

Animal Management, preparation and sacrifice: reconstructing burial 6 at the Moon Pyramid, Teotihuacan, México

Nawa SUGIYAMA

Harvard University, Anthropology Department, Peabody Museum,
11 Divinity Avenue, Cambridge, MA 02138 (USA)
nsugiyam@fas.harvard.edu

Raúl VALADEZ

Gilberto PÉREZ

Bernardo RODRÍGUEZ

Fabiola TORRES

Instituto de Investigaciones Antropológicas,
Universidad Nacional de Autónoma de México. Circuito Exterior,
Ciudad Universitaria, Coyoacán, México, D. F. 04510 (Mexico)
raul_valadez@hotmail.com
gilgertions@yahoo.com.mx
sanber65@hotmail.com
fabiola_torres_estevez@yahoo.com.mx

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ABSTRACT

In 2004 the Moon Pyramid Project uncovered Burial 6, a massive offering cache at the core of the monument located at Teotihuacan's central ceremonial precinct. This dedicatory chamber included the remains of over fifty animals, the majority representing the most dangerous carnivores on the landscape such as eagles, felines (jaguars and pumas), canines (wolves, coyotes and hybrids between wolves and dogs) and rattlesnake. Faced with this extraordinary faunal assemblage, we investigate the dynamic ritual processes which took place during the dedication ceremony. We reconstruct not only the *chaîne opératoire*, the acquisition, preparation, use and deposition of each animal, but also attempt to recreate individual life histories of some of the animals deposited in this burial.

KEY WORDS

Teotihuacan,
Moon Pyramid,
Animal Sacrifice,
Dedication Ritual,
Feline,
Canine,
Eagles,
Serpents.

This type of analysis allows us to appreciate and understand the truly complex types of interactions the Teotihuacanos had with these highly symbolic animals; including the practice of animal management and captivity within the urban center. This study demonstrates the heterogeneity of the animal population interred in the offering chamber, which involved both wild and tamed animals sacrificed alive as well as faunal products manipulated and prepared extensively prior to their deposition. Such a reconstruction of the ritual processes prompts us to question the significance of such a deposit within the context of the arising metropolis at Teotihuacan.

RESUMÉ

Gestion, préparation et sacrifice des animaux de la tombe 6 de la Pyramide de la Lune, Teotihuacan, Mexique.

En 2004, le *Moon Pyramid Project* a entrepris la fouille de la tombe 6, situé au coeur du quartier cérémoniel de Teotihuacan, contenant une large cache d'offrandes. Les restes de plus de cinquante animaux ont été découverts dont certains appartenant à la liste des plus dangereux de la région, tels des félins (jaguars et pumas), des canidés (loups, coyotes et des hybrides entre loups et chiens), des crotales et des aigles. L'étude révèle la diversité des espèces enterrées (animaux sauvages et apprivoisés), sacrifiés vivants, ainsi que la présence de produits animaux traités et préparés avant leur dépôt. Face à cet assemblage exceptionnel, nous nous sommes interrogés sur la dynamique des processus rituels ayant eu lieu lors de la cérémonie de mise en place. Nous avons non seulement reconstruit la chaîne opératoire incluant l'acquisition, la préparation, l'utilisation et le dépôt de chaque animal, mais avons aussi tenté de recréer l'histoire individuelle de certains animaux déposés dans la sépulture. Cette analyse nous a permis d'apprécier les interactions complexes qu'entretiennent les Teotihuacanos avec ces animaux hautement symboliques qui incluaient la gestion de ces animaux et de leur captivité dans le centre urbain et nous invite à nous interroger sur la signification d'un tel dépôt dans le contexte de la métropole grandissante de Teotihuacan.

MOTS CLÉS

Teotihuacan,
Pyramide de la Lune,
sacrifice animal,
rituel de consécration,
félidés,
canidés,
aigles,
serpent.

THE DISCOVERY

In the summer of 2004, the Moon Pyramid Project came upon an extraordinary offering chamber, designated Burial 6, at the corpus of the Moon Pyramid in Teotihuacan, México. This burial cache was built during one of the seven remodeling phases as part of a dedicatory offering placed at the three-dimensional center of Building 4 (Sugiyama and Cabrera Castro 2007). Its contents included an extremely rich assortment of offerings such as large obsidian eccentrics and knives, greenstone artifacts, pyrite

disks, shell accessories, Tlaloc vessels, and other exotic artifacts. The most extraordinary contents of the burial included twelve human sacrificial victims, of which ten were found decapitated, and the remains of over fifty animals. The quantity of fauna associated in Burial 6 is unprecedented in Teotihuacan, and is an extraordinary discovery that outnumbers any faunal offering dating to this period (0-550AD). The only comparative material from Mesoamerica published to date is found dur-

ing the much later Post Classic period where varied and ubiquitous fauna were found in the offerings at the Templo Mayor, the Aztec capital (900-1521AD) (Polaco 1991).

Faced with this extraordinary faunal assemblage, we question what dynamic ritual processes took place during the dedication ceremony. This project not only reconstructs the *chaîne opératoire*, the acquisition, preparation, use and deposition of each animal, but also attempts to recreate individual life histories of some of the animals deposited in this burial. This perspective allows us to reconstruct the types of interactions fauna had with the Teotihuacanos while the animals were alive, how and why the animals were chosen to be deposited within the burial chamber, and the ritual sequence in which these animals played a critical role. This detailed zooarchaeological study highlights the truly complex and varied interactions the Teotihuacanos had with these ritual animals, which lead us to question the implication of such a deposit within the context of the arising metropolis at Teotihuacan.

Three aspects will be discussed in detail for this reconstruction: the species representation, the spatial distribution, and the reconstruction of individual life histories. While the former two analyses help construct a holistic understanding of ritualistic animal use at Teotihuacan, this study focuses on the merit of an in-depth analyses of individual life histories that acknowledges heterogeneity of the animal population. Such a reconstruction allows us to recreate a model of the different pathways the animals would have experienced during their life cycles and postmortem until their deposition into the offering chamber.

THE CONTEXT

Teotihuacan, located some 45km to the northeast of modern Mexico City, was a cosmopolitan center that quickly developed into one of the largest urban cities in Mesoamerica during its occupation. It is estimated that over 100,000 people inhabited the valley covering over 20km (Cowgill 2008; Millon 1981). At the heart of this site was the ceremonial center, organized around a central north-south axis,

the Avenue of the Dead, flanked by three pyramids: the Sun Pyramid, the Feathered Serpent Pyramid (FSP), and the Moon Pyramid.

The Moon Pyramid, located at the northern end of the Avenue of the Dead, is the second largest pyramid at Teotihuacan (Schávelzon 1983). From 1998-2004, the Moon Pyramid Project, directed by Saburo Sugiyama and Ruben Cabrera Castro (2007) has conducted extensive tunnel excavations in the interior of this monument. As a result, they were able to reconstruct the expansion of the pyramid from a small mound structure (Building 1) to the seventh construction which is visible today (Building 7). Associated with Building 4 to 6, the project identified a series of five offering chambers, of which four (Burials 2, 3, 5 and 6) contained faunal remains. This chapter focuses on one of two burials associated with the fourth construction phase, Burial 6.

