

13. Foodways on the Frontier: Animal Use and Identity in Early Colonial New Mexico

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Abstract: This chapter examines animal use at Paa-ko (LA 162), a pre-Pueblo Revolt colonial site in New Mexico. A seventeenth-century reoccupation of a thirteenth- to fifteenth-century aggregated pueblo, Paa-ko is characterized by innovative metallurgical technology, new uses of space within an older architectural setting, and evidence for both traditional wild and introduced domestic food animals. Such innovations beg the question of whether the evidence reflects Puebloan, Hispanic, or even Mexican Indian everyday practices. Paa-ko's faunal assemblage suggests a brief but vigorous set of new economic strategies within an essentially Puebloan social and cultural framework, as reflected by continuities in wild species choice and animal processing, consumption, and disposal. Notable signatures of Puebloan spiritual and social practices include wild carnivore claws; raptorial birds' beaks, wings, and claws; and remains of birds with colorful plumage. These bespeak persistence of indigenous ritual practices and the beliefs underlying them, despite the Spanish enculturative project.

Food practices play a central role in forming cultural and social identities. Selection, preparation, and consumption of food, carried out both self-consciously and unself-consciously, act to constitute and distinguish individuals as members of age, gender, class, ethnic, or other cultural groupings. Moreover, though less well theorized, the passage of food waste through both culinary and digestive systems is likewise highly culturally structured. From midden to trash pit, vomitorium to privy, what is acceptable and what is disgusting—literally

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appetite killing—is policed at least as strictly as the gustatory side of culinary practices. Thus, archaeological evidence for food type selection, preparation, consumption, refuse disposal, and, where recoverable, toilet habits all can offer insights into the demarcations of social identity.

Insights into foodways in this broad sense are valuable investigative tools for tracing the dynamics of culture contact, especially in colonial situations, as a number of chapters in this book illustrate. Lightfoot and colleagues (1998) have elegantly demonstrated the relevance of foodways analysis in their work with the pluralistic Fort Ross community, inhabited by several native Californian and Alaskan groups who co-resided with Russians and persons of mixed European, Asian, and indigenous origins on the coast of north-central California. The researchers demonstrate that food processing and refuse disposal practices, architecture, and site structure provide more compelling evidence than do artifacts alone for teasing out the roles and activities of persons of multiple origins.

This chapter focuses on foodways and other uses of animals in another potentially culturally pluralistic colonial context, that of Paa-ko (LA 162), a pueblo site on the eastern slopes of the Sandia Mountains in what is now Bernalillo County, New Mexico. Paa-ko is of special interest because it was inhabited over no more than two generations during New Mexico's earliest colonial history. Ceramic styles and radiocarbon dates place its historic occupation between the late sixteenth and mid-seventeenth centuries. Its occupation thus begins soon after the initial entry of colonists from New Spain (Mexico) in 1598 and ends by the time of the Pueblo Revolt of 1680, which drove the colonists out of the upper Río Grande Valley for 12 years. Thus, Paa-ko documents a very early phase of face-to-face contact between North American native peoples and European colonists, as well as a relatively early stage in overall Spanish colonization of the Americas: the Aztec capital, Tenochtitlán, fell to Cortés less than a century earlier, in 1521.

Similarly to Fort Ross, the cultural situation in early New Mexican colonial settlements was likely to have been much more complex in nature than the conventional dichotomy of colonizing Spaniard and colonized Indian. Indigenous peoples in what became the colony of New Mexico were hardly homogeneous. They included Pueblo Indians speaking several distinct languages, Caddoan- and Athabaskan-speaking Indians from the adjacent eastern and northern Plains, and, to the west, the Athabaskan speakers who would become the Navajo. Precolonial relations among these groups were complex, with raiding for goods and captives, trading, and intermarriage in variable combinations over time and space.

The colonizers, as attested by solid historic documentation, consisted of *peninsulares* (persons of Iberian or, occasionally, other European birth), *criollos* (persons of European parentage born in the Americas), *mestizos* (persons descended from indigenous and Spanish parentage), highland Mexican Indians who had nominally converted to Christianity, Africans both free and enslaved, and persons of mixed European, Indian, and African descent (Snow 1998).

Even among the *peninsulares* great diversity existed. Juan de Oñate y Salazar, leader of the first wave of colonists into New Mexico in 1598, was of Basque origins and thus, while Christian and loyal to the Spanish crown, by history and culture was of a distinct and often politically dissident group in the Spanish colo-

nies. He married Isabel de Tolosa, daughter of Hernán Cortés, conqueror of the Aztecs, and granddaughter of the last Aztec ruler, Moctezuma (Simmons 1991). Details of Oñate's original colonial enterprise reveal such social and ethnic complexity from top to bottom of the social scale.

Oñate's proprietary colonial initiative was organized in his birthplace, the silver-mining boomtown of Zacatecas, about 400 km north of Mexico City and about 1,500 km south of central New Mexico, and had to pass hundreds of kilometers of hostile terrain before coming to the central Río Grande Valley. Records show that Oñate's band of colonists comprised about 500 persons: about 130 men of European descent and of fighting age, plus missionaries, are listed by name, along with a few wives and adult children of some of these men. Unnamed were male cart drivers, cattle drovers for the 7,000 head of livestock brought by the colonists to New Mexico, and persons listed as mulattos, mestizos, and Indians, including several hundred "Zacatecan Indians." The latter were most probably not from the dwindling population of indigenes around Zacatecas but rather from the town's laboring classes, who in turn originated in the Valley of Mexico itself, Nahuatl-speaking Mexica (Aztecs) and Tlaxcalans, or in Michoacán, being members of the conquered Tarascan state (Gerhard 1993).

Thus, the earliest colonists of New Mexico were a diverse group, only two generations away from the first contact between Europeans and Mexicans. One may therefore expect that, as colonial relations played out on the ground among actors differently situated according to Spanish racial classification, ethnicity, cultural heritage, and class, considerable variation in practices would exist. For example, Isabel de Tolosa and an unnamed laborer in the Oñate group might both technically be mestizos, but they would be worlds apart in terms of their life options. Pueblo Indians likewise came to this encounter with their own histories of internal and external differentiation.

This known potential for regional cultural diversity presents a challenge to discerning the identities of historic Paa-ko's inhabitants, since there is only marginal documentary evidence for the site. Inspired by work of Lightfoot and others, we wished to avoid assuming that nonindigenous technologies necessarily imply a Spanish presence. Likewise, we wished to avoid the formal approach to acculturation as applied in some archaeological situations, in which ratios of indigenous versus foreign artifacts are simplistically interpreted as indexing the degree of a group's changeover to the colonizer's culture. Moreover, we were aware of the pitfalls of seeking "ethnic" identity in faunal remains (Crabtree 1990; Gust 1993).

In place of such formal approaches that treat ethnicity as an essential category and cultural change as a matter of artifact tallies, we chose to focus on everyday practices, including processing and culinary practices, refuse disposal, and uses of domestic and public space, as per Lightfoot and colleagues (1998). We found this approach more compelling because it treats identity as mutable and negotiable, forged in part by everyday practices, and because it stresses the autonomy of even subject populations in manipulating and reframing the uses of artifacts to suit different, culturally specific, culinary practices (Wilkie and Farnsworth 1999).

