UNIVERSITY OF CALIFORNIA, SAN DIEGO

Food Function and Status: Analysis of Faunal Remains from the Maya Site of Pusilhá, Belize

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by

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ABSTRACT OF THE THESIS

"Food Function and Status: Analysis of Faunal Remains from the Maya Site of Pusilhá, Belize"

by

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This essay is a study of faunal remains from the archaeological site of Pusilhá, Toledo District, Belize. Based upon data collected by the Pusilhá Archaeological Project over five seasons of survey in the field, I argue that the remains of large game animals, especially deer, supports conclusions about social differentiation reached by Braswell and Volta and shows which areas may have been used for ceremonial functions.

INTRODUCTION

This study examines some aspects of the political economy of the Maya based on an archaeozoological analysis of key elements of the faunal remains from the site of Pusilhá, Belize. Much of the faunal data and analyses presented here are based on original research carried out by the author.

The site of Pusilhá, the archaeological site from which the data were obtained, is located in southwestern Belize (Figure 1). It lies just east of the Guatemalan border and about 30 kilometers from both Modesto Mendez and San Luis Petén, Guatemala. Pusilhá was the largest and politically dominant city of the region throughout much of the Classic Period (Braswell et al. 2004a). Hieroglyphic inscriptions indicate that the site was ruled by divine kings (Braswell et al. 2006; Leventhal 1990). Moreover, settlement reflects shows geographic patterns of status differentiation. Specifically, the overall pattern seems to fit the concentric zone model proposed for Maya communities, with the highest status individuals residing at the center of the site, followed by community members of lesser status as one moves outwards towards the settlement peripheries (Braswell et al. 2006; Smyth et al. 1995; Volta 2007)

In order to test some of the interpretations reached by researchers such as Braswell et al. (2006) and Volta (2007), the project described here aimed at using selected aspects of the faunal study to test whether food remains, especially large game, show similar status-based spatial patterns to those of other status indicators such as architectur

POLITICAL ECONOMY

To contextualize these mute eco-facts, this study first considers a range of political economy models used by social scientists and Mesoamerican archaeologists to explain the ways in which the ancient Maya organized their society and how we can draw conclusions about this subject based on the material record. In general terms, these models can be described as "political economy" and "debt" models.

Political economy models, based studies of labor and exchange relationships (Marx 1964; Weber 1978), attempt to account for the processes by which surplus goods and labor are channeled through social systems to create material wealth and finance political institutions. In some Mesoamerican models derived from studies of political economy, social relations are defined in terms of access to wealth and power. That is, the role of elites in expropriating resources from the broader population is explained through the manipulation of the social and demographic environments (Marcus 1983; Wells 2006).

Debt models, as summarized by Wells (2006), tend to focus on the idea that elites may have emerged in response to "opportunistic possibilities for self-aggrandizement" (Wells 2006). The "aggrandizer concept" (Clark and Blake 1994) suggests that self-interest is one of the main guiding forces behind social action. In order to obtain political power, aggrandizers strategically attempt to indebt others through the control of production and distribution in order to create reciprocal obligations. With regard to prestige goods, exchange can materialize social relations. In Mauss' (1990[1925])

example of the potlatch, items are displayed and distributed through public rituals in order to demonstrate social status and prestige. Establishment of contractual debt relations prolongs and maintains the status associated with feast and gift-giving activities as long as these things have not been repaid. This can lead to socioeconomic difference between social groups as well as opportunities for some individuals to use debts to obtain political power. In Mesoamerica specifically, Rathje (2002) has proposed a type of "nouveau elite potlatch" in which material investments in socially significant symbols of community allowed aggrandizers to demonstrate generosity as well as their own wealth and power.

An issue with debt models that Wells (2006) emphasizes is that they assume that it is universally desirable, and even morally acceptable, for community leaders to indebt their supporters. In addition, they only allow for the development of hierarchy when individuals act against their own economic autonomy by providing surplus labor and accepting higher levels of sociopolitical integration.

Managerial models characterize power as contingent on the mobilization of labor and resources to take advantage of ecological diversity and reduce the risk of subsistence failure. Early ethnographic work on Polynesian societies (e.g., Sahlins 1972) raised this idea to explain the development of centralized leadership in complex societies. In Mesoamerica, this model has been proposed mainly to explain water management facilities and the cultivation of food using irrigation (Wells 2006). Wittfogel's (1972) hydraulic hypothesis has provided a basis for such explanations. The idea is that the organization necessary for the construction, maintenance, and operation of large-scale irrigation systems required centralized management, which eventually yielded coercive

power to irrigation managers. While this example is not without reasonable challenges (Adams 1966, 1983; Flannery 1972), it is worth considering possible connections between resource management and political development (Wells 2006). For the Maya lowlands, some have argued for elite management or control of reservoirs, canals, and associated subsistence resources (Scarborough 1992-1998; Davis-Salazar 2003). In these cases, elites are viewed as managers of rare and critical resources who strategically exploit their positions to construct and protect political power. Water management in these cases was not part of the initial processes associated with the growth of complex societies because it took place after state development. Instead, it shows the efforts of Late Classic community leaders and elite to maintain and extend their power bases (Davis-Salazar 2003; Wells 2006).

Status in the Material Record

In summarizing literature using traditional approaches to status, Turkon (2004) comments that many studies tend to assume that elite members of a society display status through symbols of wealth and power. These are often objectified in luxury or prestige goods, elaborate burial treatment, and architectural elaboration. This is based on the idea that, due to greater power and access to wealth, the elite can restrict access to high value goods as a way to visually express domination. Typically, prestige goods have little utilitarian function, require great amounts of specialized labor to produce, are made of scarce materials, use specialized technology, or are imported from distant places. Either

because lower social groups cannot afford them or because they are consciously restricted to certain groups, the elite have restricted access to or greater amounts of such objects.

When high value goods and prestige items are used to indicate elite presence, an assumption is that high status is derived from economic power. It is also assumed that all people want high value goods and that those who have them also have power. Economic means through which power is achieved include control and ownership of resources or production, hosting feasts that serve to redistribute goods, and controlling production or exchange, especially of wealth objects (Turkon 2004).

Masson (1999) points out that in the analysis of Maya economic patterns, as well as for other societies, it is common to draw a distinction between “utilitarian” and “nonutilitarian” realms of exchange. Often, nonutilitarian commodities are viewed with higher status or value because they are produced in fewer numbers and are possessed by a limited sector of society (Masson 1999; Rice 1981). Control of ritual was an important role of precolumbian Maya elites, who sponsored a range of public and private ceremonies that reinforced their social positions. Ritual objects were therefore closely linked with elite members of Maya society (Masson 1999).

Prestige goods, however, are not always sufficient for showing status distinctions. As Turkon (2004) points out, in the Malpaso Valley of Zacatecas, Mexico, there is a lack of prestige items or significant wealth, limited evidence of craft specialization, and a near-absence of individual burial treatment. The few prestige items recovered in this area are not concentrated in a few specific contexts. Nevertheless, monumental architecture at the main site of La Quemada suggests the existence of an elite social group. Turkon looks to variation in distribution of more day-to-day materials, specifically food, to explore

how the elite of this area expressed their status, as well as how status influenced and was influenced by food and its preparation.

As with other goods, due to greater power, wealth, and social contacts, elites may have greater access to preferred foods, to larger quantities of food, or to greater diversities of food. In addition, elites can assemble staple foods through ownership of the means of production, such as land or water rights, or through the requirement of labor or goods as a form of tax or tribute. Redistribution of these resources has the potential to build and reinforce debt relationships. As with most prestige goods, types of food may become status markers, especially those that are rare or imported, take a great deal of preparation, or are especially appealing to the senses (Turkon 2004).

