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THE JAGUARS OF ALTAR Q, COPÁN, HONDURAS: FAUNAL ANALYSIS, ARCHAEOLOGY, AND ECOLOGY

DIANE A. BALLINGER
Dallas VA, North Texas Health Care System
Department of Physical Medicine and Rehabilitation
UT Southwestern Medical Center
Dallas, TX

JEFFREY STOMPER
College of Lake County
Grayslake, IL

ABSTRACT.—An excavation at Copán, Honduras, a Late Classic Maya site, revealed the ritual cache of bones of at least fourteen big cats associated with Altar Q. Several of the large cats were identified as jaguar, *Panthera onca*. Preliminary analysis showed that the animals were in good health at the time of their deaths. All but one were adults. Tail fans of several species of birds accompanied the feline bones. Associated with the crypt of the felines were the smaller tomb burials of two macaws, *Ara* sp. The authors conclude that it is unlikely that all the jaguars were procured locally because of environmental constraints.

Keywords: Maya archaeology, zooarchaeology, jaguar, Copán, ritual

RESUMEN.—La excavacion del escondite des huesos felinos en el sitio Maya con la fecha de clasico tardio en Copan, Honduras, ha revelado un entieramiento des los huesos de catorce jaguares, *Panthera onca*, y otros gatos grandes, asociados con el Altar Q. El analisis ha mostrado que los animales estaban saludables quando murieron. Todos menos uno que eran adultos. Los huesos de los jaguares estaban acompanados por unos abanicos de cola de varios pajaros. Los huesos de dos arcangas, *Ara* sp., han sido descubiertos en dos peque(os tumbas cerca de la cripta de los jaguares. Los autors concluyen que no es possible que los jaguares fueron obtinidos en el valle de Copan porque del constre(imientos cercaniá.

RÉSUMÉ.—L'excavation ‡ Copán, Honduras, un site Maya de Classique Tardif , a revelé un enterrement rituel des ossments de, au moins seis *Panthera onca*, quatorze chats grands, associés avec l'Altar Q. L'analys des ossments a monstré que les animaux etaint en bon santé au temps du mort. Il y a un jeune et trieze adults dans l'assemblage. Les ventails de la queue de les oiseaux a accompagné les ossments des chats grands. Associés avec le crypt des les animeaux il y ont deux petites enterrements de les deux oisieux, *Ara* sp. Les auteurs ont conclué que ce n'etait pas possible pour les jaguars Ítre obtiner dans le vallée de Copán parce que des contraintes d'environnment.

INTRODUCTION

The discovery of an offertory cache of feline bones yielded an exciting glimpse of ancient Maya ritual behavior to archaeologists. Feline bones filled the masonry crypt to the east of Altar Q at Copán, Honduras, an altar whose sides bear high relief portraits of the sixteen rulers of Copán's Classic Period dynasty. The cache at the foot of Altar Q contained the remains of at least fourteen large felines, two macaws, and the tail fans of seven other birds. This is a report of the discovery and preliminary analysis of the offertory complex associated with Altar Q and Structure 10L 16 in the Acropolis area of the Main Group. Jeffrey Stomper, then a graduate student under the supervision of Dr. William Fash, the Director of the Copán Acropolis Archaeological Project instituted under the auspices of the government of Honduras, excavated the offertory complex in 1988. The offering consisted of a sealed crypt containing the remains of at least 14 large felines, including *Panthera onca*, and macaws (*Ara* sp.) associated with a stone altar on a low, round platform that was placed on the central axis of the western side of Structure 10L 16 in the Main Group at Copán.

Until now, the evidence that large felines were involved in Maya ritual has consisted of skeletons of single animals and portions of skeletons of cats buried in ritual contexts (Pohl 1983, 1990). Landa (Tozzer 1941) discussed animal sacrifices stating that animals were used in rituals and were sacrificed. They were presented to the gods either alive or not, sometimes dismembered but also whole (Tozzer 1941). The cache at Copán is the largest cache of felidae bones discovered by Maya archaeologists to date.

