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OUR FATHER THE CAYMAN, OUR DINNER THE LLAMA: ANIMAL UTILIZATION AT CHAVIN DE HUANTAR, PERU

George R. Miller and Richard L. Burger

Analysis of the animal bones recovered from the excavations of residential contexts at Chavín de Huántar reveals a mixed economy that included the herding and hunting of camelids (llama and vicuña) at Chavín de Huántar as early as the Urabarriu Phase (900–500 B.C.). It also suggests that a pattern of trade in dried llama meat (ch'arki) from high altitude environments (punas) to lower ones had developed by the Chakinani phase (500–400 B.C.), while the consumption of hunted animals (especially deer) sharply declined in importance. During the apogee of Chavín de Huántar (400–200 B.C.), socioeconomic stratification is reflected in differential access to tender meat from younger animals. The role of Chavín de Huántar in the spread of camelid pastoralism and the importance of highland vs. tropical rain forest animals in Chavín ideology is discussed as well.

El análisis de los huesos de animales recuperados durante las excavaciones de contextos residenciales en el sitio arqueológico de Chavín de Huántar revela que una economía mixta basada en el pastoreo y caza de camélidos (llama y vicuña) floreció durante la fase Urabarriu (900–500 A.C.). Asimismo, sugerimos que un patrón de intercambio de carne de llama deshidratada (ch'arki) existía entre los asentamientos de las alturas (punas) y el valle bajo durante las fases Chakinani (500–400 A.C.) y Janabarriu (400–200 A.C.) mientras que el consumo de animales silvestres, como venado declinaba dramáticamente en importancia. Durante el apogeo de Chavín de Huántar, la estratificación socioeconómica se manifestó a través del acceso diferencial al consumo de animales jóvenes. El rol de Chavín de Huántar en la expansión del pastoreo de camélidos y la importancia relativa de los animales de la puna vs. los de la floresta tropical en la ideología Chavín son aquí brevemente discutidos.

Next to this town of Chavín is a large building of huge very well-wrought stone blocks; it was a huaca, and one of the most famous of the heathen sanctuaries, like Rome and Jerusalem with us; the Indians used to come and make their offerings and sacrifices, for the Devil pronounced many oracles from here, and so they repaired here from all over the kingdom. There are large subterranean halls and apartments, and even accurate information that they extend under the river which flows by the huaca or ancient sanctuary [Vázquez de Espinosa 1948 (1632): 458].

More than three centuries have gone by since Vázquez de Espinosa's commentary. And although the town of Chavín de Huántar is today just one of a multitude of small district capitals in highland Peru, the archaeological site next to it has taken on an importance analogous to Rome or Jerusalem for specialists in Peruvian archaeology. During the

mid-Early Horizon (ca. 500–250 B.C.), the influence of Chavín de Huántar was felt from the Lambayeque Valley to the Ica Valley on the coast and from northern Cajamarca to Ayacucho in the highlands, and radical shifts in metal and textile technology, ceramic style, religious ideology, and other aspects of culture were often associated with these new patterns of interaction (Burger 1988, 1992a). The profound impact of Chavín de Huántar on the emergence of complex societies in the Andes led Donald Lathrap (1973:92) to write:

I would suggest that any attempt to understand the civilizing effects of agriculture in the Central Andes must ultimately face up to the problem of the agricultural basis of Chavín de Huántar and the state that it ruled.

Unfortunately, investigations at Chavín de Huántar were traditionally confined to the zone

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of religious architecture. Consequently, most discussion of the agricultural basis has focused on the only available "hard data," which, in this case, are the approximately 150 stone sculptures that once decorated the temple buildings. The fascination with the iconography of these carvings is understandable: Their beauty and sophistication is perhaps unparalleled in Peruvian prehistory. Gordon Willey (1962), for example, considered them to represent the "first great art style" in Peru, and Alfred Kroeber (1947) believed they were among the greatest works of Prehispanic art in the Americas. Chavín stone carving is rich in representations of tropical forest animals and, in one famous piece, of lowland plants. However, the light shed on Chavín de Huántar's subsistence systems by the iconographic studies of these sculptures has not been illuminating. In fact, the identification of the animals and plants represented raises more questions about the basis of Chavín economy than it resolves.

A more direct approach is called for in order to begin to explicate the subsistence system underlying the success of Chavín de Huántar and, ultimately, to grasp how the ideological messages encoded in these exotic iconographic themes are related to the social reality of those worshipping at the Chavín de Huántar temple. Fortunately, excavations in the habitation area surrounding the public architecture at Chavín de Huántar have yielded material evidence of the site's prehistoric economy. This article will focus on the changing patterns of animal use in the mixed agricultural system practiced there. Analysis of the faunal remains allows us to go beyond the problem of dietary reconstruction to consider the way in which animal products were differentially produced and consumed in a complex and stratified "formative" society. Before proceeding, however, some background material will be summarized on the environment of Chavín de Huántar and the archaeological context of the remains under consideration.

The Environment

Chavín de Huántar is located in the Mosna Valley at 3,150 m asl in the north-central highlands of Peru (see Figure 1). To its west is the Cordillera Blanca, whose glaciated peaks often exceed 5,500

m, and to its east is another somewhat lower, but equally steep mountain range, the Cordillera Oriental. The topography is rugged and the slopes surrounding the site have steep gradients, commonly 45 percent or more. Consequently both landslides and erosion are serious problems in the area. Chavín de Huántar lies on the valley floor at the juncture of the Mosna River with one of its tributaries, the Huachecsa. These rivers are part of the Pukcha drainage that eventually empties into the Marañón, a major tributary of the Amazon River. Chavín de Huántar has an environment typical of the high intermontane valleys of Peru and does not resemble in its topography, climate, or vegetation the tropical forest to the east. The trip down to the eastern lowlands from Chavín de Huántar is a difficult one requiring several weeks. The journey would have been made on foot, since the Mosna like all highland rivers is not navigable. A six-day walk is needed just to reach Arancay, the point on the Marañón where tropical forest products first become available.

At present, rainfall at Chavín de Huántar ranges from 750 to 1,042 mm annually (1971–1975 figures) with an average of 855.8 mm per year. Most precipitation—87 percent—falls during the rainy season from October to April, but enough occurs during the remaining months to support perennial grasslands. During the dry season, nightly frosts are common at elevations above 3,300 m and on rare occasions they even affect the valley floor (Burger 1983). Thus, it is feasible to produce traditional Andean freeze-dried items such as *ch'arki* (freeze-dried meat) and *chuño* (freeze-dried potatoes) on a seasonal basis at high elevations.

Using the Holdridge system of classification, the Oficina Nacional de Evaluación de Recursos Naturales (ONERN 1976) identifies three major life zones in the Chavín de Huántar area. The environmental zonation is largely a function of altitude, and quite different life zones consequently are compressed into a relatively small area. It is possible to walk from the lowest to the highest zone in less than two hours. The lowest life zone is the "tropical mountainous humid forest" (bb-MT); it occurs between 3,100 and 3,300 m elevation. This zone, which includes Chavín de Huántar itself, corresponds roughly to the production

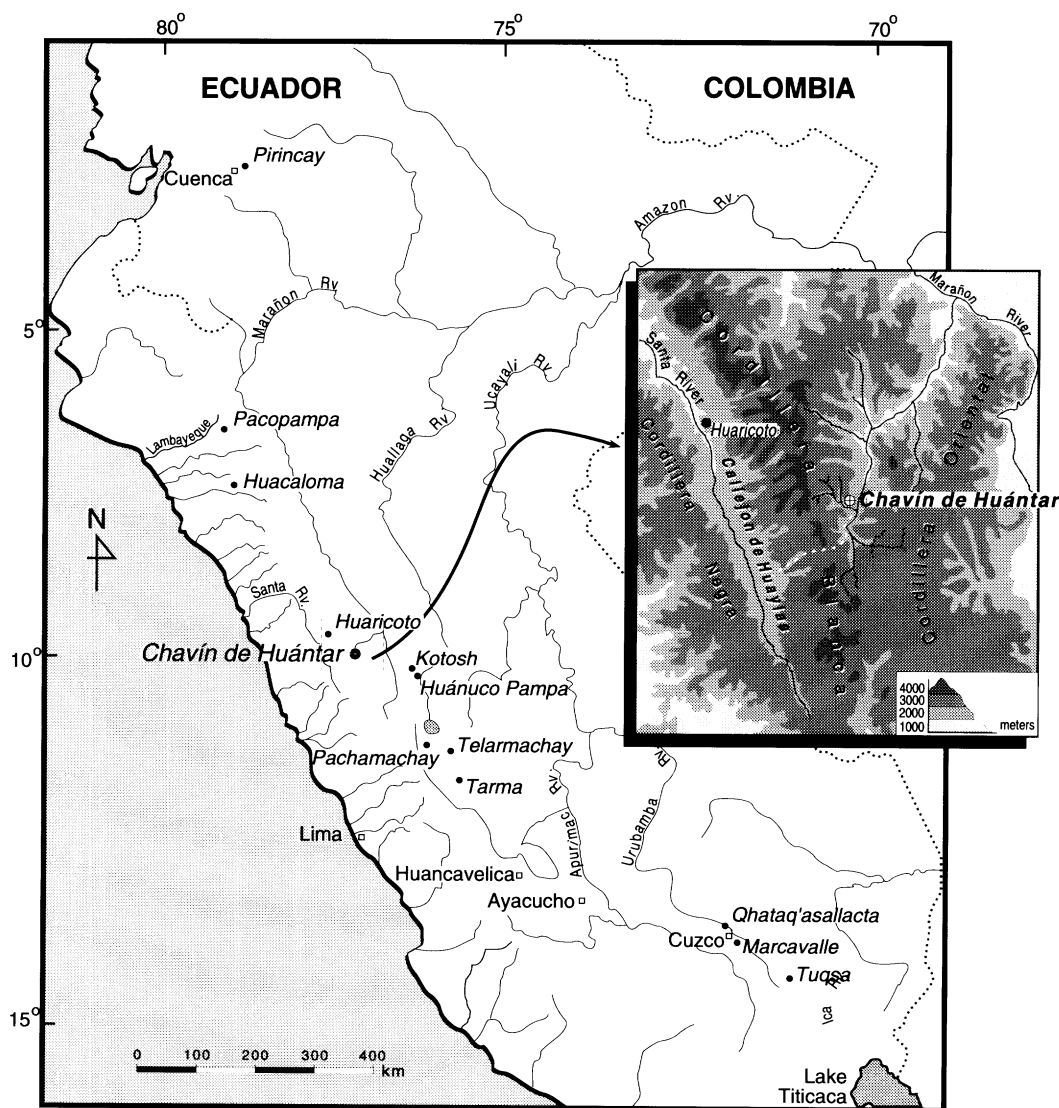


Figure 1. The location of Chavín de Huántar in relation to other archaeological sites (•) mentioned in the text.

zone referred to as the *kichwa* or *quechua* (Pulgar Vidal 1970:75). The *kichwa* is the only irrigated zone, and maize, fruit, and other crops sensitive to frost are traditionally grown here. Natural precipitation is sufficient to support rainfall agriculture, but supplementary irrigation reduces the risks involved, especially on the valley floor, which receives less rain than the higher elevations.

The next life zone defined by the ONERN study is the "tropical mountainous very humid forest" (bmh-MT) between 3,300 and 3,800 m,

which comprises the upper slopes and high meadows. This zone, also known as the *suni* or *jalca* (Pulgar Vidal 1970:89–90), is esteemed by farmers because of its dependable rainfall, good drainage, and rich soil. The native crops grown here are potatoes, *tarwi*, *quinoa*, *ullucu*, *oca*, *achis*, and *mashua*, roughly in that order of importance.

The uppermost zone of economic importance is the "tropical subalpine pluvial páramo" (pp-SaT) locally referred to as the *puna*. This life zone begins at 3,800 m elevation to the east and

4,000 m to the west of Chavín de Huántar and ends at 4,800 m where grasslands can no longer be sustained. Now used primarily as pasture land for cattle and sheep, older residents recall llamas being kept in the early years of this century. These vast grasslands also constitute a rich natural habitat for a variety of wildlife, including vicuña, deer, spectacled bear, skunk, and partridge (*perdiz*). Several lines of evidence indicate that the climate was similar, but not identical, to the modern pattern during the time period under consideration (900–200 B.C.) (Cardich 1985).

We can begin to get a better sense of the implications of these life zones for the ancient subsistence economy by calculating the amount of land in each life zone within a 10 km radius of the Chavín de Huántar center (see Figure 2). While the *kichwa* zone represents a mere 4 percent of the land surface, the *suní* habitat, favored for high-altitude agriculture, makes up almost 36 percent of the land. The remaining 60 percent of the land lies within the puna zone, and consequently, grasslands were among the most abundant land resources available locally. While the edge of the grasslands can be reached from Chavín de Huántar in an hour or less, it is more time consuming to reach some of the upper slopes and more distant grassland from the valley floor. Because of this, only 13 percent of the population in the district of Chavín de Huántar lived in the valley-floor center in 1961, while the remaining 87 percent resided in small villages and hamlets whose mean settlement size was 107 people. The most frequent location of these villages is just below the grasslands in the uppermost zone of high-altitude farming.

Chavín de Huántar was established in an area with rich agricultural potential, particularly for rainfall agriculture on the valley slopes and herding in the vast pasture lands. Irrigation agriculture, on the other hand, would have had limited possibilities. The agricultural resources of Chavín de Huántar are by no means unique. Innumerable other locations in this region offer comparable opportunities for mixed farming. There are, however, few locations that are equally advantageous from the perspective of interregional trade and communication. In the highlands, topography often determines patterns of travel, and the

Cordillera Blanca, in particular, presents a formidable barrier because of its perennial glaciation. Because this range runs parallel to the coast, it separates the peoples of the central coast from the rich highland valleys of the Callejón de Conchucos and the lowland zones farther east. For travelers entering the southern portion of the Callejón de Huaylas, there are three passes to the east: Two lead into the headwaters of the Mosna and one into the headwaters of the Huachecsa. The trails that lead over the passes meet at Chavín de Huántar. Other unglaciated passes exist in the central and northern Callejón de Huaylas, but none as low as the pass (4,700 m) above Chavín de Huántar. If the snow line had been more than 100 m lower (Cardich 1985) at certain times in the late Initial Period/Early Horizon, some of the alternative routes available today would have been impassable. Thus, Chavín de Huántar is ideally suited as a gateway community. Moreover, it is centrally located, roughly midway between the coast and the eastern lowlands and, analogously, nearly at the midpoint between the dry *puna* Andes to the south and the moister *páramo* Andes to the north. This location is particularly advantageous in the context of panregional networks of exchange.

The Archaeological Background of Chavin

Relative chronologies have been developed for Chavín de Huántar using ceramic, architectural, and iconographic evidence (Burger 1984a; Rowe 1962). The faunal materials considered in this article were dated on the basis of associated pottery, which, in turn, was associated with ¹⁴C samples. The ceramic sequence developed in the settlement surrounding the temple (Burger 1984a) will serve as the basis for the discussion here. The Chavín occupation at Chavín de Huántar has been divided into the following three sequential phases spanning the late Initial Period and the first half of the Early Horizon: the Urabarriu phase (900–500 B.C.), the Chakinani phase (500–400 B.C.), and the Janabarriu phase (400–200 B.C.). The Old Temple is believed to have been established during the Urabarriu phase, while the New Temple flourished during the Janabarriu phase. The above estimates of absolute ages are derived from the analysis of 22 radiocarbon measurements

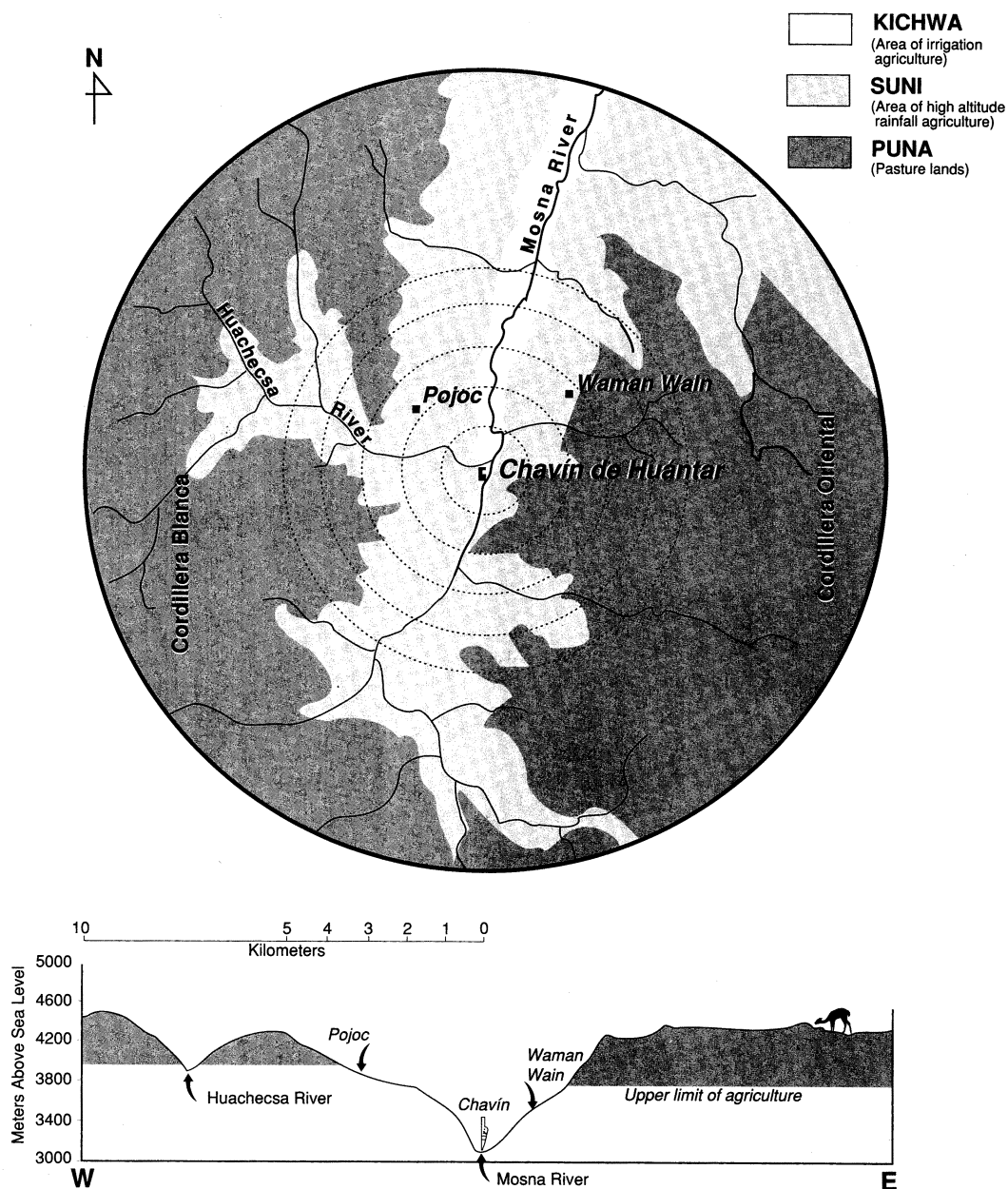


Figure 2. The catchment area (top) of Chavín de Huántar showing the proportion of different ecozones within a 10-km radius of the site and (bottom) a 20-km east-west transect passing through Chavín de Huántar. Note that the upper limit of agriculture to the west of the site is slightly higher than it is to the east due to greater rainfall and runoff from the Cordillera Blanca.

available for the Chavín culture at Chavín de Huántar (Burger 1981, 1984a:277–281).

