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# FUNCTION OF CHACO-ERA GREAT HOUSES



**Kathy Roler Durand**

## ABSTRACT

Chacoan great houses have been a focus of research in the Southwest for well over a century. While models to explain these structures have ranged from great houses as residences to great houses as administrative centers, it is argued here that the evidence points to a ritual role for these structures. This evidence includes an analysis of avifauna from Chacoan sites. The analysis indicates that Chacoan great houses have a larger, more diverse assemblage of ritual avifauna than is found at nearby small house sites. It follows that more ceremonies using bird feathers took places at these structures. Further, there is considerable diversity in architecture and associated material culture among the great houses, both within Chaco Canyon and at the myriad outlying great houses across and beyond the San Juan Basin. In the absence of a centralized Chaco system, peer polity interaction is proposed as the mechanism whereby Chacoan ritual beliefs and practices spread throughout the region.

## RESUMEN

*Los "Great Houses" de los Chacos en el suroeste han sido el foco de investigaciones por más de un siglo. Aunque para explicar esas estructuras se han propuesto tales modelos como viviendas y centros administrativos, aquí tratamos de clasificarlas como estructuras que desempeñaban una función ritualística. Las pruebas que se dan aquí incluyen el análisis de avifauna de los emplazamientos de los Chacos. El análisis indica que los "Great Houses" de los Chacos tienen la colección de avifauna ritualística más diversa de la que se encuentra en los emplazamientos vecinos cercanos. Por lo tanto concluimos que más ceremonias con plumas de pájaro tomaban lugar en estas estructuras. También, entre los "Great Houses" hay gran diversidad en cuanto a la arquitectura y a la cultura material, tanto en el Cañón Chaco como en muchos "Great Houses" al otro lado y más allá de la Cuenca de San Juan. En la ausencia de un sistema político centralizado de los Chacos, proponemos que el sistema de gobierno de iguales funcionaba como el mecanismo por el cual las creencias y las prácticas ritualísticas de los Chacos se extendieron por la región.*

**T**he role of Chaco-era great houses has long been a focus of interest to those working in the northern Southwest. Hundreds of these intriguing structures dot a broad swath of land stretching from the Rio Puerco of the east in New Mexico to the Rio Puerco of the west in Arizona and from the Red Mesa Valley north to southwestern Colorado and southeastern Utah. Over the past century, a number of models have been proposed to explain the function of great houses. I summarize them here under three broad categories: great houses as residences, great houses as redistributive centers, and great houses as ritual structures. In considering these models below, I will argue that the latter model, great houses as ritual structures, is best supported by the evidence. This evidence includes: aspects of great house architecture such as their overall layout and internal features; external features found near great houses, such as berms and roads; and material culture associated with great houses, including a wide variety of bird bones that I argue are the remains of ritual activity.

The following discussion also will highlight a point made by many archaeologists (e.g., Irwin-Williams n.d.; Jalbert and Cameron 2000; Kantner 1996; Marshall et al. 1982:1240; Powers et al. 1983; Van Dyke 1999, 2000), that great houses are very diverse. This suggests that they may have differed in their functions and, further, that many of the outlying great houses may not have had close connections to sites in Chaco Canyon. An explanation for this diversity and the implied lack of centralization among the great houses is that some form of peer polity interaction was the mechanism for the spread of beliefs and rituals across the Chaco region.

### **WHAT ARE CHACO-ERA GREAT HOUSES?**

The term great house is used to refer to large masonry structures that are found in Chaco Canyon and across the San Juan Basin (Figures 1 and 2, Preface, this issue). They were primarily constructed and used during the Chaco-era, dating from approximately A.D. 890–1150, although many were re-occupied, possibly by different cultural groups, from 1150–1300. While there is no specific size that a structure must have to be considered a great house, they are larger than the other structures in the immediate area. As Lekson (1991:36) recently phrased it, a great house is “a significantly bigger “bump” than other contemporaneous bumps in its vicinity.” Great houses were constructed using classic Chacoan core-and-veneer masonry, with rooms that are larger than those of nearby structures (Lekson 1984; Powers et al. 1983). Some great houses are associated with roads or ceremonial entrances (Lekson et al. 1988; Powers et al. 1983) and berms or earthen mounds (Cameron 2002; Stein and Lekson 1992). Outside of Chaco Canyon, great houses often were built in an existing community and are surrounded by numerous small house structures (Eddy 1977; Harper et al. 1988; Irwin-Williams and Baker 1991; Marshall et al. 1979; Powers et al. 1983). Small

house structures also are scattered throughout Chaco Canyon and its immediate vicinity (Truell 1986; Windes 1987). The small houses usually consist of several habitation and storage rooms with one or more kivas. They are variants on the Unit-type Pueblo (Prudden 1903).

Typically, the larger great houses (such as Chetro Ketl, Pueblo Alto, Pueblo Bonito, and Pueblo del Arroyo) are found at Chaco Canyon, while the great houses in the outlier communities tend to be smaller in size (such as Casamero, Chimney Rock, and Guadalupe Ruin). There are exceptions to this rule, however, with some very small-sized great houses found in Chaco Canyon (such as Casa Chiquita and New Alto) and some very large-sized great houses found outside Chaco Canyon (notably Salmon and Aztec Ruins in the Totah region [McKenna and Toll 1992] of the northern San Juan Basin). Thus, while most great houses are larger than other structures in the surrounding area, it is not merely size that defines the great houses but their overall appearance and layout. As Marshall et al. (1979:15) note, the great house "stands as an extremely well defined and discreet unit; the entire perimeter presents an even and unbroken surface since there are few doorways to the exterior. Structural walls appear to have been constructed as long, parallel units, with the overall effect suggesting a standardized design."

There is a tremendous amount of variation among the great houses in terms of their size and layout, their environmental settings, and their proximity to Chaco Canyon. This variation likely reflects diversity in the function of great houses, suggesting that models of their function cannot be applied to all sites without considering the evidence for each. While some patterns are found at all great houses for which data are available, other aspects of these structures are highly variable. In the following sections, I consider evidence for interpreting great houses primarily as residences, redistributive centers, and ritual structures. I will conclude with a more detailed discussion of ritual paraphernalia that has been recovered at great houses paying particular attention to avifauna, a subset of the ritual paraphernalia that can be extended with some confidence from the ethnographic present into the Chaco era.