JAGUAR SYMBOLISM

Maya art and iconography are rich with depictions of jaguars. The same is true of other Mesoamerican civilizations. Copán, Palenque, Uxmal, and Tikal are among the lowland Maya sites where jaguars are featured prominently (Morley, Brainerd, and Sharer 1983; Spinden 1975; Tozzer and Glover 1910). Spinden (1975) considered them second only to the snake in symbolic importance to the Maya. Coe (1972) pointed out the links between rulers and jaguars and the separation of king and commoner in native Mesoamerican religions. He further remarked on the antiquity of the jaguar as a religious icon and its ties to Mesoamerican religions and the ruling lineage (Coe 1972).

Images of jaguars frequently decorate ceramics recovered from Maya sites, appearing on a variety of vessels. On these, men often wear clothes with jaguar markings or jaguar pelts (Spinden 1975: 149). Many times jaguar symbolism is part of a ritual or religious context on vessels, such as one from Altar de Sacrificios. On this vessel, the ruler of Yaxchilan is dressed in jaguar skin trousers, mitts made of jaguar paws complete with claws, and a jaguar headdress. A second figure in jaguar regalia is near that has the arms, hands, tail and feet of the jaguar on a human body (Saunders 1989: 146).

The jaguar epitomized two different kinds of strength to the Maya. The jaguar motif was associated with the underworld and its supernatural power and also with physical strength. The association with physical strength derived from the

fact that jaguars are powerful, nocturnal hunters. Ideas of the supernatural power of the jaguar arose from the early totemic tradition of Mesoamerica and the jaguar ***nagual's*** (spiritual co-essence) relationship to the shaman's power. Possession of supernatural power and physical strength was important to Maya rulers because their political power rested on their ability to act as a priestly bridge between the ancestors, the underworld, and the living world (Schele and Freidel 1990).

Maya artists juxtaposed rulers and warriors with jaguar symbolism in art. Strength and prowess of combat were required of both the ruler and the warrior but especially of the ruler. A fearsome beast of the tropical forest, the jaguar personified a dual symbolism: control of the supernatural, a necessary power for Maya kings, and the physical prowess needed by the successful warrior (Saunders 1989; Hassig 1985).

Mesoamerican cultures from Olmec to Aztec revered the jaguar. The Olmec associated jaguars with shamanic power and filled their art with images of were-jaguars. The Aztecs linked the jaguar to war, sacrifice, and royalty (Saunders 1989: 150; Hassig 1985). Furthermore, they associated jaguars with jade, rain, and fertility (Saunders 1989). At the time of the Spanish conquest, Aztec (*Mexica*) traders routinely transported pelts and live animals from outlying parts of the empire to the capital. Pictures of both live animals and pelts appear on trade and tribute lists of goods moving from Soconusco, the colonial province located on the coastal plain of the state of Chiapas, Mexico, to the Aztec Empire (Voorhies 1989).

Relicts of this symbolism are found today in remote areas of Central America, Mexico, and South America. Jaguar symbolism is most visible in masks and ceremonies performed in isolated villages. Wearing a jaguar mask transforms the wearer into a new creature that combines animal, human, and supernatural qualities (Saunders 1989). Thus, the jaguar is an ancient and potent symbol permeating native cultures of Mexico, Central, and South America.

ARCHAEOLOGY

As part of the first season's work of the Copán Acropolis Archaeological Project, William Fash conducted preliminary investigations of Structure 10L-16 and the adjacent Plaza areas in 1988 (Fash 1991; Agurcia, Stone and Stomper 1989). During the spring of that year, excavations at the site of the western base of Structure 10L-16 and Altar Q were in progress, supervised by Jeffery Stomper and veteran local excavator, Ismael González. Stomper concentrated the initial excavations on the area in front of and beneath Altar Q, anticipating finding the dedicatory offering or other remains of associated rituals at that locus. Other examples of dedicatory caches had been found either directly in front of or underneath altars and stelae elsewhere at Copán (Stromsvik 1941). An area was marked off directly west of the altar and excavated to a depth of 120 cm. Fearing for the integrity of the trench if he dug between the stone supports that uphold Altar Q, Stomper elected instead to tunnel beneath the altar from the eastern sidewall of the same pit. This mini-tunnel excavation beneath the altar produced no evidence of a cache, nor was there any evidence that the area under the altar had been disturbed.