The site began during the Urabarriu phase as a relatively small ceremonial center covering 1.5 ha surrounded by several hectares of habitation. The

occupation was limited to the western bank of the Mosna, but spanned both sides of the Huachecsa. A wall exceeding 160 m in length was built 1 km north of the public architecture, apparently to control movement along the trail on the valley

floor. A small habitation area, referred to as Sector B, was located a short distance to the south of the wall. The population in Sector B probably did not exceed 100 residents, and it is unlikely that more than a few hundred permanent residents surrounded the temple at this time.

The site grew notably during the subsequent two phases, as the temple gained interregional prominence. It covered 15 ha by the Chakinani phase and 42 ha during the Janabarriu phase. After the Urabarriu phase, the wall and the adjacent habitation area were abandoned, and population focused around the public center. The Janabarriu-phase population has been conservatively estimated at between 2,000 and 3,000, and it would have been one of the most populous Early Horizon settlements in the Central Andes at this time. This expansion was accompanied by an increasing diversity of activities and some of the first unambiguous indications of socioeconomic stratification documented in Peru.

Throughout the sequence much evidence indicates the importance of long-distance exchange at Chavín de Huántar. The valley-floor center was the central place in a regional system consisting of a multitude of small villages and hamlets, many of which were located near the upper limits of agriculture, while others were located on the lower slopes or valley floor. An archaeological survey conducted by Hernán Amat (1971, 1976) failed to locate late Initial Period/Early Horizon sites within the *puna* zone; but it is probable that the grassland resources were exploited by communities living at lower elevations, particularly in the upper *suní* zone. Several of these rural sites have been briefly described in the literature (Espejo 1951, 1955, 1961; Tello 1960), and two of them, Pojoc and Waman Wain, have been sampled with test excavations (Burger 1983). The occupants of these small settlements shared the belief system best known from the valley-floor center, and several of them had places of worship featuring Chavín-style sculpture. It is likely that much of the labor and support for the Chavín de Huántar center came from villages like Pojoc, rather than the residential area immediately surrounding the site. At the same time, there are more exotic items in these small sites than the residents of a village could normally acquire on their own, and it would appear that the

benefits of supporting the temple were economic as well as spiritual.

As noted, the agricultural base of Chavín de Huántar is poorly understood. Little direct evidence exists of the cultigens grown there, but it seems probable that maize, squash, beans, and *lúcuma* would have been cultivated on the valley floor, while potatoes, *oca*, *ullucu*, and perhaps *quinoa* would have been grown in the *suní* zone. All of these cultigens have been documented at coastal, and in some cases, highland sites of the time period in question (Cohen 1978; Martins 1976; Ungent et al. 1983), and it is reasonable to assume that they were incorporated into the Chavín de Huántar economy. Charred maize kernels were recovered from both Urabarriu and Janabarriu contexts at the site (Burger 1984a:254), but recent isotopic analysis of human skeletal remains of the Urabarriu and Chakinani phases indicates that maize, the sole C_4 plant eaten in the Prehispanic Peruvian highlands prior to the conquest, was not the main dietary staple. Cultigens that follow the C_3 photosynthetic pathway constituted the bulk of the diet, and considering the ecology the Chavín de Huántar area, it is likely that the potato and other high-altitude tubers and grains were the dietary staples (Burger and van der Merwe 1990).¹

Relative Abundance of Animal Taxa

The 1975–1976 excavation of the secular precincts of Chavín de Huántar yielded a great quantity of animal bone, and it is the analysis of these remains that constitutes the core of our discussions here. Excavations were small scale, and the faunal remains were recovered either in situ or as a result of passing all the soil matrix through a ¼-inch screen. Careful troweling permitted the recovery of small rodent and fish bone, although some bias against the recovery of microfaunal remains probably existed. All of the excavated units were in or around late Initial Period and Early Horizon habitations and most of the bone samples came from these domestic structures or more extensive refuse deposits adjacent to these households. In some instances, refuse was found in platform fill or other secondary domestic contexts; such materials were only considered when the deposits were culturally homogeneous and

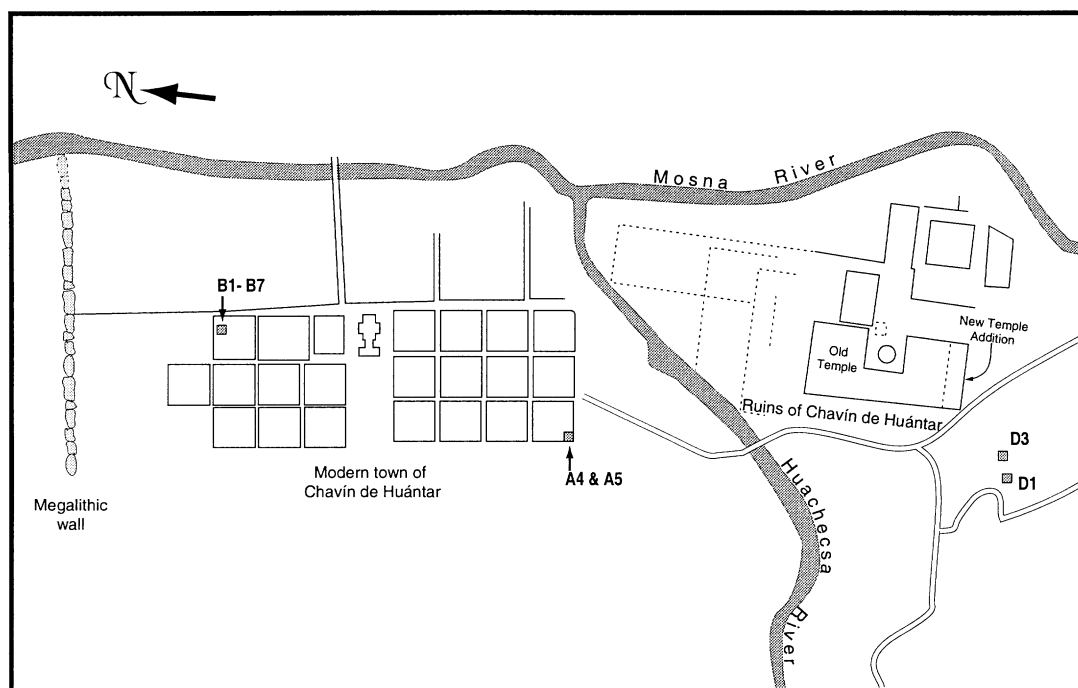


Figure 3. Plan of the ancient site of Chavín de Huántar and adjacent town, showing the locations of excavation units mentioned in the text.

showed no evidence of temporal mixing. A description of the specific excavation contexts and an interpretation of their depositional history have been published elsewhere (Burger 1984a:11–36, 328–335).

From the total excavated faunal assemblage we selected a research sample representing each of the three Chavín chronological phases: Urabarriu (900–500 B.C.) from Units B1, B2, B3, B4, B5, and B7; Chakinani (500–400 B.C.) from the lower strata of Unit D1; and Janabarriu (400–200 B.C.) from the upper strata of Unit D1 and Units A4 and A5 (see Figure 3). The faunal assemblage was identified and analyzed by Miller and several students from the Department of Anthropology, California State University, Hayward. The total sample consisted of 12,672 bone fragments (33.205 kg), of which 2,252 (16.580 kg) could be identified to species, genus, or family.

The Chavín de Huántar faunal assemblage, during all three phases, reflects a pattern common to most prehistoric sites in the Peruvian highlands: The vast majority of animal protein

was obtained from artiodactyls of the families Cervidae and Camelidae (see Figure 4). Smaller food species, such as viscachas (*Lagidium peruanum*), guinea pigs or *cuyes* (*Cavia* sp.), and small birds were eaten occasionally by the residents of the site but appear never to have been of major dietary importance. The preponderance of cervids and camelids is supported whether the method of quantification used is numbers of fragments (NISP), minimum numbers of individuals (MNI), weight of dry bone, or weight of usable meat (although it is more extreme with the latter two methods, which tend to emphasize carcass size).

Urabarriu Taxa

Of the three phases at Chavín de Huántar, the Urabarriu assemblage demonstrates the greatest faunal diversity. In addition to the predominant artiodactyls, the Urabarriu residents made minor use of fish, Pacific Ocean shellfish (Burger 1984a:255–261), an unidentified bird, guinea pig, viscacha, skunk, and a canid that may have been either the Andean fox (*Dusicyon culpaeus*) or the

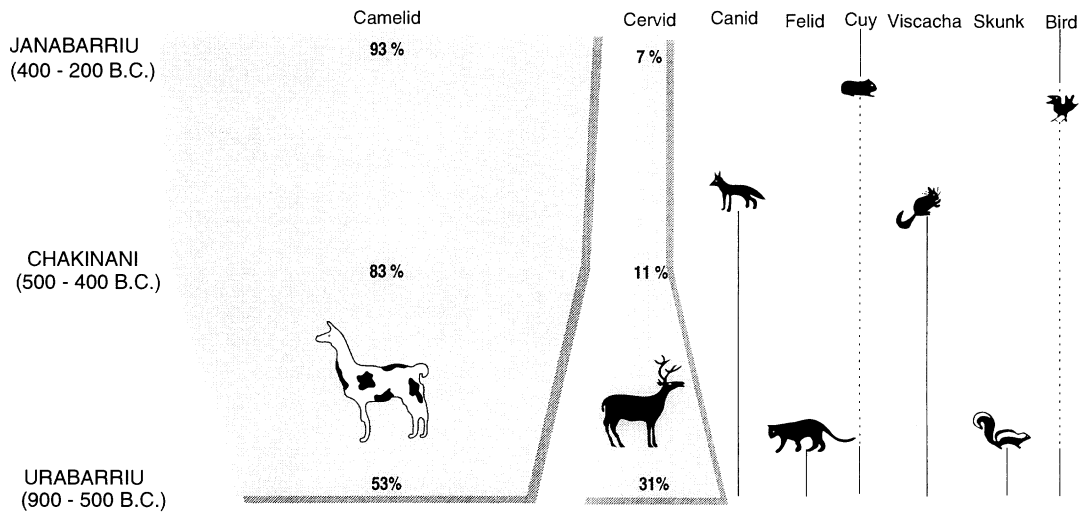


Figure 4. Relative abundance of major taxonomic groups measured by weight of usable meat from Urabarriu through Janabarriu times Usable meat values = MNI x known carcass weight (Miller 1979:138).

domestic dog (see Table 1). Of special interest among the non-artiodactyl bones were two worked and polished proximal radii of large felids (Burger 1984a:213–214, Figures 422 and 423), either puma (*Felis concolor*) or jaguar (*Felis onca*). If from jaguars, they were probably obtained far to the east, because these animals rarely occur above 1,000 m elevation (Rodríguez de la Fuente 1975:203). Pumas, although present locally, are scarce and difficult to hunt. As no other felid bones were identified in the Chavín de Huántar refuse, it is possible that these rare bones were acquired specifically for bone working because of the symbolic importance of large felines in the ideology of the Chavín culture.

Compared to the subsequent phases, the most salient character of the Urabarriu faunal composition is the larger percentage of cervids used during this time (Figure 4). Cervids constitute between 9.8 percent and 30.8 percent of the total Urabarriu faunal assemblage, depending on the method of quantification used, and this percentage actually may be slightly higher, considering the number of Urabarriu bones that were classified as “indeterminate artiodactyl” (either cervid or camelid) because of their high degree of fragmentation. Based on diagnostic antler fragments,

these deer were probably all white-tail (*Odocoileus virginianus*), although the taruka (*Hippocamelus antisensis*), another species of cervid present at high altitudes in the area today (Grimwood 1969:83), may be represented in the postcranial remains. On the other hand, neither of the smaller species of Andean deer, the brocket (*Mazama* spp.) or the pudu (*Pudu mephistopheles*), was present in the Urabarriu sample. Today these smaller deer tend to occupy the *ceja de selva* zone to the east of and generally at a lower altitude than Chavín de Huántar (Grimwood 1969:74–80). Their absence in the Urabarriu assemblage may indicate that this tropical lowland environment fell outside of the normal catchment area of Chavín de Huántar. This tentative conclusion is reinforced by the total absence of other bone remains from distinctive lowland animals, such as the tapir or the woolly monkey.

While the relative abundance of Urabarriu deer is noteworthy compared to their marginal importance during the later two phases, the exploitation of cervids at Chavín de Huántar, even during earliest times, seems not to have assumed the importance that it held at other relatively contemporaneous sites in the northern highlands. Zooarchaeological studies demonstrate that until

Table 1. Relative Abundance of Chavin Vertebrate Taxa.

Taxon	NISP	%	Bone Weight	%	MNI	%	Usable Meat	%
Urabarriu								
Camelid	356	55.2	2800.6	68.0	7	41.2	312.5	52.9
Cervid	63	9.8	560.9	13.6	3	17.6	182.0	30.8
Artiodactyl indet.	140	21.7	594.0	14.4	—	—	—	—
<i>Cavia</i> sp.	4	.6	.9	.02	1	5.9	.7	.1
<i>Lagidium</i> sp.	24	3.7	17.6	.43	2	11.8	2.2	0.4
Rodent indet.	3	.5	1.2	.03	—	—	—	—
<i>Conepatus rex</i>	1	.2	1.2	.03	1	5.9	2.4	.4
<i>Felis concolor</i>	2	.3	7.8	.19	1	5.9	68.5	11.6
<i>Canis</i> sp.	3	.5	26.7	.65	1	5.9	22.0	3.8
Bird	3	.5	.7	.02	1	5.9	—	—
Mammal indet.	45	7.0	108.3	2.63	—	—	—	—
Total	644	100.0	4,119.9	100.0	17	100.0	499.8	100.0
Chakinani								
Camelid	131	81.4	1,842.0	94.6	7	70.0	342.5	83.3
Cervid	5	3.1	39.9	2.0	1	10.0	45.5	11.1
Artiodactyl indet.	8	5.0	29.9	1.5	—	—	—	—
<i>Lagidium</i> sp.	1	.6	.7	.1	1	10.0	22.0	.3
<i>Canis</i> sp.	5	3.1	5.8	.3	1	10.0	22.0	5.3
Mammal indet.	11	6.8	28.8	1.5	—	—	—	—
Total	161	100.0	1,947.1	100.0	10	100.0	411.1	100.0
Janabarru								
Camelid	1,039	84.2	9,141.9	93.7	30	81.1	1,725.0	92.6
Cervid	21	1.7	152.6	1.56	3	8.1	136.5	7.3
Artiodactyl indet.	69	5.6	277.5	2.84	—	—	—	—
<i>Cavia</i> sp.	17	1.4	5.8	.056	3	8.1	2.1	.1
Rodent indet.	2	.1	.4	.004	—	—	—	—
Bird	10	.8	3.5	.04	1	2.7	—	—
Mammal indet.	76	6.2	176.2	1.8	—	—	—	—
Total	1,242	100.0	9,757.9	100.0	37	100.0	1,863.6	100.0

NISP = numbers of identified specimens; bone weight in grams; MNI = minimum number of individuals; usable meat values = MNI x known carcass weight (Miller 1979:138).

the Early Horizon, deer constituted the most important component of the animal protein diet for the inhabitants of many northern and central highland valleys. Evidence derived from sites with Initial Period/Early Horizon occupations such as Huaricoto, Huacaloma, Kotosh, Guitarrero Cave, and Pacopampa (Burger 1985; Sawyer 1985; Shimada 1982, 1985; Wing 1972, 1980; Daniel Morales and Alfredo Altamirano, personal communication 1987) shows that the valley dwellers of the northern highlands maintained their dependence on deer much later than populations living in the high grasslands farther to the south. On the *puna* of Junin, only 200 km to the south of Chavín de Huántar, deer hunting had given way to reliance on camelids by the fifth

millennium B.C., and a pastoral economy based on domesticated llama and alpaca is documented there from several sites such as Telarmachay and Pachamachay between 3500 B.C. (Wheeler 1984) and 2200 B.C. (Kent 1982). The intermontane valley populations to the north of Junin, however, were slow to adopt this technological innovation (Matos 1976, 1978).