Burial 6 was built at the three dimensional center of Building 4. The timing of this dedication ritual is important to note, as this structure marked not only a substantial enlargement program within the construction sequence of the Moon Pyramid, but also an important point in the city's growth. Unlike the first three structures that were of a modest size (23.5m² to 31.35m²), Building 4 was built nine times larger in volume than its previous structure (89.2m by 88.9m) reaching a monumental scale. This structure was constructed around AD 250±50 when not only the Moon Pyramid, but the Sun Pyramid and the Ciudadela complex with the FSP, were also completed. Evidence of a mass-sacrificial complex at the FSP, containing more than 200 victims (Sugiyama 2005), contemporaneous to Burials 2 and 6 suggest that there was a city wide materialization effort to promote state ideology (Sugiyama 2011:178). Furthermore, the standard Teotihuacan orientation, fifteen degrees west of true north, had become implemented at a city-wide scale (Sugiyama 2010b).

The reconstruction of Burial 6 helps us understand the truly magnificent character of one of these burials that clearly demarks a new level of state power reached by the Teotihuacan state. They were able to not only build monumental works, but also organized the deposition of highly symbolic and empowered

TABLE 1. — Minimum Number of Individuals (MNI) of the faunal assemblage from Burial 6. Note: This table was created in 2010 prior to completion of zooarchaeological study and the numbers may change.

Taxa	Common Name	MNI	Complete	Prepared	Stomach Cont/ Fill
<i>Canis lupus</i>	Mexican gray wolf	7	-	7	-
<i>C. lupus-familiaris</i>	Hybrid wolf-dog	2	1	1	-
<i>Canis latrans</i>	Coyote	1	-	1	-
<i>Felis sp.</i>	Felid	1	1	-	-
<i>Panthera onca</i>	Jaguar	7	1	6	-
<i>Puma concolor</i>	Puma	7	3	4	-
<i>Aquila chrysaetos</i>	Golden eagle	18	9	9	-
<i>Crotalus sp.</i>	Rattlesnake	1	1	-	-
<i>Sylvilagus sp.</i>	Cottontail	1	-	-	1
<i>Sylvilagus floridanus</i>	Eastern cottontail	1	-	-	1
<i>Sylvilagus audubonii</i>	Desert cottontail	3	-	-	3
<i>Columbina inca</i>	Inca dove	1	-	-	1
<i>Sciurus auereogaster</i>	Mexican gray squirrel	1	-	-	1
<i>Colinus virginianus</i>	Bobwhite quail	2	-	-	2
Non-ID bird		3	-	-	3
Non-ID mammal		2	-	-	2
TOTAL		58	16	28	14

animals in these burials, a feat that required a very profound understanding of and interaction with the animals involved in these rituals.

SPECIES REPRESENTATION

There is a high degree of homogeneity in the species included in Burial 6 (Table 1). This contrasts greatly with the materials analyzed from the Templo Mayor that report a highly diverse faunal assemblage of local and non-local species brought from marine, freshwater, tropical, and arid climates such as marine and freshwater fish, crocodiles, sting rays, and aquatic and tropical birds (López Luján 2005; Polaco 1991). The species representation is similar to the other three burials excavated from the Moon Pyramid, where the majority of animals, particularly those interred complete, are represented by select few species: canines (wolves, coyote and hybrids between dogs and wolves), felines (pumas and jaguars), eagles, and serpents (rattlesnake) (Polaco 2004; Sugiyama *et al.* in press). These taxa represent the wild carnivores that dominated the landscape and their status as top predators no doubt added to their symbolic value. Other microfauna associated in this offering chamber include small game probably mixed in the fill and microfauna found within the stomach contents of some of the sacrificed carnivores.

Low species diversity suggests the Teotihuacan state dominated the use of these specialized species associated with state-level ritualized activities in Teotihuacan. Zooarchaeological evidence from apartment compounds support this hypothesis, as the fauna identified in state-level burial complexes were rarely found in domestic contexts, where a more varied assemblage of herbivore and avian species were identified. (Rodríguez Galicia 2006; Starbuck 1987; Valadez Azúa 1992).

The iconographic evidence also suggests there was a strong association between the carnivores deposited in burial caches, and symbolism of state militarism, warfare, ritual sacrifice and power. Depictions of felids dominate the Teotihuacan iconographic repertoire, as large clawed pumas and jaguars wear headdresses and march in militaristic attire (e.g. Berrin 1988; de la Fuente 2006; Miller 1973). In the Atetelco apartment compound at Teotihuacan, canid warriors march in procession dressed in militaristic attire, while other mural paintings from other residential zones depict canids walking with a large obsidian sacrificial knife besides them (Fig. 1A) (Cabrera Castro 2006; Millon 1988a). Raptors, which are argued to possibly represent eagles, are depicted in procession in a vessel found near Calpulalpan, Tlaxcala (Millon 1988b: Figure V.14), while an anthropomorphic

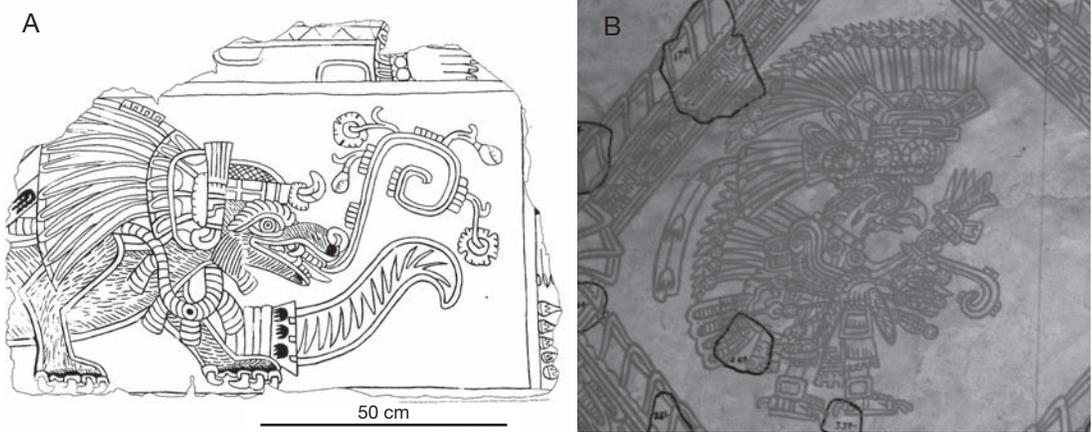


FIG. 1. — Iconographic representations of: **A**, close up of a canid depicted in mural painting “Coyote with Sacrificial Knife” probably from Techinantitla (taken from Millon 1988b: Figure V.12, tracing by S. Sugiyama); **B**, eagle from Atetelco apartment compound (photo taken by N. Sugiyama).

raptor is depicted walking with military regalia in the Atetelco apartment compound (Fig. 1B) (Cabrera Castro 2006: Figure 18.8). Serpents, such as the feathered serpent deity (Quetzalcoatl), are dominant figures not only in Teotihuacan, but all over Mesoamerica. Feathered rattlesnakes meander through many of the principle facades of pyramids as exemplified by the FSP in the Ciudadela Complex at Teotihuacan. The close parallel recorded between the animals depicted in Teotihuacan art and those identified in the burial complexes suggest that these carnivores were selected species within the Teotihuacan symbolic repertoire, and were thus chosen to participate in the offerings as central icons.

SPATIAL DISTRIBUTION

Burial complexes were arenas where the Teotihuacanos expressed their cosmos through elaborate state-level rituals, and the dedicatory offerings are the material traces of such acts. Thus the offertory remains must be examined in detail as each item was placed carefully in a planned and symbolic manner. Particularly striking in Burial 6 was the extreme care in which individual animals were placed in groupings, despite the fact

that many of these animals must have been alive during their internment (Fig. 2). This greatly contrasted the heap of human skeletal remains concentrated in the northern area of the burial. It is obvious that the careful placement of the faunal materials was crucial to orient the ritual enclosure.