Differential distribution of food remains can be used to examine domestic activities. Hendon (1996) suggests that elites could be expected to give up food preparation activities when alternative means of procuring prepared food are available because of the tedious, physically difficult, and time consuming nature of such activities in prehispanic Mesoamerica. In that case, we would expect the elite to be less involved in domestic chores and have relatively fewer residues of food preparation activities than non-elites. This could be achieved by either employing servants or slaves to prepare food within elite residences or by bringing already prepared food from outside the household. Household activities, like prestige objects, become visible symbols of the elites and distinguish them from other members of the society (Hendon 1996; Turkon 2004). In the case of the Malpaso Valley, Turkon found that some households were more involved in food preparation than others and that this distinction did correlate with social differences.

Feasting and Food

Masson (1999) provides a useful summary of the ethnohistorical information available relating to the manipulation of certain game animals at Postclassic Maya communities. Fray Diego de Landa (1941) provides examples of ritual animal sacrifice and feasting in his writings. One example is a description of a New Year ceremony. An "idol" (Kan Uayeb) was set up at the south entrance to the town, and another (Bolon Tzacab) was set up at the house of a lord who was hosting the ritual and accompanying feast. Corn, incense, and the head of a turkey were offered to Kan Uayeb. After a procession to the house of the host, the two idols were placed together, and offerings of food and drink were given to both the idols and to the guests. A haunch of venison was presented to the officiating priest. Masson (1999) infers from this account that game was distributed or consumed based on status, as a preferential haunch was given to the priest.

It has been suggested that the ancient Maya domesticated deer (Masson 1999). For example, Masson finds it highly unlikely that large game such as tapir or deer were actually hunted, believing instead that they were likely tamed, penned, or tethered. Some evidence from the time of the Conquest, summarized by Carr (1996: 251) does hint at that possibility. Cortés encountered an area in which deer were abundant and unafraid of humans. The local people explained to him that they had been ordered by their gods not to kill or frighten the deer (Díaz del Castillo: 452). Diego de Landa mentions Maya women raising fawns by breast-feeding. The women would take the deer out to the woods to live, but they would not run away (Tozzer 1941: 127). Finally, in descriptions

of his travels in the Maya highlands, Francisco Ximénez (1967: 57) mentions that deer were tamed but does not provide any details.

One source of information on the role of deer for the ancient Maya is artistic depictions. The Madrid Codex, for example, contains an entire section focused on the capture or captivity of animals. The majority of the animals portrayed in this section are deer. Nonetheless, interpretation of these scenes can be somewhat problematic. Deer tied to trees in the codex may have already been captured and may be serving as part of a ritual (Pohl 1981: 516). On the other hand, the codex may portray hunting with the use of a spring-pole snare (Franco 1969), which is a known trapping technique in the Maya area (Carr 1996).

Although management of deer populations may be uncertain, what is certain is that deer played an important role for the Maya. White-tailed deer are usually one of the most frequently represented animals in the zooarchaeological record, and often exceed other mammals in frequency. The frequency and distribution of white-tailed deer remains suggests that the species was a favorite food of the Maya from Preclassic times on.

METHODS

Identification and Quantification

A wide variety of faunal materials has been recovered from the site of Pusilhá. *Jute* shells were identified in the field and then discarded. The rest were brought back to the University of San Diego Mesoamerican Archaeology Lab for identification and analysis, which focused primarily on cervids and other large game mammals due to the known importance of these taxa to the Maya as demonstrated in the ethnographic and zooarchaeological record. Peccaries are considered one of the three top meat sources for the Maya (Sharer 1994; Teeter 2004: 185), but deer are often considered the most important. Two species are found in the area of southern Belize: white-tailed (*Odocoileus virginianus*) and red brocket (*Mazama americana*) deer. Identifications were facilitated by the use of comparative collections at the University of Florida, the San Diego Natural Science Museum, and the University of California, Los Angeles. Additional references consulted include osteology manuals published by Gilbert (1997), Hillson (1992), and Olsen (1982).

Samples in this analysis were quantified by bone count (Number of Identified Specimens, or NISP). There are some issues with this method for the purposes of analysis, which have been summarized by Grayson (1979, 1984) and presented by Brewer (1992). Post-depositional processes, scavenger activities, and butchering practices can affect specimen counts. NISP assumes all elements are equally affected by breakage. There is variation among species of the number of identifiable anatomical

elements prior to any modifications. Elements from some species may be more easily identified than elements from others. NISP can be affected by different collection techniques, such as the use of different sizes of screens for recovery. Finally, NISP values are potentially interdependent units. There is no way to determine which specimens came from different individuals or even from the same bone.

As a result of these issues, Minimum Numbers of Individuals (MNI) is often used to analyze faunal data. This method involves tabulating the numbers of sided or unique elements in the body that represent the minimum number of animals of each species present in an assemblage. This method works best for large samples of bone from a few locations. In cases where only a few pieces of bone are found in a wide range of contexts, however, this method is less effective. MNI estimations in this case are low based on element counts alone and may not reflect the likelihood that these elements were parts of many different individual animals (Masson 2004 98-99; Grayson 1984). As a result, we use NISP as the primary method of quantification rather than MNI.

Distribution and Analysis

From the time of their procurement until subsequent deposition and recovery, animal remains are subjected to a variety of cultural and natural taphonomic processes. As a result of this, the majority of archaeologically recovered animal assemblages are biased to some degree. Much of the literature relating to taphonomy and the archaeofaunal record, summarized by Stanchly (2004), deals with noncomplex societies and hunter-forager bands. These studies aim at identifying whether hominids or other

animals are responsible for animal bone accumulations. Faunal assemblages from complex societies also tend to be biased, although at times in very different ways from those of foraging and hunting societies (Stanchly 2004). For the most part, such assemblages are the by-products of human activity. Occupation surfaces, burials, and caches tend to contain faunal material that is directly related to issues of subsistence, economy, and ideology, although both pre- and post-depositional agents play a role in the formation of the site.

Post-depositional processes acting on faunal remains can be either natural or cultural. Cultural agents consist primarily of redeposition events. For example, construction involved the use of large amounts of material incorporated into fill. Often, midden material, including bone, was cleared from within and around structures for use as fill. Natural taphonomic agents include soils, water, sunlight, tree and plant roots, animal scavengers, and invertebrates such as termites, ants, and earthworms. These factors all contribute to the diagenesis, fragmentation, or displacement of bone materials (Stanchly 2004). It is for these reasons that *Pachychilus* NISP counts are included in this analysis. Different areas of the site will experience differing amounts of post-depositional degradation. As a result, absolute numbers of large mammal bones may differ between two structures due to both cultural and natural processes, making it difficult to determine how much of the difference is in fact due to status rather than preservation. *Pachychilus*, commonly referred to as *jute*, were a non-prestige food source that would have been more or less equally available to all. Because of this, it provides a useful baseline for comparing proportions of large mammal bones between different areas.

In addition to what species are present in what quantities, it is also worth looking at what parts of the animals' bodies are found in which locations. While notions of edible parts can vary with different cultures, cranial and foot elements often represent the least edible portions of the skeleton, and axial and limb elements such as the femur, tibia, ribs, and vertebrae correspond to more meat-laden portions of the carcass (Masson 1999).

Skeletal element abundances are commonly used in attempts to make inferences about human behavior from an archaeofaunal assemblage. Relative frequencies of elements are used to examine carcass-acquisition strategies, butchery and transport decisions, site function, and taphonomic history of bone assemblages. The underlying rationale is based on the observation that hunters are constrained by transport limitations and will often select a limited number of bones for transportation from a kill site to a consumption site. It is presumed that butchery and transport decisions are based in part on some recognition of the nutritional value associated with different elements (Faith and Gordon 2007).