As summarized in Figure 5 the northern highland pattern changed dramatically sometime after the middle of the Early Horizon (ca. 500 B.C.), when all available data point to the sudden integration of camelid pastoralism into the subsistence economy of most *kichwa* zone populations. At Chavín de Huántar, however, the record is distinct. By the time of the construction of the Old

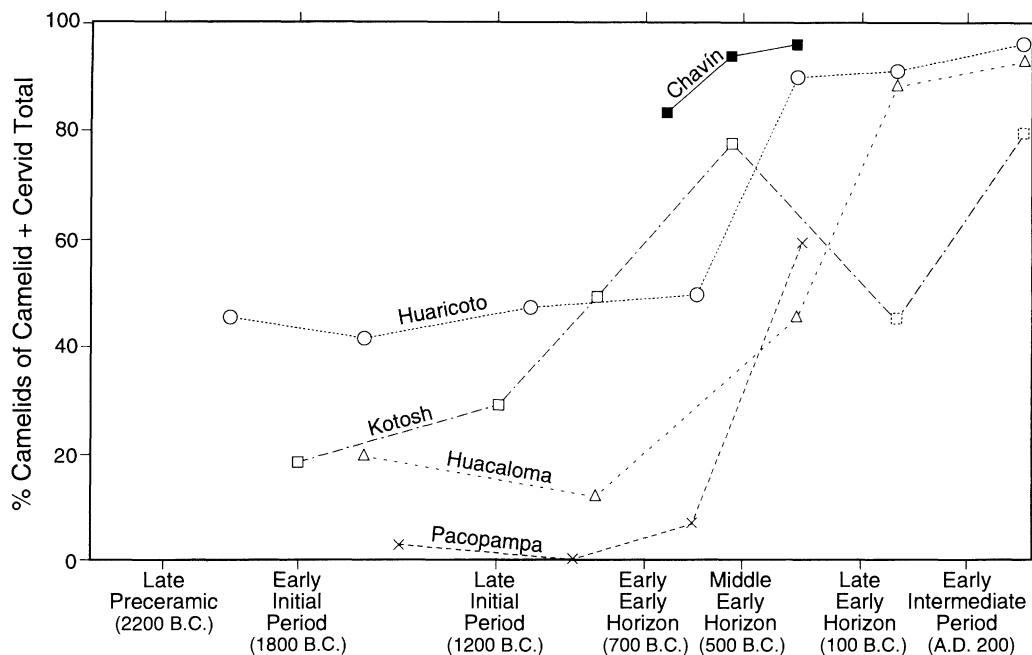


Figure 5. The increasing incidence of camelid exploitation through time at five relatively coeval sites in the north-central Andes. Percentages are based on NISPs because these were the comparable data from the five sites. Huaricoto data from Sawyer 1985:Table 3. Kotosh data from Wing 1980:Table 8.2 (later periods' trend line extrapolated from MNI data contained in Wing 1972:Table 3). Huacaloma data from Shimada 1982:Table 1 and 1985:Table 1. Pacopampa data from Daniel Morales and Alfredo Altamirano, personal communication 1982.

Temple during the late Initial Period, camelids already constituted the dominant item in the animal diet. Curiously the Urabarriu faunal profile, rather than resembling Early Horizon sites such as Huaricoto, Pacopampa, Huacaloma, or Kotosh, is more reminiscent of the situation found at Early Horizon sites far to the south, such as Marcavalle. There, in the Valley of Cuzco, by the mid-first millennium B.C., camelids already constituted 89 percent of the usable meat remains (Miller 1979:161). As will be discussed below, the early embrace of camelid pastoralism by the people of Chavín de Huántar may, in fact, have played an important role in the vigor of their economy and the unprecedented influence of the Chavín cult.

To understand the importance of camelids in the Urabarriu economy and the aforementioned contrasts, we must first know which of the camelids species were present at the site. Four separate forms of the family Camelidae are found in the Andes today: the llama (*Lama glama*), the alpaca (*Lama pacos*), the guanaco (*Lama guanicoe*), and the vicuña (*Vicugna vicugna*).

Although the taxonomy of the South American camelids is still a matter of considerable debate, both historical and ethnographic evidence show that the four forms have functioned in distinct ways at least since Inka times. Llamas were used principally as pack animals and secondarily for coarse fiber, while alpacas were used for their fine and abundant fleece. Both of these domesticates were also used for meat and religious sacrifice. Guanacos and vicuñas, on the other hand, were never domesticated and were obtained only through hunting, including, in the case of the vicuña, the strategy of community drives. The main use of the guanaco seems always to have been meat, whereas the vicuña was also caught and shorn for its extremely fine fiber. Given these functional differences, our understanding of the people that labored in construction of the Old Temple and worshipped there will be greatly enhanced by identifying which of the camelid varieties sustained them.

The Andean camelids are difficult in this respect because evolution and/or the domestica-

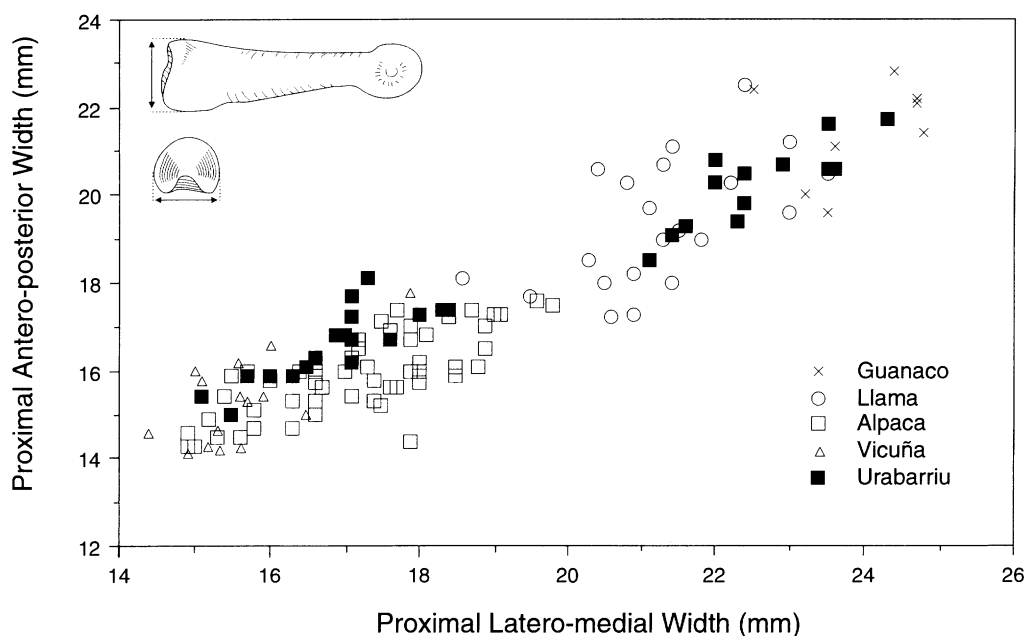


Figure 6. Bivariate plot of measurements from Urabarriu proximal first phalanges superimposed over identical measurements taken from modern camelids of known identities. Comparative llamas, alpacas, and vicuñas from the southern highlands of Peru, guanacos from Tierra del Fuego.

tion process have not been allowed sufficient time for diagnostic morphological criteria to develop and permit identification of fragmentary bone remains from archaeological sites. The zooarchaeologist is fortunate, however, in that the four species exhibit a definite size gradient; i.e., in general, it is observed among contemporary camelids that guanacos are larger than llamas, llamas larger than alpacas, and alpacas larger than vicuñas,² and hence the bone measurements of contemporary animals may be used as a baseline with which to judge the identities of unknown archaeological bones (Kent 1982; Miller 1979; Wing 1972).

When pairs of measurements from Urabarriu camelid bones are plotted over identical measurements from modern camelids of known identities, the Urabarriu measurements cluster in a clear bimodal fashion with a distinct gap between the clusters. Figure 6 provides an example of such a scatterplot from a particularly well-represented element, the proximal first phalanx. The distinct bimodality of the phalanges' measurements is mirrored by all other Urabarriu camelid elements that occur with sufficient frequency to plot. The two camelid varieties seen in Figure 6 appear to

have been separate, homogeneous breeding populations, an interpretation that seems to be supported statistically by the low coefficient of variation values presented in Table 2.

Due to the overlap in llama-guanaco size and in alpaca-vicuña size, however, the exact identity of the Urabarriu camelid populations is somewhat more difficult to establish. Scrutiny of Figure 6 suggests only that two distinct camelid populations were present during Urabarriu times, but whether they were domesticated llamas and alpacas, wild guanacos and vicuñas, or some other combination is beyond the resolution of the bivariate plot. Statistical tests comparing the Urabarriu osteometric data with known comparative camelid species also yield ambiguous results. For instance, t-tests comparing the means of measurements from the Urabarriu small camelids and the comparative species sometimes indicate vicuñas and sometimes alpacas, but the fit is inexact in either case. The means of Urabarriu large camelid measurements tend to match llamas more closely than guanacos, but the fit is not precise here either (Table 3). As has been argued elsewhere (Miller and Gill 1990), problems of this sort are to be expected among populations of

Table 2. Descriptive Statistics for a Representative Sample of Urabarriu Camelid Univariate Measurements.

Sample	Measurement	n	\bar{x}	S.D.	Range	V
Urabarriu large first phalanx	prox. lateromedial breadth	13	22.5	.96	21.1–24.3	4.3
Guanaco first phalanx	prox. lateromedial breadth	9	24.0	.82	22.5–24.8	3.5
Llama first phalanx	prox. lateromedial breadth	22	21.3	1.19	20.8–21.9	5.6
Urabarriu small first phalanx	prox. lateromedial breadth	20	16.9	.90	15.1–18.4	5.2
Alpaca first phalanx	prox. lateromedial breadth	55	17.2	1.28	16.8–17.5	7.5
Vicuña first phalanx	prox. lateromedial breadth	16	15.5	.87	15.0–16.0	5.6
Urabarriu large astragalus	maximum breadth	5	30.4	1.28	28.2–31.5	4.2
Guanaco astragalus	maximum breadth	7	30.6	1.51	29.2–32.0	4.9
Llama astragalus	maximum breadth	10	27.2	2.24	25.6–28.8	8.2
Urabarriu small astragalus	maximum breadth	3	22.3	.83	21.5–23.9	3.7
Alpaca astragalus	maximum breadth	18	23.2	.57	22.7–23.8	2.5
Vicuña astragalus	maximum breadth	6	22.3	.80	21.4–23.1	3.6

Note: Separation of large camelid and small camelid groups was made visually by first plotting the measurements in histogram fashion. Note the low V values, which may be taken as an expression of population homogeneity (Simpson et al. 1960).

archaeological camelids far removed from the geographical origin of most of the camelids in the comparative collection (i.e., the southern highlands of Peru for most of the llamas, alpacas, and vicuñas, and Tierra del Fuego for the guanacos). The size and representativeness of the reference collection is presently insufficient to compensate for the variations in camelid body size that may result from breeding strains and/or environmental differences along the Andean chain. Regrettably, osteometric analysis based on modern reference collections provides an essential, but as yet, low-resolution window into the taxonomic identity of archaeological camelids.

If it were not for the pivotal position that Chavín de Huántar and the Chavín cult occupied in Andean culture history, such large camelid–small camelid, low-level resolution might be considered adequate. The Urabarriu phase at Chavín de Huántar, however, stands precisely at the threshold of a series of technological innovations that swept through the northern highlands and the north coast of Peru during the Early Horizon and the Early Intermediate periods. To know whether these changes were founded on and/or facilitated by an established agropastoral economy is extremely important to our understanding of Andean prehistory. Lacking precise and unequivocal diagnostic tools with which to identify the Urabarriu camelids, we are forced, therefore, to emphasize factors of cultural context and environmental setting, as well as somewhat indirect arguments, to give meaning to

the rather imprecise osteometric guidelines. It is mainly in reference to these cultural and environmental parameters that we make the following species judgments. We hope that these will function as working hypotheses until such time when the taxonomic identity of the Chavín de Huántar camelids can be tested by more rigorous scientific means.

Considering the presence of llamas and alpacas for over 2,000 years on the *puna* of Junín just 200 km to the south of Chavín de Huántar (Browman 1974a; Kent 1982; Wheeler 1984) and the assertion that llamas (Pozorski 1976, 1979; Shimada and Shimada 1985) and perhaps alpacas (Shimada and Shimada 1987) were well established on the north coast by the late Initial Period or early Early Horizon, it is tempting to bypass the aforementioned complexities of camelid identification and simply conclude that the Urabarriu bimodal clusters represent domesticated llamas and alpacas. This interpretation must be summarily rejected, however, because of the structure of the bimodality. Examination of Figure 6 and other Urabarriu data reveals that there was virtually no overlap between the small camelid and large camelid populations. This degree of separateness is unlike the situation observed among contemporary llama-alpaca populations and at Inka period llama-alpaca sites such as Qhataq'asallacta (Miller 1979:152) and Huánuco Pampa (Wing 1988: Figure 3) where the larger population commonly grades into the smaller population, probably because of occasional interbreeding between

Table 3. Student's t-Test Comparisons Between Equivalent Linear Measurements from the Chavín Camelids and Modern Llamas.

Pair	n	\bar{x}	t	p
Urabarriu large first phalanges, PLM	16	22.4	-2.8	<.005
↑				
Llama first phalanges, PLM	22	21.3	—	—
↓				
Janabarriu large first phalanges, PLM	13	20.3	2.7	<.01
Urabarriu large astragali, PLM	5	30.4	-3.3	<.005
↑				
Llama astragali, PLM	9	28.2	—	—
↓				
Janabarriu large astragali, PLM	15	27.4	1.5	<.1
Llama scapulae, DAP	8	38.4	—	—
↓				
Janabarriu scapulae, DAP	14	36.7	1.6	<0.1
Llama humeri, DLM	8	45.0	—	—
↓				
Janabarriu humeri, DLM	6	44.8	.2	>.4

PLM = proximal lateromedial width; DLM = distal lateromedial width; DAP = distal anteroposterior width

llamas and alpacas and the production of hybrids of intermediate size. In contrast, the Urabarriu camelid populations appear to have been reproductively isolated.

Secondly, the degree of dimorphism observed between the large and small Urabarriu populations makes llamas and alpacas unlikely. Put simply, the size distance between the large population and the small population more closely resembles the vicuña/guanaco or vicuña/llama distance than it does the alpaca/llama distance. This distance may be expressed as the index of dimorphism, $D = \frac{\bar{x}_s}{\bar{x}_l}$ where D equals the index of dimorphism, \bar{x}_s equals the mean of the measurement from the small population, and, \bar{x}_l equals the mean of the measurement from the large population. Expressed as a percentage, D provides a measure of the average size of the small population relative to the large one. In Figure 7 the D values of four Urabarriu camelid measurements are graphically presented along with the camelid D values from several other contexts. From this figure it can be seen that the Urabarriu D values hover around the 75 percent level and appear much closer to those recorded for comparable vicuña/llama measurements than they do to com-

parable alpaca/llama measurements. Similarly the Urabarriu D values resemble more closely those that we have calculated from Preceramic sites in the *puna* of the Callejón de Huaylas (Wing 1973) than they do for sites for which the two domesticated camelids were clearly dominant, such as Inka Tarma near Junin and Qhataq'asallacta in Cuzco or the Early Intermediate Period occupation at Chavín de Huántar designated as P1RC (Wing 1973). If the Urabarriu camelid populations had consisted of only llamas and alpacas, we would expect the D values to be at or above 85 percent, but since they are not, we must seek candidates for the mystery camelids of Urabarriu other than the domestic pair.