There were three types of deposition among the animals found in this burial: 1) animals deposited complete, often with their extremities tied suggesting they were buried alive; 2) fauna prepared postmortem, represented only by the skull and sometimes its claws, probably because the soft tissue and pelts were extracted; and 3) individuals found semi-complete that were prepared postmortem, possibly composed by a taxidermist. Zooarchaeological signatures of every deposition type will be examined in continuation, but here we highlight the spatial organization of different species and their preparation methods.

Nine groupings of animals can be identified, each group represented by one or two canids, one or two felids, and two eagles (Fig. 2). There are variations in these groupings: a group may be represented by one skull and one complete individual, two skulls or two complete individuals. These groupings are distributed at cardinal

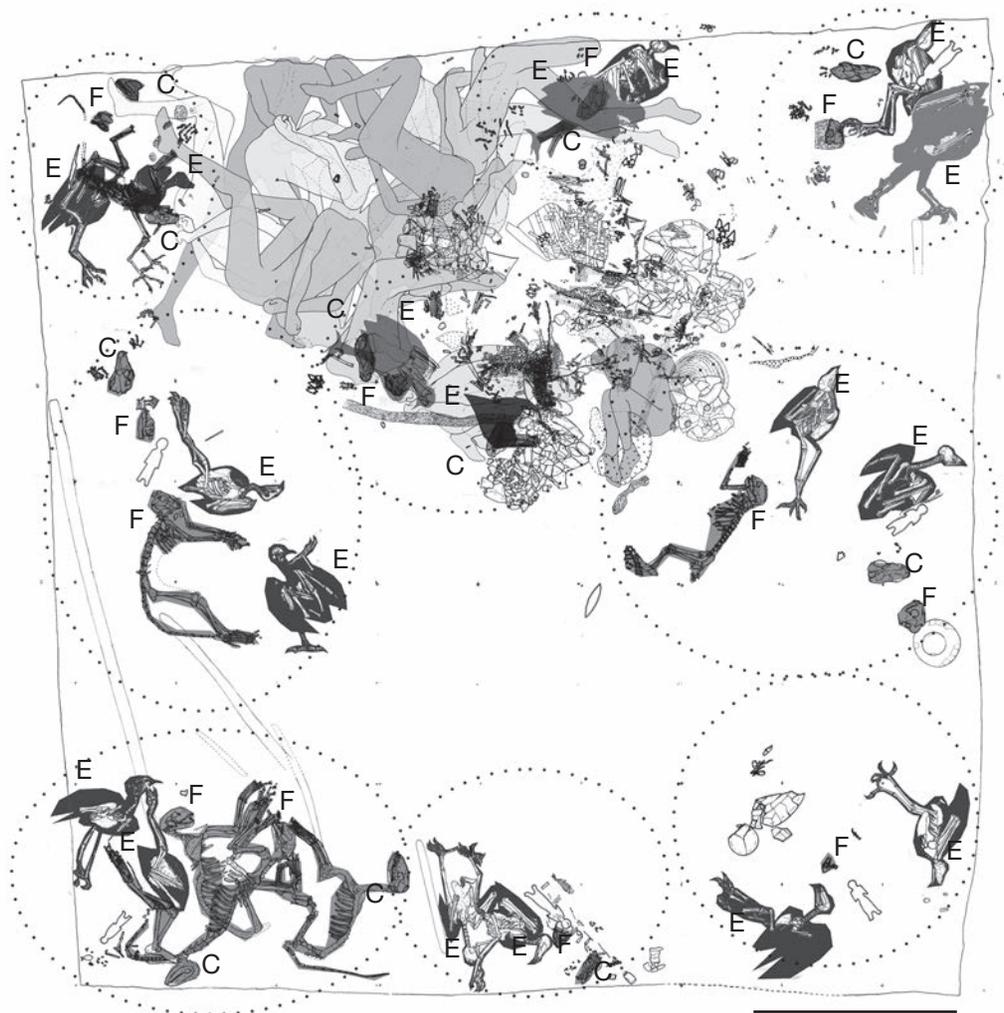


FIG. 2. — Plan view drawing of Burial 6. Each dotted circle shows a grouping within the burial complex, these groupings are distributed in cardinal and intercardinal directions and at the center of the dedicatory cache. Abbreviations: E, eagles; F, felids; C, canids. Burial Scale bar: 1 m.

and inter-cardinal directions and at the axis of this burial. This alludes to foresight and planning involved and indicates that the number of animals sacrificed was likely predetermined by the need for a symmetrical and patterned deposition.

Repeated emphasis on cosmologically significant number of animals placed in a specific orientation exemplify the extensive planning and preparation required. For example, there was a close parallel in

the placement of paired eagles and that of sacrificial knives which were also found in pairs at cardinal and intercardinal directions (Fig.2). It is no coincidence that both of these items totaled eighteen objects/individuals, a highly symbolic number within Mesoamerica's calendric cycle (Sugiyama 2010a, b). The numerical and spatial importance of the eagles from this burial cache required exactly eighteen eagles to be deposited carefully in a highly symbolic layout.

LIFE HISTORIES OF ANIMALS FROM BURIAL 6

Detailed zooarchaeological investigation of the animals deposited in Burial 6 resulted in a very fruitful reconstruction of individual life histories of the fauna that participated in these offering rituals. Previous researchers have investigated life histories of ancient humans ((e.g. Torres-Rouff and Knudson 2007), but the use of such reconstructions among zooarchaeological remains are still uncommon, mainly because it is very difficult to find the combination of sufficient preservation, complete individuals, and the presence of detailed archaeological contextual control for such reconstructions. The materials from Burial 6 were unique in providing all of these qualities on various individuals, which allowed us to reconstruct life histories of some of the better preserved individuals.

Four phases have been investigated during the lifetime of the animal until their deposition into the burial chamber; 1) acquisition, 2) management, 3) preparation, and 4) sacrifice and/or deposition. First we will provide examples of the level of detail attained from each of these phases using eagles, canids/felids and serpents as examples, and then we will discuss the different pathways the animals underwent prior to their deposition. Such a detailed reconstruction has resulted in identifying the in-depth interactions that occurred between the Teotihuacanos and the symbolic fauna utilized in these rituals, as some of the animals deposited in the burial exhibit evidence of being kept in captivity in an artificial environment.

Such a discovery is unique in Teotihuacan, and is unprecedented in any other context in Mesoamerica during this period. Only historical sources confirm the presence of animal keeping during the later Aztec occupation at Tenochtitlan (Blanco *et al.* 2009; Nicholson 1955), and only recently has this been suggested by zooarchaeological evidence obtained from remains of golden eagles excavated from offering chambers at the Templo Mayor (Quezada Ramírez *et al.* 2010). The discovery of the fauna from the burials at the Moon Pyramid illustrates the antiquity of such a practice and, at the same time, suggests there was continuity in some of the preparation methods discussed below.