Asymmetries of military power between Spanish and Pueblo peoples were stark (Ebright 1994; Frank 1998, 2000; Gutierrez 1991; John 1975; Kessel 1979; Levine 1999, 2001; Schroeder 1992; Spicer 1962). The Spanish enculturative project comprised missionization, military administration, the pre-Revolt *encomienda* labor system, and other systems of tribute designed to re-form Pueblo peoples into colonial subjects (Lycett 2005). However, Puebloan peoples were active and selective in their responses to these pressures, and their resistance culminated in the success of the Pueblo Revolt of 1680 (Preucel 2002). Lycett (2002, 2005) has stressed the localized and situational nature of colonial processes in New Mexico, asserting that Paa-ko testifies to the partial effectiveness of missionization and economic encapsulation in subjugating indigenous groups early in that colonial encounter. This chapter explores a case of the interaction between indigenous groups and a pluralistic colonizing population as it played out in everyday uses of animals in an out-of-the-way part of the New Mexico colony.

Colonial-Era Paa-ko: Background

Paa-ko (LA 162) lies at 1,975 m altitude on the eastern slopes of the Sandia Mountains due east of the city of Albuquerque, in what is today piñon-juniper woodland on the piedmont of the San Pedro Valley (Figure 13-1). The historic occupation is in fact a reoccupation of a late thirteenth- to early fifteenth-century aggregated pueblo, among the largest in the San Pedro Valley (Cordell 1980; Lycett 2002). Paa-ko has been known since Nels Nelson's first excavation there in 1914, when he tested every room block in the pueblo, including the prehistoric and historic components. During the Great Depression, Paa-ko was subject to further extensive excavation, with plans made for making it a stop on the so-called Turquoise Trail, an early automobile touring route in New Mexico (Lambert 1954). From 1949 to 1950, the University of New Mexico carried out further research at the site. From 1996 to the present, its historic component has been investigated under the direction of Mark Lycett (University of Chicago). Dissertations resulting from the latter work and a monographic treatment of the site are forthcoming. However, it is clear that both continuity in Pueblo practices and some radical new introductions coexisted in the first few decades after Spanish colonization began.

Paa-ko's layout consists of a northern and a southern complex of room blocks, plazas, and kivas (underground social and ceremonial rooms with a round floor plan, normally entered from the plaza surface), with various water-control features and outlying fields (Figure 13-2). Unlike Indian settlements close to the Río Grande and its tributaries, Paa-ko is away from the main track of commerce and communication along that river valley, facing the plains east of the Sandia Mountains (Figure 13-1). It was thus more vulnerable to attack by nomadic Plains Indians who periodically raided sedentary Pueblo communities. Such insecurity may have contributed to Paa-ko's abandonment in late precolonial times, circa 1425-1450, when other settlements in comparable situations, such as Arroyo Hondo and Tijeras, were also deserted.

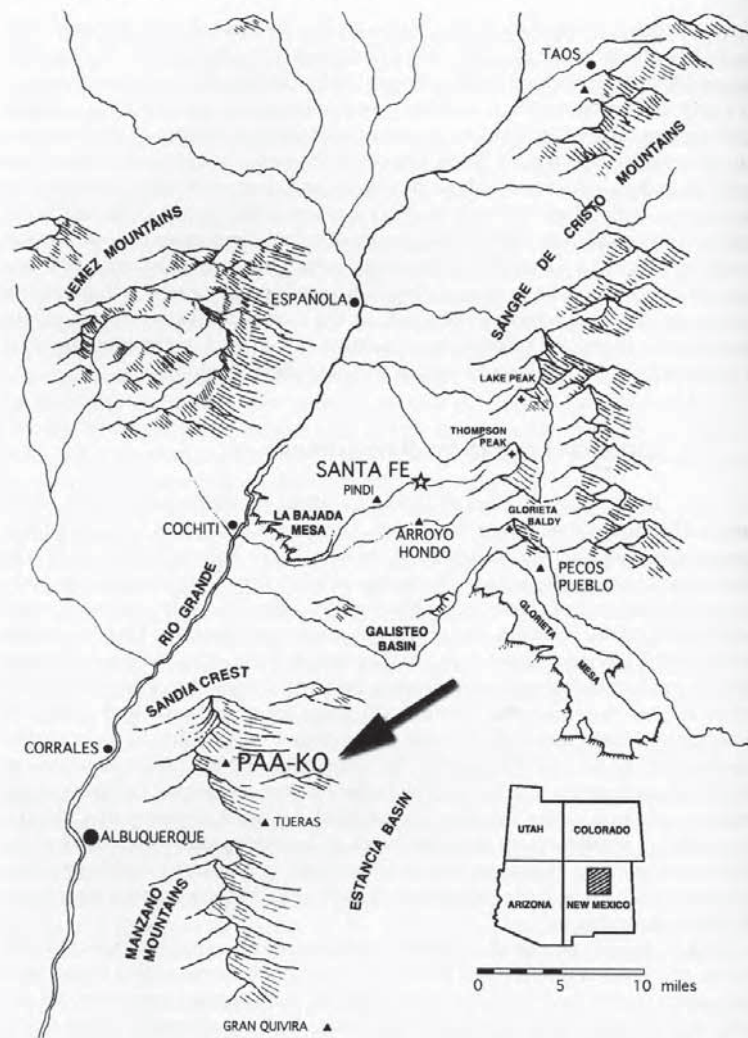


Figure 13-1. Northern New Mexico, showing the location of Paa-ko and other pueblos mentioned in text (adapted from Lang and Harris 1984:Map 2; reprinted by permission from Richard W. Lang and Arthur H. Harris, *The Faunal Remains from Arroyo Hondo Pueblo, New Mexico: A Study in Short-Term Subsistence Change*, copyright © 1984 by the School of American Research, Santa Fe).

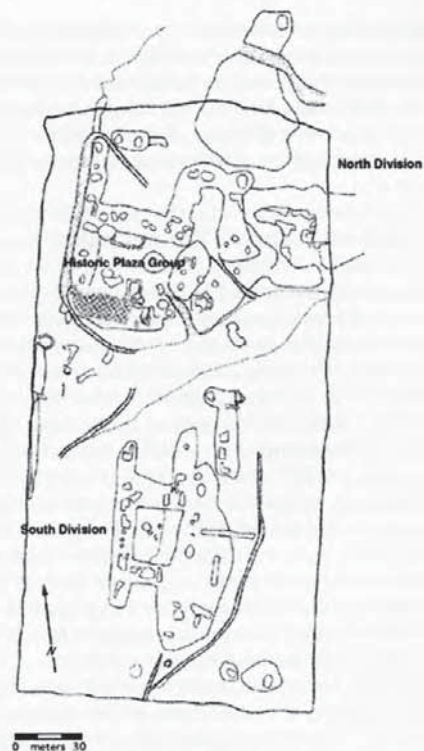


Figure 13-2. Paa-ko/San Pedro (LA 162), showing the overall plan of earlier pueblo and the location of historic occupation (Lycett et al. 2004b).

