpa through Late Xolalpan phases, about 300–600 CE). While these burials appear to represent a range of statuses and occupations, they do not include examples of very high-status elites. It has been suggested that the bodies of rulers may not have been buried but instead were preserved (as mummy bundles) in temples and then destroyed when the temples were desecrated at the time of the fall of the city (Headrick 1999). The absence of elite burials is an unfortunate gap in the data.

A second set of mortuary items takes the form of thousands of obsidian artifacts (together with jade and shell ornaments) placed as dedicatory offerings in association with human (and animal) sacrificial victims during the construction of major ceremonial structures, such as the Sun Pyramid, the Moon Pyramid, and the Feathered Serpent Pyramid. These offerings date mostly to an earlier period than the apartment compounds, from the Terminal

Formative period (Late Tzacualli through Early Tlamimilolpa phases, about 150–300 CE).

The most common obsidian artifacts in mortuary contexts are prismatic blades. About 20 percent of burials with offerings in residential contexts include obsidian blades. Blades "are included in the burials of adults and subadults and males and females from almost all locations, residential as well as ceremonial" (Sempowski and Spence 1994:155, see also Table 29). The presence of blades in a burial seems unrelated to the deceased's age and sex, as well as to the varying craft specializations of different residential compounds.

Although prismatic blades are also the most common utilitarian implements in domestic refuse, the frequent occurrence of blades in burials of perinatal (fetal or newborn) individuals (who presumably would have been unable to use cutting tools) suggests that the grave offerings were not intended to serve utilitarian purposes or at least had not been used by the deceased individuals during their lifetimes. They do not seem to be occupational markers.

This pattern (or, rather, lack of pattern) provides a sharp contrast between Teotihuacan and burials from earlier (Middle and Late Formative) sites. At Ticoman, for example, there are clear differences in the grave offerings associated with people of different ages (Vaillant 1931). Three neonates or infants and three children (one age 3–4) had no offerings. One child (age 7–8) was buried with one pot, and another child (age 6–8) was buried with a pot and a shell bead. Only adult burials included obsidian (or bone) tools, and several elderly males had obvious toolkits. For example, Ticoman Burial 17, an elderly adult male(?), had 3 obsidian end scrapers, a hammerstone, 16 gopher mandibles (used as cutting tools), and 7 bone tools (e.g., awls, bodkins, scrapers). This is interpreted as a leather worker's toolkit (ibid.:300, 321, 416–17, 423). Ticoman Burial 34, another elderly male, had a slightly different tailor's kit, including 8 unretouched obsidian flakes, 5 obsidian blades, a quartz perforator, and 10 bone tools (e.g., needles, awls) (ibid.:300, 304, 418–19, 423). No similar personal toolkits or occupational markers have been recognized in the later burials at Teotihuacan.

At Teotihuacan, there is also no obvious relation between the presence of obsidian blades and the status or wealth of the deceased, as measured by the quantity and diversity of ceramic offerings or by the presence of jade or shell ornaments. While some very rich burials have obsidian, such as Tlamimilolpa Burial 1 (see discussion that follows), others lack it. Tetitla Burial 9 had 423 ceramic vessels and a collar of *Dentalium* shells but no obsidian. Tlajinga Burial 57—the richest burial in that residential compound—had 2 jade ornaments, several spectacular shell ornaments, and 4,000 *Olivella* shell beads but again no obsidian (Rattray 1997; Sempowski and Spence 1994). Conversely,

some burials with obsidian had only 1 or 2 pots, if any. Many of these were infants, but at least two burials of adult females (La Ventilla B Burials 94 and XXVI) had obsidian blades or points and no other offerings (Sempowski and Spence 1994).

After blades, the next-most-common obsidian artifacts in mortuary contexts at Teotihuacan are bifacial projectile points, usually stemmed (see figure 10.4). About 6 percent of burials with offerings in residential contexts include obsidian projectile points (ibid.:150, 155). Like blades, points are found with infants, adult males, and adult females. Points, like blades, are also commonly encountered in domestic refuse as well.