## **GREAT HOUSES AS RESIDENTIAL STRUCTURES**

The earliest interpretations (1950s and earlier) of Chacoan great houses primarily concerned those in Chaco Canyon and concluded that they were large residential structures. Studies from this period include Kluckhohn's (1939) proposal that great houses and small houses in Chaco Canyon were occupied by members of separate cultures, who perhaps spoke different languages (Vivian 1990:394–395). Gladwin (1945) felt that the small houses and great houses represented a cultural progression through time, rather than the simultaneous occupation of Chaco Canyon by two different culture groups (Vivian 1990:395–398). Judd (1954:1) suggested that "Pueblo Bonito is a ruined communal dwelling,

the home of perhaps 1,000" inhabitants. The underlying assumption of these early models was that great houses functioned as large residential structures.

Some more recent models also have assumed that great houses were elaborate residences. The dichotomy between great and small houses has been argued to stem from differences in their inhabitants' agricultural practices (Vivian and Matthews 1965; Vivian 1970), access to land (Grebinger 1973, 1978), or access to exotic trade goods (Di Peso 1968; Frisbie 1980; Hayes 1981; Kelley and Kelley 1975).

The problem with these models is that there is a growing body of evidence to indicate that great houses in Chaco Canyon were not primarily residential structures (e.g., Bernardini 1999; Lekson and Cameron 1995; Windes 1984, 1987). This evidence includes the low frequency of hearths (Windes 1984) and other domestic features such as mealing bins (Windes 1987) at great houses compared to small sites. A similar pattern also is seen at outlying great houses. For example, a low frequency of hearths and mealing bins was found at the Chaco-era occupation of Guadalupe Ruin, an outlier to the southeast of Chaco Canyon. Here, hearths and a masonry bin were found in only one room each (Room 12W for the hearths and Room 22W for the single masonry bin), although 10 Chaco-period rooms were excavated (Pippin 1987).

A review of the Chaco World database (<http://sipapu.gsu.edu/chacoworld.html>) indicates that 15 of 216 great houses have had rooms tested. Most of the rooms tested either contained features that were from their post-Chaco occupation (including Casamero, Dittert, Edge of the Cedars, Houck, Lowry, Salmon, Sundown, Village of the Great Kivas, and Wallace [Figure 1, Preface, this issue]), or had one or two Chaco-era features (including Chimney Rock, Guadalupe, and Sanders). At two sites, McCreery and Kiatuthlanna, no internal features were found.

Hearths and mealing bins would have been important for every prehistoric household. Windes (1984:76) even used firepit rooms as a proxy for households in an attempt to estimate the total number of households in residence at great houses in Chaco Canyon. Based on the small number of firepits present, he concluded that the *maximum* number of residents at Pueblo Bonito, Pueblo del Arroyo, and Pueblo Alto would have been 100, 60, and 100 individuals, respectively (Windes 1984:83–84). While these are low estimates, Bernardini (1999) analyzed room suite configurations at Pueblo Bonito and similarly concluded there was a maximum occupancy of 72 individuals.

Residential structures also are typically associated with continuous deposits of daily household refuse in middens. The intermittent rate of deposition evident in the trash middens at Pueblo Alto (Windes 1984), a great house in Chaco Canyon, and the quantity of imported ceramics they contain (Toll 1984) suggest that these deposits do not represent typical household trash. Instead, they appear to contain construction debris and layers of trash "suggestive of peri-

odic dumping events" (Toll 2001:71) rather than continuous debris from daily trash disposal (but see Wills [2001] for a different interpretation of the Pueblo Alto trash middens). The unique nature of the great house trash middens also is seen in the absence of burials within them. Akins and Schelberg (1984:92) note that while 49% of the burials associated with small houses were in middens, "the many tests of great house trash middens have not revealed burials."

Based on the scale of the great houses, if they were residences they were almost certainly elite residences (Lekson 1984:265). The burials found within them provide evidence of the unique status that these individuals held. Akins (1986) found that the few individuals buried in rooms at Pueblo Bonito were 4.6 cm taller than individuals found buried at the surrounding small house sites. In addition, some of these burials contained a tremendous quantity of grave goods. More than 56,000 pieces of turquoise were found with two individuals in Pueblo Bonito, as well as thousands of pieces of shell jewelry, a shell trumpet, and numerous other artifacts (Akins and Schelberg 1984; Mathien 2001).

A number of great houses were reoccupied after the Chaco period, either by new immigrants to the region or descendants of former inhabitants. This post-Chaco occupation was different from the Chaco-era occupation in many ways. The large rooms were subdivided, sometimes into as many as four smaller rooms, doorways were blocked-off, and features such as hearths and mealing bins were added to many rooms (Irwin-Williams and Shelley 1980; Pippin 1987:114). It seems clear from these changes that the great houses were converted into large residences at this time and used as residential structures until final abandonment of sites in the late 1200s (Marshall et al. 1979:337).

### **GREAT HOUSES AS CENTERS FOR REDISTRIBUTION**

A second type of model that has been used to explain the great houses is that they were administrative centers in some type of redistributive system. The harsh environment in the San Juan Basin and the aggregation of its inhabitants in great house communities, particularly in Chaco Canyon, could have led to crop failures in parts of the basin from year to year. While occupation of Chaco Canyon provides access to run off from several washes, the average annual rainfall is very low (220 mm), as is the lower end of the range of average frost free days (100 to 150 days). Corn requires 110 to 130 frost free days to grow (Gillespie 1985:18), thus Chaco Canyon would have had years in which this minimum was not reached. Redistribution of crops could have compensated for shortages in colder or drier years. The large empty rooms at the great houses could have been used for centralized storage (Lekson 1984:271; Windes and Ford 1992:79–82). Models that incorporate some form of redistribution include those of Grebinger (1973), Altschul (1978), Judge (1979), Marshall et al. (1979), Judge et al. (1981), Schelberg (1984), Toll (1991), and Sebastian (1992).