The historic inhabitation of Paa-ko was restricted to the northern sector of the site and is associated with new soil and water-control facilities as well as entirely novel developments related to new technologies and food species. Most striking is ample evidence for smelting copper and other metals from local ores. Copper smelting was unknown in New Mexico prior to the colonial period, although copper bells had been manufactured in the Paquimé/Casas Grandes area of Chihuahua, Mexico, in the thirteenth and fourteenth centuries (Cordell 1997) and traded north into the Río Grande and other areas. The far eastern set of room blocks in the northern sector of the settlement was reworked into a smelting complex. Analysis of pollen spectra from systematic stratigraphic samples of the landscape from the thirteenth through nineteenth centuries revealed a massive reduction in the piñon-juniper tree cover during the colonial occupation, relative to the impacts of both the original Coalition Period occupation and later, non-residential historic land use (Morrison et al. 2002). The sharp downturn in tree

pollen most likely results from demands of the smelting operations, which relied on charcoal to achieve firing temperatures sufficient for smelting (Thomas 2002). It is notable that Morrison and colleagues (2002) found no pollen from European crops such as barley and wheat for the colonial occupation span but did find European disturbance vegetation (*Plantago*, *Tribulus*). While maize pollen is only lightly represented in samples from landscape away from the pueblo, it is more common in the plaza area.

Historic Paa-ko also shows reorganization but not obliteration of the main plaza space to the west of the smelter complex. This area underwent successive changes during the historic occupation, including construction of a wooden corral to enclose domestic livestock, whose manure built up on one side (Lycett et al. 2000). Excavation has also revealed a rectangular structure built over a filled-in kiva in the plaza (Lycett 2005), similar in plan to small chapels at some other colonial pueblos. Chapels of such scale normally were constructed for occasional visits by priests to their outlying areas, rather than for continuous missionary occupation as with large missions associated with pueblos such as Pecos, Gran Quivira, or Acoma. Paa-ko has been linked to the recorded *visita* of San Pedro (Lycett 2002, 2005).

If the founding population of historic Paa-ko were mainly Pueblo Indians, its geographic location may, in contrast to the risks conferred in precolonial times, have offered advantages in the altered political and economic landscape. Precisely because it was out of the way, a considerable distance from either permanent mission or colonist settlements, and thus away from daily invigilation, it could have afforded indigenous inhabitants more leeway to pursue their own initiatives, economically and socially. However, this matter is moot until a better grasp of the identity of Paa-ko's historic inhabitants is obtained.

The fact of founding the historic occupation upon an older Indian pueblo suggests an indigenous component, as does some of the space use. However, Hispanic colonists elsewhere in New Mexico initially occupied abandoned pueblos, as in 1695 at Santa Cruz de la Cañada (Gerhard 1993:322). Some artifactual and architectural evidence suggests the influence, if not the presence, of persons with European technical knowledge and practices (Lycett et al. 2004a). European domesticates comprised a major part of the animal species at historic Paa-ko, but many wild animal species traditionally used by Pueblo Indians are also present in abundance. Thus, the settlement-scale evidence for the cultural heritage of persons in historic Paa-ko is ambiguous.

A finer-grained reading of Paa-ko's faunal and contextual evidence suggests a brief but vigorous example of new subsistence and economic strategies, within an essentially Puebloan framework of food processing, consumption, and disposal practices. The balance of this chapter explores the multiple lines of evidence that lead us to this conclusion. We caution again that final collation of evidence from animal remains, architecture, metallurgy, ceramics, other artifacts, and plants is still several years in the future and that some of our conclusions may alter. However, with the preponderance of identifiable fauna analyzed, we doubt that the body of data upon which we base our primary inferences will change.

The next sections present an overview of what is known about precolonial Pueblo animal acquisition in New Mexico. We then review impacts of intentional

colonial extraction of resources and labor from, as well as insertion of domestic animals into, local indigenous economies in the sixteenth and seventeenth centuries. Next we survey what is known of foodways in Spanish colonial borderlands. We then present findings on the Paa-ko fauna, discussing these data in relation to precolonial Pueblo animal use and foodways. Finally, we offer some general observations about productive lines of future research.

The Precolonial Pueblo Faunal Food Base

Southwestern archaeologists have used faunal remains to assess local changes in ecology (Cordell 1997) and impacts of resource depletion. In the past 30 years, zooarchaeological analyses have provided insights into the diversity of precolonial Pueblo faunal processing, consumption, and waste disposal practices (Lang and Harris 1984; McKusick 1981, 1982; Mick-O'Hara 1998; Potter 1997; Young 1980). Analyses of butchery patterns at Arroyo Hondo produced *chaîne opératoire*-type models of skinning, disarticulation, and postprocurement processing for several taxa (Lang and Harris 1984). Juxtaposition of butchery, refuse disposal, and contextual evidence has also permitted discernment of animal-handling patterns typical of quotidian household meals versus communal ritual feasts (McKusick 1981; Potter 1997).

One important finding in the past 30 years is the extent to which the Río Grande Pueblos were engaged in exchange of goods and foodstuffs among themselves and with Athabascan speakers to the north and west, as well as with other Plains Indians to the east. The nature and extent of late precolonial trade in animal goods such as buffalo products (Speth 1991) impressed upon researchers the fact that the Spanish colonial economy entered well-established and regionally integrated indigenous exchange systems.

Depending upon the region, bison (*Bison bison*), wapiti (*Cervus elaphus canadensis*), deer (*Odocoileus hemionus*), bighorn sheep (*Ovis canadensis*), jackrabbits (*Lepus* spp.), cottontail rabbits (*Sylvilagus* spp.), a wide variety of rodents from very small to beaver (*Castor canadensis*) size, and various carnivores were taken as sources of food and useful items. Domestic turkeys (*Meleagris gallopavo*) were widely reared for food and feathers, and in some locations imported macaws (*Ara macao*) were either traded in or reared with varying degrees of success (Lang and Harris 1984).

From careful readings of archaeological data in light of Southwestern Indian ethnography, it has become clear that new forms of communal ritual emerged in about the two centuries before the arrival of the Spanish, involving new uses of mammal and bird species. Ceremonies with dancers clad in elaborate feathered costumes, still typical of modern Pueblo Indian rituals, emerged throughout the Southwest in the fourteenth century (Pueblo IV Period). These rituals and their iconography are associated with fertility, weather control, and community well-being (Clark and Eckert 2004; Potter 1997) and are seen as playing a major role in integrating communities newly aggregated in the wake of the abandonment of the Four Corners region (Crown 1994; Schaafsma 1994). Kiva murals and ce-

ramic motifs show both dancers and ritually important wild animals or their valued anatomical segments, especially teeth, claws, beaks, talons, and feathers. Artifacts incorporating these parts have been found in some archaeological sites (Potter 1997). Frequencies of nonfood wild birds, usually those with colorful plumage, increase over those of food species in zooarchaeological samples from the same period.

The zooarchaeological "signature" of Pueblo IV and later beliefs and ritual practices, as opposed to simple subsistence, is now widely recognized in well-analyzed sites. While technically not a "foodway," such faunal evidence attests to the existence of a specific range of ritual practices typical of all Pueblo communities, regardless of their linguistic stock or location. As such, these practices formed a pan-Pueblo identity and were part of the animal uses encountered by the Spanish.