The third-most-common obsidian artifacts in mortuary contexts are bifacial, bipointed (or "laurel leaf") knives (see figure 10.6), occurring in perhaps 2 percent of burials with offerings. Other rare obsidian items occur in only one or two residential burials, such as human figurines or eccentrics (Tlamimilolpa Burial 4 and Xolalpan Burial 1), serpent figurines or eccentrics (Tetitla Burial 16), "awls" or "drills" (Tlajinga Burial 43 and Tlamimilolpa Burial 4), scrapers (Tlamimilolpa Burial 4 and Tetitla Burial 14), "beads" (Tetitla Burial 26), a "ring" (La Ventilla B Burial 109), and a pair of earspools (La Ventilla B Burial 21) (Rattray 1997; Sempowski and Spence 1994). With the exception of scrapers, all of these items are extremely uncommon in domestic refuse.

The frequency of obsidian blades and points in residential burials at Teotihuacan is best illustrated by examples from three apartment compounds: La Ventilla B, Tlajinga 33, and Oztoyahualco. These three compounds encompass a range of variation, as they are located in different parts of the ancient city, represent different economic specializations, and probably also differed in wealth and status. Even so, the occurrence of obsidian grave goods is similar in each.

At La Ventilla B, burials included the remains of 176 individuals, of which 122 had associated offerings. Of these, 25 individuals were buried with a total of 60 obsidian blades (ranging from 1 to 9 blades per individual). Three perinatal, 1 child, 11 adult males, and 10 adult females were buried with blades. Two other individuals (1 infant and 1 adult female) were each buried with a single projectile point (Sempowski and Spence 1994:81–116, 148).

Tlajinga 33 included 65 burials, of which 46 had offerings. Of these, 18 individuals were buried with a total of 59 obsidian blades (ranging from 1 to 8 blades per individual). Eight perinatal, 1 infant, 8 adult males, and 1 adult female were buried with blades. Two other individuals (1 adult female and 1 adult of unknown sex) were each buried with a single projectile point (ibid.:431–45; Storey and Widmer 1999).

At Oztoyahualco, 18 burials were excavated. Of these, 7 individuals (2 infants and 5 adults) were buried with blades. Most of these had only a single blade, but 1 adult male was buried with 10 blades and 1 projectile point (Manzanilla, Millones, and Civera 1999).

Although obsidian grave goods at Teotihuacan typically consist of a couple of blades and perhaps a single point, 4 burials (out of 20) excavated in the 1930s by Sigvald Linné in the Xolalpan and Tlamimilolpa apartment compounds were unusual (Linné 2003a [1934], 2003b [1942]; Sempowski and Spence 1994:50–54). These burials each contained bifacial or miniature artifacts or both of varying forms (some are illustrated in Berrin and Pasztory 1993:119, 269). Xolalpan grave 1 (an elderly adult, sex unknown) included a bipointed knife (15 centimeters long), an unusually large spear point (12 centimeters long), and 3 miniature human figurines or eccentrics (Linné 2003a [1934]:56, 58, 146, 149, 152). Tlamimilolpa Burials 4 and 5 (both adults, probably male) each had typical stemmed points and bipointed knives (one 19 centimeters long). Each also had miniatures: Burial 4 had 2 miniature bipoints and 2 miniature human figurines, while Burial 5 had 3 miniature bipoints and 3 miniature projectile points (Linné 2003b [1942]:134–36). These items are typical of sacrificial offerings (see following discussion) but are not otherwise known from residential burials.

Tlamimilolpa Burial 1 is unusual in several respects. It was a cremation, and the artifacts had been burned and intentionally broken. It is also one of the richest burials known from a residential compound. In addition to more than 240 ceramic vessels, jades, and shells, there were 47 obsidian artifacts: 2 typical points, 2 miniature points, and 43 pointed obsidian blades. Four of the latter are lancets with extensive retouch, while some of the others have fine retouch at their tips (ibid.:126–32). The only other comparable residential burial is Tetitla Burial 16, a double burial of 2 adult males with 15 vessels, 3 pieces of mica, a drilled mandible of a child, and 102 obsidian artifacts: 1 projectile point, 1 miniature serpent figurine, and 100 blades (Sempowski and Spence 1994:71–72). Architectural and other evidence suggests that Tetitla may have been the residence of a relatively wealthy lineage, but Tlamimilolpa was much lower in the social scale (ibid.:xii), so the relatively elaborate obsidian offerings in some of the burials do not seem to be markers of wealth or status.