There are two problems with models that rely on redistribution with Chacoan outlier communities. The first problem is the great distance that food would need to be transported on foot. Redistribution relying on such transportation would likely be inefficient (Lightfoot 1979:332), although it is not clear precisely how far corn regularly could have been carried across the San Juan Basin (Malville 2001; Toll 1991:101). Based on a study of modern porters in Nepal, Malville (2001) concludes that food could have been carried from most of the outliers to Chaco Canyon. She suggests that such a trading journey may have been a yearly activity following the harvest for members of Chacoan outliers to "exchange surplus produce, raw materials, and handicrafts for other resources" (Malville 2001:238). Such trading activities would not require centralized organization and she notes that in Nepal the porters are independent operators who are not coerced into portage, but either carry their own goods or the goods of others for pay. As discussed further below, the problem with this model for Chaco is the lack of evidence for the exchange of non-foodstuffs out of Chaco Canyon. Foodstuffs may well have been more frequently shared or redistributed within Chaco Canyon, however, just as they were likely shared within each outlier community. The environment in Chaco Canyon is such that agricultural efforts in parts of the canyon would have yielded higher returns than efforts in other parts. The variable quality of agricultural land in Chaco Canyon is largely related to the capacity to divert rainwater runoff to fields; some areas had such potential but others did not.

A second problem, as noted above, is the lack of evidence for the redistribution of non-foodstuffs out of Chaco Canyon to the outliers (Mathien 1993; Powers et al. 1983; Toll 1991). If food was being brought in to the center for redistribution, what was going back to the outliers in exchange? It is clear that non-local goods came into Chaco Canyon from a variety of sources including the Chuska Mountains to the west, possibly the Cerrillos mines to the southeast, and Mexico in the distant south. However, there is little or no evidence that these goods went back out to sites in other parts of the San Juan Basin (Powers et al. 1983:342–343). As Toll (1991:96) explains, "ceramics and lithics probably were not regularly rerouted through the central canyon from the Chuskas" to southern sites in the Red Mesa Valley/south Chaco slope region. Mathien (1993:48–49, citing Jacobson [1984:129]) notes that "Artifacts at the outlying greathouses were more like those from the local small sites than Chaco Canyon greathouses, which would indicate little or no involvement in exchange or redistribution by the Chaco Canyon elite." While Lekson (1999:52) has recently argued for "a flow of prestige goods from the center out to the farthest periphery" of the Chaco world, he has only a single artifact (albeit a very beautiful macaw feather sash) as evidence of this "flow." Lekson also mentions ceramic feather holders as evidence, but these may well represent items traded in to Chaco Canyon rather than flowing out to the northern periphery (see Sullivan and Malville [1993] for a sourcing study of these objects).

## **GREAT HOUSES AS RITUAL CENTERS**

A lack of evidence for great houses as residences or centers of redistribution led to a search for other explanations of their function. Much recent evidence points to either a ritual/ceremonial role for great houses (Judge 1989; Lekson et al. 1988; Lekson 1999; Mills 2002; Renfrew 2001; Roney 1992; Stein and Lekson 1992; Toll 1985) or their use as vehicles for aggrandizement by developing elites (Kantner 1996) or both (Roler 1999:211–214; Van Dyke 2000:99–100). This evidence includes specific aspects of the external features associated with great houses, their architecture (including their low kiva/room ratio described by Van Dyke [this issue]), and some of the material culture found within them. In the following sections, I will describe the evidence for each of these categories, concluding my discussion of material culture with some new evidence regarding the ritual use of avifauna at great houses.

### **External Features**

Many great houses are surrounded by features that may have acted together to form a ritual landscape (Stein and Lekson 1992). Some of these features include berms or middens, roads, and even the location of the great houses on prominent points in the landscape. These features may have added to the visual impact and possibly the symbolism of the great houses. They are found both at great houses within Chaco Canyon and at many of the outlier communities.

Berms or middens encircle or occur adjacent to many great houses (Cameron 2002; Fowler and Stein 1992; Stein and Lekson 1992; Windes 1987). Sometimes these mounds are associated with roads, either flanking roads as they approach the great house or surrounding “the sunken avenue that commonly encircles the great house” (Stein and Lekson 1992:95). These mounds may consist of trash deposits, but Stein and Lekson (1992:95–96) note that many times they are largely made up of construction debris with little household trash. In addition, these mounds rarely contain burials, a common feature in middens associated with unit pueblos (Stein and Lekson 1992:96). They argue that the mounds, or berms, and the great houses were in symbolic opposition to the subterranean kivas and graded roads. As they explain, “The extra-canyon landscape is intensively sculpted to dramatize the architectural context of the great house” (Stein and Lekson 1992:97). This level of sculpting was not necessary in Chaco Canyon, where the canyon itself provided the ‘drama.’ The Chaco World database lists 30 great houses with associated berms. Most of these are to the west and southwest of Chaco Canyon, along the Rio Puerco of the west and Chinle drainages. It also should be noted that a number of outlying great houses (such as Andrews, Chimney Rock, Far View, and Guadalupe Ruin) were situated on prominent points in the landscape that naturally set these great houses apart from their surroundings.



Prehistoric roads also may have served more of a ritual than a utilitarian purpose. The Chaco World database lists 127 of 216 great houses that have associated roads or road segments (43 sites are unknown). At least 30 sites are associated with multiple roads. Van Dyke (this issue) found that great houses farther from Chaco Canyon (particularly in Arizona and the Four Corners region) were more likely to have multiple roads than were great houses closer to Chaco Canyon.

Roney (1992) reviewed the empirical evidence regarding roads in an attempt to determine their primary purpose. He concluded that there were four lines of evidence to suggest that the roads' primary purpose was not to transport goods. Roney (1992:123–125) notes that: 1) unlike early roads elsewhere in the world, Chacoan roads are more elaborate near the great houses and disappear when the terrain gets rough; 2) although they are much less frequent, the roads continue to be constructed into the post-Chaco period (later Pueblo III/Pueblo IV times); 3) the roads are not associated with trade artifacts or campsites, as might be expected if they were regularly used to bring trade goods to Chaco Canyon from across the San Juan Basin; and 4) the destinations or end points for most roads were not consistently areas with desired resources, most went on for short stretches and ended at Chacoan buildings. He concludes that some roads may have been "regional in scale," but others were "purely local phenomena" (Roney 1992:130). The latter type may have served primarily as ceremonial entryways for the great houses, rather than as a means of transporting goods. Fowler and Stein (1992) discuss a symbolic roadway in Manuelito Canyon. They suggest that this, and other roadways in the Chaco region, acted as a "time bridge" connecting ritual structures built and used in different periods. Hurst and Till (2002:16) describe a series of roads in the northwestern corner of the Chaco region. Here again, the roads do not lead either to Chaco Canyon or important local resources, rather they connect great houses to one another.

The combination of the mounds and the ceremonial entryways in the form of roads would have added to the visual impact of the great houses. They may have made these structures more sacred and increased the pageantry of ceremonies held there. The elevated position of great houses and berms would have contrasted sharply with the subterranean great kivas, another important form of ritual structure. Most, though not all Chacoan communities had great kivas and the general form of these structures continues to be used by Puebloan groups today as places for ritual activities.