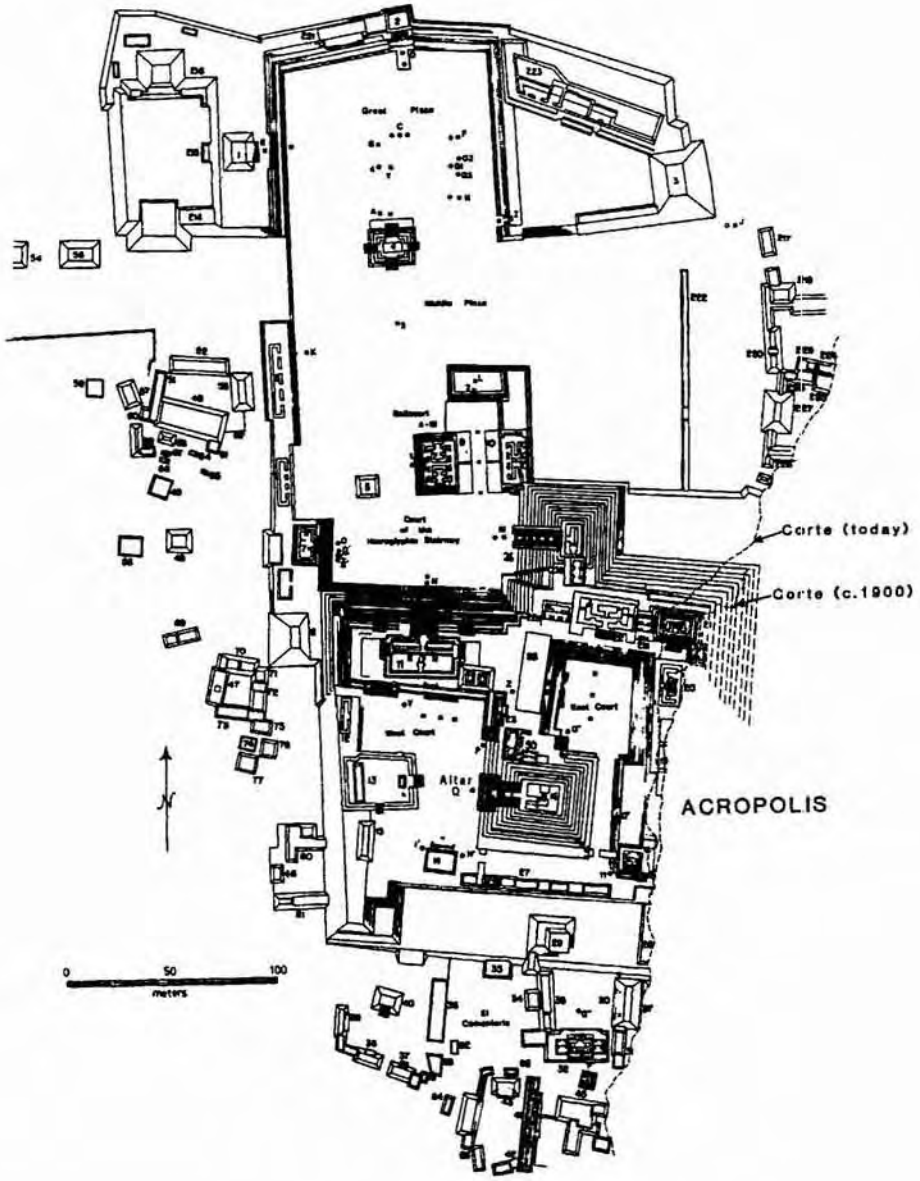

FIGURE 1.—The East Court, Main Group, Copán, Honduras. Supplied by William and Barbara Fash.

Stomper began another pit that mirrored the location of the previous one. Immediately, he found two features. The first was a plain, round altar, CPN 13470, with a diameter of 36 cm. Altars such as these were used as stands for incense burners elsewhere in Copán during the Late Classic period (Fash 1983:464). The second feature was what appeared to be several rough slabs of stone, Feature 8, in a line below the level of the last plaza floor. The excavation was expanded to uncover the extent of this feature.