PUSILHÁ

Geography and Settlement Patterns

The site of Pusilhá developed in the valley running between the Machaca and the Poité rivers. So far, approximately 500 residential structures and platforms, not including the Gateway Hill Acropolis, have been mapped. Most of these are concentrated along the two rivers and on the tops of the ridges between them. Settlement is fairly uniform throughout the site, although it is somewhat more dense within approximately 200 meters of the rivers. For the most part, the whole site is within close distance of watercourses, although areas with easier access to water were preferred for habitation. Well-drained, elevated ground were preferred for habitation, as indicated by a correspondence between settlement and the slope of the terrain (Braswell et al. 2003). The most obvious example of this pattern is the Gateway Hill Acropolis (Braswell et al. 2006).

The residential structures that have been mapped tend to be grouped into arrangements that are spread out over the landscape. Some of these groups show more formal spatial arrangements than others. Two basic categories have been suggested (Ashmore: 1981): (1) informal groups, which are defined solely on the basis of the proximity of the structures, and (2) patio or *plazuela* groups, which are more formal arrangements of structures grouped around a central court. *Plazuela* groups are thought to indicate the somewhat higher social status of their inhabitants compared to those living in informal groups (Willey et al. 1965). They appear to be more elaborate versions of the smaller mounds. Central courts and plaza arrangement of secondary platforms are more

clearly defined and more easily seen in superficial contours than with “ordinary” mounds (Braswell et al. 2006).

Based on the presence of twelve formal *plazuela* groups, the area around and to the southwest of the Stela Plaza is thought to have been inhabited by groups of higher-status individuals (Volta 2007). Further support for this idea is presented by the association of the formal residential complexes with the Stela Plaza, which itself was not a residential area and which served as one of the ceremonial foci of the site. Other elite residential complexes include Lower Groups I and II to the southwest of Gateway Hill Acropolis and two settlement clusters just north of it. Settlement seems to indicate the existence of status differences between individuals who lived in proximity of the Stela Plaza and the Gateway Hill Acropolis and those who lived in areas more distant from the site core. Overall, the general pattern seems to correspond to the concentric zone model proposed for Maya communities, with the highest status individuals residing at the site center, lesser nobility around them, and lower status members at more distant settlement peripheries (Braswell et al. 2006; see Smyth et al. 1995; Volta 2007)

Within a survey area of approximately 1.7 km^2, approximately 500 structures presumed to be residential have been mapped to date. Based on a variation of Rice and Culbert’s (1990) method, an estimated population density of approximately 1100 persons per km^2 has been determined for the site (Braswell et al. 2006). This is comparable to adjusted Late Classic estimates for urban zones of Central Lowland sites such as Seibal and Tikal, and of Northern Lowland cities such as Sayil. Based on this estimate, Pusilhá was probably more than two times as large as nearby Lubaantun, suggesting it was the

largest and most populous city in the region during the Late and Terminal Classic (Braswell et al. 2006).

Political Organization

Pusilhá was ruled by a divine king. The strongest evidence for this is provided by epigraphic and excavation data. The size and complexity of the Gateway Hill Acropolis suggests political authority concentrated in the hands of a ruler who could command significant labor resources. The distribution of the *plazuela* groups implies the existence of higher- and lower-status residential areas, with the former centered around the Stela Plaza and the Gateway Hill Acropolis. The clustering of residential architecture around these groups emphasizes their centrality and provides further evidence for the interpretation that they defined the civic and ceremonial center of the site (Braswell et al. 2006; Leventhal 1990).

British Museum Project

The site first came to the attention of British scholars in 1926 during excavations of the nearby site of Lubaantun. Joyce (1928) gathered reports from local peoples of stone remains located on or near the Pusilhá branch of the Mojo River. Based on information gathered during initial visits to the site, the British Museum Trustees decided to suspend operations at Lubaantun and instead organize a preliminary survey of Pusilhá.

Surveys of the site began soon after its rediscovery in the 1920s (Grunning 1931; Joyce et al. 1928; Joyce 1929). A few days before one of the first expeditions was due to leave, a cave was discovered that researchers thought had been used as a pottery-dump (Joyce et al. 1928: 324). Further exploration of the cave occurred in 1929. A feature like a chimney was found leading from the cave to the surface of the limestone outcrop in which the cave is located. Joyce suggests this chimney was the original means of access to the cave and that the inhabitants of the site used it as a dump for broken and discarded pots. Joyce describes the archaeological strata uncovered by excavations as curvilinear rather than horizontal. The richest finds were located immediately under the chimney, forming a mound. Later additions to this pile added layers to the mound, and in later stages a pot dropped through the chimney would break on the apex and the fragments would scatter. Pottery fragments of various types made up the main bulk of the remains. Most of these were course domestic ware and dishes. Stone remains included fragments of *metates* and *manos* as well as a small number of bifaces of flaked chert and some obsidian flakes and cores. Animal bones found in the cave at this time included deer, peccary, turtle, fish dental plates, and crab claw fragments (Joyce 1929).

Pusilhá Archaeological Project

The Pusilhá Archaeological Project began in 2001 in an effort to study a small polity located in the peripheral area between much larger neighbors. The specific aims of the project included developing a more complete understanding of the political history of Pusilhá through a thorough study of the hieroglyphic texts of the site, testing opposing political models using hieroglyphic evidence, and investigating the economic consequences of these political events on both commoners and elites at Pusilhá (Braswell et al. 2002).

Contextual Descriptions of Areas and Structures Excavated

During the 2002 field season, test pits from off-mound, non-architectural contexts were excavated in the Stela Plaza, Moho Plaza, Weller's Plaza, and Pottery Cave. Artifacts of various types from these groups provide some insight regarding the functions of the various groups. A wide range of cooking and storage vessels, as well as *jute* shell and animal bone (discussed in more detail below) were included in the assemblages from Pottery Cave, Weller's Group, and the Bulldozed Mound, suggesting that these groups were primarily residential in nature. In contrast, test pits from the Stela Plaza and Moho Plaza contained many more incense burners, far fewer cooking and storage vessels, and little or no *jute* or animal bone, suggesting that these two groups were primarily ceremonial in nature and that ritual feasting was not a significant activity in these areas (Braswell et al. 2002).

In the Stela Plaza, seven test pits were dug in off-platform contexts to the east of three structures that defined the eastern edge of the plaza in order to locate middens of domestic or other debris that could have been discarded behind the structures. Test pits closest to the structures had more material than those farther away, suggesting that garbage may have been disposed immediately behind the structures rather than at some distance. Artifacts recovered from this area included Late Classic ceramics. No animal bone or *jute* shell was recovered, suggesting that the function of the group was primarily ritual rather than residential (Braswell et al. 2002).

Eight test pits were dug in a small architectural group the researchers have named Weller's Group. This group consists of three mounds and several wall features built on top of a limestone outcrop. The majority of the ceramics recovered from this area are utilitarian. This and the quantities of animal bone and *jute* shell recovered suggest that Weller's Group served primarily as a residence during the Late Classic period (Braswell et al. 2002).

Two test pits, Operations 1/16 and 1/17, were located in backdirt excavated by the British Museum project at Pottery Cave, which is located a few meters northwest and below the Pottery Cave Group. Units were set up with the purpose of gathering missed artifacts in disturbed contexts in an effort to facilitate the formulation of a ceramic type collection for the site. The first test pit was located within what remains of the cave itself, which is now an open rock shelter. The second was placed in the beds of backdirt left outside of the cave. Materials recovered from these test pits reflect a wide range of activities. Ceramics include small sherds of fine wares, utilitarian cooking and serving vessels, and urn and censer fragments. Lithics, animal bones, *jute* shells, and even human

remains were also recovered. Preservation in this area was significantly better than at other areas of the site, probably because materials here are not in contact with the acidic, iron rich A and B horizon soils that typify the region. Materials date to the Late Classic period, approximately contemporary with Weller's Group (Braswell et al. 2002).