### **Architectural Features**

There are many architectural features that also set great houses apart from other structures in their surrounding communities. Windes (1987:355–379) defines three types of room suites at Chaco Canyon great houses: big-room suites; road-

associated, storage-room suites; and habitation suites. I have already reviewed, as does Windes (1987), the scarcity of habitation rooms at great houses. The other two types of room suites would have made great houses well-suited for ceremonial activity. For example, the front rooms in big-room suites are much larger than they are in most other structures in the prehistoric Southwest. The average size for plaza facing rooms at great houses within Chaco Canyon ranged "from 45 m<sup>2</sup> in the early 900s to only 10 m<sup>2</sup> in the early 1100s" (Lekson 1984:40), while rooms in the rear row were close to 10 m<sup>2</sup> throughout the construction periods at Chaco Canyon. Unusually large rooms also are found at some of the outliers, such as Guadalupe Ruin (Pippin 1987:101–103) and Chimney Rock (Roney 1993:64). As discussed above, the large size of great house rooms and their lack of internal features suggests they were not habitation rooms, but they would have been ideal places to hold or prepare for ritual activities.

The road-associated suites are also unusual. These suites had exterior doorways and only limited connections to other rooms in the great houses, suggesting that they were not used as storage facilities by the great house inhabitants. The location of these rooms would have made them quite useful for pilgrims, however, either as places to store goods or as temporary housing (Judge 1989; Renfrew 2001; Windes 1987).

### **Associated Material Culture**

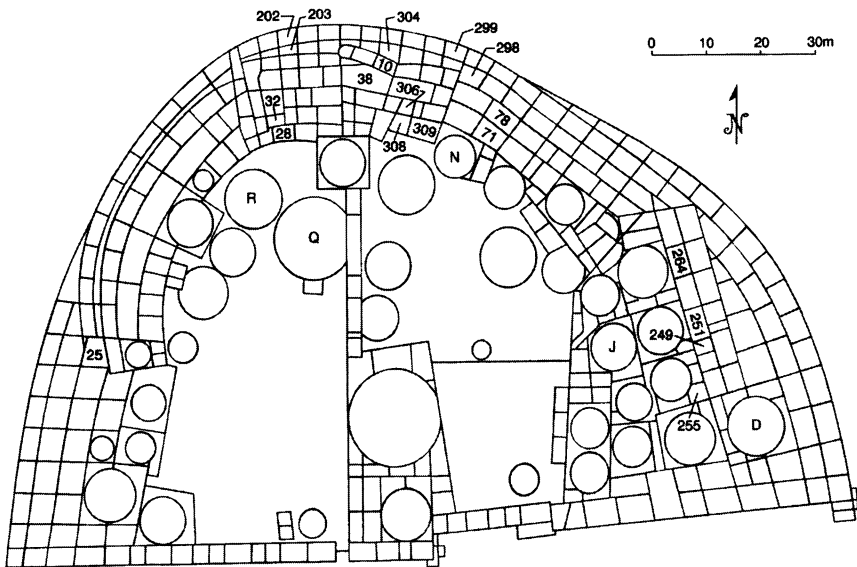
Of all aspects considered here, the ritually related material culture seems to differ the most among the great houses. An incredible wealth of material has been found in several of the great houses within Chaco Canyon (particularly Pueblo Bonito, but also Chetro Ketl, Pueblo Alto, and Pueblo del Arroyo [Figure 2, Preface, this issue]) and many of these objects appear to have been for ritual activities. There are far fewer and a less diverse assortment of ritual artifacts at the outlying great houses. This appears to be true for at least one of the large great houses in the Totah area (Salmon Ruins [Irwin-Williams and Shelley 1980]). The low diversity of ritual artifacts may be due, in part, to the reoccupation of outlying great houses during the post-Chaco period. Any Chaco-period ritual items still remaining at these great houses would have been removed and either reused or disposed of during reoccupation.

### **Material Culture at Pueblo Bonito**

Pueblo Bonito contained the lion's share of the artifacts, although caches of ritual objects also were recovered at Chetro Ketl (Vivian et al. 1978) and Pueblo Alto (Akins 1987). While the mass of grave goods recovered from two male burials in Room 33 are well known and frequently cited in the literature (e.g., Lekson 1999:98; Mathien 2001:103), there was an enormous quantity of artifacts recov-

ered from many rooms across the structure (Figure 1 and Table 1). Many of the objects were undoubtedly utilitarian in nature, but many others likely were used for ceremonial or ritual purposes. The latter category includes such items as: pipes, bird and animal effigies, human effigy jars, cylinder jars (165 of which were found, with 111 coming from Room 28), flutes, shell trumpets, prayersticks, various feather objects, and certain birds discussed further below (Judd 1954; Pepper 1996 [1920]). In addition, several kivas contained caches of items in their walls or floors which Judd [1954:322–324] refers to as “sacrificial deposits.” A complete inventory of these items is beyond the scope of this paper, but examples of the collections from two rooms (Room 32, which also contained a burial, and Room 25) are given below to illustrate the incredible assemblage recovered at the site.

Room 32, in the north central portion of Pueblo Bonito (Figure 1), is most notable for the cache of wooden implements it contained. Over 400 “ceremonial sticks” were recovered at Pueblo Bonito (Pepper 1996:369–370); approximately 375 of these were recovered from one corner of Room 32 (Judd 1954:267; Pepper 1996:369–370). All of these sticks were carved on the end, some sticks were painted, and some had yucca fiber cords attached or sections with rawhide wrapped around them. Additional examples of these sticks were found in Rooms 10, 202, 203, 298, 299, 304, 320, 326, and Kiva N (Judd 1954: 267–272; Pepper 1996). Pepper suggests that some of the sticks might have been



**Figure 1.** Map of Pueblo Bonito. Rooms labeled include those discussed in text and listed in Table 1. Adapted from Lekson (1984:111).