We judge that a significant proportion of the large Urabarriu camelids were domesticated llamas based on the following factors: (1) Some of the large Urabarriu camelid measurements match the reference llamas quite well (see Table 3), (2) domesticated llamas were a mainstay of the Chavín de Huántar economy during the terminal Janabarriu phase, (3) some of the Urabarriu camelids had apparently consumed considerable quantities of maize, probably in the form of post-harvest fodder (*panca*), judging from stable-car-

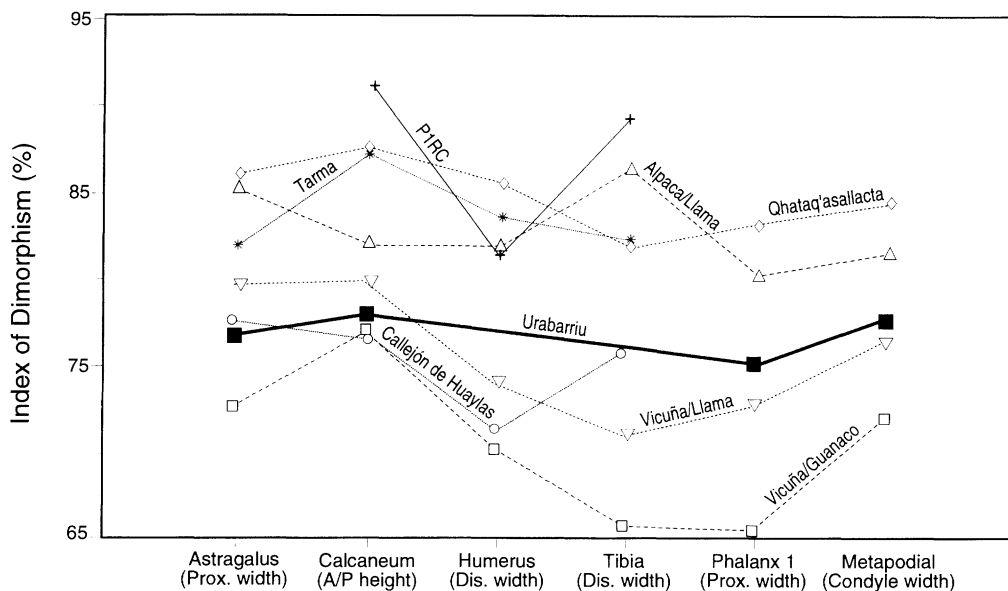


Figure 7. Urabarriu indexes of camelid osteometric dimorphism compared to the same measurements from four other archaeological contexts and three comparative camelid dimorphism baselines. This figure demonstrates the similarity of the Urabarriu indexes of dimorphism to the vicuña/llama indexes as opposed to those of the alpaca/llama. $D = \frac{x_s}{x_l}$, where D equals the index of dimorphism, x_s equals the mean of the measurement from the population of small camelids, and x_l equals the mean of the measurement from the population of large camelids.

bon-isotope analysis of their bones (Burger and van der Merwe 1990:90).

Osteometrically the large Urabarriu camelid measurements do not fit the llama parameters exactly, however. Scrutiny of Figure 5 and Table 2 reveals that some of the Urabarriu camelids were significantly bigger than modern llamas. In general, the large Urabarriu measurements average slightly larger than modern llamas and slightly smaller than modern guanacos.³ We suspect that this osteometric inflation of the large Urabarriu group is because the sample contains a few guanaco bones in addition to those of llama. Large camelids of the approximate size of the Urabarriu large camelids have been reported from several earlier and contemporaneous sites in the *puna* of the Callejón de Huaylas (Wing 1973). With justifiable caution, Wing identifies these animals only as "large camelids," but it is highly probable that they were guanacos (Lynch 1980:314) because of both their chronological and environmental provenience. That the Urabarriu residents of Chavín de Huántar occasionally hunted these guanacos seems quite likely.

We interpret the small Urabarriu camelids to

be primarily vicuñas on the basis of the following evidence: (1) some of their measurements fit the vicuña parameters quite closely, (2) the presence of one definite vicuña incisor in the Urabarriu sample demonstrates that the residents of Chavín de Huántar exploited vicuñas at least occasionally during this time, (3) wild vicuñas are present today in the grasslands to the west of Chavín de Huántar in the Parque Huascarán, (4) the relatively high frequency of cervid and viscacha bones, as well as 26 projectile points, indicate that the Urabarriu people were actively engaged in hunting. A logical extension of their deer hunting would have been the hunting of vicuñas, and (5) as noted above, camelids of vicuña size have been reported from several earlier and contemporaneous sites in the *puna* zone of the nearby Callejón de Huaylas (Wing 1973).

In terms of osteometrics, however, identifying all the small Urabarriu camelids as vicuñas is somewhat problematic. The small camelid measurements fit the vicuña parameters reasonably well, but as can be seen in Table 2, they consistently exhibit slightly larger mean values than modern vicuñas from the southern highlands.

Although unconfirmed by detailed observation, the average body size of vicuñas is suspected to decrease from the southern extreme of their range to the north (De la Tour 1954:347; Novoa and Wheeler 1984:121). Finding vicuñas of greater average size at Chavín de Huántar in the Department of Ancash (10°S) than in the Department of Puno (15°S) would fly in the face of Bergman's Rule and the general tendency of populations within the same mammalian species to have less body bulk near the equator, while those with greater bulk are found farther from it.

It could be suggested, of course, that the Urabarriu small-camelid sample may also not be pure. If even a few alpacas had been consumed by the Urabarriu residents, the osteometric mean of the mixed sample might very well resemble that of the Urabarriu small camelids. Such an interpretation, however, is fraught with difficulties. If the small Urabarriu camelids were judged to be alpacas, their disappearance during later periods at Chavín de Huántar, a fact to be discussed below, would have to be explained in terms of a temporary and failed experiment in northern alpaca raising. Moreover the hypothetical presence of late Initial Period or Early Horizon alpacas in northern Peru (Shimada 1982, 1985; Shimada and Shimada 1987) has not been convincingly demonstrated (Miller and Gill 1990; Kelgard 1989). Significantly, alpaca fiber does not appear on the north coast until the time of the Gallinazo culture (200 B.C.–A.D. 200) and does not occur in quantity until nearly a thousand years later (Conklin and Moseley 1988:155–156).

In summary, we believe that the Urabarriu faunal assemblage represents a transitional phase in the animal procurement strategy of the people in the northern highlands. It was a time of mixed hunting and experimental herding. Paralleling the pattern observed to the west in the Callejón de Huaylas (Lynch 1980:314), the hunters of Chavín de Huántar appear to have shifted the focus of their activity from the nearby *kichwa* slopes to the high-altitude *puna* grasslands, and in doing so, from the white-tail deer, *Odocoileus virginianus*, to the wild camelids, both guanacos and vicuñas. At the same time domesticated llamas were beginning to be introduced from the *puna* areas to the south. At Chavín de Huántar during the

Urabarriu phase, camelid bones outnumber cervid bones by approximately 6 to 1. On the basis of 81 camelid bones well enough preserved for measurement, we judge roughly 55 percent of the Urabarriu camelids to have been llamas and the remainder vicuñas—the identity of each of these populations being somewhat clouded by an occasional closely related camelid form that entered the Chavín de Huántar system.

Chakinani Taxa

The faunal assemblage from the intermediate Chakinani phase (500–400 B.C.) of Chavín de Huántar, because of its small sample size, provides a rough but important picture of subsistence behavior during the time of the expansion of the Old Temple. The diversity of Pacific Ocean shellfish consumed at the site increased somewhat during this phase with the addition of a species of scallop, *Argopecten purpuratus*. The volume of shellfish utilization, however, remained insignificant with a MNI of only 6. In contrast, the mammalian fauna changed significantly (see Figure 4 and Table 1) with an approximate fivefold reduction in the percentage of deer over the previous Urabarriu phase. A concomitant increase in the frequency of camelids signals the virtual replacement of the earlier mixed hunting/herding pattern with one devoted almost exclusively to the camelids.

Although the Chakinani faunal sample is too small to permit serious statistical evaluation, measurable bone fragments suggest that the nature of camelid exploitation was also undergoing a significant shift during this time. Measurable bones indicate that both large and small camelids were still present during the Chakinani phase, but that the large variety had come to predominate over the small by a ratio of approximately 2:1. As with the earlier Urabarriu phase, we tentatively interpret the larger camelids as introduced llamas and the smaller as vicuñas. Osteometric analysis of the Chakinani large camelid bones indicates that they fit the parameters of modern llamas quite well. The guanacos that may have elevated the osteometric profile of the earlier Urabarriu large camelids seem not to have been hunted during Chakinani times. Supplementing this camelid-dominated animal diet were a small number of

other mammals, the viscacha, and an unidentified canid. The guinea pig was not represented in the Chakinani fauna—not to be taken as a sign of the abandonment of *cuy* raising but rather a reflection of the small sample size.

The most interesting additions to the vertebrate fauna during Chakinani times were several marine fish specimens; no freshwater species were identified. The absence of freshwater fish is consistent with the current poverty of riverine life in the Mosna and Huachecsa rivers. The appearance of marine species of fish at Chavín de Huántar was due probably to the importation of dried fish. This item has traditionally played an important role in highland-coast exchange, and dried fish are still commonly seen in the markets of Chavín de Huántar and the Callejón de Huaylas. The dietary importance of exotic marine fish and mollusks may be greater than their small numbers would suggest. Their significance may have been as a source of supplementary iodine and salt rather than of protein or calories.

Janabarriu Taxa

The diversity of shellfish remains continued to increase during the Janabarriu phase, which is contemporaneous with the New Temple and the period of maximum expansion of the settlement. A total MNI of 25 shellfish representing 14 separate species of mussels, clams, scallops, gastropods, crustaceans, and polyplacophora are represented in Janabarriu-associated deposits (Burger 1984a:258). Nevertheless, they constituted only a minor item in the total diet.

Of the three phases represented at Chavín de Huántar, the Janabarriu phase (400–200 B.C.) provides the largest vertebrate sample (see Table 1). In contrast to the increased diversity of invertebrates, the exploitation of vertebrate taxa became quite specialized during the Janabarriu phase with camelids achieving an almost total monopoly of the diet. With the exception of single bird and rodent specimens, along with 10 poorly preserved marine-fish bone fragments, the only wild vertebrates in the assemblage are represented by a few deer bones (1.56 percent of the total bone weight). The people who expanded the site of Chavín de Huántar to around 42 ha during Janabarriu times seem to have nearly abandoned

the exploitation of wild fauna in favor of domesticated llamas. Figure 8 provides one example of this pattern of increased specialization—i.e., 95 percent of the 201 Janabarriu camelid bones suitable for measurement were derived from llamas. This pattern of Janabarriu species abundance was independently confirmed in the analysis of 917 identifiable bone fragments not included in this study from Unit D1-floor 1 and Unit D1-floor 2 and performed at the Laboratorio de Paleotnozoología in Lima (Cardoza A. and Pozzi-Escot 1977).

We interpret the large Janabarriu camelids to be llamas for the following reasons: (1) The almost total absence of hunting-associated evidence derived from Janabarriu contexts suggests that the Janabarriu people relied on domesticated stock. (2) Janabarriu patterns of both differential representation of body parts and mortality/management are distinct from those observed in the Urabarriu sample. These differences are interpreted as reflecting the harvesting of domesticated stock and are discussed in detail below. (3) Measurement of Janabarriu camelid bones indicates that only one homogeneous population was present at this time. Most of these measurements fit reasonably well with comparable measurements derived from modern llamas (see Table 3). It is important to note, however, that in all cases the Janabarriu measurements average significantly smaller than comparable measurements from the Urabarriu phase and slightly smaller than the comparative llama measurements. This apparent diminution in large camelid size between Urabarriu and Janabarriu times may be simply a statistical artifact of the elimination of the few guanacos that we have suggested were hunted by the Urabarriu occupants.

This same decrease in average size through time is also evident, however, in the measurements of llama-size bones from two other contemporaneous sites in the north-central highlands of Peru. Comparable osteometric data on camelid proximal first phalanges are available from Huacaloma (Shimada 1982:329) and Huaricoto (Sawyer 1985, personal communication 1990). Figure 9 summarizes these data and illustrates the tendency of large camelids in the north-central highlands to decrease in size from late Preceramic

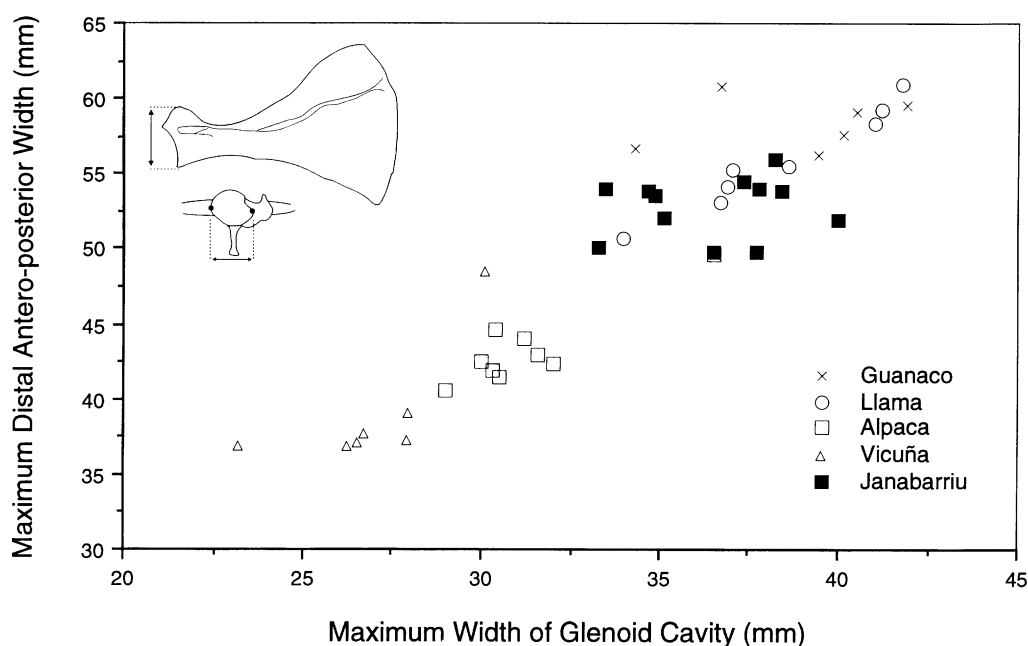


Figure 8. Bivariate plot of measurements from Janabarriu distal scapulae superimposed over identical measurements taken from modern camelids of known identities. Comparative llamas, alpacas, and vicuñas from the southern highlands of Peru, guanacos from Tierra del Fuego.

through Middle Horizon times. Seen at its most extreme at the site of Huaricoto (Chaukayan phase, ca. 2200–1800 B.C., to Marcará phase, ca. A.D. 400–600), this diachronic change represents a more than 20 percent decrease in phalanx width. Several other bone dimensions were checked for further evidence of this diachronic diminution: Chavín de Huántar, five bone dimensions; Huaricoto, three bone dimensions (Sawyer, personal communication 1990); Huacaloma, three bone dimensions (Shimada 1985:302). With only minor inconsistencies, all cases exhibited the same tendency: a 10 to 20 percent decrease in the size of large camelids from the earliest period to the latest.

The cause of this phenomenon is as yet unknown. We suspect, however, that it is related to at least two poorly understood aspects of camelid variation and biogeography. We have suggested above that guanacos may have been present in the *puna* zone of the Callejón de Conchucos and the Callejón de Huaylas, and that the occasional hunting of this species may have contributed to the osteometric inflation of the Urabarriu large camelids. As the hunting of these

animals was supplanted by the herding of domesticated llamas, the osteometric sample would become pure and the average size of the large camelids would decrease.

In addition to the elimination of guanacos from the platter of the herder/hunters of the north-central highlands, it is probable that the continued diachronic decrease in large camelid size at Chavín de Huántar, Huaricoto, and Huacaloma is related to the synchronic decrease in large camelid size observed from south (Valley of Cuzco, Peru) to north (Pirincay, Ecuador) during the Early Horizon to Early Intermediate Period (Miller and Gill 1990:62). Based on an observed latitudinal cline in bone measurements, these authors have argued that Early Horizon and Early Intermediate Period llamas constituted a polytypic species morphologically adapted to a variety of habitats ranging from the southern *puna* Andes of southern Peru and northern Bolivia to the *páramo* Andes of southern Ecuador. The morphological extremes of this latitudinal cline appear to have occurred, on the one hand, in the Collao (the area surrounding Lake Titicaca), where the largest llamas, those

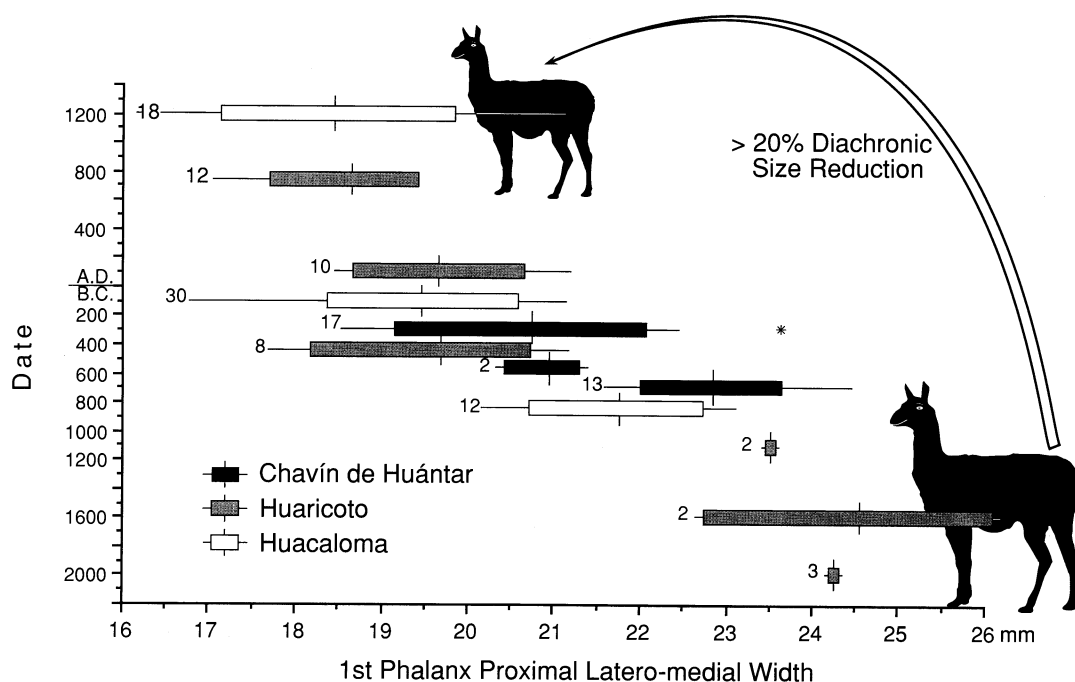


Figure 9. Modified Dice-Leras diagrams showing the diachronic diminution of proximal width measurements of camelid first phalanges from three Andean sites. Huaricoto data from Michael J. Sawyer, personal communication 1990. Huacaloma data from Shimada 1982: Table 3. Vertical line = mean; horizontal line = range; rectangle = one standard deviation; * = outlier.

described as "large cargo Inca army llamas" by Gilmore (1947:437), were bred, and on the other hand, in the highlands of southern Ecuador where a previously undocumented llama form, intermediate in size between contemporary llamas and alpacas, recently has been identified (Miller and Gill 1990). We believe that the diachronic diminution in large camelids observed at Chavín de Huántar and nearby sites provides further evidence of the gradual adaptation of southern llamas to northern environmental conditions and the development of a llama variety that in some instances was almost 15 percent smaller than the average llama of the Collao.