Seven test pits were placed in a large group named Moho Plaza. Although substantially larger, Moho Plaza shares some similarities of form with the Stela Plaza. They share a similar orientation. The eastern edge of both groups is defined by a linear arrangement of three structures that effectively limit access to that side. The western side, on the other hand, is more open. Finally, in both places large structures are located at both the north and south end of the plaza. Moho Plaza also has some rather unique features. It is the location of the largest ballcourt known in southern Belize. The southernmost platform of the Plaza contains the only known hieroglyphic staircase in southern Belize. Finally, the location of the plaza on a low, flat plain rather than on a high ridge represents a departure from general Classic Period settlement patterns at the site. All of this suggests that Moho Plaza was constructed relatively late in the history of Pusilhá, possibly at the end of the eighth century when most of the site was abandoned. The goals of excavations in Moho Plaza were to retrieve ceramic materials for use in defining a transitional Late Classic to Terminal Classic occupation and determining the function of the group. Ceramics included censer and urn fragments and fewer cooking and serving vessels. Compared to Weller's Group and Pottery Cave, only small numbers of *jute* shells were recovered, suggesting the plaza served more as a ritual location than as a domestic area (Braswell et al. 2002).

In the spring of 2002, one structure was partially destroyed and two others were completely leveled by a bulldozer. Soon thereafter, salvage operations were conducted. Excavations of the "Bulldozed Mound" revealed an earlier substructure, possibly built during the Early Classic. Present were one preserved side, a partially preserved front, and a fragmentary stair that had been partially demolished by the ancient Maya. The final form of the Bulldozed Mound probably dates to the Terminal Classic period. The platform was used heavily during the Postclassic (Braswell et al. 2002).

Lower Group I, one of the main areas of excavation during the 2004 field season, consisting of Operations 5, 6, and 7, is one of two distinct groups below the southwest edge of the Acropolis. Because of the location of the group near but not on Gateway Hill, it was assumed that the occupants were high-status but non-royal elites. Compared to the Operations 3 and 4 structures of the Acropolis, the structures of Lower Group I has a lower quality of masonry construction, smaller buildings, and a somewhat reduced variety of artifacts (Braswell et al. 2004b).

Three buildings in this area were excavated. The eastern structure, labeled Operation 5, was excavated the most thoroughly. All four sides of the platform were revealed, and most of the architectural fill was excavated. The southern structure, labeled Operation 6, was planned with a similar strategy, but excavations of the stair block and sides of the platform were closed before the structure was completely cleared. The fill of the platform, however, was excavated almost in its entirety. The western structure, Operation 7, was subject only to test excavation on its summit, which had already been significantly damaged by looters. In addition to the three structures, a test pit (Op 1/25) and an extension thereof (Op 1/25a) were placed 45 meters east of the Operation 6

structure on a slope just below a small platform. This location was chosen because a non-intrusive soil conductivity survey suggested that a trash pit may have been present (Braswell et al. 2004b). None was found.

The Operation 5 structure was discovered in an unlooted condition, although it was poorly built and preserved (Braswell et al. 2004b).

The platform of the Operation 6 structure was assumed to have served a special purpose and did not support a residence. Despite its small size, it is similar in many ways to structures that have been called shrines or temples. The structure was chosen because of its perceived functional differences from that of the Operation 5 structure, as well as a lack of evidence of significant looting despite its deteriorated and collapsed condition. The original excavation plans for this operation were modified for two reasons. First, clearing revealed that most of the facing stones on the front and stair block of the structure were missing due to scavenging for the construction of the foundations of two modern Q'eqchi' structures just north of the Operation 6 Structure. Poor preservation of the stair block and front face of the platform made them difficult to identify as features and suggested that the potential of the structure for consolidation was minimal. Second, strife in the village required excavations to shut down for ten days. After this, there was not enough time to complete the excavations according to the original plan. Instead, researchers focused on excavating the core of the platform itself in an effort to salvage as much information as possible before the end of the season. The structure was built in a single construction phase dating to the eighth century (Braswell et al. 2004b).

The Operation 7 structure was the largest structure in this group. As with other structures of its size at the site, it had been subject to substantial looting. Because of this,

it was not chosen for extensive horizontal excavation. Instead, a quick salvage operation was undertaken to determine if it had been built in one phase and if looters had left any burials near the central axis of the building (Braswell et al. 2004b). None were found.

The other main area excavated during the 2004 season was the Gateway Hill Acropolis (Figure 2). The acropolis fills the oxbow in which Gateway Hill is located. It rises approximately 80 meters above the river in a series of terraces containing stone platforms (Braswell et al. 2004b).

Operations 3 and 4 consisted of the excavations of two structures located at the south end of Gateway Hill Acropolis, the heart of the regal center of Pusilhá. Based on the location in a prominent part of the acropolis as well as the quality of the masonry, it was anticipated that these structures would contain material remains reflecting elite status occupation and activities. The goal of these excavations was to reveal as much as possible about the daily lives of the elite of the site, especially during the Late Classic (Braswell et al. 2004b).

Among the purposes behind the investigations of the Operations 3 and 4 structures were the recovery of ceramic materials from surface and fill in order to define the chronology of the structure, understanding the construction and use history of the buildings, and the gathering and analysis of portable material objects associated with the structures, including both utilitarian objects and ritual materials from deliberate burial and cache deposits (Braswell et al. 2004b).

The Operation 3 structure is oriented north to south and defines the eastern side of the southeast corner of the Acropolis. To the immediate east lies a steep drop-off to the fields below. The structure was built in a single stage during the Late Classic period,

most likely some time between AD 650 and AD 770. It was built as a single unit with a well-built wall separating the fill of the platform from the fill of the stair blocks (Braswell et al. 2004b).

Unfortunately, the Operation 4 structure was looted during a brief period not long before the beginning of the 2004 season. The central portion of the platform was completely destroyed. Only the eastern portion of the building was preserved up to, but not much beyond, the east end of the stair block. The central two thirds of the structure were destroyed and the western low annex was completely buried (Braswell et al. 2004b).

In 2005, two more structures on Gateway Hill Acropolis were excavated: the Operation 8 and 9 structures. These are the tallest structures known at the site, and they define the highest points on the acropolis (Braswell et al. 2006).

Faunal Remains

Tables 1 and 2 list the NISP counts for large mammals as well as for mollusks, including the genus *Pachychilus*, commonly called *jute*. *Jute* was most likely not a prestige good and would have been equally available to all members of the community, making it a useful baseline for comparing relative frequencies of deer remains. Where possible (given the portions of bones that were preserved), most specimens were identified to the level of order.

The first column of Table 1 lists the total number of indentified specimens included in this analysis for each area within the site. Med/lrg *Mammalia* includes all medium and large mammals that could not be identified more specifically, *Artiodactyla*

includes all even-toed ungulates that could not be identified more specifically, *Tayassuidae* includes all peccaries that could not be identified more specifically, and *Cervidae* includes all deer that could not be identified more specifically; of the large mammals, only cervids were identified to the genus and species levels. The total med/lrg mammal column shows the total number of specimens from each of the previously mentioned categories.

As with Table 1, Table 2 is organized based on how specifically each specimen was identified. The *Mollusca* column includes all mollusk specimens that could not be identified more specifically, the *Bivalvia* column includes all bivalves that could not be identified more specifically, etc. The total *Pachychilus* column shows the total number of *jute* from each area in the site, and the total *Mollusca* column shows the total number of mollusks, including *jute,* from each area of the site.