**Table 1.** Some of the Exotic Items Found at Pueblo Bonito, Rooms are Identified in Figure 3.

Room	Avian Remains
25	Small bird skeleton
38	14 Scarlet Macaws—macaw cage, 10" of droppings on floor
71	1 Scarlet Macaw
78	2 Scarlet Macaws
249	4 macaw skeletons and 1 macaw skull—macaw cage
251	2 Scarlet Macaws
255	1 juvenile macaw skeleton
264	1 Red-tailed Hawk skeleton
306	3 macaw burials
308	1 Thick-billed Parrot burial
J	1 Scarlet Macaw
Room	Other Remains
28	111 cylinder jars
32	375+ ceremonial sticks and other ritual items
38	4 shell trumpets, jet and turquoise effigy, and many other items
D	Cache of ritual items under floor
N	12 prayer sticks
Q	Cache of ritual items in the north wall
R	Shell trumpet

*Note:* Information taken from Judd 1954 and Pepper 1996 [1920] and does *not* include all materials recovered from rooms. Rooms and items listed are discussed in text.

used for ceremonial games, based on a similar practice reported by Cushing among the Zuni (Pepper 1996:147). The shape and size of the sticks, the presence of two sandstone balls in the same room, and the wooden ball recovered from Room 10 (Pepper 1996:55) lend support to Pepper's explanation. Judd (1954:269), however, notes that sticks somewhat similar in form (though often smaller in size) are used in a variety of ceremonial contexts at Acoma, Hopi, and Zuni. He dismissed Pepper's ceremonial gaming explanation for the sticks (Judd 1954:272). Vivian et al. (1978) suggest that they may have been medicine or prayer sticks. More recently, Lutonsky (1992, 1998) proposed that some of the largest sticks may have been weapons (also see LeBlanc 1999:97–98, 105–106). Whatever the original purpose was for the sticks, they were widely dispersed across Pueblo Bonito and likely were used in ceremonies.

Room 32 also contained other wooden objects (possibly weaving implements), a painted wooden board, a carved hematite figurine (bird?) inlaid with shell and turquoise, several pieces of cloth (likely associated with the burial), and numerous whole ceramic vessels including 3 mugs, 7 pitchers, 6 jars, 12 bowls, and a dipper (Pepper 1996:129–162). One of the jars contained nine

turquoise beads and two shell beads, while Pepper believed that two of the bowls originally contained food.

Room 25 (Figure 1), which Pepper (1996:98 [1920]) described as "another refuse room," is located in the western portion of Pueblo Bonito. Beyond the large quantity of everyday trash, this room contained a number of items that likely were ritual in nature. For example, although no whole ceramic vessels were recovered, fragments of five zoomorphic effigy vessels and three human effigy jars were found. Among several fragments of cotton cloth was found one fragment that "is similar to that seen in the kilts and sashes worn by the Antelope and Snake priests in Hopi ceremonies" (Pepper 1996:107 [1920]). Also found were a carved sandstone fetish, two flute fragments, eagle and turkey feathers, fragments of three ceremonial sticks, and a "beautiful" carved and painted wooden object that may have been the handle for another ceremonial stick.

### **Material Culture at Other Great Houses in Chaco Canyon**

Although Pueblo Bonito is unique in its recovered material culture, some ritual objects have been found at other great houses in Chaco Canyon. A cache of more than 200 wooden objects was recovered at Chetro Ketl from Room 93, a second-story room in the northern room block (Vivian et al. 1978). Many of these objects were flat painted cut-outs that likely were part of multicomponent effigies. Some of these components are clearly parts of birds, including heads, beaks, tails, and feathers. Some pieces contain holes and fragments of cords (Vivian et al. 1978:9, 11, 13, 71), while others have thin strips of wood attached and extending from them (Vivian et al. 1978:9, 68, 69). Both features would allow the pieces to be connected together to form a whole effigy and Vivian et al. (1978:10, 53) provide hypothetical reconstructions and ethnographic examples of such effigies. Other pieces from this cache likely were parts of elaborate head-dresses, altars, and zoomorphic wands. Also found were a number of prayersticks and plume holders, as well as numerous other small perishable objects and fragments. Some of these objects resemble items recovered at Pueblo Bonito, albeit not as well preserved at the latter site (e.g., the fragments of wooden "altar screens" in Judd [1954:275]).

In addition to the objects found at Chetro Ketl, Vivian et al. (1978:21) note that a small number of similar wooden objects have been recovered from the great houses of Pueblo del Arroyo, Kin Kletso, and Tseh So (Bc50, one of the small house sites on the south side of Chaco Canyon). A variety of exotics (including turquoise, copper, and shell artifacts) also have been recovered at great and small houses in Chaco Canyon, but in substantially fewer numbers than at Pueblo Bonito. Toll (1991:86) remarks that, although this disparity is sometimes attributed to more excavation having occurred at Pueblo Bonito, "excavations of various sizes reported in varying levels of detail at Pueblo Alto,

Pueblo del Arroyo, Una Vida, and Chetro Ketl have not produced comparable finds in any category."

As a further example of the unique nature of Pueblo Bonito, 31 macaws were recovered from this site (all from the eastern half of the site). Few macaws have been recovered from other great houses in Chaco Canyon. The remains of five macaws were recovered from Pueblo del Arroyo (three were clearly Scarlet Macaws [Hargrave 1970:32]), four of which were complete burials. Partial remains of a single Scarlet Macaw were recovered at Kin Kletso. As these bones consisted of a skull and premaxillary, Hargrave (1970:32) notes that the bones "may have been the remains of a stuffed macaw." No macaws were recovered from Pueblo Alto, although other interesting avifauna from Pueblo Alto are discussed below.

### Material Culture at Outlying Great Houses

The discovery of ritually related material culture at great houses requires excavation. As discussed above, few outlying great houses have been excavated. Those that have been partially excavated with published reports available include: Aztec Ruin (Morris 1921, 1924, 1928), Chimney Rock (Eddy 1977; Malville and Matlock 1993), Far View House (Jalbert and Cameron 2000; Lister 1965, 1966; Rohn 1977), Guadalupe Ruin (Baker and Durand 2003; Pippin 1987), Kiatuthlanna (Roberts 1931), Lowry (Kendrick and Judge 2000; Martin 1936), Salmon Ruins (Irwin-Williams and Shelley 1980), and Village of the Great Kivas (Roberts 1932). An additional problem with many of the outlying great houses is their reoccupation during the post-Chaco period. Most of the older trash was removed by the new inhabitants and almost nothing remains *in situ*. Guadalupe Ruin is a good example of this pattern—very little of the Chaco-era trash was recovered at the site, while a great deal of post-Chaco material was found (Pippin 1987).