Northern Frontier of New Spain: Economy and Resource Control

New Mexico in the early colonial period was not a "rich" colony, wherein the economy of a European superpower swiftly overwhelmed that of the Indians. Undoubtedly, Pueblo societies were already seriously challenged by alien infectious diseases that preceded the actual arrival of colonists (Ramenofsky 1996), as well as by the major impacts of the earlier Medieval Climatic Anomaly (Jones et al. 1999). However, the New Mexican colonial enterprise was relatively small scale and its lines of supply and military authority attenuated, due to its distance from highland Mexico or even from well-stocked northern Mexican towns (Simmons 1991). Early colonists who arrived expecting to find mineral wealth instead found themselves scrambling to make an agricultural living. Multiple governors' reports complain about the lack of basics, including cloth, and their continued dependence on irregular supply caravans from Mexico (Simmons 1991). On the basis of core reduction technology, Moore (1992) suggests that lithic artifacts at Spanish colonial sites may have been produced by colonists, at least some of whom knew how to form flints for flintlock rifles. Thus, some cases suggest that colonists without ready access to metal resorted to flaking stone for cutting edges.

During the initial, pre-Revolt period, many Pueblo Indian communities near the Río Grande or key trading routes were subject to intensive missionization in the form of both established mission churches with permanent staff and *conventos* established to manage Indian laborers in the mission enterprise. These and other Pueblo communities were subject to a variety of obligations to render goods (primarily food and textiles) and labor to colonists or to the governor. Economic demands and other excesses, such as suppression of Pueblo religion and abduction of Pueblo women, imposed stresses on indigenous communities that ultimately led to the Pueblo Revolt.

Spanish colonial policies manipulated indigenous access to domestic animals to accomplish multiple goals. Domestic animals were crucial to implantation of

the Spanish agricultural technological complex (Simmons 1983). Larger animals such as cattle, burros, and horses offered traction for plowing and transport of goods. Smaller livestock were used for milk, meat, and fiber, as well to trample and thresh grain. All livestock provided fertilizer to grow introduced crops on marginal soils. Horses were also essential to the enterprise as military mounts.

Free Spanish settlers (*vecinos*) owned their own livestock and might take Indians as client herders. Franciscan missionaries in New Mexico invested heavily in rearing livestock, especially sheep, a source not only of food but also of textile fibers, largely relying on Pueblo people for herding labor (Simmons 2001). Some Spanish missionaries provided younger men in hard-to-convert Pueblos gifts of domestic stock, ostensibly to develop skills in animal husbandry but perhaps to undermine the Pueblo power structure by giving the less powerful members a means of accessing economic power outside traditional channels of social control.

Introduction of European domesticates changed the economies and lifeways of Río Grande Pueblos on many levels. The horse irrevocably changed nomadic abilities to strike deep in the Pueblo realm from the Great Plains and to carry away booty and captives. However, the less charismatic introductions of cow, goat, pig, and chicken revolutionized long-established Pueblo lifeways, which swiftly evolved into a new sort of agricultural peasantry (Frank 2000). Taking up Spanish livestock had repercussions for indigenous New Mexican Indians beyond immediate economic relations with the colonizers. As Pueblo people transformed their communities from farming to mixed farming and herding, they faced new time and labor allocation conflicts, the need to sort out age and gender roles vis-à-vis these new demands, and the need to avoid risks of herd attrition by disease, starvation, or raids. However, Pueblo Indians were no strangers to keeping and exploiting living animals for food and nonfood products. Domestic turkeys were penned and macaw parrots imported and kept at numerous precolonial Pueblo sites (Lang and Harris 1984; Minnis et al. 1993), and dogs had always been present. Thus, Pueblo peoples were accustomed to the idea that certain animals could be tamed and even bred as sources of food and nonfood resources.

The introduction of domestic animals into New Mexico and other Spanish borderlands was a double-edged sword for both colonizers and colonized. Domestic ungulates must have had a major impact on regional semiarid habitats and animal species, undermining indigenous subsistence strategies and creating a potential pool of agricultural laborers for the colonists (Melville 1994). At the same time, the entry into Pueblo communities of domestic animals through bestowals, client relations, trade, theft, and capture of feral individuals provided indigenous peoples with new resources and technical knowledge that broadened their range of options in the face of colonial extractive pressures.

Such changes in the regional economy, the use of space, and technologies can be discerned in archaeologically recoverable architectural and artifactual elements rather than with faunal assemblages themselves. Examples known from New Mexico include livestock corrals erected in plaza and communal spaces (Lycett et al. 2000), expanded room blocks for livestock feed storage, and use of interior spaces for associated animal equipment such as saddles, hobbles, and shears (Simmons 1983).

Colonial Foodways in the Spanish Borderlands of North America

Studies of Spanish colonial foodways have been relatively well developed in some regions but not so well in others. In all areas studied, it is clear that numerous factors influenced the degree of syncretism between the introduced cuisines and those of indigenous groups. These include the source point of the colonizing enterprise (e.g., Spain, a Hispanic Caribbean island, Mexico, and so on), the ease of resupply from the point of origin or other supply sources, the success of imported plant and animal species in the local environment, and the degree of integration of indigenous and colonizing people into the same households.

Spanish colonial expeditions to Texas, New Mexico, Arizona, and California were organized in Mexico. Highland Mexican Indian cuisines had a strong impact on colonial Spanish food habits from the sixteenth century, which in turn determined foodways introduced by Spanish colonists moving farther north. Such syncretism may have emerged in households composed of Spanish men and Mexican Indian women, which ran the gamut of social class from Nahuatl nobility to commoners, or in the role of native Mexican women in the kitchens of even "pure" Spanish households. The Mexican food complex assimilated into Hispanic diets featured processing of maize kernels by soaking or cooking in lime-treated water, a Mesoamerican trait unknown to Southwestern Indians, production of *tortillas* (flatbreads) of maize meal (and, post-Conquest, of wheat flour) ground on distinctive, three-legged lower grindstones, or *metates*, and cooked on ceramic (and, post-Conquest, metal) griddles, or *comales*. Consumption of chile peppers and their products also marks indigenous Mesoamerica's enduring contribution to the creole cuisines of Mexico and paradoxically often served as a diacritical marker distinguishing "Spanish" from local Indian diets in the borderlands. Detailed archaeological evidence for early phases of the development of such syncretic Hispanic cuisines in either Mexico or the borderlands is not well documented. However, as early as the Oñate expedition, the influence of Central Mexican Indian cuisine on habits of the Hispanic colonists is shown in inventories of food preparation gear (Simmons 1991).

Through the first century of colonization, Hispanic settlers in New Mexico depended largely on the Pueblos for ceramic vessels needed for their own daily lives. Although evidence for Hispanic ceramic specialization exists later in New Mexico's colonial history (Carrillo 1997), Pueblo ceramics are ubiquitous at all colonial sites with a preponderance of Spanish artifacts and architecture (Simmons 1983; Snow 1992; Wilcox and Masse 1981). The scarcity of Spanish or Mexican-manufactured ceramics at many colonial sites and the forms and styles of local vessels (Thomas et al. 1992) support an argument for the colonists' dependence on Pueblo potters for their everyday domestic needs. This contrasts with the eighteenth-century colonization of Alta California, where settlers perforce had to produce or import their own ceramic vessels, given most California Indians' lack of pottery technology but where maritime transport to some extent facilitated supply.