EAGLES

The golden eagle was the most ubiquitous species represented in Burial 6, totaling eighteen individuals, which allowed us to examine in detail the heterogeneity in the population represented in one burial. While a first rough sort of the eagles from this burial seemed to indicate almost all of them were complete individuals, detailed zooarchaeological analysis demonstrated that there are two types of deposition: those deposited complete with their extremities tied, suggesting these individuals were sacrificed alive during the offering ritual, and those deposited with zooarchaeological indicators of post-mortem preparation. Within the former category, we discuss the presence of individuals that had varying levels of interaction with the Teotihuacanos, including individuals that were captured in preparation to the ritual as chicks and raised within the urban center, and individuals that present no zooarchaeological indicators of being kept in confinement. On the other hand, individuals with markers of postmortem preparation allude to the production of ritual paraphernalia; either extracting feathers, meat or both, or through what we suggest to be evidence of taxidermy. Through utilizing comparative materials, both modern and archaeological, we closely examine the zooarchaeological indicators of each of these preparation methods.

COMPLETE INDIVIDUALS

Complete individuals (n=9) were deposited carefully in a symbolic layout with their extremities bound. Five of these individuals exhibit pathologies that indicate they may have been kept in captivity for prolonged periods. For example, three of the eighteen eagles present bone deformation of the tarsometatarsus, one of the leg bones (Fig. 3). This pathology was always present along the medial shaft of the bone. The degree of deformation varied, sometimes causing lipping along an irregular surface. We hypothesize such pathologies were the result of being tethered to a leather rope or other restrictive devices on their legs for extended periods, causing an infection that can be detected in the zooarchaeological record.

American kestrels (*Falco sparverius*) have been recorded to have presented “traumatic slough-

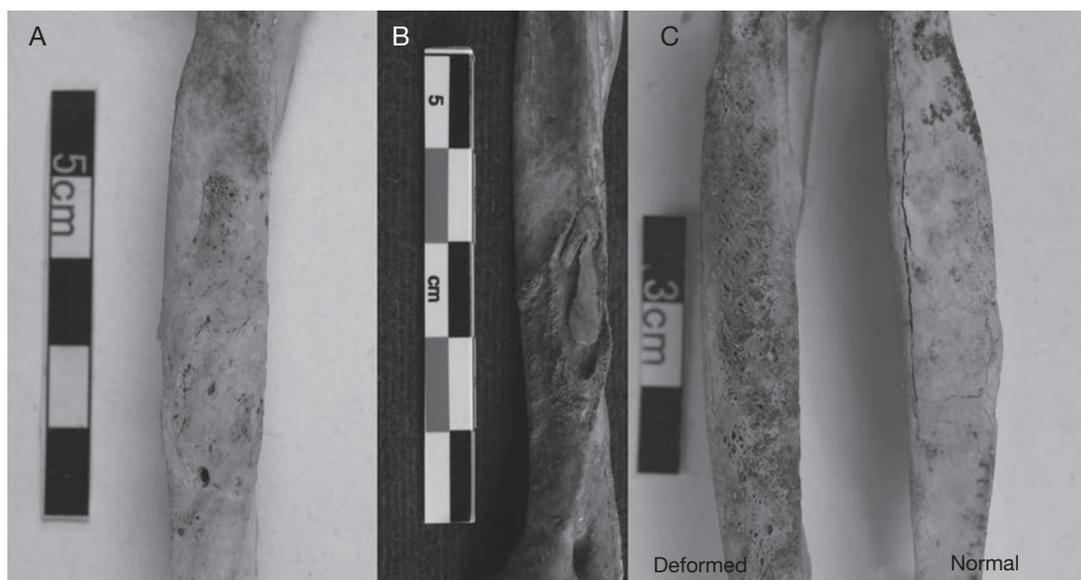


FIG. 3. — Eagle tarsometatarsus bones with pathological deformation: **A**, Element 2069 left side; **B**, Element 2246 right side; **C**, Element 1961 right side.

ing of the epidermal scales on the legs” (Brisbin and Wagner 1970:29) when fitted with standard jesses, supporting this hypotheses. It is interesting to note that these jesses on screech owls (*Otus asio*) also caused the removal of feathers from the legs (Brisbin and Wagner 1970:29), a feature that is present on golden eagles that may have added to the irritation and infection of the bone. While the authors describe that other raptors, such as the red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*) and barn owl (*Tyto alba*) do not present such sensitivity to the restrictive device, there is no zoological literature that discusses the effects on the golden eagle, and even less information is available concerning fitted chicks.

Two of the eagles that present pathologies on their tarsometatarsus contained bones inside of their stomach contents, which demonstrated that these eagles consumed a rabbit immediately prior to their sacrifice. Element 1961 ingested parts of a desert cottontail (*Sylvilagus audubonii*), including portions of the flanges, metacarpus, ulna, humerus, vertebral column and vertebral fragments and even parts of the skull. Element 2069 consumed an east-

ern cottontail (*Sylvilagus floridanus*), represented by parts of the femur, tibia, metatarsus, and pelvis. During the analysis of these stomach contents, it was noted that the bones had a different texture and discoloration, as if they had been boiled prior to consumption. While it is difficult to discard other taphonomic processes that may have affected these bones resulting in their distinct appearance, it is interesting to note the possible evidence for artificial feeding of rabbits to these raptors. As we will discuss in more detail below, such evidence for ritual feeding, particularly of cooked aliments, prior to sacrifice was also recorded among felids from Burial 6.

Ethnographic and ethnohistoric evidence support the hypothesis that eagles were caught as chicks and maintained within an artificial environment. Modern Hopi and Zuni ethnographic accounts describe the continued use of eagles for sacrifice (McKusick 2001:Fig. 25). Historical accounts from the colonial period in Mexico record the method used to catch eagles as chicks from their nests. A hunter would climb along cliffs where eagles nest with a basket or palm-leaf on his head. This causes

the adult eagle to grab the basket when attacking the intruder, leaving the hunter to safely grab the chicks from the nest (Sahagún 1979: Book 11, 42). These chicks were probably brought into captivity to be raised in what was known as “Moctezuma’s house of birds” named *totocalli*, where eagles, as well as many wild and exotic birds were kept under confinement in the Aztec capital (Blanco *et al.* 2009; Nicholson 1955; Sahagún 1979: Book 8, 45).

Several archaeological sites have presented architectural features interpreted as bird cages. Among the most convincing are the abundant evidence of turkey and macaw pens and faunal remains from the site of Paquimé (ca. 1200-1450 AD) in the state of Chihuahua, Mexico (Di Peso 1974). Archaeological evidence confirms the presence of hundreds of macaw remains and stable isotope analysis of their bones indicated a high degree of maize consumption, suggesting the long-term care, management, and likely breeding of these tropical parrots (Somerville *et al.* 2010). While it is unknown where the animals were housed and if they were bred within the ancient metropolis, the present zooarchaeological evidence from the burial suggests that eagles were kept in captivity by the Classic period even though it may have still been in the initial stages of experimentation.

While we focused on the evidence of some individuals that were kept in captivity, it is equally important to note the heterogeneity present among the eagle population in Burial 6. Along with individuals that display pathological indicators of captivity, four do not exhibit any surface modifications, while non-fatal cutmarks were recorded on one individual. This eagle (Element 1962) contained cutmarks on the distal articular surface of both tibiotarsus (Fig. 4). If these cuts were placed to obtain meat or tarsi feathers, we would expect the cutmarks to be present along the shaft. Thus these cuts could not have been intended to extract feathers or meat, but rather they were probably inflicted to cut the tendons and ligaments attached in this area, paralyzing the raptor’s feet and claws, which are the most dangerous elements of a bird of this size. This would have facilitated handling the eagle tremendously, particularly if it was wild and not accustomed to human manipulation.