Approximately 5 percent of the Janabarriu camelid bone measurements fall below the llama osteometric range. All of these measurements were derived from bones of the foot, a point with implications to be emphasized below. We interpret the 5 percent of Janabarriu camelid bones that do not fall within llama parameters to be vicuñas and to represent vestiges of the ancient deer-vicuña-guanaco hunting pattern, perhaps

transformed into an infrequent activity with ritual and/or recreational associations, as was apparently the case among the later Moche and Inka (cf. Donnan 1982; Pizarro 1978).

Ch'arki and Bone Tools at Chavin

The diachronic profile of species abundance and the nature of the camelid populations found at Chavín de Huántar attest to the introduction of llama herding and a correlative decline in hunting, but they tell us little about the organization of these productive activities or the context in which the resulting animal products were distributed and consumed. Fortunately, these concerns can be approached by analyzing the imprint of cultural behavior left on animal bone due to activities such as butchery and the transport of foodstuffs. The study of these phenomena has only recently begun to be explored in Andean prehistory as part of a more general interest in taphonomic analysis in archaeology (cf. Stahl and Zeidler 1990; Tomka 1989). Numerous cultural and environmental factors are known to contribute to the formation of an

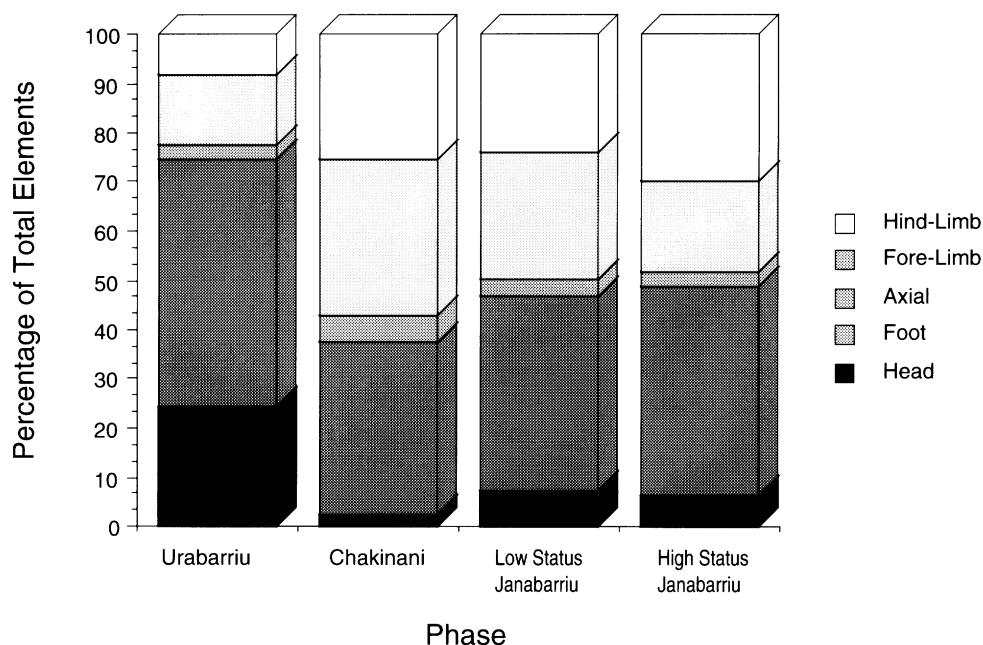


Figure 10. Differential representation of camelid major carcass groups from the three phases of occupation at Chavín de Huántar. Note that because of the difficulty of distinguishing between fragmentary camelid and cervid vertebrae and ribs, and hence their necessary inclusion in the taxon "artiodactyl," the axial category of camelids is certainly underrepresented during all three phases.

Andean faunal assemblage (Miller 1979), but for purposes of the current study, taphonomic discussion will be necessarily limited to issues that reflect directly on the situation at Chavín de Huántar, and on the camelids in particular.

A convenient point of departure for the study of the human handling of Chavín de Huántar animal bones is the differential representation of skeletal parts surviving in the collection. Figure 10 illustrates the relative proportions of the five major camelid carcass groups (head, axial elements, forelimbs, hindlimbs, and feet) recovered from each of the three Chavín phases. It is evident from this graph that a dramatically different pattern of camelid bone survival applies to the Urabarriu-phase material than that which typifies the later two phases. In a word, the Urabarriu camelid assemblage is characterized by an abundance of head and foot bones, while the Chakinani and Janabarriu phases show an acute reduction in those carcass groups and a correlative increase in leg elements. One might question, of course, whether these impressionistic contrasts are real or simply a result of different samples. Spearman's Rank Order Correlation Coefficient,

when applied to the Urabarriu vs. the Chakinani assemblage or the Urabarriu vs. the Janabarriu assemblage, yields results indicating that the differences are statistically significant ($r_s = .221$; $p \geq .1$ and $r_s = .061$; $p \geq .1$). In contrast, the same test applied to Chakinani vs. Janabarriu camelid bones demonstrates that these faunal samples possess quite similar rank-order profiles ($r_s = .678$; $p \leq .001$). Thus, something besides chance seems to have been producing the contrasting patterns of camelid bone survival from earliest to latest time at Chavín de Huántar.

In order to evaluate the two prehistoric patterns of Chavín bone survival summarized in Figure 10 and detailed in Table 4, it will be helpful to compare them to an ethnographic baseline. The differential representation of camelid skeletal elements from several ethnoarchaeological contexts in the *puna* of southern Peru has been studied by Miller (1979). A common pattern of head and foot overrepresentation and leg underrepresentation emerged from the excavations and surface collections conducted in 1975 at modern herding communities there. For instance, excavations conducted in a midden from the communi-

ty of Tuqsa, located at 4,300 m asl in the southern highlands, yielded head and foot elements approximately five times more frequently than leg elements.

Most of the causes of camelid bone survival at Tuqsa are well understood, and this assemblage will serve as a baseline with which to compare differential representation at Chavín de Huántar and other prehistoric sites in the Andes. There are four major influences acting on contemporary camelid bone survival in the highlands: (1) Intrinsic factors of differential bone density in several mammalian species (goat, sheep, caribou) have been documented to favor the survival of compact podial elements and enamel-protected teeth more than cancellous long-bone articulations and vertebrae (Binford and Bertram 1977; Brain 1969, 1981). Density determinations conducted on modern alpaca bones from the South American Camelid Research Station at La Raya, Peru, confirm that the camelids are no different in this regard (Miller 1979:68). (2) The contemporary pattern of camelid butchery takes advantage of the relative fragility of certain long-bone articulations (proximal humerus, proximal tibia, proximal femur, and distal femur) by fracturing them longitudinally and thereby differentially exposing these parts to higher degrees of postdepositional stress. (3) Bone gnawing and consumption by domestic dogs adds to the vectors of density and butchery factors because dogs differentially destroy spongy, nutritious and/or easily broached bones and, more often than not, ignore less desirable podial elements and teeth-bearing cranial bones. Thus, factors 1 to 3 converge in modern camelid herding communities in the southern highlands to decrease the archaeological visibility of such elements such as the cancellous, longitudinally fractured proximal humerus, while increasing the visibility of the elements such as the dense, generally unfractured astragalus.

The fourth factor, unlike the previous three, is not a factor of bone destruction but rather of bone transport, and can have the same effect as factors 1 to 3, or just the opposite, depending on the environment in which it is recorded. This factor is based in a practice common in the *puna* of modern southern Peru of producing dried llama and

alpaca meat by alternately exposing it to the desiccating effects of the Andean sun and freezing nights. The product of this freeze-drying process, *ch'arki*, has made its way from the native Quechua into English as "jerky" and constitutes one of the principal items traded by camelid herders of the *puna* to the occupants of highland valleys and the coast (Inamura 1981; Miller 1979). Camelid *ch'arki* is mentioned by several chroniclers (Acosta 1954 [1589]:136; Cobo 1964 [1653]:244) as having been an important food item at the time of the Spanish conquest.

For the zooarchaeologist the method of manufacturing *ch'arki* is fortuitous and conforms well to other researchers' observations concerning differential treatment of carcass parts with high-meat utility indexes versus those with low-meat utility indexes (cf. Binford 1981). Traditional *ch'arki* is unlike western beef jerky in that the product normally incorporates the bones within the meat and makes use of all portions of the animal except for the head and feet, which are generally reserved for immediate home consumption by the herding communities.⁴ Although the modern residents of the *puna* above Chavín de Huántar no longer possess llamas or alpacas, they continue to manufacture *ch'arki* from cattle and swine in the same manner as observed among camelid herders of southern Peru. Traditionally, this beef and pork *ch'arki* is traded to people living at lower elevations for corn, wheat, and barley (Martín Justiniano, personal communication 1983).

Hypothetically, the zooarchaeological manifestation of *ch'arki* production and trade would be an overrepresentation of podial and cranial elements at high-altitude sites where camelids were resident and *ch'arki* was manufactured, and a concomitant overrepresentation of leg and axial elements at intermontane valley or coastal sites that were on the receiving end of the trade arrangement (see Figure 11). This phenomenon, termed the "*ch'arki* effect" (Miller 1979:210), was hypothesized as a result of Miller's ethnoarchaeological research, and its high-altitude manifestation is proposed here as the fourth causal element in the differential representation seen at several modern and prehistoric sites in the southern highlands.

Table 4. Frequencies and Survival Percentages of Camelid Bone Elements at Chavín de Huántar.

	Urabarriu			Chakinani			Janabarriu (Sector A)			Janabarriu (Sector D)		
	ENF	ONF	%	ENF	ONF	%	ENF	ONF	%	ENF	ONF	%
Cranial												
Maxilla	28	0	35.7	28	0	0	64	0	0	56	0	0
Mandible	28	10	71.4	28	0	0	64	5	0	56	0	0
Cranial (Misc.)	28	77	203.6	28	3	10.7	64	37	57.8	56	29	51.8
Total cranial	84	87	79.8	84	3	3.6	192	42	21.9	118	29	17.3
Appendicular												
Scapula (glenoid)	28	15	53.6	28	10	35.7	64	37	57.8	56	14	25.0
Proximal humerus	28	5	17.9	28	18	64.3	64	19	29.7	56	16	28.6
Distal humerus	28	15	53.6	28	16	57.1	64	43	67.2	56	34	60.7
Proximal radio-ulna	42	7	16.7	42	4	14.3	96	39	40.6	84	16	19.0
Distal radio-ulna	28	4	14.3	28	7	25.0	64	21	32.8	56	19	33.9
Carpal	196	13	6.7	196	16	8.2	448	44	9.8	392	36	9.2
Proximal metacarpal	28	4	14.3	28	5	17.9	64	20	31.3	56	11	19.6
Phalanx												
1st	112	89	79.5	112	8	7.1	256	31	12.1	224	52	23.2
2nd	112	30	26.8	112	2	1.8	256	5	2.0	224	20	8.9
3rd	112	7	6.3	112	5	4.5	256	11	4.2	224	4	1.7
Distal metapodial	56	22	39.3	56	8	14.3	128	42	32.8	112	32	28.6
Proximal metatarsal	28	11	39.3	28	4	14.3	64	25	39.1	56	22	39.3
Tarsal	84	14	11.8	84	6	7.1	192	26	13.5	168	28	16.7
Astragalus	28	11	39.3	28	4	14.3	64	34	53.1	56	20	35.7
Calcaneum	28	17	60.7	28	5	17.9	64	42	65.6	56	13	23.2
Distal tibia	28	3	10.7	28	4	14.3	64	14	21.9	56	15	26.8
Proximal tibia	28	9	32.1	28	2	7.1	64	12	18.8	56	9	16.1
Patella	28	3	10.7	28	10	35.7	64	25	39.1	56	37	66.1
Distal femur	28	1	3.6	28	7	25.0	64	13	20.3	56	23	41.1
Proximal femur	28	1	3.6	28	10	35.7	64	13	20.3	56	20	35.7
Acetabulum	28	4	14.3	28	16	57.1	64	15	23.4	56	26	46.4
Axial												
Atlas	14	3	21.4	14	0	0	32	3	9.4	28	2	7.1
Axis	14	0	0	14	4	28.6	32	3	9.4	28	7	25.0
MNI			7			7			16			14

ENF = expected number of fragments (probable number of recognizable fragments per element per individual multiplied by the minimum number of individuals; see Miller 1979:178–185); ONF = observed number of fragments; % = survival percentage (ONF/ENF).

Chakinani and Janabarriu Differential Representation

With this understanding of the taphonomy of modern camelid-herding communities, we can now return to the differential representation observed at Chavín de Huántar. For sake of clarity it will be convenient to discuss the evidence from the last two phases first and then to examine the somewhat more complex Urabarriu situation. As seen in Table 4 the skeletal element profiles from Chakinani and Janabarriu, although possessing slight variations in detail, exhibit the same general pattern: inordinately high survival rates for leg bones and relatively poorer representation of cranial and podial elements.⁵ This pattern,

when compared graphically to the skeletal-element profile from Tuqsa, presents a pattern almost exactly opposite to the typical bone survival seen in a contemporary alpaca herding community (see Figure 12). What could have caused camelid bone to have survived in such a distinct fashion at Chavín de Huántar? Of the four taphonomic factors mentioned above as contributing to the differential representation of camelid bone in known ethnoarchaeological contexts, factors 1 to 3 appear to have been acting on the later two Chavín assemblages in approximately the same fashion as they functioned at Tuqsa: (1) Differential bone density always favors foot and head elements, regardless of the location or antiquity of the deposit. (2) Longitudinal fracturing of

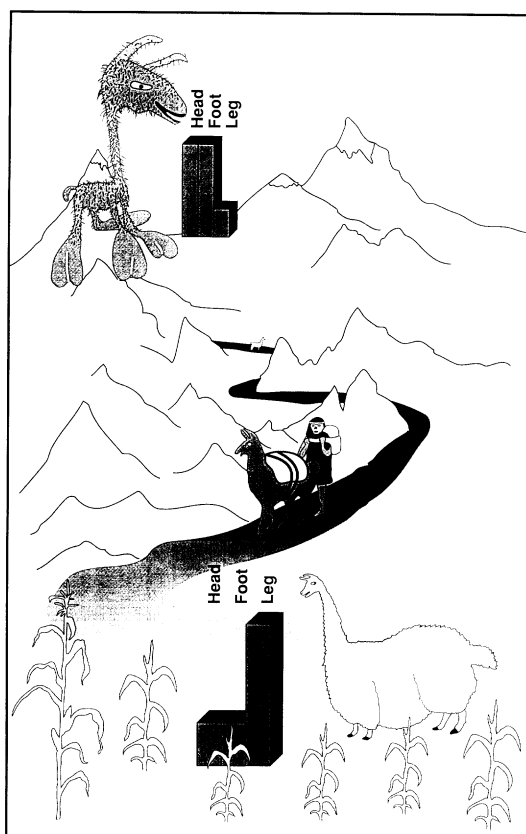


Figure 11. Pictorial representation of the ch'arki effect, an explanatory model of the differential representation of camelid bone in *puna* vs. *kichwa* environmental zones.

articular ends is very common among Chakinani (53.7 percent) and Janabarriu (78.1 percent) camelid leg bones. Such a pattern conforms to butchery practices observed among contemporary llama and alpaca herders of southern Peru (Miller 1979:61–66). (3) The incidence of carnivore gnawing on Chakinani (6.1 percent) and Janabarriu (16.3 percent) camelid bones is within the same order of magnitude as that observed on the Tuqsa bones (9.9 percent). In any case, the sum total of these three taphonomic factors would be to *decrease* the survival of leg elements, not to increase their survival as is observed with the Chakinani and Janabarriu assemblages. We believe that the most important factor influencing the differential representation of camelid bones from the last two phases at Chavín de Huántar was taphonomic factor number 4 (i.e., the ch'arki

effect) and the nature of the environment surrounding the site.