Investigations of the penetration and persistence of indigenous foodways in Florida's colonial households (Reitz and Cumbaa 1983) are among the most de-

tailed. There, in contrast to other parts of the Spanish borderlands, most zooarchaeological assemblages have a preponderance of wild game and marine resources, suggesting little regular use of domesticates for meat by most foreign colonists. Domestic herd attrition in a climate inappropriate for several favored species, plus irregular provisioning from the Caribbean (Deagan 1983), increased Florida colonists' reliance on local wild food sources. Researchers argue that lower-class Hispanic households simply could not afford to maintain Spanish foodways. Even where colonial Floridians managed to maintain substantial domestic herds, lower socioeconomic status households exploited relatively more wild fish and game resources. Moreover, Indian women, as wives of poorer male colonists and as kitchen servants in more affluent households, shifted food preparation styles toward more indigenous practices. Wing (1989) reports the absence of horse remains from early Spanish colonial middens in Florida and the Caribbean, the logical outcome of a strong customary food avoidance on the part of the Spanish.

The Upper Californian colonial enterprise, which did not get under way until the middle to late eighteenth century, had a radically different cast from either the Southwest or the Southeast. Though relatively resource-poor and based on a rapidly collapsing population of subject Indians, Spanish missionaries, military administrators, and settlers created a system of ranching and trade that more reliably supplied European domesticates for their tables (Beebe and Senkewicz 2001) than was the case in Florida. The semiarid grasslands of Alta California were irrevocably altered by exotic domesticates but sustained them in great numbers. Mission herds were cattle rather than sheep and often substantial enough to supply presidios, pueblos, and neophyte populations with meat and animal products, independent of the sporadic supply ships from Mexico, though not in all parts of California. Indigenous acceptance of domestic animals was widespread, since Indians were often employed as *vaqueros* and herders, and they also assimilated domestic livestock into their own household economies. Indigenous people did sometimes transgress Spanish mores by eating horses (Beebe and Senkewicz 2001).

In sum, while much remains to be learned of Spanish borderlands foodways north of Mexico and the Caribbean—as well as in those originally colonized areas—we can get a sense of some of the parameters of Hispanic cuisine in New Mexico. Paradoxically influenced by Mexican Indian food habits, "Hispanic" foods in New Mexico not only had European domestic plants and animals but also from the outset appear to have imported lime-processed maize and flatbreads, which employ distinctive artifacts in their production. At the same time, we know that early colonial Hispanics used many Pueblo Indian artifacts in their culinary practices, thereby complicating any straightforward diagnosis of identity from artifacts.

Faunal Evidence for Foodways at Paa-ko

Analysis of Paa-ko materials is still under way, and we cannot offer a definitive, holistic picture of foodways incorporating faunal evidence, ceramic vessel choice, and housekeeping practices. However, it is possible to present sev-

eral independent lines of evidence drawn from the faunal assemblage itself that lead us to conclude the assemblage is most likely the product of predominantly indigenous practices.

Taxonomic Representation

The Paa-ko faunal assemblage combines a strong representation of domestic animals, mainly of European origin, with species typical of Pueblo animal use before Spanish contact (Figure 13-3). Lagomorphs and wild hoofed species such as mule deer and pronghorn are common, as are a variety of bird species (see below). The high ratio of cottontail rabbit to jackrabbit suggests vegetation disturbance (Lang and Harris 1984), likely not only farming but also the extensive removal of piñon and juniper trees mentioned earlier. Pronghorn antelope, an open-country species, are about as common as deer, represented by a minimum of six individuals ranging from neonate to adult in age. They may have foraged closer to the site when it lay in largely deforested grasslands. However, further comparative analysis of element frequencies is needed to evaluate possible transport decisions for deer, antelope, and domestic animals, and this awaits final analysis of the assemblage.

Sheep and goat dominate the domestic faunal list. It is notable that most of the identifiable individual specimens in the caprine (sheep and goat) sample are goats, less economically valuable sources of textiles than were sheep. However, if these goats were the "hairy goats" typical of Navajo herds today, their hair could have been harvested for fiber. Remains of three neonatal sheep or goat individuals suggest that caprines were being bred at Paa-ko.

Taxonomic identifications of the caprine species are relatively secure, but it should be noted that metapodia of goats at Paa-ko depart from the morphologies described for the species by northern European authors (Boessneck 1969; Prummel and Frisch 1986). Metapodia from Paa-ko all more resemble *Ovis aries* in their proportions and gracility than they do *Capra hircus*. However, Iberian goats from the Bronze Age site of Cerro de la Virgén (Granada) analyzed by von den Driesch (1972) display the same elongation. This trait has been noted by the senior author for East African goats and by Arturo Morales M. (personal communication 2000) for goats from the Arabian Peninsula. Morales attributes this departure from the published norm to pasturing goats on relatively level terrain, resulting in different locomotor habits than those of the goat in more rugged landscapes.

Cattle remains are derived from at least five individuals, spanning from neonate to adult in age. A thoracic vertebra and an anterior sacral segment show arthritic lipping, reflecting stress to the spinal column during life.

Domestic equines are represented by a NISP (number of identified specimens) of 46 and at least four individuals: a very young horse, a juvenile horse, an adult horse, and a mature donkey. Specimens that can be referred to *Equus caballus* are in the size range of larger contemporary domestic horse comparative specimens. It is very clear from cut marks, chops, and impact modifications, as well as from commingling of their bones with those of other food animals, that equines were used as food. Implications of this will be discussed in the next section.

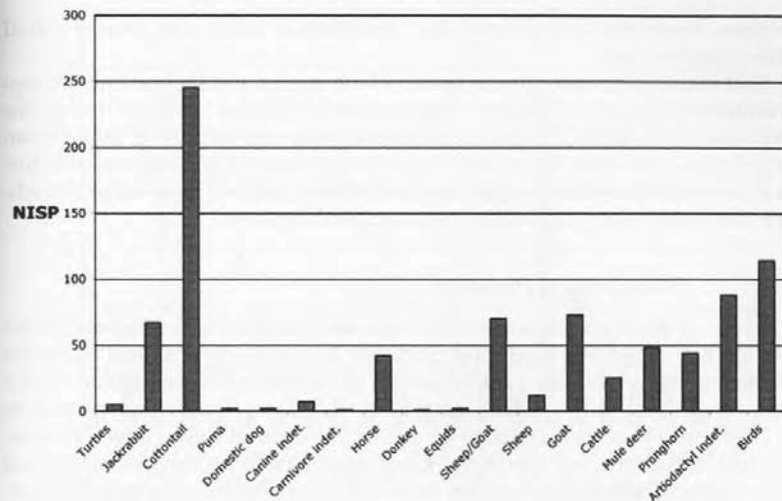


Figure 13-3. Taxonomic representation of the identifiable vertebrate fauna in the Paa-ko historic fauna, given as NISP (for specific information on birds, see Figure 13-4).

Canine remains derive from at least two large individuals, one an adult with very worn maxillary teeth, and another represented by a maxilla and mandible just beginning to erupt anterior adult dentition. Both specimens are as large as, if not slightly larger than, New Mexican wolf (*Canis lupus*) specimens in comparative collections; details of molar morphology resemble those of wolves more than Rocky Mountain coyote. However, this resemblance may simply reflect domestic dogs' derivation from wolf stock. The degree of wear on the older animal's teeth may reflect the rough diet of domestic dogs. Taphonomic analysis of all identifiable bone specimens found a total of 108 (13 percent) specimens modified by canids. The most compelling evidence for the presence of dogs rather than scavenging wild canines is 10 acid-etched and eroded specimens that have clearly passed through a canine's digestive tract. These were from the entire range of food animals and were deposited in the plaza area, either in feces or vomit, strongly implying the tolerated presence of dogs in the settlement.