Tables 7 and 8 contain more detailed information on what specimens we found in each individual lot. Table 7 contains the NISP counts for all identified vertebrates, including large mammals, and all mollusks except *Pachychilus* and *Pomacea*. NISP counts for *Pachychilus* and *Pomacea* are presented in Table 8.

The last column of Table 2 shows the NISP ratio of total large and medium sized mammals to total *jute* for each area of excavation. This ratio was calculated by dividing the large mammal NISP for each structure by the *Pachychilus* NISP for that structure. Figure 3 graphically compares these ratios. The “expected ratio” was calculated by dividing the total large mammal NISP for all areas except Pottery Cave by the total *Pachychilus* NISP for all areas except Pottery Cave. Pottery Cave was left out of these calculations because of preservation differences. Preservation in Pottery Cave was

significantly better than anywhere else in the site, resulting in a skewed ratio. Had access to both resources been equal across the site, we would expect the ratios in each area to be close to this value. As shown in Figure 3, this is not the case.

Tables 4 and 5 list how many identified large mammal specimens of each element were present as well as how many identified specimens were present from each region of the body. The head region includes the cranium, teeth, and mandible. The axial region includes vertebrae and ribs. Forequarter includes scapula, humerus, radius, and ulna. Hindquarter includes innominate, femur, tibia, and fibula. The unidentified limb group includes metapodials (as I was unable to assign these specimens to fore- or hindquarters), some unidentified longbones, and two specimens from pottery cave that are either humeri or femura.

Table 4 contains element counts for all specimens identified as large mammals. Table 5 contains element counts for just those specimens identified as cervids.

Figures 4 and 5 show what percentage of the specimens of the assemblage from each structure was identified as being from each region of the body. Similar to Masson's (1999) site (discussed below for the purpose of comparison), the non-royal contexts appear to generally have a somewhat higher concentration of large mammal limb remains than the royal structures. The pattern is much less visible when looking only at cervids. This could indicate behaviors similar to those proposed by Masson for the site of Laguna de On. That is, elites may have had more control over the processing and distribution of large animal carcasses. It is difficult to draw conclusions about resource distribution for the entire community, as the majority of data is from elite contexts, there are certainly levels within the elite stratum.

Laguna de On: A Comparison

Masson (1999) has discussed a similar case at the archaeological site of Laguna de On, an island located on a freshwater, inland, semi-saline lagoon in northern Belize. Occupation of Laguna de On occurred primarily during the Late Postclassic period, from around AD 1000 to 1500. Inhabitants probably cultivated a range of crops such as corn, bean, squash, cotton, and cacao. Local and long-distance exchange networks appear to be well developed and to have obtained, among other goods, marine shells from nearby Belize coastal sites. Animal bones from various contexts suggest the presence of a great number of species available for exploitation.

Masson's analysis focuses on variability in the use of animal resources within the Postclassic community of Laguna de On. NISP data and identifications of skeletal elements for each taxon are used to compare percentages of animal bones by taxa and element for several key areas at the site.

Masson's Area 1, located in the north central zone of the island, appears to have been used for upper status residence and ritual activity. Areas 2 and 3 are zones from the south and north end of the central plateau that runs along the top of the island. Area 2 is a midden deposit in which numerous burials were found, while Area 3 is a midden zone that is probably associated with nearby domestic features that have not been located in excavation. Areas 2 and 3 provide a contrast to Area 1 because artifact and feature assemblages from these areas suggest they were occupied by individuals possessing less social status than do the occupants of Area 1.

Table 6 shows Masson's comparison of the column proportions of each large mammal taxa of the total number of animal bone for each area. Based on this data, larger game are more common in Area 1 than in either Area 2 or Area 3. Since all areas were excavated to equivalent depths, Masson is also able to compare percentages calculated from the total of each taxa from the site based on the size of each area. Based on area, Area 1, which is significantly larger than Areas 2 and 3, would be expected to have 70 percent of each taxa present, while 2 and 3 would each be expected to have about 15 percent each. However, 90.9 percent of large mammal specimens, for example, are found in Area 1. When comparing the frequencies of animals within each area, Area 1 has more than twice as many large mammals (24.9 percent) than Area 2 (12.9 percent), while Area 3 has very few large mammals (5 percent).

Numerical frequencies of elements of large game at these areas also distinguish Area 1 from Areas 2 and 3 (see Table 7). Masson found Area 1 to possess higher proportions of cranial and foot elements compared to postcranial limb or axial elements, while two other areas (Areas 2 and 3) showed an inverse pattern. Masson suggests that game animals were butchered in Area 1 and then redistributed to community members who consumed them in residential zones such as Areas 2 and 3.

Tamed or hunted animals could have been brought to Masson's Area 1 for butchering. The disproportionate amount of cranial and foot elements compared to axial and limb elements supports this idea. Similarly, higher proportions of axial and limb elements in other areas supports the idea that cuts of meat may have been obtained at Area 1 and then transported to other areas for consumption. Masson points out that truly exclusive element distributions are not seen in these contexts at Laguna de On, however,

differences in proportions do suggest a tendency for large game to be more commonly manipulated and processed in upper status and ritual activities (Masson 1999).

The pattern of spatial distribution of food remains suggested by Masson is very similar to the pattern I propose for Pusilhá in that there seems to be a general trend of higher status residences having greater proportions of large game, especially deer, and greater proportions of less meat-laden skeletal elements.

DISCUSSION AND CONCLUSIONS

As shown in Figure 3, there is a difference in distribution of large mammal and *jute* remains between different areas of the site. Both the Stela Plaza and Moho Plaza had no large mammal remains, which supports the idea that they were primarily ceremonial in function and were not the location of a significant amount of ritual feasting.

Of the Gateway Hill Acropolis and Lower Group I structures, Operations 8 and 9 have the highest large mammal:*jute* ratios, followed by Operation 6, then Operations 3 and 4, then Operation 5, and finally Operation 7. Of this group, Operations 8 and 9 are the only structures with ratios over the expected ratio. Based on the assumption that a greater ratio would mean the residents of these structures had more access to this resource, this supports the idea that the residents of Operations 8 and 9 were members of an elite class. The other two structures of Gateway Hill Acropolis included here, Operations 3 and 4, had ratios below the expected value but still above the residential Operation 5 and 7 structures.

Operation 6 is interesting in that its ratio is between those of Operations 3 and 4 and Operations 8 and 9. Perhaps, as Braswell et al. (2004b) suggest, this structure served a special purpose. The Operation 6 structure could have served as the site of ritual feasting similar to that described by de Landa (1941). If this was the case, then it would be an important location for the consumption of prestige foods such as large game, and it would not be surprising to find larger quantities of large game remains than nearby residential areas. It is worth noting that there were Q'eqchi' Maya living near this spot and raising domestic pigs about 40 years ago. The addition to the assemblage of more

recent mammal remains could have skewed the data somewhat. However, no remains were definitively identified as domestic pig. For the most part, the structures of Lower Group I tend to have smaller ratios than the structures of Gateway Hill Acropolis, supporting the idea that the status of the inhabitants of the residential structures in this group was somewhat lower than that of the inhabitants of the Gateway Hill Acropolis.

The Bulldozed Mound had a ratio of large mammal remains to *jute* that was larger than the expected value. The disturbed nature of the context of this structure makes certainty difficult, but it is possible that the residents of this structure had the necessary status to allow them significant access to this coveted resource. Pottery cave had by far the highest ratio of any of the areas included in this analysis.