The capstones were aligned in a north-south direction, sloping from east to west, and covering the masonry crypt that contained the animal bones. Probing between the stones revealed a hollow area approximately 1.3 m deep and at least 1m wide. When Stomper removed the capstones, he found that debris from places where the walls had caved in filled the crypt. The crypt, measuring 131 cm long and 48 cm wide, had walls of eight courses of finely cut building stone rising to a height of 117 cm.

Within the crypt, the excavators found animal bones. The removal of the first level of bones revealed an irregular intrusion of lime plaster in parts of the cist. Excavation of this layer revealed that more bones were embedded in the layer of plaster with still more bones below it. These layers were removed in the plaster matrix in large sections and kept separated. Stomper continued excavations into the fill under the cist to a depth of 3 m under the plaza level. He recovered only 7 fragments of ceramics from under the cist. Approximately 319 cm below the original cist floor, the excavators uncovered an earlier plaster floor of the West Court. Excavations were terminated at this point.

Two small shafts adjacent to the cist were also uncovered just outside the northeast and southeast corners of the cist. The inside of the roughly square shafts measured 22 cm on each side. At the bottom of one shaft were nine whole prismatic obsidian bladelets and parts of two others. Located 25 cm above the obsidian were the bones of a medium-sized bird. The second shaft also contained the bones of a bird but no obsidian. Nothing else was found.

Stomper excavated the entire area between Altar Q and Structure L10-16, revealing a round platform of small, faced stones two courses high in some places. Unfortunately, the whole platform was not preserved. Located in the center of the platform was an oval stone with a smooth upper surface, repeatedly charred by fire. Resting on the top of the platform was a small, highly polished fragment of jade. The area around the platform yielded incensario fragments, a ceramic incense burner. In an adjacent area to the west of the platform just below the level of the last plaza floor, a small cache of obsidian lancets was found.

FAUNAL ANALYSIS

During the summer of 1988, the faunal material was identified and recorded, and a preliminary report was filed at the Central Office of the Project in Copán (Ballinger 1988). The bones were counted, sorted into skeletal elements, and examined for pathological conditions and anomalies.[1] Ballinger used weight-bearing bones of the appendages to determine the minimum number of individuals (MNI) because weight-bearing bones have large areas of dense, compact bone, and, hence, tend to be better preserved (Brain 1981). Left and right elements were identified

and counted. Ballinger matched the bones by size or age to determine if they belonged to a single individual (Chaplain 1971). Juveniles were identified by the lack of epiphyseal closure. The analyst ignored most of the fragments because time was limited. The largest MNI of the elements was then determined as the MNI for the species (Klein and Cruz-Uribe 1984). Actual bone counts were made at Copán. Photographs of the best preserved crania were taken for later identification. Final identification to species level was made in the Zooarchaeology Lab at Indiana University, where a comparative collection is housed.

Analysis was done under field conditions without the use of a comparative collection or manuals commonly used by faunal analysts. Neither a comparative collection nor library resources were available in 1988 at the Copán laboratory to aid in identification. Ballinger took notes supplemented with photographs and sketches. The initial identification of the bones as feline resulted from her examination of the teeth, crania, scapulae, and femora while in Honduras.[2]

Condition of the Bones.—Burial in a closed crypt resulted in good preservation. Although the bones were subjected to natural decay, they were protected from some of the taphonomic processes that radically change relationships between skeletal elements (Lyman 1982). Thus, while many of the bones were not articulated, they were close to the position in which they were placed in the crypt. The crypt walls kept them from being dispersed after burial. They were also protected from water and heat, the two most powerful agents in bone dissolution (von Endt and Ortner 1980). The bones were dry and chalky but retained their shapes, so skeletal elements were easily identified. Exfoliation was present on some of the bones but most of them were well preserved.

An assessment of pathological lesions was made on the bones that had minimal flaking on them. The bones of the second level, excavated as a unit and curated as a unit, allowed Ballinger to determine the position of the jaguars of the second level in the crypt by the association of skeletal elements. The heads of some had been laid over the rear legs and feet of others.