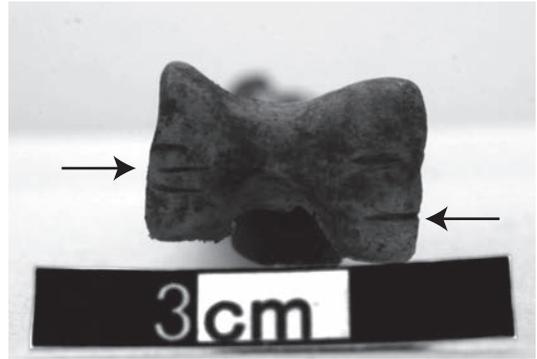


FIG. 4. — Cutmarks on the distal articular surface of the tibiotarsus of an eagle, Element 1962.

PREPARED INDIVIDUALS

The second category of eagles interred in Burial 6 were those with postmortem manipulation. Most of the eagles at first sight seemed complete, but some of them had surface modifications (n=6), such as cut marks or perforations, or lacked anatomical elements demonstrating extensive preparation methods took place prior to their internment. We consult two comparative sources, a modern comparative specimen prepared by a taxidermist and an archaeological sample from the later occupation at the Templo Mayor, to argue that taxidermic preparation methods may have also existed at Teotihuacan.

A modern eagle with taxidermal preparation was analyzed from the comparative collection at the Paleozoological Laboratory in the Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México. Careful attention was given to the localization and type of surface modification and differences in the element distribution. Surface modifications on the comparative sample was present throughout the skeleton, including transversal cuts along the occipital region of the skull and the ends of the mandible, cutmarks on the articular surfaces of the ulna (both sides) and fibula (right), and perforations on the humerus (right), tibiotarsus (right) and skull (Fig. 5). Various elements were absent in this skeleton: the axial skeleton (vertebrae, keel, and synsacrum), the ribs, the shoulder girdle, and part of the hindlimbs (femur). These elements were most likely removed when extracting the internal organs,

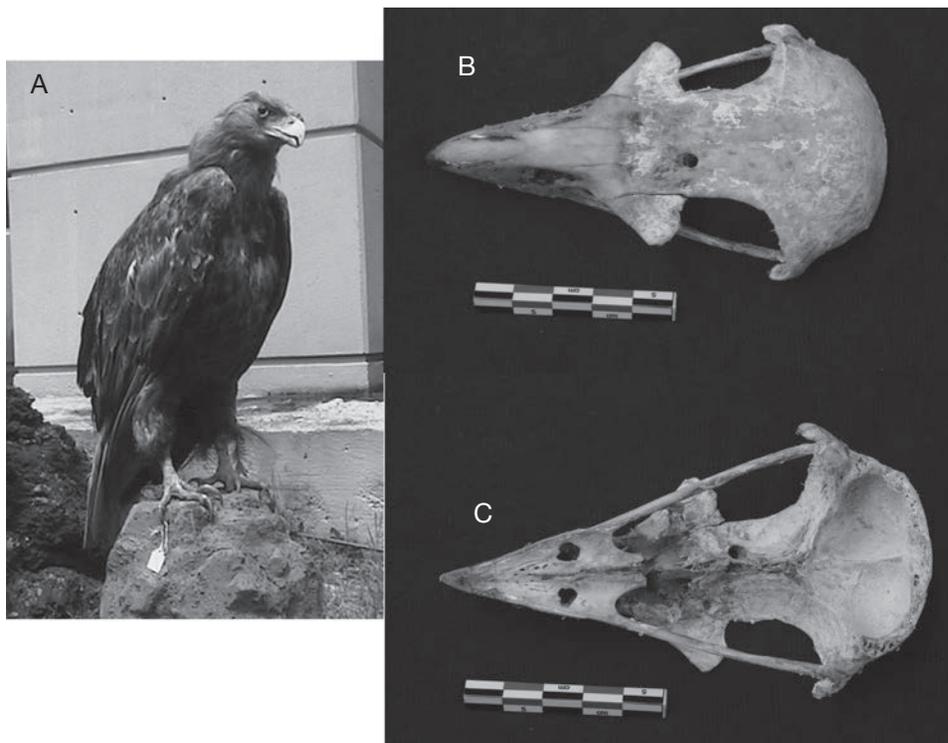


FIG. 5. — **A**, Modern taxidermically prepared specimen; **B** and **C**, surface modifications on the skull.

later stuffing the internal cavity, leaving the skull, wings, and part of the hind limbs intact.

These markers were compared to an archaeological example from Burial 6, Element 2193, deposited on the northeastern corner of the offering chamber. After cleaning, piecing, and restoring the skeleton it became obvious that this individual had undergone extensive postmortem preparation. Only the beak and frontal portions of the skull were present. Several elements presented cutmarks (mandible, radius) and many were lacking, including many of the bones absent on the comparative eagle (Fig. 6). Utilizing the same method of analysis, recording in detail the distribution of elements on skeletal templates, we were able to observe close parallels in the element distribution and surface modifications of these two individuals (Fig. 7). While there were variations in the extent of preparation between the modern and prehispanic sample, it is evident that both preparation techniques required the extraction of the axial

skeleton, the ribs, the shoulder girdle, and part of the hind limb (either only the femur or the femur, the tibiotarsus and the fibula). The internal tissue and the cerebral organs were discarded, the latter through cutting along the occipital region (comparative sample) or removing the entire brain case (archaeological sample).

A zooarchaeological investigation of golden eagle skeletons from the Templo Mayor, the later Aztec capital, support this hypothesis. Quezada Ramírez *et al.* (2010) argue these raptors demonstrated taxidermal preparation techniques. They described many of the features also observed on the Teotihuacan material and even on the modern example, which include the extraction of various axial elements and the removal of the encephalic organs from the brain case. There are some variations in the preparation methods from Templo Mayor, such as the retention of the pygostyle (tail bone) where the tail feathers would attach, how the brain tissue was extracted (sometimes through



FIG. 6. — Anatomical elements present on an eagle, Element 2193.

expanding the foramen magnum), and the retention of the complete hind limb. However, they note that there are five types of preparation methods within the Templo Mayor samples, suggesting that some of these differences may be variations of the same practice. Nonetheless, it is intriguing to observe the overall continuity present in the preparation methods for more than 1000 years from Teotihuacan to Aztec archaeological samples, and even the resemblance of both to modern taxidermic preparation methods.

Other individuals, such as Element 2246, suggested that animals kept in captivity were prepared post-mortem. Both pathological indicators and fatal cutmarks were inflicted on this individual (Fig. 8A, B). This individual represents the truly complex relationship the animal had with the Teotihuacanos as it moved from a natural, to artificial environment, and even after death was manipulated extensively prior to deposition. Although most of the skeleton was present and seemed like a primary deposit, the

Teotihuacanos supplemented live sacrificed eagles with secondary deposits, most likely to accumulate all eighteen eagles necessary for the ritual event.

CANIDS AND FELIDS

Similar to the eagle remains, many of the canid and felid materials were composed of an equally complex heterogeneous population of animals that participated in the dedication ritual. There were two types of deposition among mammals; complete individuals bound and buried alive, or individuals prepared postmortem, in this case leaving only the skull and sometimes the claws in the offering. Unfortunately the extremely deteriorated state of the bones did not permit gathering data on many of the individuals. However, we concentrated on those with sufficient preservation that allowed us to reconstruct their life histories.