The relatively low rates of chewing marks and presence of many delicate immature specimens in the Paa-ko sample may not adequately reflect the ubiquity of the effects of dogs. First, we have not fully inventoried the several hundred less-identifiable and unidentifiable bones, which could have been reduced to those states in part by canine gnawing. Second, experimental and ethnographic observations show that dogs do not always leave the gnawing marks typical of heavy scavenging (Kent 1981).

Wild mammal carnivore remains are most often phalanges, including the terminal (claw) bones. Given the lack of elements representing other parts of the

skeleton, these may have entered the sites either on pelts or as parts of sacred "medicine" bundles.

Bird remains are interesting in terms of both species and skeletal element representation (Figure 13-4). Raptors (eagles, hawks, falcons, owls) are among the most common species, despite their relatively low proportions in living avian populations. In addition to ritually important predatory birds and domestic turkeys, identifiable species are predominantly those yielding more colorful feathers than edible meat. This will be discussed further below.

Processing and Preparation Styles

Formal and informal stone tools are abundant in the historic Paa-ko assemblage, suggesting significant continuity in processing of animal and other resources with lithics. However, 60 percent of cut marks (Figure 13-5) on animal bones were made by low-quality metal tools. The nascent metalworking industry at Paa-ko may have contributed to the availability of metal cutting edges. However, much of that smelting operation focused on production of copper sheeting and other artifacts. Metal cutting edges were more likely provided by colonial trade knives incorporated into extensive frontier trade networks early in the historic period (Spielmann 1991). Economic asymmetries most probably existed between indigenous peoples and colonists, between outlying pueblos such as Paa-ko and their more strategically located trading partners, and within the settlement itself. This may explain the 30 percent of lithic-processed remains (Figure 13-5). However, as Moore (1992) cautions, it may be unjustified to assume that all stone tools in New Mexican colonial sites necessarily reflect indigenous activities.

Lack of saw marks on Paa-ko faunal remains reflects absence of European styles of carcass dressing that date from Medieval times, but many Hispanic settlements in the Greater Southwest display few if any saw-aided cuts, reflecting instead jointing of carcasses in a style that overlaps with that of indigenous practices (Szuter 1991).

Other indicators of carcass processing are hammerstone impact marks, anvil marks, and chop marks made by metal implements. Hammerstones would mainly be used to breach bones to remove within-bone contents such as brains, dental pulp, and marrow. Of 39 specimens with one or more hammerstone impact notches, one is a cranial segment, three are ungulate maxillas and mandibles, three are scapula and pelvic sections, and the remaining 32 are long bones. Specimens are mainly from ruminants, both wild and domestic, but one is horse and four are from rabbits. Anvil marks, the reciprocal of hammerstone impacts, are recorded for 21 specimens, all but one of these from ruminants, and all are on long bones.

Chopping can be used to breach bone cavities but is most common in carcass segmentation or dismemberment (Gifford-Gonzalez 1989). Metal cutting tools of sufficient size and weight (e.g., hatchet/axe, cutlass/machete) can chop through bone portions that resist flaked or polished stone. Of 20 specimens with one or more chop marks, most are identifiable to *Equus* or to wild and domestic ruminants including pronghorn, deer, and goats. In contrast to the placement of hammerstone and anvil marks, seven chop marks are on vertebrae, reflecting chopping

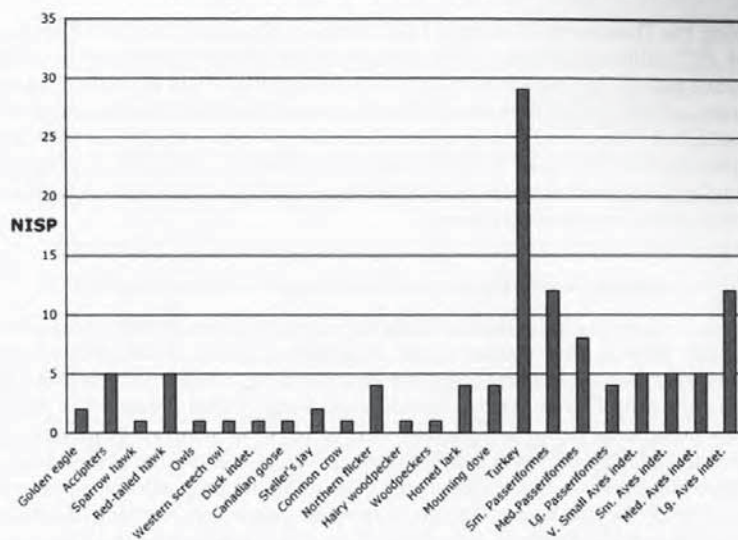


Figure 13-4. Taxonomic representation of the bird fauna in the Paa-ko historic fauna, given as NISP.

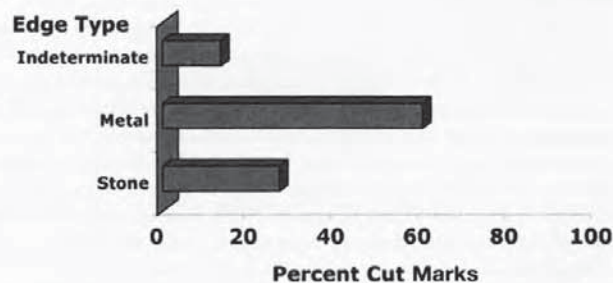


Figure 13-5. Proportions of cut marks made with various cutting tools on identifiable bone specimens at Paa-ko.

as a means of body segmentation, and one is on a cranial element. Of the balance, two are on the hip socket and nine on long bones, mainly near articular ends, again reflecting a dominant use of metal chopping tools for dismemberment.

Taken together, modifications to the Paa-ko fauna testify to a kind of syncretic processing mode, with heavy metal chopping tools used for primary carcass segmentation, both stone and metal cutting edges used for finer dismemberment and defleshing, and hammerstones with stone anvils used to extract within-bone nutrients. Gifford-Gonzalez witnessed something like this array of approaches

among the Dassanetch of eastern Lake Turkana, Kenya, in the mid-1970s (Gifford 1977; Gifford-Gonzalez 1989). Because of the Kenyan government's *cordon sanitaire* policy, Dassanetch agro-pastoralists had little access to markets and to metal products. Each family usually had one *panga* (bush knife) and a rough metal knife, but women and poorer men often had to resort to flaked stone tools, and hammerstones were used to break bones of cooked animals. One can imagine a similar set of limitations, as well as habits of a lifetime, may have determined choices of butchery tools at Paa-ko.