The presence, quantity, or type of obsidian artifacts in residential burials at Teotihuacan shows no evident correlation with the age, sex, occupation, or status of the deceased. This is in striking contrast with the earlier burials from Ticoman. Therefore, it is unlikely that the Teotihuacan grave goods represent either personal possessions used by the deceased during their

lifetimes or symbols of their individual roles. Perhaps their meanings derive from the statuses of the mourners rather than the deceased or the actions performed during the burial ritual rather than activities during the lifetime of the departed. The same interpretation holds even more strongly for obsidian artifacts deposited as offerings with sacrificial victims during the construction of major monuments.

Large samples of non-utilitarian obsidian artifacts have been recovered from dedicatory offerings in the largest monuments at Teotihuacan: the Sun Pyramid, the Moon Pyramid, and the Feathered Serpent Pyramid. Three of these offerings appear to date around the end of the Tzacualli phase (about 150–200 CE). A small (partial?) offering in the Sun Pyramid includes 1 obsidian human figurine or eccentric, 40 crude miniature points, and 7 blades (Millon and Drewitt 1961; Millon, Drewitt, and Bennyhoff 1965). Two much larger offerings (Burials 2 and 6) in the Moon Pyramid each include more than 300 obsidian artifacts, in association with bound and sacrificed human victims and various sacrificed animals, as well as offerings of shell and greenstone (Cabrera Castro and Sugiyama 1999; Parry 2001b; Parry and Kabata forthcoming; Sugiyama and Cabrera Castro 2004; Sugiyama and López Luján 2007).

Obsidian artifacts from Moon Pyramid Burials 2 and 6 include large eccentrics (human and serpent figurines) and large bipointed knives, between 20 centimeters and 50 centimeters in length. The majority of these are red (meca) obsidian, and the remainder are gray. Numerous pointed blades (many with small notches), stemmed projectile points, and crude miniature points are also included, along with a few lancets. Nearly all of these are gray obsidian; green obsidian is rare in these earliest offerings at Teotihuacan (Parry 2001a; Parry and Kabata forthcoming; Sugiyama and Cabrera Castro 2004:43–45).

Other dedicatory offerings at Teotihuacan are slightly later, probably dating to the Miccaotli and Early Tlamimilolpa phases (about 250–300 CE). One offering was found in the Plataforma Adosada of the Sun Pyramid (Millon, Drewitt, and Bennyhoff 1965; Noguera 1935). An offering in the Moon Pyramid (Burial 3) includes 304 obsidian artifacts in association with 4 sacrificed human victims, sacrificed animals, and offerings of shell and greenstone (Parry 2001a; Parry and Kabata forthcoming; Sugiyama and Cabrera Castro 2004; Sugiyama and López Luján 2007). The largest offerings have been found in the Feathered Serpent Pyramid, most notably the central offering (Burial 14) where 20 sacrificed human victims were buried with more than 1,750 obsidian artifacts (Cabrera Castro, Sugiyama, and Cowgill 1991; Sarabia 1996; Sugiyama 2005).

Obsidian artifacts from this second group of offerings are similar in form to the earlier ones, but they differ in size and color. Nearly all of the eccentrics (again, human and serpent forms), bipointed knives, and lancets are miniatures of green obsidian, and the giant red examples are no longer present. Nearly all of the pointed blades are also green obsidian, as is a significant minority of projectile points (Parry 2001a; Parry and Kabata forthcoming; Sarabia 1996; Sugiyama and Cabrera Castro 2004:46–47).