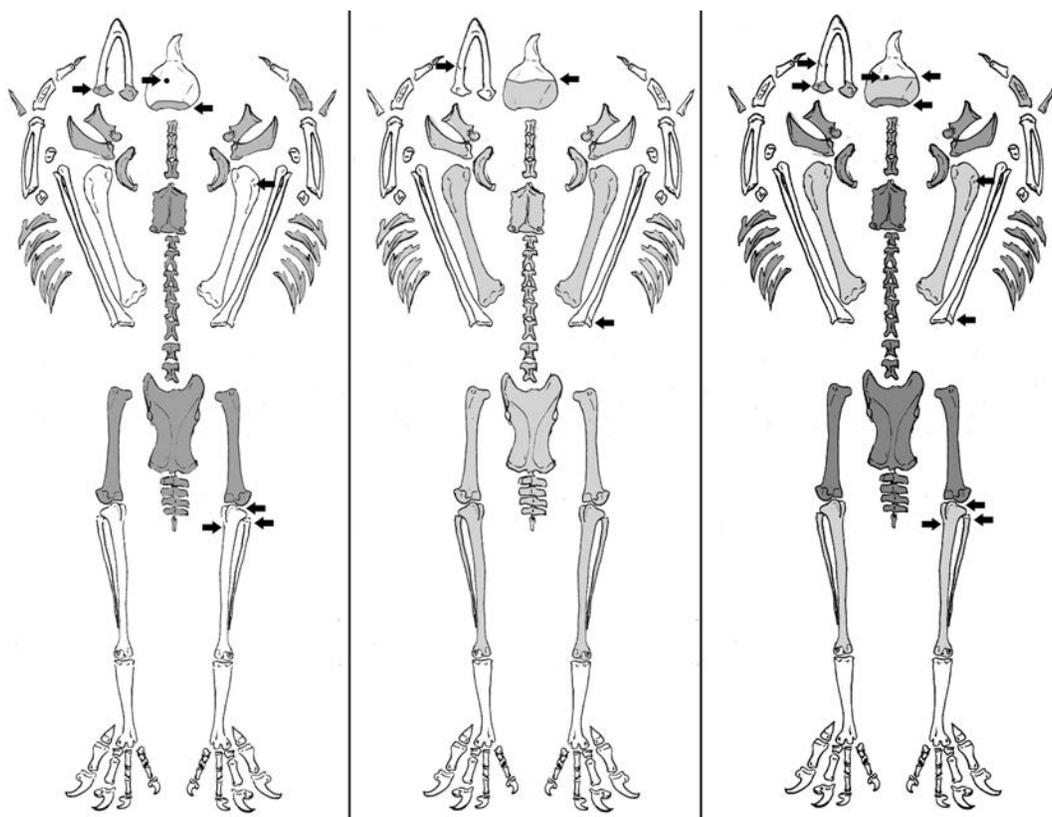


FIG. 7. — Comparisons of the element distribution (grey=absent) and surface modifications (black arrow) present on the modern and archaeological sample: **A**, modern comparative sample; **B**, Element 2193; **C**, overlap of the two templates, areas in dark grey indicate where the element in both the comparative and archaeological sample were absent.

COMPLETE INDIVIDUALS

Unfortunately the only complete canid was badly preserved inhibiting analysis of its surface modification. Only the species, age and sex identification was gathered based on its skull morphology, while the rest of the skeleton remained in its original soil matrix. On the other hand, we were able to extract some detailed information from various complete felids. Both pumas ($n=2$) and a jaguar ($n=1$) were found complete (one identified only to *Felis sp.*). One puma in particular contained conclusive evidence of being in confinement for a prolonged period of time. Element 1818 was a female puma around a year and half old that was interred in the western area of Burial 6. This individual was found well preserved, with all bones intact and with the extremities bound (Fig. 9A). This puma was most

likely caught alive, and based on the abundant pathological evidence, probably resided within the city for an extended duration. It experienced a blow along the nuchal crest (Fig. 9B), and the right femoral head was injured, in fact probably cut off as it was absent (Fig. 9C), causing extreme deformation on the corresponding acetabulum (Fig. 9D). Both of these injuries may have occurred during capture or confinement, as it was not an easy feat to capture and maintain a beast of this size. The loss of the femoral head was particularly noteworthy as such a lesion would have restricted the movement of the animal significantly, making it unable to hunt in the wild. Signs of remodeling around the remaining femoral shaft suggest the animal survived what would be a fatal wound in the wild, probably because it was placed in an artificial environment.

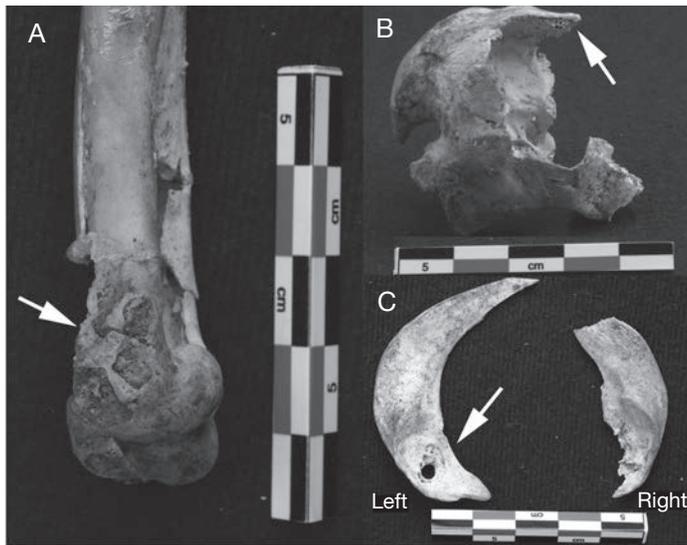


FIG. 8. — Element 2246: **A**, pathology on the distal humeri, **B**, breakage along the occipital region of the cranium; **C**, perforation on the left coracoids bone.

This puma was most likely confined within a wooden cage or some sort of restrictive device, upon which it gnawed extensively with its frontal teeth, leaving the canines and incisors extensively worn to the degree that the first and second incisors are completely absent. These injuries suggest that by the time the animal was taken to the ritual event, it must have been tamed. Immediately prior to the sacrifice, this puma consumed two baby desert cottontails (*Sylvilagus audubonii*), one of which was burned. The burnt remains demonstrate artificial feeding practices, as they were cooked ailments prepared by the Teotihuacanos and fed to the puma as its last meal prior to sacrifice. Lastly, this animal met its death by having its extremities bound and sacrificed.

While this individual illustrated various indications of being in an artificial environment, other complete felids showed no pathologies or other surface modifications that demonstrated signs of manipulation prior to sacrifice. Again, this supports the hypothesis that not all of the individuals were tamed within the city and that there was a mixture of wild, freshly caught carnivores as well as some that had some precedence within Teotihuacan.

PREPARED INDIVIDUALS

Many of the canids (n=9) and felids (n=10) were deposited as prepared skulls, some of which included its paws (phalanges and claws), possibly utilized after the removal of their pelts. Two felids were also found to be incomplete, but unlike the prepared heads, they were represented by a mixture of anatomical elements. Schematic templates record the presence/absence of cranial parts and the distribution of surface modifications. Comparative analyses demonstrated the overall similarities between canid and felid preparation methods. Overall, many of the mammalian fauna were cut along the edge of the occipital region, particularly along the nuchal crest to extract the cerebral organs. There was some variations in the extent to which the braincase was removed: some skulls were cut along the frontal bone, removing the entire braincase and leaving only the snout in place. Nonetheless, most preferred cutting only along the nuchal crest or slightly higher along the parietal bones (Fig. 10).