Species Selectivity, Nonfood Species, and Cultural Identity

If one excludes domesticates from the Paa-ko species list, its taxonomic composition is quite similar to that at precolonial Pueblo settlements in the same region. Among the best-analyzed precolonial faunal assemblages is the late prehistoric sample from Arroyo Hondo, near Santa Fé (see Figure 13-1). Figure 13-6 compares the faunal sample from Arroyo Hondo's Sample 8 terminal occupation (A.D. 1410–1425) with that from Paa-ko. With the exception of the addition of domestic livestock and the relative reduction in the proportional representation of birds, the Paa-ko and Arroyo Hondo faunas are very similar, with strong representation of cottontails, jackrabbits, deer, and pronghorn, with all segments of their skeletons represented, and low frequencies of elements from many carnivore species. Notably, cottontail and pronghorn are somewhat higher in relative frequencies at Paa-ko, perhaps reflecting the expansion of disturbed brushy and open habitats caused by charcoal production.

The avian faunal assemblage from Arroyo Hondo Sample 8 (Lang and Harris 1984) is also very similar to that of Paa-ko. An impressive range of raptor species is sparsely represented, mainly by wing and talon elements, as well as an array of birds with colorful plumage, but only a few bird species could be classified either as garden pests or as game birds (Figure 13-7). Thus, acquisition of birds at these and other precolonial sites seems to have been aimed at acquiring either culturally significant parts of the animal, such as wings or talons, or ritually important colored feathers, rather than food (Carrillo 1997). Paa-ko resembles these sites closely, with about the same relative frequency of domestic turkey as at Arroyo Hondo 8 (Figure 13-7).

In sum, several lines of evidence point to the fundamentally Puebloan nature of animal use and foodways at Paa-ko. First, horses were processed and discarded as if they were any other food animal, a practice that horrified Spanish chroniclers in other regions (Beebe and Senkewicz 2001). It is clear that, even if some Spanish or hispanicized Indians resided at Paa-ko, they could not restrain other inhabitants from enjoying horsemeat. Second, the representation of species and osteological elements at Paa-ko tracks with the nonfood animal representation found at precolonial historic pueblos in the region—notably a strong bias toward certain parts of carnivorous mammals and birds considered to be spiritually powerful by recent Pueblo peoples, as well as toward birds with colorful plumage.

One final, independent datum regarding everyday practices at Paa-ko is that of bone tools, which are made on the same osteological elements and in the same

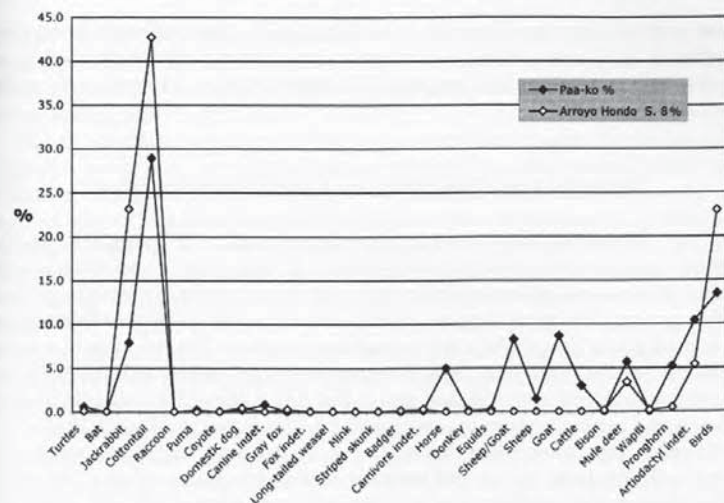


Figure 13-6. Comparison of Paa-ko and Arroyo Hondo Sample 8 identifiable fauna, given as percent of NISP. For details on bird taxa, see Figure 13-7.

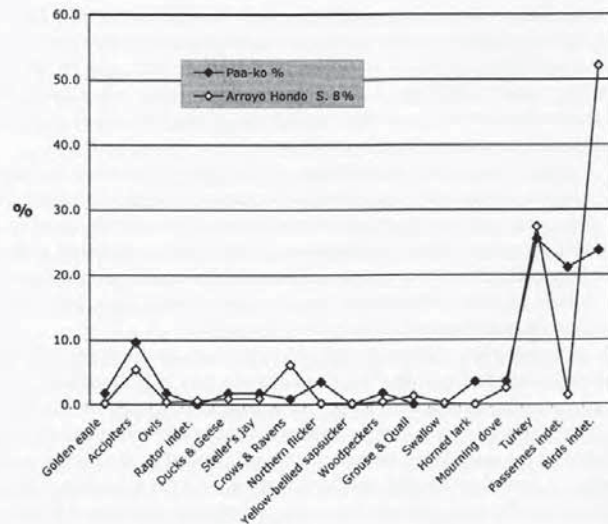


Figure 13-7. Comparison of Paa-ko and Arroyo Hondo Sample 8 bird fauna, given as percent of NISP.

forms as those from pre-Hispanic sites in the region. This suggests strong continuities in indigenous craft practices, such as weaving and basket making, at the site, with gender implications, as in the eastern pueblos women traditionally produce these crafts.

Potentials and Problems of Exotic Domesticates

When Pueblo Indians began herding introduced domesticates, whether those animals were owned by the herders or were part of a clientship with foreign missionaries or settlers, new dynamics were necessarily introduced into Pueblo society. The dung deposits at Paa-ko attest to the keeping of livestock in the central plaza during the early colonial occupation. Construction of a fence across part of the plaza may seem a radical intrusion into a space normally associated with public activities and ritual, but this is the same zone allocated to penning and raising turkeys in precolonial Pueblos (Lang and Harris 1984).

However, this isomorphism in space use masks some major differences between traditional and introduced animal husbandry in terms of labor demands, skills development, entitlements, and the unexpected consequences of disease and landscape modification. First, large and small livestock require active herding: escorting animals to pasture and water and invigilation throughout the day, especially in an unfenced and predator-rich landscape. Obviously, animals were returned to the plaza corral at night. Goats, especially, require constant, active attention, since they are mobile and independent-minded foragers (Dahl and Hjort 1976). In agrarian societies, care must be taken to keep herds and flocks away from growing fields. In many societies, children or younger people are given such herding responsibilities. This excludes them from other tasks, especially work at the settlement or guarding crops from avian and small mammal predators, traditionally a task of Pueblo children.

Second, it has been noted in southern Africa that people used to hunting wild ungulates readily make the transition to herding, since they understand the behaviors and communication systems typical of hoofed animals, wild or domestic (Yellen 1984). However, detailed veterinary knowledge and other more intimate details of domestic animal management must be learned from experts. While we lack the details of such technology transfers in colonial New Mexico, it is clear that incorporation of livestock was relatively swift.

Third, however they did so, Pueblo Indians such as those we believe lived at historic Paa-ko needed to negotiate the entitlements of individuals, households, and the community as a whole to the new animal possessions. Unlike wild ungulates, living sheep, goats, cattle, donkeys, and horses required daily inputs of labor. Unlike wild ungulates, livestock offered products, in the form of hair and wool, milk, and work potential, while still alive, and thus decisions about allocation of these products were called for. They therefore presented Pueblo peoples with new, reiterated challenges regarding ownership and entitlement. Whether the inhabitants of Paa-ko followed models derived from traditional management of domestic turkeys or bred macaws or whether they adopted Hispanic concepts

of entitlements and responsibilities toward grazing, care, and products is not clear from the archaeological evidence. However, it is clear that the presence in numbers of such new domesticates would have presented challenges to traditional Pueblo property relations.