The valley of Chavín de Huántar is extremely narrow, roughly 1 km wide, and while it is well suited to potato cultivation, it would not have provided adequate pasturage for large herds of domesticated camelids. As noted earlier, abundant and excellent pasture land is available within the catchment of Chavín de Huántar, an hour or more away in the *puna* of the Cordillera Blanca and the Cordillera Oriental at altitudes of 3,800 to 4,100 m (see Figure 2). The llamas used by the inhabitants of Chavín de Huántar were probably never resident on the valley floor itself for any length of time, but instead were maintained in the *puna* zone where a significant percentage of them were slaughtered and prepared as ch'arki. Following this interpretation, dried meat containing mostly bones of the upper legs and the axial skeleton would have been traded from high-altitude herding communities to the settlement surrounding the temple of Chavín de Huántar. In return, the Chavín residents would have provided agricultural products such as maize, which could not be cultivated without great risk on or above the valley floor, or exotic items such as coastal shell or obsidian acquired through exchange.

Numerous Early Horizon village sites have been located near Chavín de Huántar between elevations of 3,600 m and 3,850 m, just below the beginning of the vast *puna* pasture land. These settlements were coeval with the valley-floor center and shared its religious ideology, as evidenced by the presence of Chavín-style sculptures at these sites (Burger 1983). Modern Quechua communities located close to these small sites combine high-altitude cultivation of frost-resistant tubers and grains with herding on the adjacent *puna*. Thus, at Chavín de Huántar the ch'arki effect provides a diagnostic faunal fingerprint of the vertical interdependence of multiple-resource zones, which is so often claimed as a hallmark of the Andean economic system (Murra 1972) and offers further evidence for the simultaneous adoption of vertical resource exploitation and camelid pastoralism (cf. Custred 1979; Lynch 1983).

Zooarchaeological evidence for the vertical interdependency of *kichwa* and *puna* communities in the northern and central highland valleys is

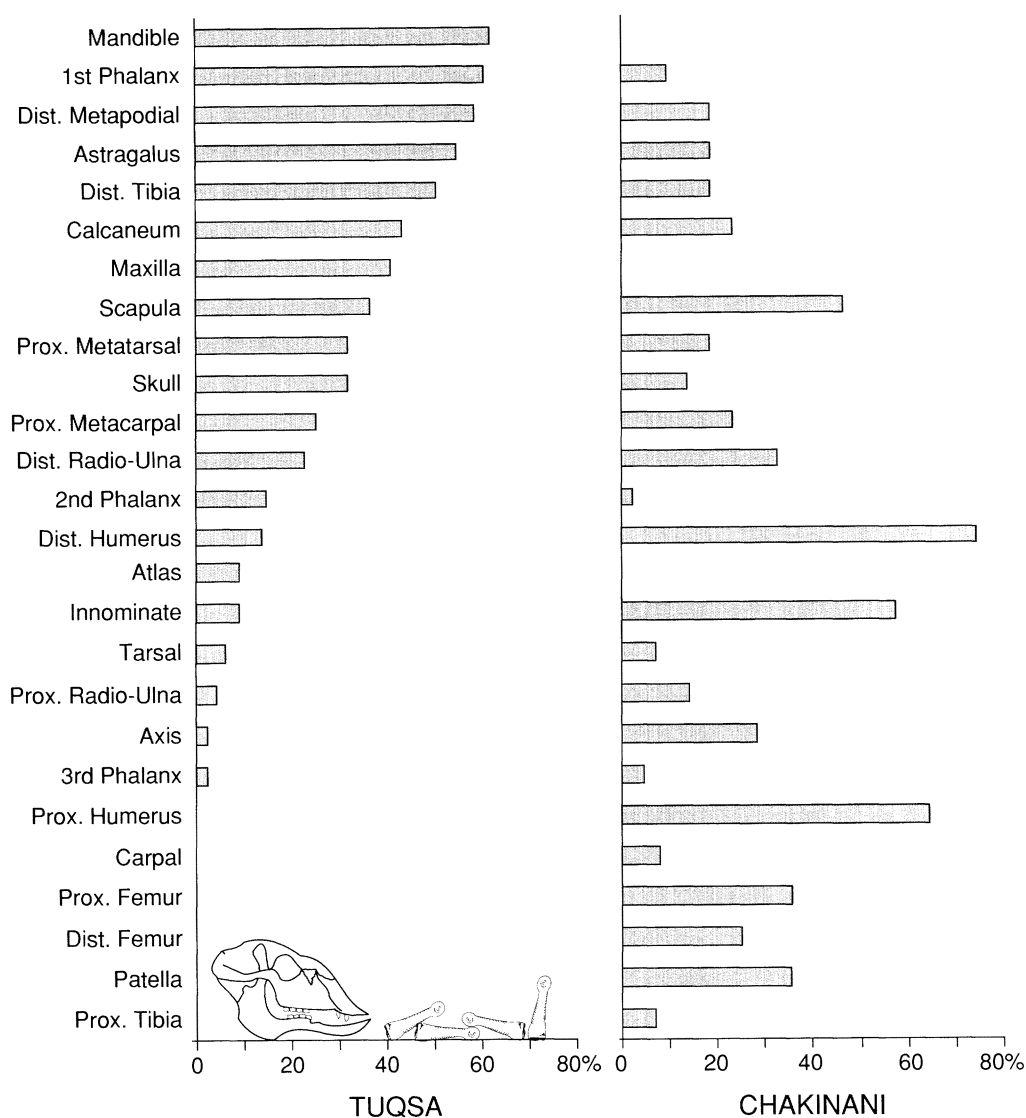


Figure 12. Differential representation of camelid skeletal elements from the Chakinani phase of Chavín de Huántar compared to the representation of those same elements from the ethnoarchaeological site of Tuqsa in the southern highlands of Peru. The figure demonstrates a highly significant difference in skeletal part representation between the two sites (Spearman's Rank Order Correlation Coefficient $r_s = -.34, p \geq .1$).

not limited to the site of Chavín de Huántar. The site of Kotosh is located some 120 km to the south on the floor of the upper Huallaga Valley at an altitude of approximately 2,000 m. In the analysis of Kotosh camelid remains approximately coeval with Chavín de Huántar, it was noted that "the terminal bones of the foot, the phalanges, are particularly infrequent" and that "the main muscle bearing bones of the limb, the humerus, and femur are

for the most part represented more frequently than expected" (Wing 1972:338). Wing attributes the Kotosh differential representation of camelid bones to procedures of butchery and bone-tool manufacture, but in addition to these factors we suspect that the over-abundance of leg bones was caused by Kotosh's position as the low altitude, agricultural partner in a vertical ch'arki trading relationship. The arid environmental setting of

Kotosh, which is located in a rain shadow, makes it quite unlikely that a large population of camelids would have been resident in the immediate vicinity of the site.

The ceremonial site of Huaricoto is located 55 km to the southeast of Chavín de Huántar on a low terrace just above the valley floor of the Callejón de Huaylas at an altitude of 2,750 m. This site also contains evidence of the ch'arki effect. Michael Sawyer (1985:70–71) reports that during the Early Capilla (600–400 B.C.) and Late Capilla phases (400–200 B.C.) there was a low frequency of camelid foot bones, concluding that the llama herds were not resident in the Callejón de Huaylas, but instead were maintained in the *puna* zone of the Cordillera Blanca above the site.

Finally, 250 km to the north of Chavín de Huántar at the site of Huacaloma, Cajamarca, and at an altitude of 2,700 m, Melody Shimada has found an overrepresentation of camelid appendicular elements and an underrepresentation of camelid podial elements from Initial Period to Middle Horizon contexts (Shimada 1982:323). Again, this pattern of skeletal representation is most probably the result of the importation of camelid meat in the form of ch'arki to the site from the high-altitude grassland environment.

It would be inappropriate, however, to interpret these data as documenting that camelids were consumed exclusively as ch'arki by lowland residents. Scrutiny of the Chavín de Huántar evidence (Figure 12, Table 4) reveals that the camelid meat consumed by the Chakinani and Janabarriu populations did not arrive at the site purely in ch'arki packages, since head and foot parts do occasionally occur in these assemblages, albeit in relatively low frequencies. This pattern is to be expected and conforms to what might be termed the "*kichwa* zone mixed consumption pattern" of *puna*-originated camelid meat. This pattern, characterized by elevated frequencies of leg and axial elements but not total absence of podial and cranial elements, probably resulted from the residents of valley-floor sites consuming a large quantity of imported ch'arki mixed with an occasional entire llama carcass brought to the site on the hoof. We suspect that such mixed consumption would have occurred more commonly than the exclusive consumption of ch'arki and that it reflects the avail-

ability of fresh meat during the culling of the herd just before the onset of winter and/or the occasional slaughter of llamas during the summer months when ch'arki production was not possible.

An additional factor that may have contributed a few podial elements to the Chakinani and Janabarriu samples was the persistence of episodic vicuña hunting. For instance, the small camelids identified as constituting 5 percent of the Janabarriu assemblage, mentioned in the previous section, are represented entirely by foot bones. These podial elements may have arrived at Chavín de Huántar as part of vicuña carcasses brought back to the site as meat packages in skin grocery bags, perhaps corresponding to the widely recognized pattern known as the "schlepp effect" (cf. Perkins and Daly 1968).⁶

Urabarriu Differential Representation

The Urabarriu camelid assemblage differs in representation of body parts from both the ethnoarchaeological pattern of *puna* bone survival at Tuqsa (see Figure 13) and the Chakinani and Janabarriu assemblages discussed above. The high incidence of cranial and podial elements in the Urabarriu assemblage presents a superficial resemblance to the ethnoarchaeological pattern found in high-altitude ch'arki production communities and seems to suggest that camelids might have been resident in the valley of Chavín de Huántar during the earliest phase of the site's development. But if the science of taphonomy has shown nothing else in the past 20 years, it is that things are not always as they seem. It is highly improbable that camelids would have been resident in the valley of Chavín de Huántar because of the absence of sufficient forage and because the *kichwa* zone altitude of the site would make ch'arki production impossible. Moreover, we interpret a substantial proportion of the Urabarriu camelids as wild vicuñas, along with a few guanacos. Instead, we believe the differential representation of Urabarriu body parts is due to both the mixed hunting and herding context of their origin and the prevalence of bone-tool production during the Urabarriu phase.

Unlike the faunal assemblages from the later two phases, the Urabarriu sample contains an extremely high frequency of bone tools and bone-

tool byproducts. A total of 16.3 percent of the specimens in the Urabarriu faunal assemblage were classified as tool byproducts or showed evidence of having been worked. At the time of excavation, Burger (1984a:204–209) identified 52 bone artifacts in the Urabarriu assemblage, including needles, awls, spatulas, gouges, and beads. The great majority of these tools were produced from the shafts of camelid and cervid leg bones, a practice that would have reduced the archaeological visibility of leg bones compared to foot and cranial elements (which were not commonly used as tool blanks) and would have artificially increased the differential representation of foot and cranial elements in the Urabarriu sample. This interpretation is corroborated by the unusually large percentage of Urabarriu bones that could be identified only as “indeterminate artiodactyl” (21.7 percent of total fragments). Most of these indeterminate specimens were long-bone fragments that had been too badly damaged to distinguish between camelids and cervids. Much of this damage could have been sustained during the production of bone tools; in fact, 45 percent of the indeterminate artiodactyl bones exhibited the characteristic polish or cut marks of worked bone. When these factors are taken into account, the Urabarriu camelid assemblage can be plausibly interpreted as being derived from wild and domesticated animals brought to Chavín de Huántar on the hoof or in carcass form from the grasslands, and subsequently used both as meat and in the bone-tool industry.

Camelid Harvesting and Social Differentiation

Just as camelid bones reflect the social and economic relationships that existed between Chavín de Huántar and surrounding groups, they also provide a window into the internal sociopolitical organization of the settlement. By the time of the construction of the New Temple during Janabarriu times, Chavín de Huántar had expanded to cover an estimated 42 ha. The settlement certainly was one of the most impressive population centers of the period and may even have constituted a protourban center with all the attendant complexity that this term implies (Burger 1984a:250; 1992a:16–181; cf. Rowe 1963:3). Excavations in Janabarriu-associated contexts

clearly demonstrate that the population of Chavín de Huántar's last phase was both specialized in craft production and hierarchically differentiated in regard to consumption of commodities (Burger 1984a:235–241, 1989:563–564). Sector A, located on the north side of the Huachecsa River, was characterized by a variety of lithic implements suggesting artisan activities by a population of low social rank. In contrast, the Janabarriu deposits excavated in Sector D, located on the lower slopes overlooking the New Temple, yielded a variety of high-prestige goods including gold jewelry, worked *Spondylus* shell, bone beads, and fossils, all of which were absent from Sector A contexts.

Based on the artifactual evidence indicating Janabarriu socioeconomic differentiation, one might expect that the faunal remains recovered from Sectors A and D would reflect similar differences in status and activities, and this is indeed the case. The Sector D residents appear to have possessed differential access to both dried fish from the coast (eight of nine identified fish bones are from Sector D), and a much greater variety of shellfish (Sector D = 12 species, Sector A = 2 species) than the residents of Sector A. On the other hand, no significant difference in the consumption of individual mammalian species was detected, nor did the high-prestige population of Sector D have differential access to prime cuts of camelid meat (see Table 4). The skeletal element profiles from the two sectors are virtually identical as judged by Spearman's Rank Order Correlation Coefficient ($r_s = .629$; $p \leq .001$). The only area of camelid consumption in which the two Janabarriu sectors exhibit clear distinction is the age of the animals consumed. But before examining these data, a brief discussion of contemporary and prehistoric camelid mortality and harvesting and the archaeological criteria used to identify this phenomenon will be required.

The tendency among modern camelid herders is to maintain their animals on the hoof for as long as they are productive, reflecting the low prestige of camelids as food in urban centers and, consequently, the lack of emphasis on producing high-quality meat by rural herders. Current notions of camelid productivity translate as fiber production for alpacas, burden-bearing strength for male llamas, and fertility for both llama and

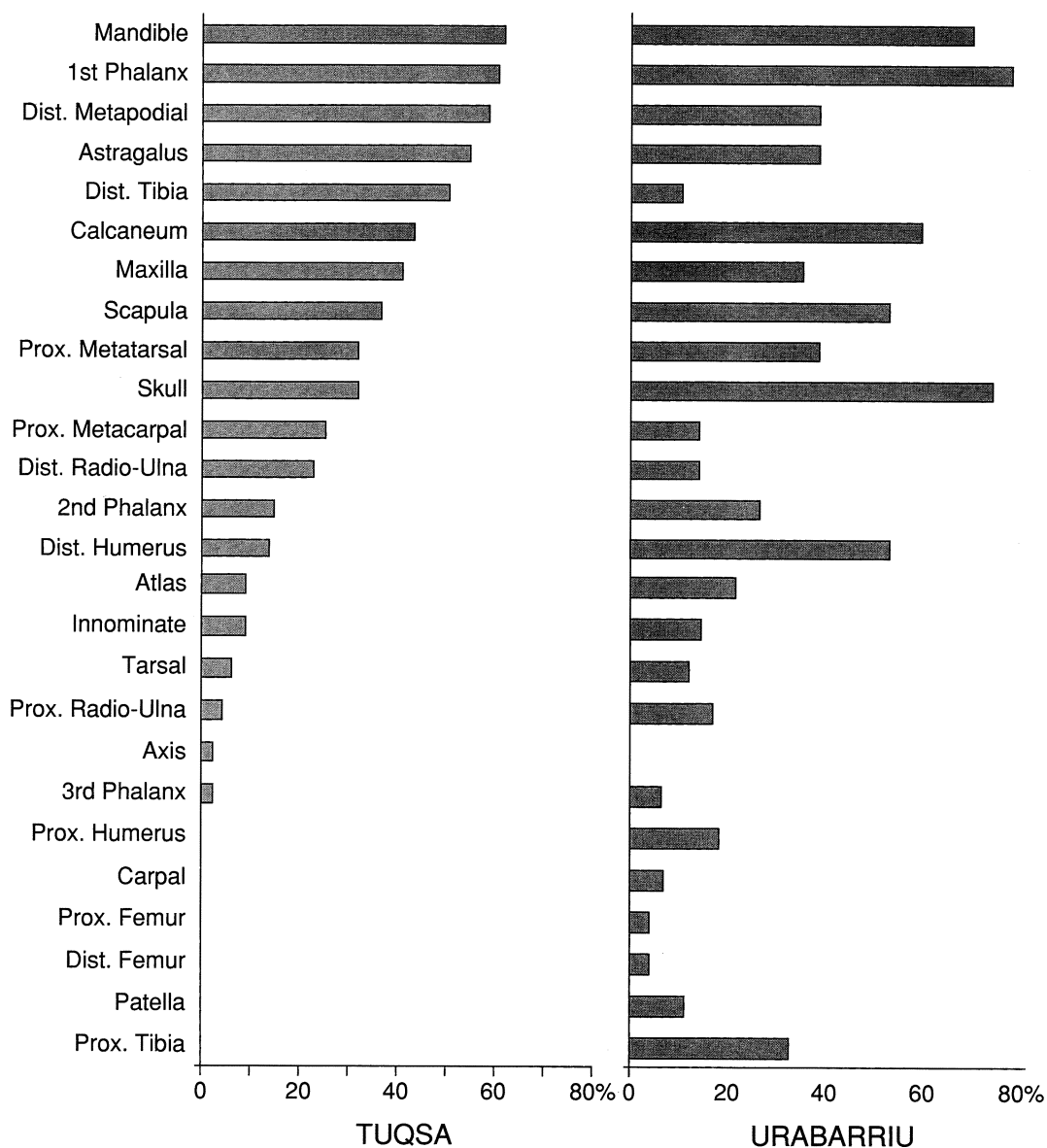


Figure 13. Differential representation of camelid skeletal elements from the Urabarriu phase of Chavín de Huántar compared to the representation of those same elements from the ethnoarchaeological site of Tuqsa. (Spearman's Rank Order Correlation Coefficient $r_s = .686, p \geq .01$).

alpaca females. Only after this productivity has been exhausted, usually after some seven to eight years, are the animals normally slaughtered for meat.⁷ This pattern of contemporary camelid harvesting, combined with an estimate of the naturally occurring mortality of the species, is represented graphically by the background mortality/survivorship curve in Figure 14.