Whether the result of smaller sample sizes at outliers (due to fewer excavations and fewer *in situ* Chaco-period artifacts) or because ritual materials were not originally present in large quantities at these sites, there is not the same quantity of ritual artifacts outside of Chaco Canyon as there is at great houses within the canyon. Wooden ritual artifacts have been reported at Aztec Ruin (Vivian et al. 1978:21–22,34) and there may have been a few at Salmon Ruin (Phillip Shelley, personal communication 2002) although there is currently no record of them (Paul Reed, personal communication 2002). The remains of six macaws were recovered from Salmon Ruin, at least one of which was an articulated skeleton associated with the Chaco-era deposits (Shelley 1980). Mathien (1997) recently conducted a thorough review of the turquoise and other ornaments at all excavated outlying great houses and found a similar paucity of artifacts. She notes that her "review of excavated outliers and a few surrounding sites suggests that sites in Chaco Canyon were much richer in ornaments than were contemporary outlying

sites" (Mathien 1997:1191). Andrews, Dominguez Ruin, Salmon Ruin, and Aztec West Ruin (Figure 1, Preface, this issue) appeared to have had more artifacts than the other outliers, "but the amounts do not compare with the amounts recovered from small sites in Chaco Canyon during the Bonito Phase" (Mathien 1997:1191). Based on the context of turquoise found at sites in Chaco Canyon, Mathien (1997:1207) suggests it may have had a ceremonial, as well as an ornamental role for Chacoan leaders. In comparison, the relative scarcity of turquoise at the outliers suggests that it was not as important symbolically to their leaders or that access to it was restricted in these communities.

### CHACOAN AVIFAUNA

While most of the ceremonial objects at great houses in Chaco Canyon have been recovered from room interiors, rooms were typically cleaned out when great houses were reoccupied. What is left at these sites is the trash in middens and it is to these deposits we must turn for evidence of ceremonial activity at most outlying great houses. Further, if we are to recover ceremonial objects or their by-products they must be durable enough to survive in this context to the present. Archaeologists working in the Southwest are fortunate that Pueblo ritual practices involve the extensive use of certain species of birds and mammals (Gnabasiak 1981; Ladd 1963; Schroeder 1968; Tyler 1975, 1991), resulting in the production of animal bone debris. Although the specific meanings of various species cannot be extended back 1000 years into the past, the ceremonial importance of birds gains support from their widespread importance to Pueblo ritual practices today. Gnabasiak (1981), Ladd (1963), Schroeder (1968), and Tyler (1979, 1991) provide hundreds of examples from Southwest ethnographic and historic records of the use of birds in Pueblo ritual. A wide variety of birds has been important ritually, ranging from water birds to raptors. The Zuni alone are reported to use feathers from 56 species of birds (Ladd 1963:41). The avian species used for ceremonial purposes and some of the specific uses for birds, feathers, and other bird parts are given in Tables 2 and 3.

Evidence of these types of activities can be gleaned from the nature and context of certain archaeological remains. Examples from Chaco Canyon of remains reflecting ceremonial activity include: the macaw burials at several great houses; the over 200 paw bones (mostly of black bear, but 9 of *Canis* sp. and 2 mountain lion claws) found in a cache with other artifacts concealed in the wall of Kiva Q at Pueblo Bonito (Judd 1954:323); and the cache of more than 200 raptor bones and other artifacts and bones from a pit beneath Plaza I at Pueblo Alto (Akins 1987:596–607).

A recent analysis of the avifauna from sites in Chaco Canyon and the Chacoan outlier community at Guadalupe Ruin revealed some interesting patterns with respect to great houses (Roler 1999:180–191). As described below, based on

**Table 2.** Documented Species of Birds Used in Modern and Historic Pueblo Ceremonies.

Bird	Species	Pueblos
<b>FEATHERS</b>		
American Kestrel	<i>Falco sparverius</i>	Cochiti, Jemez, San Felipe, Santo Domingo, Zia
Bluebird	<i>Sialia</i> sp.	Cochiti, Jemez, Taos
Bluejay	<i>Cyanocitta Cristata</i>	Cochiti, Jemez
Duck <sup>a</sup>	Various	Cochiti, Jemez, Santo Domingo, Taos, Zia
Eagle	<i>Haliaeetus leucocephalus</i> and <i>Aquila chrysaetos</i>	Acoma, Cochiti, Hopi, Isleta, Jemez, Laguna, San Felipe, San Ildefonso, Santo Domingo, Taos, Zia, Zuni
Hawk	Various	Cochiti, Jemez, Laguna, Santo Domingo, Taos
Hummingbird	Various	Hopi, Zia
Macaw	<i>Ara</i> sp.	Cochiti, Jemez, Santo Domingo
Maggie	<i>Pica pica</i>	Taos, Zia
Mockingbird	<i>Mimus polyglottos</i>	Jemez, Zia
Owl	Various	Cochiti, Santo Domingo, San Felipe, Zia
Parrot <sup>b</sup>	<i>Rynchopsitta pachyrhyncha</i>	Acoma, Cochiti, Jemez, San Felipe, Santa Ana, Santo Domingo, Taos, Zia
Roadrunner	<i>Geococcyx californianus</i>	Cochiti, San Felipe, Santo Domingo, Zia
Rock Wren	<i>Salpinctes obsoletus</i>	Zia
Steller's Jay	<i>Cyanocitta stelleri</i>	Zia
Turkey <sup>a</sup>	<i>Meleagris gallopavo</i>	Cochiti, Hopi, Jemez, Laguna, San Felipe, San Ildefonso, Santo Domingo, Taos, Zia, Zuni
Warbler	Various	Hopi, Jemez
Woodpecker	Various	Santa Ana, Taos
Wren	Various	Zia
<b>COMPLETE WINGS</b>		
Eagle	<i>Haliaeetus leucocephalus</i> and <i>Aquila chrysaetos</i>	Cochiti
Hawk	Various	Taos
<b>STUFFED BIRDS</b>		
American Kestrel	<i>Falco sparverius</i>	Zia
Parrot <sup>b</sup>	<i>Rynchopsitta pachyrhyncha</i>	San Felipe, Zia
<b>BIRD SKINS</b>		
Duck	Various	Taos
Eagle	<i>Haliaeetus leucocephalus</i> and <i>Aquila chrysaetos</i>	Cochiti
Parrot <sup>b</sup>	<i>Rynchopsitta pachyrhyncha</i>	Not Given
<b>EGGSHELL</b>		
Bobwhite	<i>Colinus virginianus</i>	Taos

*Note:* All information taken from Gnabasik 1981:182-224. Disposal of most carcasses was reported to have been in the trash middens, with the exception of eagles, macaws, and parrots (Gnabasik 1981:182-224).