The distribution of cutmarks also followed an overall pattern, mostly found along the zygomatic region, several along the frontal bone around the orbits, and the paracondylar process on the skull.

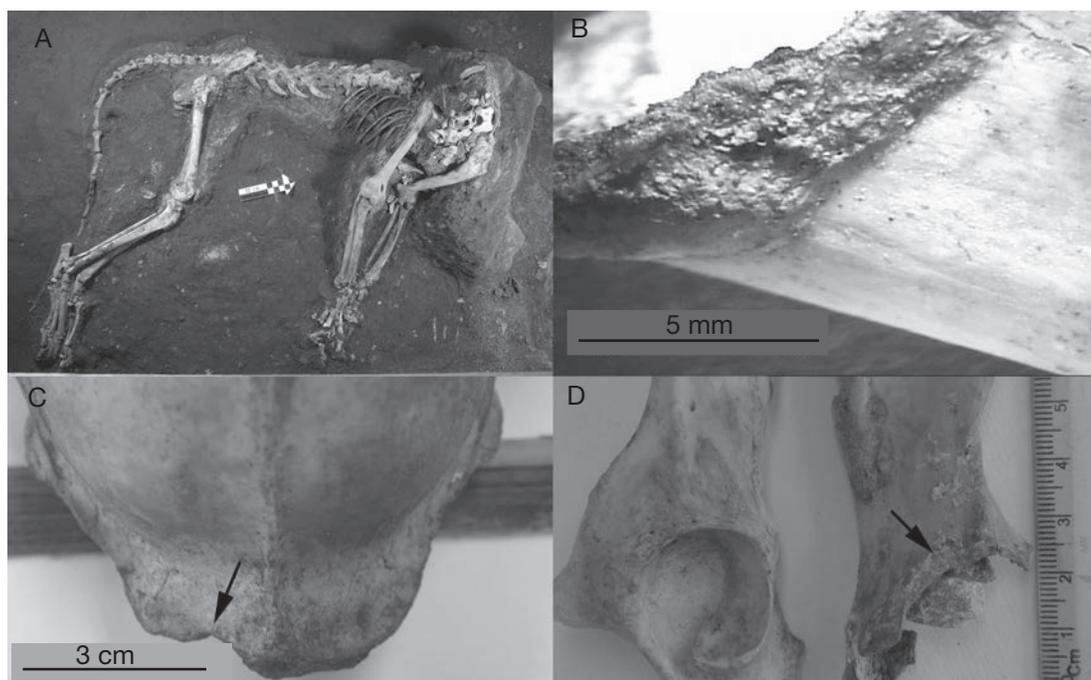


FIG. 9. — Element 1818: **A**, *in situ* in Burial 6; **B**, deformed right femoral shaft; **C**, head injury along the nuchal crest; **D**, right innominate with deformed acetabulum.

On the mandible cutmarks were identified along the coronoid process, angular process and the inferior shaft. All these cutmarks were placed in areas where the pelt of the animal lies closest to the bone. The distribution of cutmarks suggests that pelts were extracted from these skulls prior to their deposition, as these cuts were likely inflicted while scraping it off. Even some of the phalangeal bones where the skin is most difficult to remove between these small elements presented cutmarks, again confirming that the skin was most likely extracted to manufacture pelt products.

Historically, pelts were used to craft high status items, used to adorn powerful rulers, warriors and shamans, and were traded in large quantities (Código Mendoza 1992). Jaguar and eagle warriors who fought in battle dressed in jaguar and eagle regalia, were considered to be the bravest of warriors (Aguilera 1985:63; Careta 2001; de la Garza 1995:62-74). Pelt products are depicted in

many parts of Mesoamerica, utilized as symbols of power, adorning the highest elites and were placed on the throne of the king (Sahagún 1979: Book 8). It is no surprise that such pelts would be extracted prior to the deposition of these cranial elements, as they were highly regarded ritual and prestige goods. Analysis of the faunal materials from Burial 6 provides clear zooarchaeological evidence for the antiquity of extraction and preparation of pelts dating to the Classic period.

SERPENTS

Analysis of the serpentine material from Burial 6 has not been concluded at this point, limiting our interpretation. All we can say is that at least one rattlesnake was deposited within the interior of a closed basket near the center of the offering chamber (Fig. 11). The rattlesnake vertebrae were discovered when

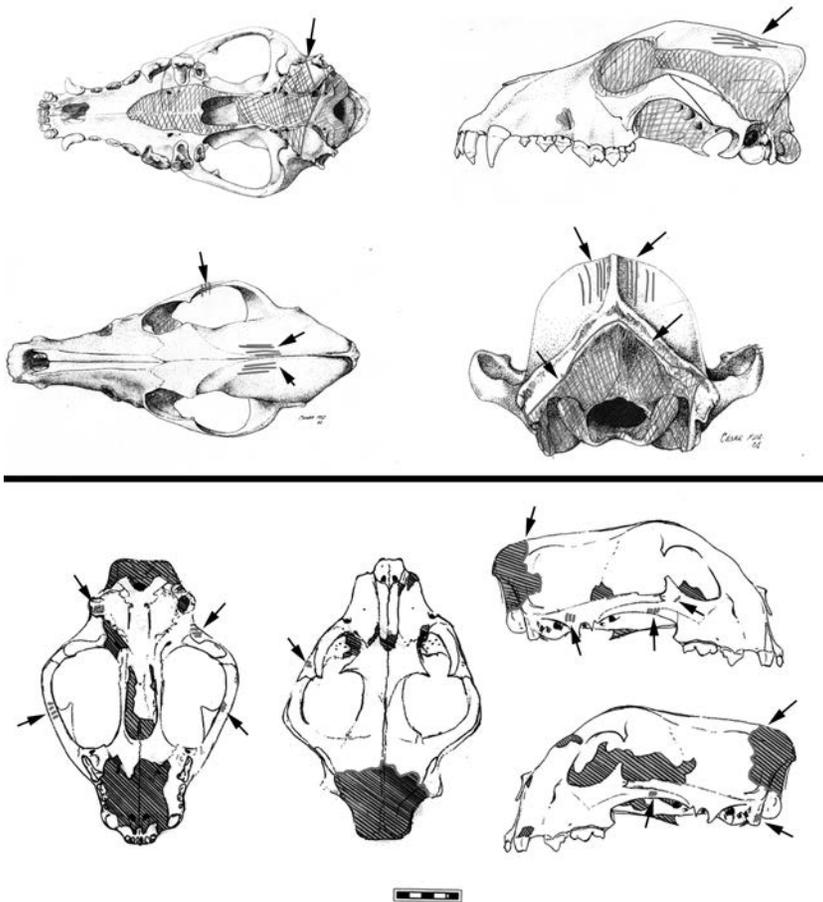


FIG. 10. — Canid and felid skull preparation methods: **A**, Element 2194 female wolf 1-2 years old; **B**, Element 1960 jaguar infant.

paleobotanists were removing a sample of the organic basket residue from a block that was removed during excavations. The complete rattlesnake has yet to be extracted from the basket. Nonetheless, the presence of a serpent, most likely complete and trapped in this basket is interesting to note within the scope of the other zooarchaeological indicators that demonstrated the practice of mammalian and avian fauna keeping in Teotihuacan. Such a discovery brings to question the possibility of rattlesnake confinement. Certainly, ethno-historic evidence records the presence of rattlesnakes in Moctezuma's house of animals, where they were kept in large pottery jars (Nicholson 1955:6). It is possible that the same practice may have existed since the Teotihuacan occupation, more than 1000

years prior to historical records and further analysis of the serpentine material can shed light on this intriguing possibility.