Results of the Faunal Analysis.—The MNI of the felines was at least 14. This number is conservative because the analyst was unable to perform a complete examination of all the faunal material. Ballinger found that many of the bones found in the crypt were *Panthera onca*. Differences in jaguars and puma lie in cranial morphology. According to Olsen (1968), jaguar crania have a sagittal concavity on the superior aspect of the cranium that rises to a pronounced lambdoidal crest that gives a slight s-shaped curve to the jaguar's skull. The posterior crest gives the jaguar cranium a squared off appearance and the skull appears longer and more rectangular. The puma, however, has an oval skull lacking the massive, posterior cresting. Crania of jaguars and puma are similar in their anterior aspects and teeth but differ in the posterior aspect. It is the posterior features on the crania the discriminate between the species. The more complete crania from the crypt have distinctive nuchal robusticity and a more elongated architecture of the jaguar. Although there is not enough cranial material remaining to account for 14 jaguars, an estimated 6 animals in the assemblage were *Panthera onca*. The others are felines but remain to be positively identified as jaguar. The remaining bone in the assemblage is bird bone and a few intrusive rodent bones.

The bones of the felines are very similar in size, indicating that the animals were similar in age and sex. They were also healthy animals. Assessment of indicators of general health routinely surveyed by investigators: cortical thickness, osteoporosis, and the frequency and severity of periosteal reactions, lesions of reactive bone growth resulting from localized and systemic infections, demonstrated that the cats were free from these pathological conditions that commonly mark the bones and indicate a decline in health status.

Large cats are prone to bone diseases in captivity. Osteoporosis, thinning of the bones, is a problem for large felines in zoos. It results from inactivity, too little protein, old age, and metabolic disorders (Fowler 1986). Caged felidae are also highly susceptible to metabolic bone disease that results in a rickets-like bowing of the long bones (Fowler 1986). The cortices of the bones were thick and only one periosteal reaction was found. The single periosteal reaction was on the hind foot of one animal and had fused two metatarsals. Appendicular bones were robust with prominent muscle markings, and had no sign of rickets-like bowing.

No cut marks, dismembering marks, or skinning marks were found on the feline bones that were examined. The removal of pelts results in a characteristic pattern of skinning marks. Skinning for pelts often makes cuts ringing the lower metapodial where the knife has circled the ankle or wrist to loosen the skin. Carpals, tarsals, and the bones of the digits are then removed with the pelt and, thus, are missing from the assemblage. Ballinger found no evidence that the pelts were removed after death. Further work, however, should include careful examination of the bones for skinning and other butchering marks.

In addition, the vertebrae must be examined. Ballinger concluded that crania may have been disposed of separately for some of the cats. The paucity of cranial fragments compared to the amount of post-cranial material leads Ballinger to the conclusion that crania may have been disposed of separately. Further analysis may reveal cut marks on the first or second cervical vertebrae if the heads were removed before burial.

The avian bones in the assemblage were collected from two places, the small shafts adjacent to the crypt and from the crypt itself. The bones of an adult macaw, *Ara* sp., were found in each shaft. Both of the macaw skeletons were missing the pygostyle, the bone to which the tail fan attaches. Two pygostyles of the correct size were recovered from the crypt, possibly the ones missing from the birds in the shafts. The pygostyle is a fragile bone, however, and may have been destroyed by postmortem diagenesis. There are seven other pygostyles from other unidentified birds in the crypt. Three of these probably are the same species. The other four are two matching sets and may represent two more species. Lack of a comparative collection precluded the complete identification of the avian bones. In all, nine tail fans were buried with the jaguars. Other bird bones buried in the crypt included a caudal vertebra, a fragment of a tarsometarsus, a fragment of a proximal radius, a rib fragment, and two phalanges. All of these remain unidentified. There were no signs of rodent gnawing or cut marks on the avian bones.

Preservation of the macaw bones differed for the two shafts. Burial 1 lacks cranial bones. The head may have been removed at the time of death but the remains were too broken to properly check for cut marks. The remains of more than

one bird may be present in the second shaft. The bones removed from the second shaft have more fragments of long bone and cranium than Burial 2. Differences between the two shafts' contents, however, may have been affected the microenvironments of each shaft. Ballinger identified the macaws by the presence of the beak in Burial 2 and a comparison of the two birds. It was clear that post-cranially they were the same (Hargrave 1970). However, all of the avian bone should be reanalyzed with a comparative collection at hand.