The contemporary pattern of camelid management contrasts with that once practiced at some prehistoric sites in the Andes. Several researchers have reported camelid mortality patterns, based on both tooth eruption and epiphyseal fusion, which demonstrate large to massive die-off for animals of less than one year of age (Miller 1979:215; Shimada 1982, 1985; Wheeler Pires-

Ferreira et al. 1976). Such neonatal and juvenile camelid exploitation has been suggested as a hallmark of early camelid domestication, perhaps precipitated by enterotoxemia infection associated with the crowded conditions of corrals (Wheeler 1984). For example, at Telarmachay on the *puna* of Junin at approximately 4000 B.C., Wheeler Pires-Ferreira et al. (1976) found 72 percent of the camelids to be newborns. Judging by the state of epiphyseal fusion, such a pattern does not characterize the survivorship of the camelids from Chavín de Huántar: 14.4 percent of the Urabarriu camelids are subadults, as are 39.7 percent of the Chakinani camelids and 26.9 percent of the Janabarriu camelids.

Within the Janabarriu sample, the two residential sectors exhibit distinct patterns of mortality/survivorship (see Figure 14), which we interpret as reflecting separate exploitation strategies practiced by the low-status vs. high-status populations. Based on the known schedule of camelid epiphyseal fusion (Miller 1981), the high-status residents of Sector D seem to have possessed differential access to tender meat from younger animals. Almost 80 percent of the Sector D llamas had died before or at three years of age, while they were still relatively tender but long before they had fulfilled their productive potential as cargo animals. In contrast, almost 60 percent of the llamas eaten by the low-status residents of Sector A were four years of age or older.

We anticipate two potential criticisms concerning the validity of the above interpretation. First, mortality/survivorship curves based on bone-fusion data possess inherent difficulties. Since each one of the age grades on the horizontal axis of Figure 14 reflects a series of epiphyseal fusion loci (e.g., the distal femur and proximal and distal radio-ulna all fuse by approximately three years of age), the zooarchaeologist ideally seeks a faunal assemblage in which all fusion planes are equally represented. Such equal representation (one bone, one vote), however, seems to exist only in theory. In real faunal assemblages factors of taphonomy and chance always skew the representation of one bone or another. Hence, the representation of some fusion planes and consequently some age grades may be inflated or underrepresented. This is certainly a problem in regard to the absolute accuracy

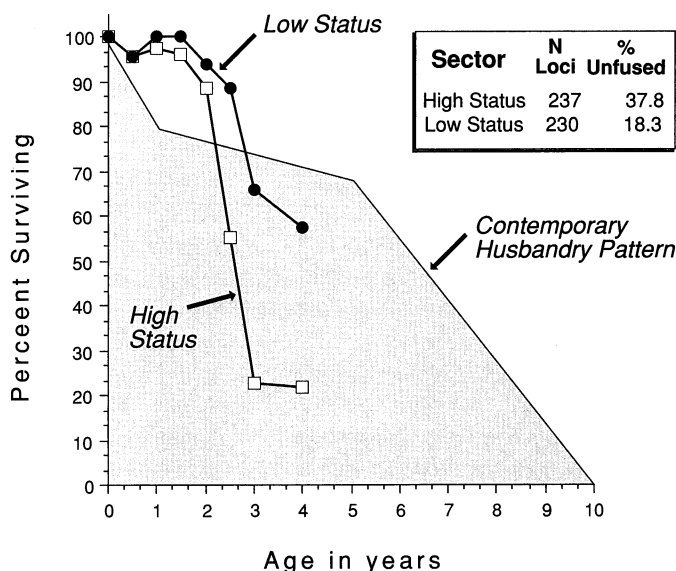
of mortality/survivorship curves based on bone fusion and in comparing the mortality/survivorship curves from widely different taphonomic contexts. For instance, it would be entirely inappropriate to compare the mortality/survivorship curves from Urabarriu and Janabarriu because we have observed that bones survived quite differently in those two phases. Valid comparison of the two Janabarriu sectors, however, is possible because we have observed above that the differential representation of bone elements in these two contexts is essentially identical.

Secondly, one might ask what difference tender young vs. tough old meat would make to Sector A or Sector D Janabarriu residents, if they were receiving the majority of it in desiccated ch'arki packages? While this question appears to present a valid academic challenge, it is not borne out in Andean experience. Today in the highlands of Huancavelica, ch'arki is made from both young and old llamas and alpacas, but to the discerning palate of the consumer it is self-evident what the age of the slaughtered animal was, since younger animals have a better flavor and more tender texture when the ch'arki is eaten. The thickness of cut and other details of production also differ in relation to the age of the animal (Mauro Tiellacuri Ramos, personal communication 1989). Like modern consumers, the Sector D Janabarriu residents probably also found ch'arki manufactured from young animals more desirable, and their ability to acquire it is reflected in the high-status survivorship curve in Figure 14. Slaughtering animals still in their prime for the gustatory gratification of the elite residents of the valley center provides independent evidence of the emergence of social inequality at Chavín de Huántar during the Early Horizon.

Summary and Discussion

Analysis of the animal bones from Chavín de Huántar has provided us with several intriguing observations concerning the diachronic pattern of faunal exploitation at the site. In this section, we shall review our findings and briefly explore some of their implications for understanding the development of the site of Chavín de Huántar and the spread of domesticated camelids to the northern highlands and coast of Peru. In our conclusion

Figure 14. Differences in camelid harvesting (survivorship) between high-status and low-status sectors of Chavín de Huántar during the Janabarriu phase. Background curve represents the mortality-management pattern observed by Miller among contemporary llama and alpaca herds of the southern highlands of Peru.



we will return to the relationship between Chavín economy and ideology as reflected in the famous sculptural symbols of Chavín de Huántar.

Economy of Chavín de Huántar

The evidence presented above demonstrates that from its foundation in the late Initial Period (ca. 900 B.C.), the settlement of Chavín de Huántar was partly dependent upon the hunting and herding of camelids on the vast *puna* grasslands above the valley slopes. During the period of the Old Temple (i.e., the Urabarriu phase), the faunal remains reveal a mixed exploitation strategy consisting both of the hunting of wild game, primarily vicuña and deer, and the management of domesticated llamas. The presence of llamas in the Urabarriu refuse fits well with other lines of evidence suggesting that Chavín de Huántar was, from its inception, an important node in the network of long-distance exchange within the highlands and among the coast, highlands, *ceja de selva*, and tropical lowlands.

Judging from the Urabarriu phase faunal remains, the primary importance of llamas initially was as pack animals, while their use for meat appears to have been a secondary byproduct of the annual culling of the herds and inevitable losses due to disease and other factors. The majority of the llamas consumed during Urabarriu times were four years of age or older. It is noteworthy

that during this time wild game comprised 60 – 70 percent of the meat, with the remaining 30 – 40 percent coming from llamas. The vicuña and white-tailed deer appear to have been hunted by the valley-floor residents themselves, judging from the presence of numerous projectile points in their refuse. The probable weapon used was the spear-thrower (*atlatl*), which figures in the iconography of Chavín de Huántar stone carvings (Rowe 1962:18). Thus, it would seem that during the Urabarriu phase the people of the valley floor directly acquired most of their own meat and were largely self-sufficient in this respect.

On the other hand, the maintenance of llama herds on the narrow valley floor would have been impractical, and managing them on the high pasture lands would have been difficult from Chavín de Huántar, despite the compressed zonation that characterizes the area. Herding would have required the active cooperation of people living in high-altitude villages near the lower edge of the *puna*. These villages must have been partially integrated into the Chavín economy even during the late Initial Period. The economic links were reinforced by shared participation in the Chavín religious cult both at the monumental valley-floor temple and at small shrines in the high-altitude villages themselves (Burger 1983).

As the settlement and temple of Chavín de Huántar grew during the Early Horizon (i.e.,

Chakinani and Janabarriu phases), the pattern of faunal exploitation shifted to one devoted almost exclusively to domesticated llamas. During the Chakinani phase (500–400 B.C.) llama consumption constituted approximately 83 percent of the total meat intake, and by the Janabarriu phase (400–200 B.C.) it reached approximately 93 percent. These changes reflect several interrelated processes that transformed the local economy. First of all, interregional commerce between Chavín de Huántar and more distant regions increased; consequently, access to llamas, the only alternative to human cargo-bearers, must have become more essential. At the same time, hunting decreased in importance until, by the Janabarriu phase, its contribution to the daily diet was almost negligible. The abandonment of hunting by the inhabitants of Chavín de Huántar would have allowed them to devote more time to trade, crafts, farming, and other valley-floor activities (temple rituals, service activities for visitors, etc.). On the other hand, it implied an increasing dependency on the herders and farmers living in high-altitude hamlets and villages. These small communities appear to have been responsible for managing the llama herds on the *puna* grasslands, slaughtering them there, and producing llama meat for consumption by the valley-floor residents. The differential representation of camelid skeletal elements found at Chavín de Huántar demonstrates that this meat was usually provided in the form of dried-meat packages (*ch'arki*) that could be consumed throughout the year.

Thus, the faunal analysis graphically documents the shift from a generalized economic system with loose ties between the vertical production zones to a more specialized economy in which communities with specialized concerns were integrated into a single interdependent subsistence system. This arrangement, although productive, is *not* environmentally determined by the vertical zonation. It is entirely feasible to maintain a stable and prosperous agriculturally based subsistence system on the valley floor without the input of meat from domesticated camelids, just as high-altitude villages could have survived by supplementing their herding with the cultivation of tubers and grains such as quinoa on the

upper valley slopes. In fact, for much of Peruvian prehistory, these two strategies coexisted without being fully articulated, and in some cases, they actually functioned in opposition to each other, both symbolically and physically (e.g., Duviols 1974). The shift to a vertical and reciprocal subsistence system reinforced the urban-rural dichotomy within Chavín society, and the differential patterns of camelid consumption between the center and its support area highlight the fundamentally asymmetric character of this relationship. The urban residents ate the meaty flanks of the animals, while the *puna* residents appear to have commonly settled for llama feet and heads.

The faunal remains analyzed here provide additional information for the presence of social stratification within the Chavín de Huántar settlement. It would appear that some valley-floor residents, previously identified as corresponding to the community elite, procured meat from young llamas, slaughtered long before they had fulfilled their potential as pack animals, while the less fortunate members of the community dined on the meat of generally older and presumably less desirable animals. Thus, the faunal remains offer preliminary evidence not only of increasing economic specialization between communities, but also of increasing social differentiation among these communities and within the principal center of this settlement system.

Chavín de Huántar and the Emergence of Andean Agropastoralism

Chavín de Huántar flourished within a sphere of interaction that included most of the central and northern coast and highlands of Peru, as well as portions of the south coast. This phenomenon resulted in the widespread adoption of religious, cultural, and technological features in previously unrelated societies, as well as the more extensive distribution of specific exotic items, such as obsidian and cinnabar. Long-distance trade and contact between many of these groups already existed before the Chavín horizon, particularly in the late Initial Period, but the intensity and impact of these linkages were significantly less. What role did the introduction of the domesticated llama have in the development of the Chavín sphere of interaction and what, if any, impact did

this horizon phenomenon have on the adoption of camelid herding beyond its original source area in central and southern Peru?

In reviewing the faunal studies carried out for Initial Period and Early Horizon occupations at northern centers, one is struck with two seemingly interrelated phenomena: the late dates when camelid pastoralism generally became accepted north of the *puna* of Junin and the rapidity with which this innovation was integrated into the economy of Chavín de Huántar. If Kent (1982), Wheeler (1984), and Wing (1986) are correct in dating the widespread adoption of domesticated camelids in the central highlands to at least the third millennium B.C. (see Figure 15d), it is noteworthy that full-scale acceptance of this economic innovation does not occur in the northern region in some cases until well into the Early Intermediate Period (200 B.C.–A.D. 600). The residents of Initial Period highland centers, such as Kotosh, Huaricoto, Huacaloma, and Pacopampa, dined primarily on venison throughout this period. The more northern centers, Pacopampa and Huacaloma, which were established centuries before Chavín de Huántar, made only minimal use of camelids in their diet during the Initial Period. These centers acquired virtually all of their meat by hunting, and wild camelids were not native to the adjacent valley slopes and moister *páramo* grasslands.⁸

Although camelids did not play a significant role in the Initial Period diet of these and other northern centers, the llama was apparently already known there as a pack animal. Camelid bones, presumably llamas, occasionally occur in late Initial Period contexts at Huacaloma, Pacopampa, and the nearby coastal center of Huaca Lucía (see Figure 15c). At the latter site, Shimada has discovered llama excrement, confirming that live animals, rather than an occasional piece of dried llama *ch'arki*, were responsible for the stochastic appearance of these camelid bones. At Huaca Negra in the Viru Valley, archaeologists Strong and Evans discovered a llama buried in a shallow pit with its front legs bound together from the hoof up to the forelimb in coiled rope and with the hind legs lashed together above the hoofs. Nearby, three other llamas were found tied, and two still wore harnesses around their

heads and neck. Dated to the Middle Guañape period, roughly equivalent to the late Initial Period (Burger 1984a:371), the large rectangular building where these animals were discovered has been interpreted as a public building (the Temple of the Llamas), and the four llama burials were considered by the excavators to be religious offerings (Strong and Evans 1952). On the other hand, camelid food-bone refuse was scarce at this and other coeval coastal sites, and camelid wool does not appear in textiles until the Early Horizon. In summary, the evidence currently available suggests that camelid herding was probably absent to the north of Chavín de Huántar before the Early Horizon, although the arrival of camelids from southern and central Peru as pack animals would have made them a rare but identifiable sight in this northern region.

Although conforming generally to the northern trend of delayed adoption of camelid pastoralism, Chavín de Huántar is exceptional in its relatively early emphasis on these animals. During the late Initial Period, when all northern coeval sites were still relying heavily on the hunting of deer, more than 80 percent of the fauna consumed by the residents of Chavín de Huántar were from the family Camelidae.

The northern pattern of camelid adoption does not resemble the scenario suggested by Lynch (1983:4) where "pastoralism may have become known nearly simultaneously in the far-flung corners of the communicating Andean world." Nor does it conform entirely to Shimada's hypothesis that "if domestic camelid diffused out of the central highlands, we might expect sequential dates later as we move farther north" (Shimada 1982:311). Instead, all available archaeological data indicate that after the initial domestication of llamas and alpacas in southern and/or central Peru, the northward diffusion of domesticated camelids progressed extremely slowly for more than 2,000 years until the rise of Chavín de Huántar around 900 B.C., when this center assumed a catalytic role in the widespread adoption of these animals into northern economies (see Figure 15b). Why should this have been so?

The reasons may be partially environmental. Throughout the Preceramic and Initial periods, wild animals, principally cervids, along with

domesticated *cuyes*, appear to have provided sufficient meat for the residents of the *kichwa* zone valleys. The forested habitats favored by deer, however, may have experienced considerable reduction in the northern and north-central intermontane valleys during the Initial Period and Early Horizon (Shimada 1985:207–208). This environmental shift, whether occasioned by climatic or cultural factors, may have caused the depletion of cervid herds and forced the expanding valley populations to look upward toward the *puna*. This explanation, however, emphasizes the nutritional value of the *puna* camelids rather than the value that we believe the valley residents found most compelling.

In trying to assess the reasons for the prosperity, success, and influence of Chavín de Huántar, the access of this center to *puna* grasslands and its ability to integrate these agriculturally marginal lands into the economic system through camelid herding must have provided an epochal breakthrough. The existence of bulk transport using llamas constituted a technological development that brought with it the potential of long-distance exchange without the extreme energy constraints that exist when human bearers are the primary means of transport. Ethnographers have described llama trains consisting of 80 animals, each carrying loads of 80–100 pounds and following a lead animal, under the care of only two or three herders. If this description is applicable in general terms to the past, it would have been possible for three people to oversee the transport of four tons of foodstuffs or other items over a distance of some 15 km per day (Flores Ochoa 1968:118). During this journey, the llamas, for the most part, could graze on natural forage found along the route, while the energetic costs of the food consumed by the herders was minimal compared to the materials being transported. At the end of the journey, some of the pack animals could be exchanged on the hoof, while others transported the goods acquired in exchange on the return trip.