<sup>a</sup> These two taxa also were eaten.

<sup>b</sup> The uses for parrots likely also apply to macaws, as these were not distinguished separately in much of the ethnographic literature (Gnabasik 1981:197).



**Table 3.** Documented Ceremonial Uses for Birds.

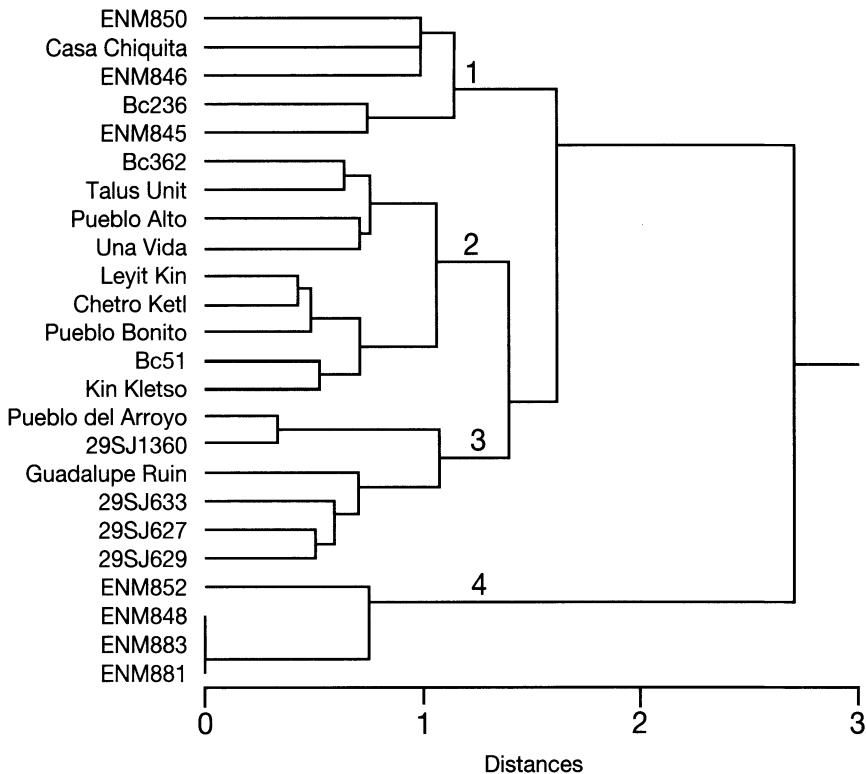
Part of Bird	Uses
Feathers	Feathers were used for a wide variety of ceremonial activities: left as individual offerings; attached to prayer-sticks or as components of prayer bundles; placed on or near altars; worn in costumes by dancers, runners, and warriors; attached as part of corn fetishes and other fetishes.
Complete Wings	Complete wings were used as part of costumes during ceremonial dances.
Stuffed Birds	Stuffed birds were used in altar displays or carried during ceremonies and processions.
Bird Skins	Bird skins, often with attached feathers, were incorporated into costumes during ceremonial dances.
Eggshell	Eggshell was rubbed on the feet of children who were slow to begin walking.

*Note:* Information gathered from Gnabasik (1981) and Tyler (1991).

the available faunal data the great houses contained a larger and more diverse assemblage of birds than did small houses in the same areas.

The basic data for the analysis were the bird taxa present at each site considered (taken from Akins 1985:323; Pippin 1987:131–132; Roler 1999: 148,165–166). Presence/absence data were used as these are the only data available for a number of Chacoan sites (e.g., Casa Chiquita, Pueblo Bonito, Pueblo del Arroyo, and others). Some of the assemblages used here include material from the pre- and post-Chaco periods (e.g., those from small house sites such as 29SJ 629 and 29SJ 633), but where published information (e.g., for Pueblo Alto and Una Vida [Akins 1985:307, 412]) or first hand knowledge was available (e.g., for sites at the Guadalupe Ruin community), only those levels dating from approximately A.D. 890 to 1150 were used in this analysis. Thus, there are some temporal discrepancies among sites, but every effort was made to compare assemblages with a large, or ideally an exclusive, Chaco-era component.

A discussion of the complete details of this study are beyond the scope of this paper, but are available in Roler (1999:180–191). In brief, after testing for sample size problems (following Grayson [1984]) I used the Jaccard's coefficient to obtain a similarity matrix for the site assemblages. Jaccard's coefficient was chosen because it bases the similarity measure on the number of positive matches two cases share (presence/presence, or presence/absence), while disregarding the number of negative matches (absence/absence). This makes it ideal for situations, such as this analysis, in which many cases had mostly absent variables (Shennan 1988:203–204). Next, a cluster diagram was created using this matrix. The resulting cluster diagram, with four clusters identified, is illustrated in Figure

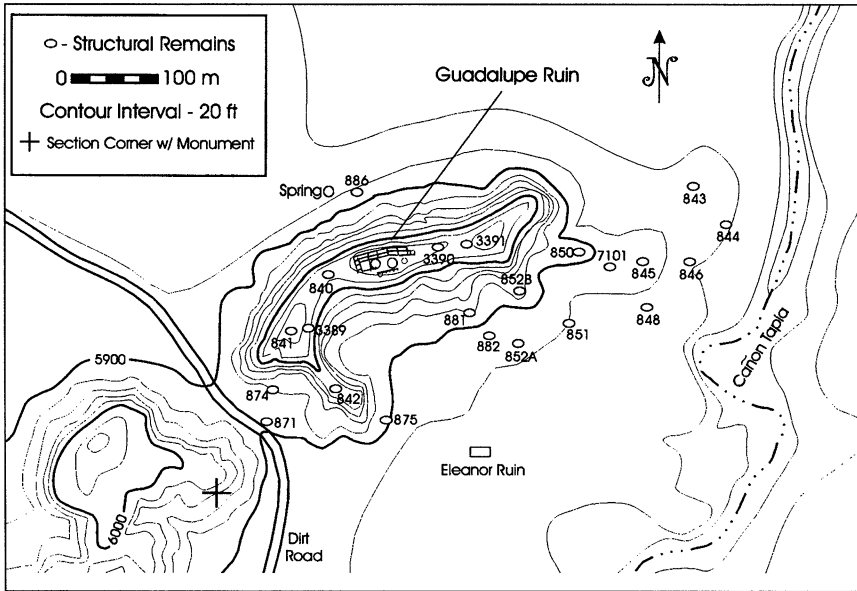


**Figure 2.** Cluster solution of bird taxa at sites in Chaco Canyon and the Guadalupe community. Wards clustering method used with matrix generated using Jaccard's coefficient. All sites with 29SJ or Bc prefix are located in Chaco Canyon (see Figure 2, Preface, this issue). Site labels beginning with ENM are in the Guadalupe community (see Figure 3).