RECONSTRUCTING BURIAL 6

Detailed zooarchaeological analyses of the faunal materials from Burial 6 has allowed us to reconstruct the ritual processes and the life histories of the carnivores; from their acquisition, management, and preparation, to their sacrifice and/or deposition. Figure 12 illustrates a model of the variations in the processes experienced by these carnivores. This figure shows not only the different stages and actions of



FIG. 11. — Photograph of basket excavated as a block from Burial 6. Arrow indicates the concentration of serpentine remains.

the animals, but the different zooarchaeological and archaeological indicators that help us reconstruct each of these stages.

As there is still no evidence of animal breeding in the city, we assume they were captured/hunted from a wild population. Thus, wild animals chosen to be utilized because they were powerful symbols of the arising Teotihuacan state were either captured or hunted from the wild during the first stage of the model. Most likely animals were seized when they were young, which facilitates taming and manipulation of some of the most dangerous carnivores present in Mesoamerica. In some instances, such as the puma described above (Element 1818), the animal may have been injured during its capture such as a blow to the head or fracture/loss of bony elements. Wild animals may have been acquired immediately prior to the ritual, in which case the animal would have been transported to the ritual alive relatively quickly, or in anticipation to a ritual. In the latter case, the animal would undergo a period of captivity within the city's limits, the second stage in the reconstruction.

Various methods of captivity were practiced for each animal; the raptors were probably kept in the residence by being tethered, the mammals were

possibly kept in wooden cages or other restricted spaces, while the serpents may have been kept in baskets or jars. Artificial confinement experienced by the animal would result in dietary and physical restraints that cause some of the pathologies described here. Some examples include injuries/diseases inflicted to ease manipulation, abnormal behaviors such as extensive gnawing, and the consumption of cooked aliments.

Ideally, animals kept in captivity would be transported alive to the ritual event, but at times, such as described above for the eagle Element 2246, there may have been occasional death of the animal during confinement, in which case the individual was prepared and deposited secondarily into the offering chamber. Zooarchaeologically, in such cases, we find evidence of several pathologies resulting from being in an artificial environment and, on the same individual, surface modifications resulting from the preparation procedures.

Hunted animals also underwent the same preparation procedures, which included the removal of soft tissue from the brain case and the extraction of the pelt or feathers. Among the raptors we see evidence of taxidermic preparation, in which case such practices are recorded through changes in the

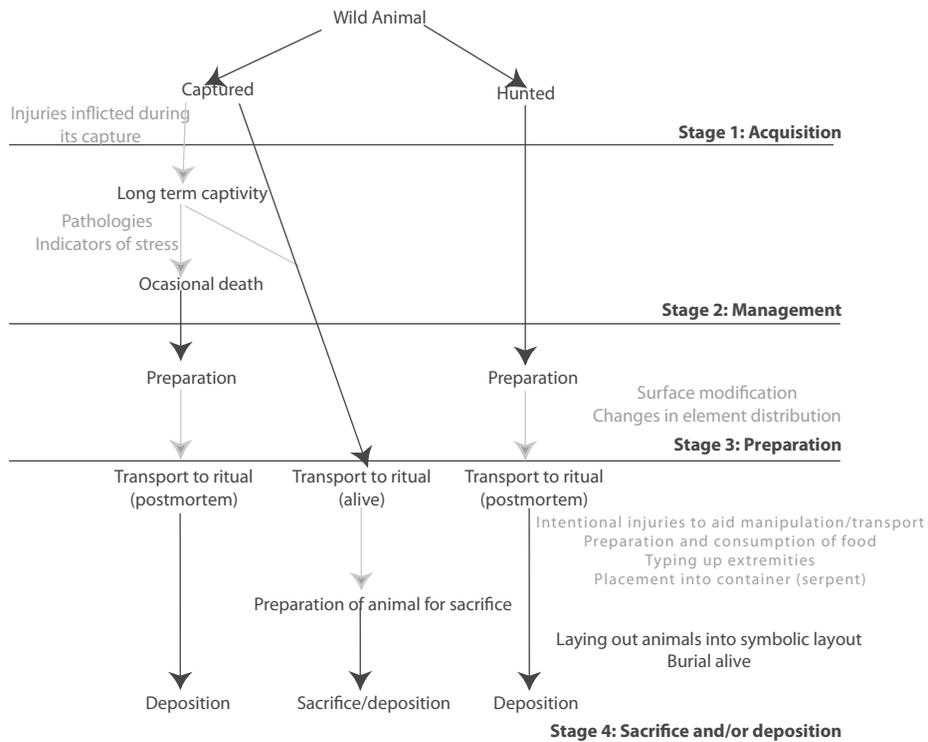


FIG. 12. — Model of the life histories of the animals interred in Burial 6 divided into four stages; acquisition, management, preparation and sacrifice and/or deposition. Arrows and letters in grey indicate the zooarchaeological and archaeological indicators of these processes.

surface modification and element distribution. In such a scenario, it may not have been obvious to the audience on the day of the ritual which individuals were alive versus which eagles were prepared taxidermically.

During the final stage of the ritual procedure fauna were transported either dead, as in the case of the prepared individuals, while others were transported alive. Some of the live individuals may have been injured by cutting ligaments to paralyze the animal, thus facilitating transportation of such wild beasts to the ritual event. A few of these sacrificial victims were fed their final meal prior to their deposition, some of which may have been cooked. Rabbits seem to have been the meal of choice among these carnivores. Finally, their extremities were bound and the animals were placed in their specific location to be sacrificed. Both prepared and live animals were deposited

in a very symbolic layout along with other offering goods. To this point, we have no evidence of a specific fatal wound that could indicate the manner in which the animals met their fate. However, the presence of coprolites and wooden cages surrounding the sacrificial victim from Burial 2 (contemporaneous with Building 4) (Sugiyama *et al.* in press), and the presence of animals with their extremities bound in Burial 6 suggest that they were buried alive.

This reconstruction of Burial 6 allows us to interpret not only the species interred in the burial, but also to recreate the individual life histories of the animals, how they were captured, whether they physically interacted with the Teotihuacanos during their captivity, how they were prepared, and what the nature of human-animal interactions were during the Teotihuacan occupation. Utilizing this method to reconstruct individual life histories,

the animals utilized in such state-level rituals can be interpreted as important participants in such ceremonies whom physically interacted with and lived among the Teotihuacanos.

This reconstruction of the ritual processes experienced by the animals interred in the offering cache questions many fundamental factors about the nature of human-faunal interactions at this ancient metropolis, and in Mesoamerica in general. The careful zooarchaeological analysis has allowed us to confirm some of the historical descriptions of the use and manipulation of animals recorded in Colonial times, and more importantly illustrates the antiquity of such practices. These factors also bring to question how and for what purpose the Teotihuacanos decided to physically manipulate these animals, a question that should be explored in more detail (Sugiyama *et al.* in press). Finally, it is important to note that the results from the analysis of the faunal remains from Burial 6 must be analyzed in conjunction with the other three burial chambers containing faunal remains from the Moon Pyramid. How did such human-animal interactions and uses change through time during the Teotihuacan occupation? No doubt further zooarchaeological analysis from the materials from the Moon Pyramid will continue to shed light on the management, preparation, and sacrifice of animals at Teotihuacan.

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