The patterns of differentiation in element distribution between areas in the site are not as clear-cut as the patterns of the large mammal to *jute* ratios; however, there are some interesting trends. First, the Operation 6 structure has a significantly high portion of hind limbs compared to other areas and compared to the percentage of hind limbs in the entire sample. The remaining portion of the sample is from the foot region. This potentially supports the previously mentioned idea of ritual feasting taking place in this area. Large game animals could have been processed at a different location, and then the desired portions of the bodies of the animal could have been brought to the Operation 6 structure. The Operations 4 and 9 structures are also composed entirely of limb and foot elements, suggesting that they could also be locations to which portions of already processed game animals were brought for consumption. In contrast, The Bulldozed Mound of Operation 2 has a much higher proportion of cranial elements than any other area. This may suggest that large game animals were processed here and that portions of

the processed animals could have been taken to other parts of the site. As with Masson's (1999) observation regarding Laguna de On, these are not strict rules. Rather, these patterns may represent tendencies.

Analyses of the faunal remains generally are consistent with the conclusions about status reached by Braswell et al. (2006) and Volta (2007). The higher proportions of deer remains in the Gateway Hill Acropolis structures, especially Operations 8 and 9, suggest that the individuals who lived here may have had more access to this particular high status resource. In addition, the distribution of skeletal elements suggests a similar pattern to that described by Masson (1999) for the site of Laguna de On. Certain areas, specifically Gateway Hill Acropolis, seem to have been the preferred locations for the processing of large game mammals, parts of which could then have been distributed to other areas. This supports the idea that the residents of Gateway Hill Acropolis would have had the highest status in that it suggests that they had the most control over the distribution of this particular resource.

With respect to political economy, the analysis presented here support the idea that access to wealth and power define some social relations. Whether this is best explained through a debt model, a managerial model, etc. is difficult to say with the data at hand. How the elites came to power and what the specific nature of their relationship with the rest of the population was are complex questions requiring research into multiple lines of evidence. However, at this point we can say with some certainty that some members of society, primarily those living in the Gateway Hill Acropolis, had greater access to desired resources as well as a larger role in ceremonial feasting events.

APPENDIX: TABLES AND FIGURES

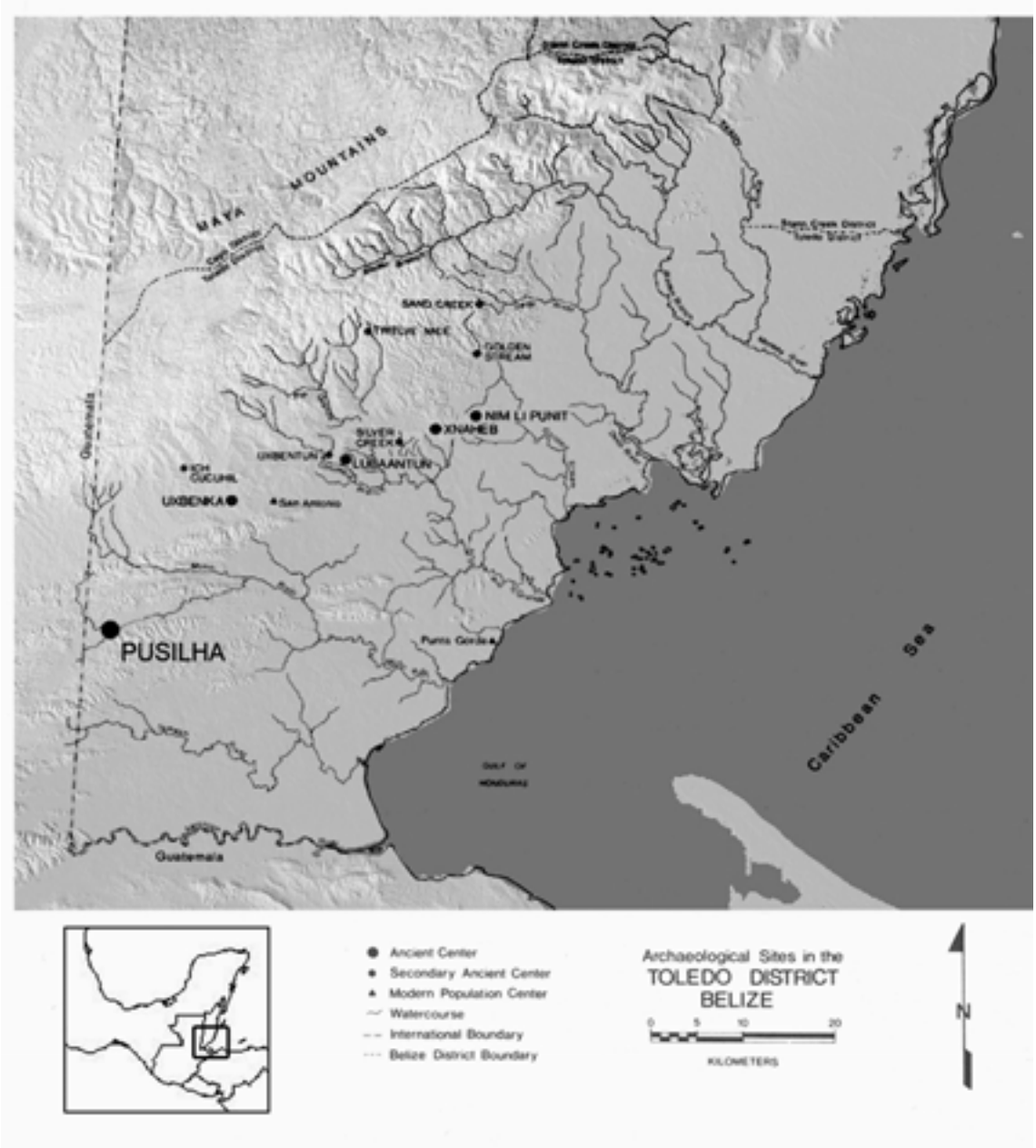

Figure 1. Location of the archaeological site of Pusilhá within southern Belize (Volta 2007: Figure 1)