While llamas make this type of long-distance interaction more feasible, it is dependent on the demand for goods, the ability to produce the surplus items for exchange, and the development of social relations sufficient for establishing the linkages and permitting safe movement across

potentially hostile terrain. These conditions appear to have occurred during the mid-Early Horizon (ca. 400–250 B.C.) within the context of cultural disruption, in many areas, and the emergence of social stratification in others (Burger 1989, 1992a; cf. Browman 1974b). Among the societies that were incorporated into the Chavín sphere of interaction were groups in Ayacucho (Ushnu Era, Jargampata) and Huancavelica (Atalla) that had a long history of familiarity with domesticated camelids. Contact between the residents of Chavín de Huántar and the herders of the southern highlands is suggested by the discovery of four Janabarriu obsidian specimens that matched the chemical patterning typical of obsidian from archaeological sites in the Cuzco and Andahuaylas regions (Burger et al. 1984:265). Contact between Chavín de Huántar and the southern highlands may also be reflected in the exceptionally large size of Janabarriu llama bones relative to comparable bones from coeval contexts at Huaricoto and Huacaloma (see Figure 9) and the general tendency for comparable camelid measurements to decrease in size from south to north (Miller and Gill 1990). The large Janabarriu llamas may represent direct importation of southern camelid stock rather than animals whose ancestors had adapted to northern environments over a period of two or more millennia.

The link between the Chavín horizon and the spread of camelid herding helps to explain the spatial as well as the temporal patterning of camelid pastoralism in the northern Andes. Rather than being a gradualistic spread of a technological innovation, the mid-Early Horizon expansion represents a sharp and sudden increase in camelids over a broad area, nearly three millennia after the animals had been domesticated in central Peru. Significantly, the extension of this shift appears to be confined within the limits of the Chavín sphere of interaction. It has been argued elsewhere that a frontier zone existed in what is now far northern Peru, separating the cultures of the Chavín horizon from the Chorrera and other distinctively Ecuadorian cultures (Burger 1984b). Recent studies (Lynch 1980; Miller and Gill 1990) from the Cuenca Basin in the southern Ecuadorian highlands have confirmed that, like northern Peru, no evidence exists of wild camelids

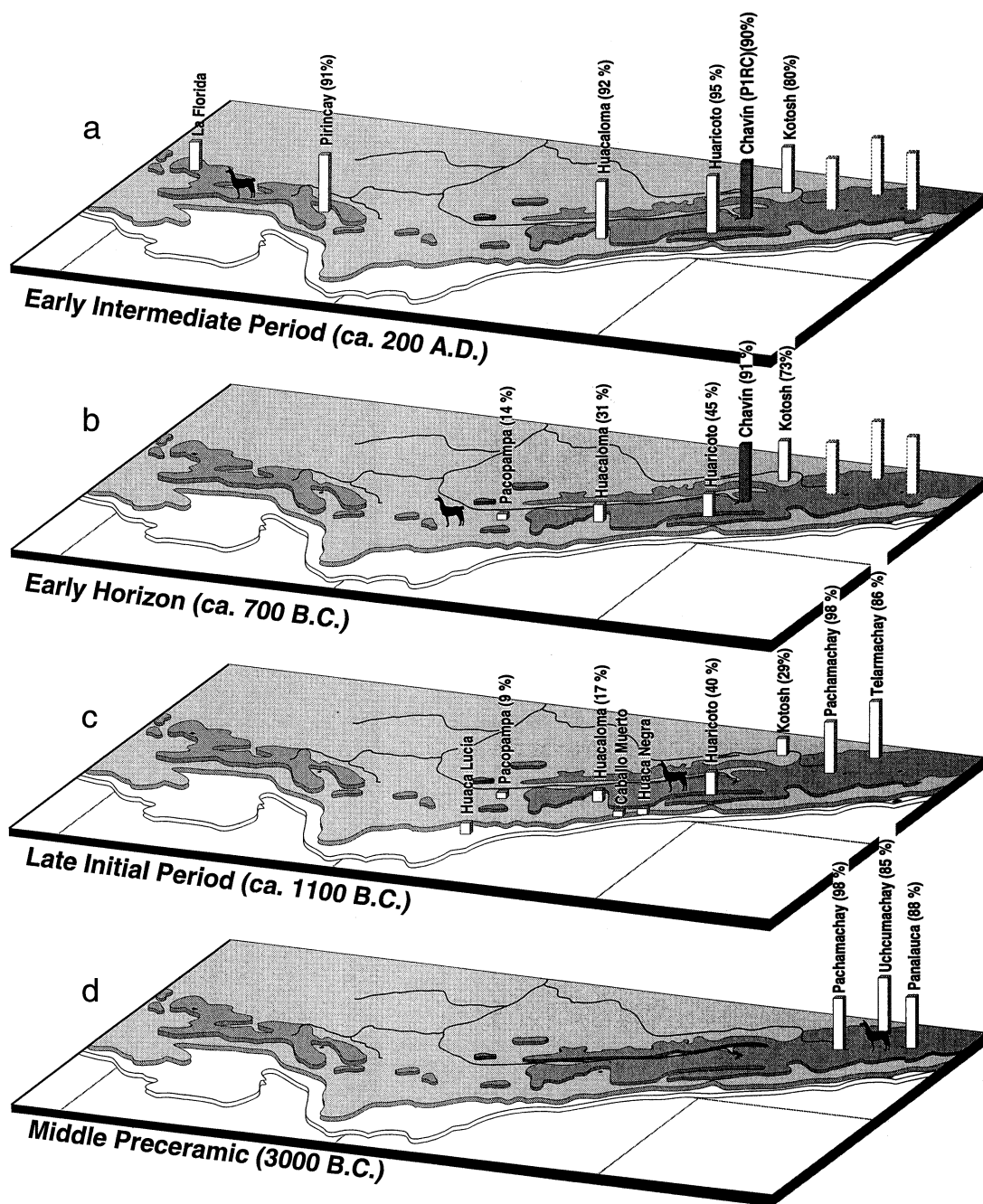


Figure 15. The progressive northern expansion of camelids from the time of their domestication during the Preceramic Period until the Early Intermediate Period. All percentages based on published NISP figures (Pachamachay, Uchumachay, Panalaucay, and Telarmachay from Kent 1982; Kotosh from Wing 1980; Huaricoto from Sawyer 1985; Huaca Negra and Caballo Muerto from Strong and Evans 1952; Huacaloma and Huaca Lucia from Shimada 1982 and 1985; Pacopampa from Daniel Morales and Alfredo Altamirano, personal communication 1982; Chavín PIRC from Wing 1973; Pirincay from Miller and Gill 1990; La Florida from Leon Doyon, personal communication 1990).

before the introduction of domesticated llama. The date of the llama's introduction has been established at the site of Pirincay in Cuenca to be approximately A.D. 100 (Miller and Gill 1990). Thus, the societies of what is now southern Ecuador did not begin to herd llamas for nearly 500 years after this practice had been adopted in northern Peru during the Chavín horizon (see Figure 15a).

How can we explain this lag? It cannot be explained in ecological terms since the landscape and climate in southern Ecuadorian highlands is similar to that in the far northern highlands of Peru; both are technically characterized by *páramo* grasslands, smaller in extension and moister than the *puna* grasslands of central and southern Peru. While camelids did not evolve in this habitat, they appear to have thrived in it for 1,500–2,000 years until the Spanish conquest led to their replacement by European domesticates. A mere 150 km separates Pirincay from Pacopampa, so the distance separating the two areas is likewise insufficient to explain the lag. In our view, the difference in timing is best understood in terms of the cultural forces behind the economic shift. During the Chavín horizon, emerging elites sought products not locally available for distribution to their communities and exotic goods as emblems of status. Increased social and religious interaction further encouraged interregional travel and created an ambiance in which such movement was feasible. Those groups within this field of socioeconomic activity had both reason to adopt camelid herding for its practical advantages and had contacts with groups that could supply them with both the domesticated animals to serve as the source of herds and the technical knowledge necessary for these herds to survive and prosper. Outside the Chavín sphere of interaction, fundamentally different conditions prevailed during the fourth and third centuries B.C. Thus, we can speculate that lesser need to transport bulk commodities over long distances, and lack of extensive contacts with camelid-herding communities to the south may have been two of the factors that prevented camelid husbandry from spreading north into Ecuador during this time.

Animals in Chavín Thought

As a clearer picture of the Chavín de Huántar

economy emerges, we can better appreciate the seeming enigma that lay at the foundation of Chavín culture. Although Chavín de Huántar is located in an intermontane valley at 3,150 m asl, the vast majority of the animals and plants depicted on the sculptures are most at home on the riverine flood plains of the Amazon Basin and the dense forest of the lower eastern slopes of the Andes. The most common themes are monstrous animal amalgams featuring distinctive attributes of the cayman, the crested eagle, the jaguar, the snake, and the monkey (Burger 1992a; Rowe 1962). Lathrap (1971, 1973) argues that an identification on the species level is possible and concludes that the cayman represented is the black cayman (*Melanosuchus niger*), the raptor is the harpy eagle (*Harpia harpyja*), and the snake is a boa constrictor, probably the anaconda (*Eunectes murinus*). While it is possible to question the basis of these specific identifications (cf. Davenport and Schreiber 1989), the particular suite of animals selected for representation are generally associated with the tropical forest and with the cosmology of indigenous peoples of the Amazonian rainforest (Roe 1982). It is also noteworthy that all of the animals commonly represented on Chavín stone sculpture are carnivorous and wild. Even in their native lowland habitats they are not particularly important from a dietary perspective, and even without investigation it is clear that they could never have constituted a major source of meat in Chavín de Huántar.

The analysis presented here has shown that from its inception the community of Chavín de Huántar was dependent on a variety of highland animals including wild deer and vicuñas as well as domesticated llamas and guinea pigs. These highland animals were probably encountered by the residents of the community on a near daily basis. In contrast, the species that contributed their fangs, talons, plumage, and scales to the anthropomorphic/zoomorphic hybrid supernaturals of the site's famous stone sculptures were native to the tropical rainforest, several hundred kilometers to the east. The paradox of Chavín existence can thus be seen as dividing itself along the classic lines of cultural materialistic vs. ideational views of culture. The cultural materialist examining only the fecal residue of Chavín

behavior finds an emergent Andean agropastoral economy and a community filling its belly from the typical menu of highland food animals. The ideationalist, reading only the iconographic data, perceives an entirely different world at Chavín de Huántar, a cosmos inhabited by fearsome creatures entirely foreign to the daily lives of the Chavín farmer or artisan.

It is not surprising, of course, that the original priestly mythogenitors of Chavín de Huántar would have chosen to focus on animals more exotic than those that appeared daily in the stew pot. The issue is not, however, simply a matter of emphasis. The highland animals on which the Chavín people subsisted were *never* portrayed on the temple sculpture, and, to our knowledge, are entirely absent on other Chavín iconographic media, such as ceramics or textiles.⁹ In as much as the supernaturals represented were likely viewed as having a decisive role in the successful functioning of Chavín society and economy, the intentional exclusion of locally inspired symbols becomes more intelligible. One message of Chavín art may have been that prosperity and well-being of the community depended on maintaining the favor of forces alien to the local habitat and daily experience, forces redolent of the powers of the distant and mysterious tropical forest. The mediation of this relationship required the services of ritual specialists. Thus the ideology of Chavín de Huántar, with its heavy emphasis on carnivorous and tropical forest fauna, can be seen as mystifying the society's source of wealth and power, rather than mapping it in metaphorical terms.

In an alternative explanation for the prevalence of tropical forest fauna on the Chavín sculpture, Donald Lathrap (1971) proposed that the people of Chavín de Huántar, supported by a highland agricultural economy, sought to lionize animals that they had probably never seen, but that had been native to the homeland of their ancestors and therefore central to their mythology and cosmology. While this is a difficult hypothesis to falsify, the analysis presented here suggests that even the earliest population at Chavín de Huántar had mastered the skills of camelid herding, a complex and quintessential high-altitude technology. Had the original Ubarbarriu settlers been pioneers from the tropical forest, we would not expect them to have

mastered camelid herding. When considered with the absence of tropical forest cultural traits in this earliest occupation (Burger 1984a, 1988), the faunal information presented here casts further doubt on Lathrap's reformulation of Julio C. Tello's hypothesis of the tropical forest source of Chavín.

For the priests and artists of Chavín de Huántar, the importance of domesticated camelids and the vertical interdependence of *kichwa* and *puna* resource zones must have been fundamental to their understanding of the world. Such concepts may have been expressed artistically in the form of general principles such as the mediation of complementary but opposing forces, as expressed in the Lanzón, the principle cult image of the Old Temple; on this carving an anthropomorphic supernatural was represented with an upraised right arm with palm open and a lowered left arm with only the back of the hand visible. It does not appear, however, that Chavín art can be understood as an ecological mirror, along the lines outlined by Reichel Dolmatoff (1976) for the contemporary Kogi of Colombia or by Schele (1986) for the Classic Maya of Palenque. Even on a metaphorical level, the subject matter would have been inappropriate since the behavior of animals serving as inspiration for the art would have been unfamiliar to the viewers and therefore a poor basis for natural symbols. It is more probable that the priests of Chavín de Huántar intentionally chose alien metaphors of profound mystery to fuel their spirits; to paraphrase Lévi-Strauss (1963), caymans and jaguars were good to think, llamas were good to eat.

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Notes

1. Carbon isotope analyses of high-altitude Andean foods by

DeNiro and Hastorf (1985) have demonstrated that all of the native cultigens, including *quinoa* (*Chenopodium quinoa*), are C_3 plants. Only maize, believed by many to have been introduced to the Andes from Mesoamerica, is a C_4 plant. A third photosynthetic pathway, known as CAM (Crassulacean Acid Metabolism), is characteristic of desert succulents, and the tuna fruit of the *Opuntia ficus-indica* appears to be the only CAM food consumed in the highlands. The tuna fruit also is thought to have been introduced from Mesoamerica, perhaps after the Spanish conquest. Whether or not this was the case, tuna fruit is currently a minor seasonal food, and it is difficult to imagine it having any impact on the stable isotope bone chemistry. Thus, the carbon isotope composition of human bone from Chavín de Huántar probably reflects with considerable accuracy the relative proportions of maize versus C_3 plants in the diet (Burger and van der Merwe 1990:87–89; DeNiro and Hastorf 1985:99–104).

2. The comparative camelid skeletal collection of the Laboratorio de Paleotnozoología, Universidad Nacional Mayor de San Marcos, in Lima was used as the basis for this gradient. The rank order positions of camelid sizes in this collection were also recorded by Kent (1982) and conform to those observed by Wing (1972) in other collections. In contrast, Franklin (1982) and Novoa and Wheeler (1984) describe llamas as being the largest of the camelids, with guanacos being somewhat smaller.

3. Since guanacos are nearly extinct within the Peruvian Andes, the comparative guanaco measurements used here are all derived from animals that originated in Tierra del Fuego where the species is believed to achieve a greater body size than is the case in environments to the north. The average stature of guanacos in north-central Peru, although impossible to confirm with certainty, may very well have been within the upper range of contemporary llamas.

4. This description of ch'arki manufacture is based on several independent observations from the highlands of Peru and Bolivia: Miller (1979:99) from the departments of Cuzco and Puno in Peru; Inamura (1980; cited in Shimada 1982) from the Department of La Unión in Peru; Tomka (1988) from near Potosí in Bolivia. In contrast, Browman (1989:263–264) has reported seeing Bolivian ch'arki, which includes head and foot skeletal elements.

5. Axial elements, i.e., rib and vertebral fragments, are not

included in Table 4 or in Figure 10 because of the difficulty of distinguishing between camelid and cervid specimens. The large numbers of ribs and vertebrae identified generically as "artiodactyl indeterminate," however, make it clear that the camelid axial skeleton was well represented in the Chakinani and Janabarriu samples.

6. The original schlepp effect was proposed to explain the method devised by hunters to butcher and transport the meat from large ungulates weighing as much as 900 kg each. The transportation of a vicuña carcass, weighing only 35 to 60 kg, would not have required the full schlepp procedure.

7. This figure is derived from interviews conducted with several alpaca and mixed alpaca/llama herders in the Peruvian departments of Cuzco and Puno (Miller 1979). Flannery, Marcus, and Reynolds (1989:99–100) report somewhat higher thresholds of productivity decline (10–15 years) among llamas of the Peruvian Department of Ayacucho.

8. The only other possible source of meat was human, and human bones both calcined and cut appear in surprising frequency at both Huacaloma and Pacopampa (Shimada 1982, 1985; Daniel Morales, personal communication 1987). In contrast, human skeletal remains are never found as part of household refuse at Chavín de Huántar with the exception of an occasional tooth.

9. The local fauna, although deemed inappropriate for purposes of religious cosmology, seems to have been important fare for the banquets and ceremonies held at the Chavín de Huántar temple and surroundings. Camelid remains, probably llama and *cuy* bone, were abundant in the Ofrendas Gallery (Lumbreras 1977, 1989). Similarly, the skeletons of at least 50 juvenile guinea pigs were recovered along with abundant *Spondylus* shell fragments from two offerings made in conjunction with the construction of Janabarriu house terraces on the slope overlooking the west of the temple. Judging from their disarticulated state, the *cuyes* were probably consumed during festivities prior to their interments as offerings (Burger 1984a:22–23; Cardoza and Pozzi-Escot 1977). The use of *Spondylus*, guinea pigs, and llamas in religious ritual constitutes an early expression of a cultural pattern that was to persist until the Spanish conquest (Murra 1975; Rowe 1946).

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