In summary, a MNI of at least fourteen large felidae, some of them *Panthera onca*, were identified from the bones in the crypt. The animals were healthy with no indications of longterm protein deficiency or inactivity. Accompanying the felines were the tailfans of nine birds, including two macaws. No evidence of butchering or mode of death was found in this analysis. A full study of the feline bones may reveal sex and age differences, less obvious evidence of disease, and the mode of death of the animals. Similarly, comparison of the avian material to comparative skeletal collections may reveal the species of the unidentified material.

DISCUSSION

Natural History and Ecology of the Jaguar.—The jaguar (*Panthera onca*), is the largest of three species of spotted cat native to Central America (Burton 1987). Classed as a big cat, the jaguar has a shoulder height ranging from 110-155 cm (Burton 1987). The jaguar prefers a forest habitat but can live in savanna environments if there is enough brush cover. They also live in slightly arid areas. Good swimmers and climbers, jaguars are primarily nocturnal feeders, sleeping during the middle of the day (Burton 1987).

Few investigators have studied the natural history of the jaguar in the wild so most information comes from zoo studies. Many of the details about breeding patterns come from studies of zoo animals. Jaguars are very easy to raise in captivity. They breed easily and can live on two or three pounds of meat a day, according to David Ruhter,[3] former Curator of Large Animals, Houston Zoo (Personal communication via telephone, 1994). Less is known about their behavior in the wild. Large felidae are long-lived animals whose prey is normally about half their body weight (Sunquist and Sunquist 1989; Gittleman 1984; Packer 1986). They usually need large areas in which to forage and, except for lions, are solitary.

Today, the jaguar has adapted to more crowded habitats in Central America. In 1983, Rabinowitz and Nottingham (1986) tracked the movements of nine jaguars in Belize. The authors found that the home ranges of the jaguars overlapped but that as long as prey was available, they remained on them, avoiding each other. Analysis of scat determined that in Belize jaguars feed on seventeen species of prey (Rabinowitz and Nottingham 1986). This is consistent with reports from other areas to the south that jaguars feed on diverse prey: capybara, fish, peccary, and alligator (Ewer 1973). Generally, jaguars feed nocturnally but the female in the Belize study changed her feeding pattern to the daytime in order to exploit cattle as prey. This study suggests that the jaguar is flexible and able to adopt new habits as needed to survive (Rabinowitz and Nottingham 1986).

Naturalists do not know much about the behavior of the puma in Central America. *Felis concolor* occupies a wider range of habitats than the jaguar, ranging from mountains to jungles to deserts (Ewer 1973). The puma is slightly smaller than the jaguar. Puma diet is omnivorous in tropical climates where they consume several types of rodents, fish, and other small game. The main component of their diet is deer and domesticated farm animals, although they have demonstrated behavior flexibility in the selection of prey species.

The jaguar and the puma are in almost direct competition in Central America because of the similarity in size, habits, and diet. Puma are also nocturnal feeders unless forced to feed at other times. They are known to live near home ranges of jaguars (Rabinowitz and Nottingham 1986) in Belize, but in the North American west, their ranges are larger and do not overlap.

The ecology of the jaguar has important implications for explanations of how the Maya acquired at least fourteen big cats for ritual use. Rue (1987) states that by the Late Classic, the valley was heavily deforested resulting in a loss of habitat for tropical forest animals. If, however, enough brushy areas still existed in the valley, jaguars could have survived there, given the presence of adequate prey. In general, species that live in savanna or parkland areas have larger populations than forest living animals (Berkoff et al. 1984), thus deforestation could lead to a slight increase in the population of cats in the valley. Jaguars have demonstrated their ability to survive crowded conditions and the ability to change feeding schedules. It is highly probably that they survived in a mosaic environment of parkland and brush.