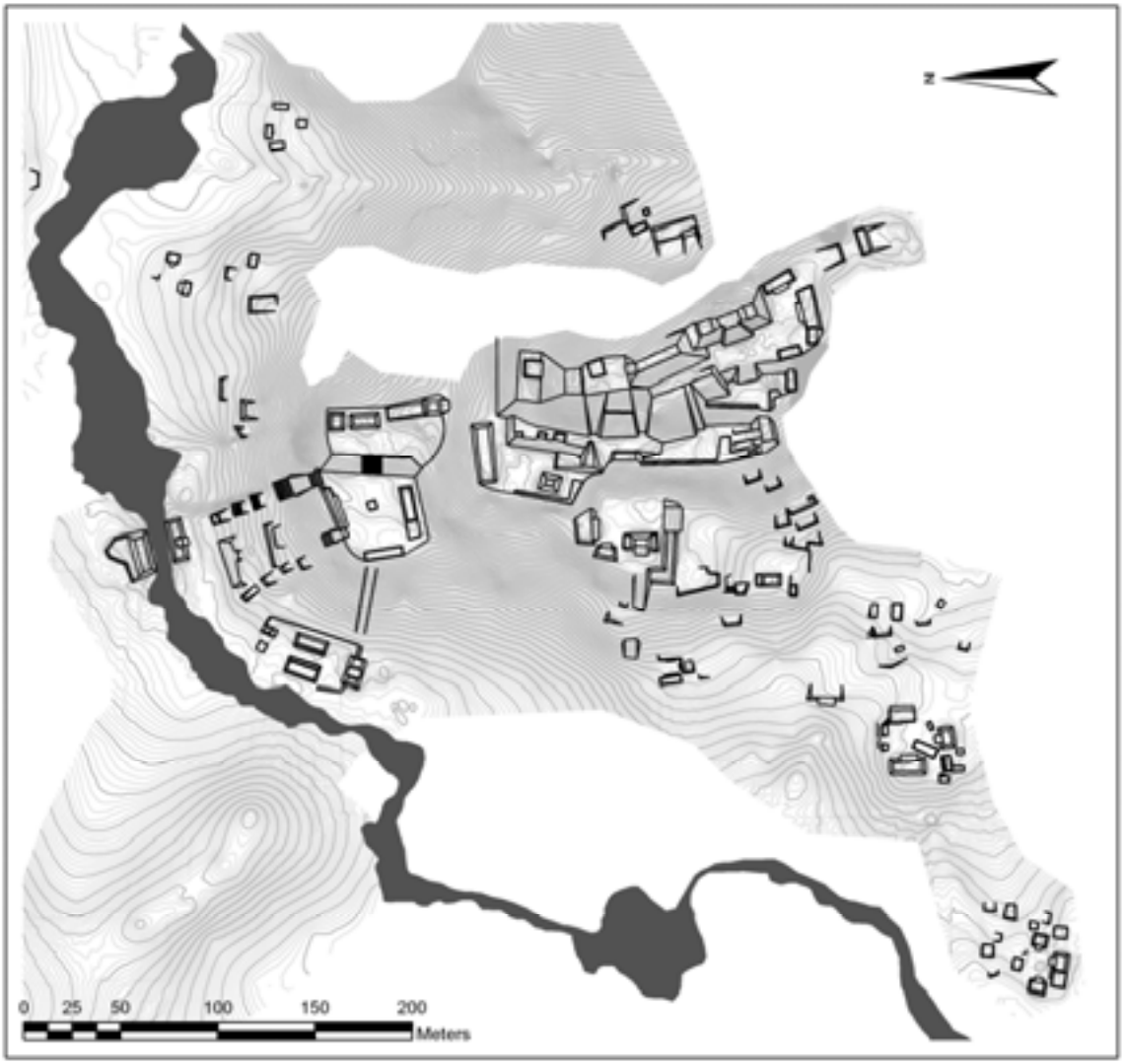

Figure 2. Map of Gateway Hill Acropolis (Volta 2007)

Table 1. Large mammal NISP counts

	NISP total	med/lrg Mammalia	Artiodactyla	Tayassuidae	Cervidae	Odocoileus virginianus	Mazama Americana	total med/lrg mammal
Stela Plaza	0	0	0	0	0	0	0	0
Weller's Group	38	0	0	0	0	0	0	0
Pottery Cave	683	36	9	3	4	0	0	52
Moho Plaza	0	0	0	0	0	0	0	0
Operation 2	1278	23	7	5	9	1	2	47
Operation 3	4227	23	17	2	8	5	0	55
Operation 4	1039	5	4	0	4	3	0	16
Operation 5	3297	10	1	0	4	0	0	15
Operation 6	189	1	1	0	1	0	0	3
Operation 7	267	0	0	0	0	0	0	0
Operation 8	1684	25	10	0	13	0	0	48
Operation 9	485	7	0	0	4	0	0	11
taxon total	13187	130	49	10	47	9	2	247

Table 2. Mollusk NISP counts and large mammal:jute ratio

	Mollusca	Bivalvia	Gastro-poda	Pom-acea	Indiorum	Glaph-orus	total Mollusca	total Pachychilus
Stela Plaza	0	0	0	0	0	0	0	0
Weller's Group	0	0	0	0	32	6	38	38
Pottery Cave	14	9	4	1	542	61	631	603
Moho Plaza	0	0	0	0	0	0	0	0
Op 2	11	4	1	0	87	1128	1231	1215
Op 3	0	0	1	9	3880	282	4172	4162
Op 4	1	1	0	2	880	139	1023	1019
Op 5	6	4	1	3	3158	110	3282	3268
Op 6	10	3	1	4	165	3	186	168
Op 7	2	0	1	1	261	2	267	263
Op 8	19	4	6	1	187	1419	1636	1606
Op 9	16	6	0	0	17	435	474	452
taxon total	79	31	15	21	9209	3585	12940	12794

Table 3. Mammalia:Pachychilus Ratios

	NISP total	total med/lrg mammal	total Pachychilus	ratio med/lrg Mammalia : Pachychilus
Stela Plaza	0	0	0	
Weller's Group	38	0	38	0
Pottery Cave	683	52	603	0.086235489
Moho Plaza	0	0	0	
Operation 2	1278	47	1215	0.038683128
Operation 3	4227	55	4162	0.013214801
Operation 4	1039	16	1019	0.015701668
Operation 5	3297	15	3268	0.004589963
Operation 6	189	3	168	0.017857143
Operation 7	267	0	263	0
Operation 8	1684	48	1606	0.02988792
Operation 9	485	11	452	0.024336283
taxon total	13187	247	12794	0.019305925
total w/out Pottery Cave	12504	195	12191	0.015995406

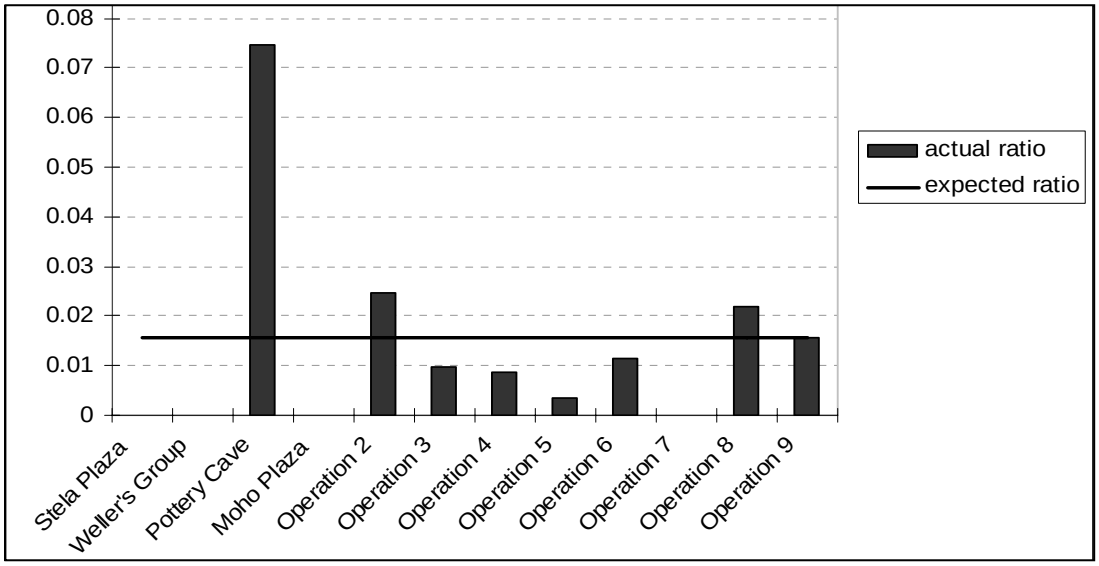

Figure 3. large mammal:jute ratio

Table 4. NISP element and region counts of all large mammals

element	pottery cave	1/25a/1	2	3	4	5	6	7	8	9
vert	6		1	6						
sacrum						1				
rib	1									
cranium	2									
mandible				2						
tooth	1	2	9	2		1			2	
scapula	1		2						1	
humerus	3		1	4		1			2	
radius	3			3	1				4	2
ulna	1			1		1			1	
innominate	1			1		1	1			
femur	1		2		1				2	
tibia	2		1			1	1			
fibula										
calcaneus			3	3	2	1			3	
talus			1	2	1				3	
phalanx	7		2	8	2	2	1		6	2
metapodial			5	1	2				4	
longbone	3		5	8					7	1
-upper	2									
total	34	2	32	41	9	9	3	0	35	5
region	pottery cave	1/25a/1	2	3	4	5	6	7	8	9
head	3	2	9	4	0	1	0	0	2	0
axial	7	0	1	6	0	1	0	0	0	0
forequarter	8	0	3	8	1	2	0	0	8	2
hindquarter	4	0	3	1	1	2	2	0	2	0
limb	5	0	10	9	2	0	0	0	11	1
foot	7	0	6	13	5	3	1	0	12	2