The most recent offering discovered in the Moon Pyramid (Burial 5) dates to the later part of the Early Tlamimilopa phase (about 300 CE). This includes 323 obsidian artifacts, together with 3 human skeletons seated in a lotus position (but apparently bound and sacrificed) with spectacular jade and shell ornaments, again accompanied by animal sacrifices (Parry and Kabata forthcoming; Sugiyama and Cabrera Castro 2004; Sugiyama and López Luján 2007). A contemporary offering, apparently exported from Teotihuacan, has been found at the Terminal Formative (Proto-Classic) Maya site of Altun Ha in Belize. This post-interment offering associated with Tomb F-8/1 includes shell ornaments, greenstone beads, ceramic vessels, and more than 239 green obsidian specimens (Gallenkamp and Johnson 1985:101; Pendergast 1971, 1990:266–70, 2003; Spence 1996).

The obsidian artifacts from these two offerings are similar to the previous group (Parry and Kabata forthcoming; Sugiyama and Cabrera Castro 2004:50–51), but the miniature eccentrics are shorter (with less extensive retouch), while nearly all of the miniature projectile points are made from segments of green obsidian blades, like the other miniature eccentrics (see figure 10.10; earlier miniature points are mostly made from flakes, both green and gray).

In general, the obsidian artifacts from sacrificial offerings within the pyramids of Teotihuacan appear to be non-utilitarian. The projectile points have military associations, while the lancets, pointed blades, and bifacial knives could have been used for human sacrifice and autosacrifice, to offer human blood to the gods. However, in most cases there is no evidence that they were so used. Rather, most of them appear to have been nonfunctional, purely symbolic representations of these sacrificial implements, the victims, or even the gods themselves; and they may have been regarded as repositories of supernatural essences or powers. The colors probably conveyed important symbolic meanings as well, especially the rare meca obsidian disproportionately selected for the earlier offerings, whose red color was undoubtedly associated with blood. The green color of Pachuca obsidian, like jade, may have been associated with water. Arrangement of these objects into sacred cosmograms added more layers of meaning, as did the ritual performances that surrounded their deposition.

Obsidian artifacts placed in residential burials at Teotihuacan tend to be more mundane forms but likewise appear to be symbolic items rather than the utilitarian possessions of the deceased. Again, the meanings were probably endowed by the actions and performances of the mourners who placed the items in the burial rather than being inherent attributes of the artifacts themselves.

FINAL REFLECTIONS

So, where do we stand, and where are we going, in our search for ancient meanings as viewed through the lens of obsidian? At this point, I will abandon my initial metaphor of the mirror and instead turn to an equally overused one: the parable of the blind men and the elephant. You know this story: several blind men are trying to describe an elephant, using only the sense of touch and unaware of its heterogeneity. The one touching the tail says "it is like a rope," the one holding a leg says "it is like a tree trunk," and so on. But in this case, I will reverse the metaphor: we are like people who perceive the whole elephant but each using a different sense. So, one says "it is large," another "it is gray," another "it is rough," another "it has a musky odor," and yet another says "it occasionally makes a trumpet sound." Unlike the blind men, we all accurately perceive the entire elephant, yet each of our descriptions is frustratingly incomplete, providing only a glimpse of one aspect of the true nature of the beast.

I think all of the contributions to this volume—including my own—should be viewed as pilot studies, experiments in method. We are each experimenting with one or two tools that can be used to approach the difficult problem of interpreting ancient symbols and discovering hidden meanings. This is not an easy problem—I often struggle to understand the belief systems and motivations of close associates; how much more difficult are those of alien cultures, far removed in time and space and revealed only through glimpses of their material residues.

Perhaps the solution lies in what Nicholas Toth (1985) has termed a "holistic approach" to lithic analysis. Once we have identified effective analytical tools—through pilot studies such as those presented in this volume—we need to employ all of them and integrate them, with each tool perhaps illuminating some small aspect of an ancient ideology, yielding some hints as to the meanings vested in obsidian objects. These tools include—but must not be limited to—formal attribute analysis of obsidian artifacts, analysis of their archaeological contexts and associations, and information gleaned from iconography, ethnohistory, and ethnography.

By viewing the residue of ancient rituals through the dark mirror of obsidian, at present we can only glimpse the underlying meanings. But the contributors to this volume have made an impressive start and leave us with some directions for future research.

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UNAM	Universidad Nacional Autónoma de México

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