Ultimately, however, access to prey governs population size. A deforested but still brushy area could have supported sufficient deer and other species of prey to, in turn, support a small jaguar population. Similarly, a mosaic of brush and cleared spaces will support a white-tailed deer (*Odocoileus virginianus*) population whereas closed canopy forest will not (Smith 1975). Deer have small home ranges, often living near humans and thriving. Historically, deer have been an important part of Maya subsistence (Mandujano and Rico-Gray 1991) and only recently have declined in importance as numbers decreased. Both brocket deer and white-tailed deer feed in cleared areas of new growth near fields because tender shoots are present there. There also may be fewer insects in young forest (Mandujano and Rico-Gray 1991). Mandujano and Rico-Gray (1991) remarked that the decline of Yucatan's deer population was directly attributed to over-hunting and loss of habitat, a relatively new situation. Population decline was exacerbated by the loss of native farming methods that provided browse each season after the fields were burned, cleared, and farmers severely trimmed brushy growth in and around the milpas. This growth sprouted anew with the rains. Pohl (1994) proposed that Copanecos were very likely to have raised deer in and around their homes and fields in the valley.

Other animals available as prey are Brocket deer (*Mazama* sp.) and peccary (*Tayassu tayacu*). Both would have done well in this open, brushy habitat. Brocket deer browse on the same kinds of plants as white-tailed deer: tender twigs, shoots, and leaves of a variety of herbaceous plants and fruits. The peccary is omnivorous, living in a variety of tropical habitats, including forests and dry savannas

(Lawlor 1979). Smaller prey, such as paca, agouti, and armadillo are native to the area and can live in brushy environments.

The Copán Valley could have supported a small population of big cats even if it were partially deforested. Whether it could have supported a population large enough to provide at least 14 adult big cats from local sources is another question. The Copán Valley is comprised of 26 square miles of territory. Of that, the heavily populated Copán pocket would have been too urban-like for jaguars or pumas to live there. Game such as deer would have been drawn to the areas surrounding fields further out rather than the kitchen gardens closer to the central site. Big cats would have lived farther out from the Main Group at Copán.

Normally big cats have large home ranges of 15 square miles. If we assume that crowding has limited the size of the home range a home to 5 square miles, the Copán Valley would only provide ranges for five jaguars at a time. Avoidance behavior as demonstrated in Belize would not make it possible for more animals to survive unless even with prey populations of very high density. Thus, the large number of felines found in the crypt most likely resulted from a combination of trade, hunting, and hand raising.

THE OFFERTORY COMPLEX AND THE JAGUAR BURIAL

Yax Pasah, the last ruler of Copán, had begun an aggressive new building program by raising Temple 11 and making significant additions to the West Court, where Altar Q is located including Altar Q (Fash 1991). The altar is an illustration of the succession of the last ruling dynasty of the polity. Along the sides of the altar the names sixteen rulers are inscribed beginning with Yax Ku'k Mo' (Blue or First Quetzel Macaw) and ending with Yax Pasah. Yax Pasah, by his choice of iconography for the West Court, indicated its relationship with the underworld, Xilbalba, and, thus, to his ancestors (Schele and Freidel 1990).

Yax Pasah faced serious problems during his reign, including deforestation, a population that was shrinking, and a diminution of his power (Fash 1994). Schele and Freidel (1990) note that most of his monuments state the cosmic sanction of his rule, and hypothesize that his reign was marked by crises. His impressive sacrifice and building program may have been an attempt to restore Copán to its previous place in the hierarchy of major sites.

Structure 10L-16 was the final product of the remodeling in the West Court. The jaguar burial occurred at this time as a ceremonial cache for the dedication of the last version of Structure L10-16. The Copenecos placed Altar Q at the base of this structure. Yax Pasah buried at least 14 big cats in the crypt associated with Altar Q. Once the people of Copán placed the felines in the crypt, tail fans of birds were placed there, and the crypt was then covered with three capstones. A small, round, carved altar was placed next to it directly between the two shafts. A final plaza floor was then laid, covering the capstones. Jaguars and other spotted cats had an unknown but important ritual significance at Copán. Pohl (1994) remarks that while skeletons of spotted cats were often cached in ritual contexts by the Maya, Copán has more such caches than any other site. All of these have so far been found in elite contexts. Pohl (1994) considers them a measure of the high

position of the site of Copán in the Maya hierarchy. The inclusion of macaws was ritually significant but their meaning is less clear. The name of the dynastic founder was macaw. Macaws occur frequently in the decoration of public ritual space at Copán, especially on the ball court.