Table 5. NISP element and region counts of specimens identified as cervids

element	pottery cave	1/25a/1	2	3	4	5	6	7	8	9
vert										
sacrum										
rib										
cranium										
mandible										
tooth			4	2					2	
scapula			1							
humerus	1			1		1				
radius	1			3	1				3	2
ulna				1					1	
innominate										
femur										
tibia	1		1							
fibula										
calcaneus									1	
talus				1						
phalanx	1		1	3	2	3	1		2	2
metapodial			5	1	2				4	
longbone										
total	4	0	12	12	5	4	1	0	13	4
region	pottery cave	1/25a/1	2	3	4	5	6	7	8	9
head	0	0	4	2	0	0	0	0	2	0
axial	0	0	0	0	0	0	0	0	0	0
forequarter	2	0	1	5	1	1	0	0	4	2
hindquarter	1	0	1	0	0	0	0	0	0	0
limb	0	0	5	1	2	0	0	0	4	0
foot	1	0	1	4	2	3	1	0	3	2

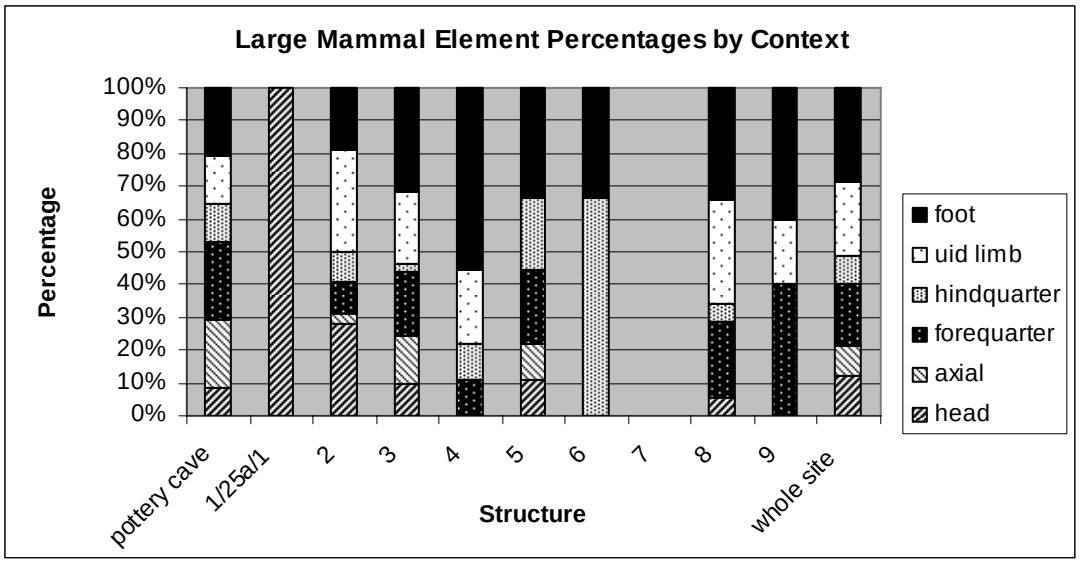

Figure 4. Element percentages by context for all large mammals

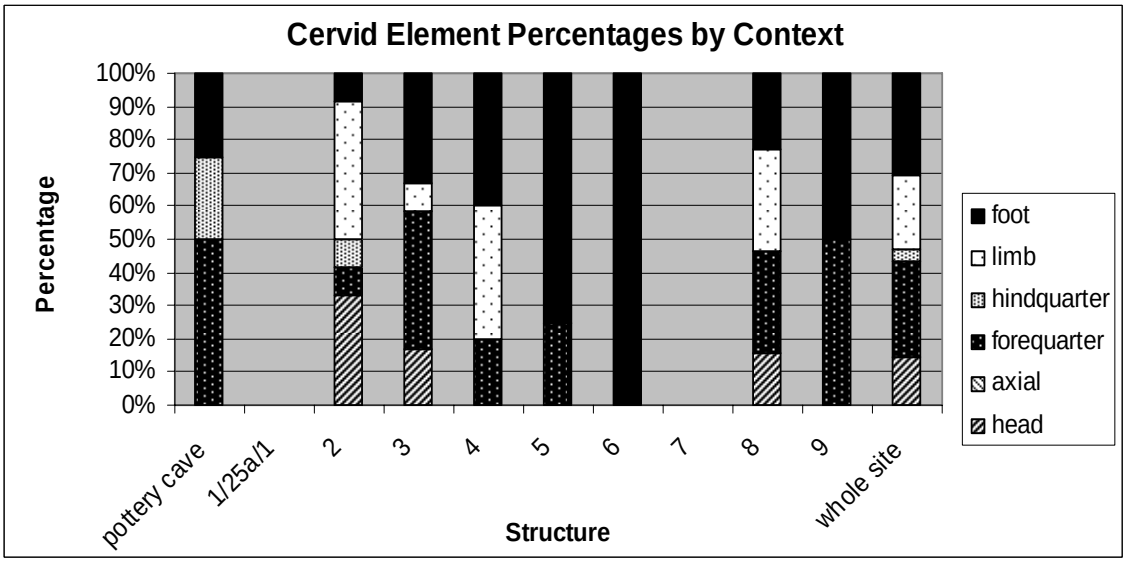

Figure 5. Element percentages by context for cervids

Table 6. Large mammal taxa by area at Laguna de On Island. Column percentages calculated from total number of identified specimens for each area. (from Masson 1999: Table 2)

	Area 1 NISP	% Area	Area 2 NISP	% Area	Area 3 NISP	% Area
Large Mammal:						
Tapir	8	2.5	0	0	0	0
Peccary	14	4.4	2	2.2	0	0
Deer	18	12.5	4	4.3	0	0.0
Large mammal	40	12.5	4	4.3	0	0
Subtotal:		24.9		12.9		3.5
Total	321		93		113	

Table 7. Elements of large game by area at Laguna de On (Masson 1999: Table 3)

			Area 1		*Area 2*		*Area 3*	
			NISP	*% large game*	*NISP*	*% large game*	*NISP*	*% large game*
Large mammal crania/foot elements:								
Deer	Petrosal						1	20.0
	Tooth		2	1.6	1	7.1	2	40.0
	Carpal		2	1.6	1	7.1		
	Phalanx		8	6.6	2	14.3		
	Crania		1	0.8		0.0		
Peccary	Tooth		9	7.4	2	14.3		
	Petrosal		1	0.8				
	Phalanx		3	2.5				
Tapir	Tooth		8	6.6				
Large mammal	Mandible		1	0.8				
	Crania		17	13.9				
	Teeth		2	1.6				
Crocodile crania/foot elements	Crania/teeth		39	32.0	1	7.1		
		subtotal		76.2		50.0		60.0
Large mammal non-crania/foot elements:								
Deer	Radius				1	7.1		
	Diaphysis				1	7.1		
	Vertebra		1	0.8				
	Patella		2	1.6				
	Astragalus		2	1.6				
	Calcaneous						1	20.0
Peccary	Calcaneous		1	0.8				
Large mammal	Diaphysis		20	16.4	4	28.6		
Crocodile non-crania/foot elements	Humerus		1	0.8			1	20.0
	Femur		1	0.8				
	Vertebra		1	0.8	1	7.1		
		subtotal		23.8		50.0		40.0
Total large game elements			122		14		5	

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