Fourth, domestic stock could have presented novel health challenges to indigenous herders in the form of diseases that jump species. Brucellosis is such a disease, caused by intimate contact with birth fluids and afterbirth or by consumption of milk products from caprines and cattle. In humans it can be caused by *Brucella abortus*, the form infecting cattle, or *B. melitensis*, the form infecting caprines. *B. melitensis* produces more severe symptoms in humans, with fever, profuse sweating, headache, weakness, chills, and aching joints (Benenson 1970:42–43). It cannot be transmitted from person to person. Fevers may recur over several months or several years; deaths are not more than 2 percent of infected cases in the Old World, but long-term debility is common. Children are less liable than adults to manifest symptoms of the disease. Brucellosis is endemic to the Mediterranean and Near East, as well as Africa, and there is strong reason to believe it would have been introduced with domesticates from the Iberian Peninsula. Because it is transmitted by milk and blood, as well as by the by-products of spontaneous abortions of infected caprines, it is a classic disease of shepherds. Adolescents and adults just starting to handle newly introduced animals would be more likely to be seriously debilitated by the disease than would children. It is not known whether first contact of a human population with the disease results in more severe symptoms.

Fifth, goats and sheep, and to a lesser extent cattle, maintain brushy habitats at a savanna-like stage of vegetation succession (Harrington 1982; Pratt and Gwynne 1977). If trees were being cleared from the piñon-juniper zone for smelting, browsing and grazing by goats and sheep would have prevented the reestablishment of trees over the long term.

Finally, one should consider the relationship of domesticates, smelting operations, and community fuel needs. Depletion of wood sources in smelter operations would have imposed added search and transport costs on those responsible for gathering fuel for cooking fires. In Pueblo societies, this task is normally the responsibility of women and children. If children were herding, this might have further diminished their abilities to range widely in search of firewood, placing more burden on women of householder age.

However, new livestock introductions may have offered a solution to the problem of fuel for cooking fires and other domestic uses. Dung is a widely used cooking fuel where firewood may have been exhausted locally and where there are sufficient domestic animals to ensure a steady supply, especially (Reddy 1997; Winterhalder et al. 1974). Shepard (1980) noted that caprine dung had become the fuel of choice on the part of Zuñi and Río Grande Pueblo potters, and Proue (2004) more recently has argued that carbon core results suggest dung was incorporated as a firing fuel as early as the mid-eighteenth century. Contrary to claims made earlier by Shepard on dung's short duration of burning as an impediment, more recent research suggests that it can give consistent and sufficiently long firing durations (Livingstone Smith 2001; Sillar 2000). Thus, the dung may well have been used as

a substitute fuel for household cooking needs and even for ceramic production. Maintenance of corrals and their resulting manure deposits in the plaza would have served the multiple functions of keeping the animals in an enclosed common space, safe from wild predators but also subject to mutual surveillance within the community, and of accumulating dung for fuel in a convenient location.

Discussion: Spatial and Economic Contexts of the Paa-ko Fauna

We anticipate that we will be able to assess our assertions of cultural continuity amid social, economic, technological, and ecological change with other data sets from Paa-ko as these become available. However, we find the evidence drawn from several independent sources within the faunal data compelling. The fauna suggests that a group of predominantly Pueblo people engaged in a variety of experiments in production and exchange during the earliest days of colonization in New Mexico.

The settlement's location and apparent status as the *visita* of San Pedro may have enhanced its ability to undertake such departures from previous cultural norms: "LA 162, with its relatively small population, discontinuous occupation, and geographically marginal position within colonial political and economic networks, provides an important contrast to mission locations elsewhere in the Middle Río Grande Valley" (Lycett 2002:67). Paa-ko's location well away from major settlement aggregations during New Mexico's early colonial period may have cost it exposure to raids by Plains Indians but gained it the freedom to conduct daily life, social and religious, away from the daily surveillance of missionaries and colonial administrators.

The people of Paa-ko had to deal with complex and perhaps internally contradictory consequences among the various cultural innovations in evidence at the site. The apparently wholesale reallocation of piñon and juniper as fuel for smelting operations would have probably taken valuable domestic fuel and food resources out of the hands of women householders. At the same time, domestic livestock, especially goats, would have provided a new source of fuel for cooking and ceramic production but consequently would have demanded a reallocation of labor from traditional tasks to herding duties. Incorporation of domestic caprines may have affected the health of persons in close contact with them. Patterns of plaza space use changed to accommodate both animal husbandry and the intrusion of Christian religious practitioners, and with these changes, indigenous understandings about entitlements to public space and to resources would have been affected and subject to renegotiation.

We should note here that we have not excluded the possibility that this settlement was in fact culturally pluralistic, with some inhabitants being of foreign origins. However, the dominant pattern expressed in foods species and other faunal acquisition and processing bespeaks a Pueblo Indian approach to animals and meals.

Because the wild bird fauna typical of Paa-ko so strongly resembles avian faunas found in precolonial Pueblos practicing katsina (*kachina*) ceremonies and their associated community feasts, we infer that, despite the incursion of Christian missionaries, such ceremonies took place at Paa-ko during the pre-Pueblo Revolt colonial period. The pre-Pueblo Revolt time span was marked by severe repression of katsina ceremonies by the Spanish at other pueblos (Gutierrez 1991; Simmons 1991), which emerged as one of the major causes of the Pueblo Revolt. After their reconquest of the region in 1692, the Spanish enacted policies more tolerant for such ceremonies, so long as Pueblos at least nominally converted to Catholicism and coincided their rituals with saints' feast days. The faunal signal of katsina practices at Paa-ko during this initial span of religious repression and despite the presence of a chapel suggests that residents felt free to conduct their traditional religion at least some of the time. In turn, this probably reflects the status of Paa-ko as a *visita* only intermittently visited by Spanish missionaries.

Finally, it appears that Paa-ko and even other pueblos more closely articulated with continuously occupied missions devoted a considerable part of their energies in the early colonial period to commodity production aimed at other Indian groups. Some colonial period pueblos such as Gran Quivira continued or intensified traditional plaza-based animal husbandry practices like turkey penning, which produced not only meat but also feathers for capes (McKusick 1981). It would seem that the copper sheeting produced at Paa-ko was another commodity of greater interest to Indian groups than to Spanish colonists, although other evidence at the Paa-ko smelter complex suggests efforts to produce a wider range of metal materials (Thomas 2002). This suggests that, even if Spanish extraction of products and labor from early colonial pueblos was high, it was not so intense, nor so constant, as to keep Indians from pursuing and innovating within their own exchange systems.

Conclusion

What led to the end of the Paa-ko experiment, we do not know. Perhaps it was decimation of indigenous inhabitants by the now-recurrent epidemics of the colonial period (Ramenofsky 1996). Perhaps it was exhaustion of local wood resources for fueling the furnaces. Perhaps its location, while shielding it from the most exigent demands of the colonizers, rendered it too vulnerable to the increasingly pressing raids from Plains Indians, a force that during the later colonial period made allies of Puebloan and Hispanic settlers. These or other factors may have combined with a long-standing Pueblo tendency to shift communities from one settlement location to another over the longer term. Whatever the reason, Paa-ko/San Pedro was never again occupied as a residential settlement after the Spanish reoccupied the Río Grande valley. What we do know is that its inhabitants, for the brief span of their time at Paa-ko, seized the opportunity to produce a truly unique blend of subsistence economy, technology, and, by implication, other cultural practices.

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