Questions of where the jaguars came from and how they were killed remain unanswered. The ecological conditions and size (over 75 km) of the Late Classic Copán Valley could have supported a small population of jaguars or pumas even if partially deforested. It was not, however, large enough to provide 13 adult and one semi-adult large cat. David Ruhter (Personal communication 1994) suggested that the easiest way to assemble that many jaguars would be to gather kits in the spring and raise them by hand. There is evidence that jaguar kits were given as gifts. A vase from Tikal shows a turbaned figure holding a kit and presenting it to the ruler (Culbert 1993).

The feline bones, however, presented no evidence of long-term inactivity or protein deficiency, indicating that the Copanecos had taken good care of the animals and that their caged time was short. At this time, it is impossible to determine whether the animals were raised by hand or captured as adults.

We can only speculate about how the jaguars met their fates. Preliminary examination revealed no cut marks on the bones to indicate that the jaguars had been skinned or dismembered. A more complete analysis of the bones may reveal skinning marks leading to determination of their modes of death. The presence of crania and numerous tarsals and metatarsals, carpals and metacarpals indicate that some heads and feet were not removed. Often on ceramic vessels, individuals are portrayed dressed in jaguar pelts with heads and paws still attached (Coe 1973; Schele and Miller 1986; Kerr and Kerr 1989). It appears that the valuable and ideologically significant skins were left on the animals.

CONCLUSION

Jaguars could have lived in the Copán Valley even after deforestation if a brushy, mosaic environment was present. The size of the valley, the amount of tilled fields, and even with deer management, the amount of prey limited the number of jaguars and pumas that were living there. The flexibility of feeding patterns and the presence of small home ranges as demonstrated by modern jaguars in Belize indicate that jaguar populations in the past could have adjusted to smaller, overlapping ranges close to humans populations without undue stress. Jaguars would have been in direct competition with the Maya for scarce protein given their reliance on a maize-based diet.

The lack of disease and stress indicators on the bones of the jaguars indicates that the bones are the remains of generally healthy animals that had not been captive for a long time. These animals had no chronic metabolic diseases that cause bowing of the leg bones, no osteoporosis, and only one periosteal reaction. Furthermore, all but one of the animals were adults with full epiphyseal closure. This indicates that healthy, adult cats were chosen for the cache. The cats could have been kept in good condition for as long as four to six months by being fed two or so turkeys each day (David Ruhter, Personal communication 1994).

Hopkins (1992), in her work on the animals bones removed from the Cenote of Sacrifice at Chichen Itza, argues against the assumption that the jaguar bones found at Chichen were solely the result of sacrifice because there are too many other reasons that the bones could have been deposited in the cenote. At Copán, the bones clearly are in a ritual context, one that is repeated many times at the site. The cache of the feline and bird bones represented a significant gift to the people of Copán. By placing his sacrifice in the West Court with all of its symbols of the underworld, Yax Pasach hoped that a continuous connection with the ancestors and the jaguars' supernatural power would be forged. Thus, homage was paid to garner the aid of ancestors and gods to keep the polity strong and growing when many Maya cities were falling into decline. It was to no avail. Shortly after this, the people of Copán ceased to erect dated monuments and the population of the central valley declined.

Future work should include analysis of the assemblage of feline bones. Measurements of the bones and assessment of small differences between the jaguar and the puma should be made. The analysis should also contain reconstruction of crania and pelves, where possible. Finally, a close examination for cut marks and any other butchering marks should be carried out.

NOTES

[1] The jaguar bones are curated at the Central Laboratory in Copán Ruines, Honduras. This is also where the field reports, preliminary reports, manuscripts, theses, and dissertations are housed. The archives at Copán include drawings, photos, and a small library and are a good resource for investigators.

[2] Two students of Wm. Fash have examined the collection of animal bones but I have not been able to contact them by publication time.

[3] David Ruhter was curator of large animals at the Houston Zoo when I contacted him. He has since moved out of state and the personnel department at the Zoo would not release his address to me.

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