2. The clusters in this diagram represent those assemblages sharing the greatest similarity in number and kinds of bird taxa.

Two of the four clusters in Figure 2 consist of small sites, largely from the Guadalupe community (Figure 3), that are impoverished in terms of their avifauna. Cluster 1 is composed of five sites with 1 to 4 avian taxa. These taxa include: mallard; *Buteo* sp.; prairie falcon; turkey; quail; woodpecker; flicker; and lark. The average total sample size for sites in this cluster is 680, with an average of 1.8 bird taxa. Cluster 4 contains four assemblages, all from small sites at the Guadalupe community. Each assemblage had turkey bones and one site (ENM852) also had golden eagle present. Average sample size for assemblages in this cluster is 561, with an average of 1.3 avian taxa.

Cluster 2 consists of the great houses of Pueblo Alto, Pueblo Bonito, Una Vida, Chetro Ketl, and Kin Kletso, as well as Talus Unit, Leyit Kin, and two other

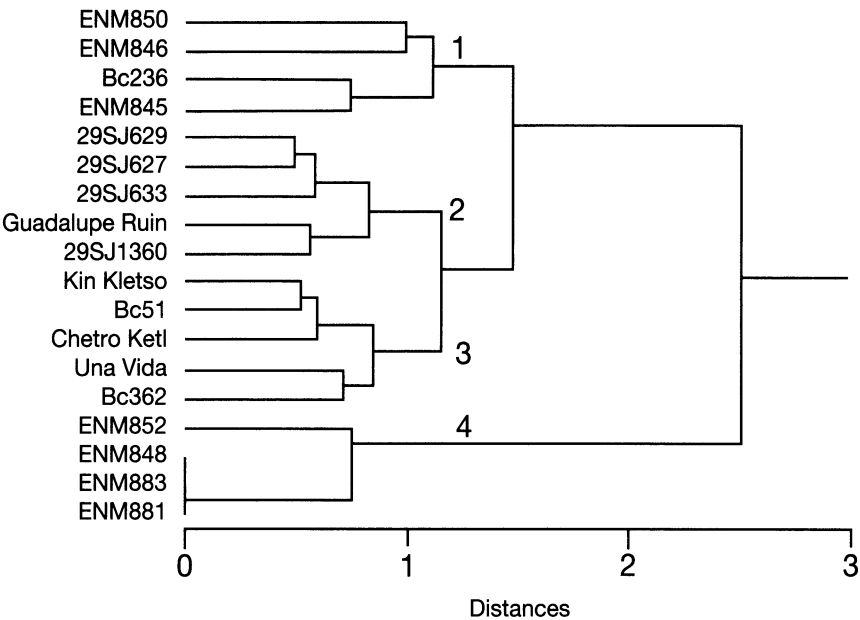


**Figure 3.** The Guadalupe community including Guadalupe Ruin and the small room blocks surrounding Guadalupe Mesa.

Chaco Canyon small sites, both of which are located in the Pueblo Bonito complex (as used by Lekson [1988], the dense area around Pueblo Bonito, Pueblo del Arroyo, and Chetro Ketl). One of these small sites, Bc 51, is adjacent to Casa Rinconada (one of the largest great kivas in Chaco Canyon). The average number of bird species per site is greater in Cluster 2 (mean = 13.6,  $N = 9$ ) than in the other clusters, as is the average total NISP (Number of Identified Specimens; mean = 6,323,  $N = 6$  [NISP for Leyit Kin, Talus Unit, and Pueblo Bonito are unknown]). Overall, these assemblages contain a total of 42 different taxa.

Cluster 3 is made up of several small sites within Chaco Canyon, the Chacoan component of Guadalupe Ruin, and the great house of Pueblo del Arroyo. The Chacoan small sites in this cluster are all outside of the Pueblo Bonito complex and are located near Fajada Gap (Figure 2, Preface, this issue). These sites had an average of 6.5 species of birds and a mean total faunal NISP of 2,922 (Pueblo del Arroyo's total NISP is unknown). Seventeen different taxa are represented in these assemblages, seven of which were raptors (hawks, eagles, or owls).

As both the mean NISP and the number of species were substantially higher for Cluster 2, further analysis was undertaken to ensure that these patterns were not based merely on sample size. Toward this end, another cluster analysis was performed that excluded all sites for which NISP is unknown (Casa Chiquita, Talus Unit, Leyit Kin, Pueblo Bonito, and Pueblo del Arroyo) and also excluded



**Figure 4.** Cluster solution of bird taxa at sites in Chaco Canyon and the Guadalupe community. Wards clustering method used with matrix generated using Jaccard's coefficient. Sites with unknown sample sizes were excluded from this cluster solution. All sites with 29SJ or Bc prefix are located in Chaco Canyon (see Figure 2, Preface, this issue). Site labels beginning with ENM are in the Guadalupe community (see Figure 3).

ed Pueblo Alto due to its very large sample size. A comparison of the resulting cluster diagram (Figure 4) with the diagram that includes all samples shows that roughly the same cluster groups form in each case. This suggests that the pattern is robust and does not simply reflect sample size differences. In fact, while the mean number of avian species remains high for the new, smaller Cluster 3 in Figure 4 (mean number of species=12.2), the mean sample size (NISP=1,485) is smaller than that of Cluster 2 (NISP=2,922) which had an average of only 6.8 bird species per assemblage<sup>1</sup>.

There are several interesting patterns in these diagrams. First, with a single exception (Pueblo del Arroyo), the great houses in Chaco Canyon all fall within the same cluster. Second, the assemblages in this cluster from the Pueblo Bonito complex have more diverse avifauna than assemblages in the other clusters, including the cluster representing the Chacoan small house, Fajada Gap community (Figure 2, Preface, this issue). The assemblage from the Guadalupe Ruin great house was not as diverse as that from most of the Chaco Canyon great houses and instead groups with the Fajada Gap sites. Importantly, the Guadalupe Ruin assemblage was more diverse than the assemblages from the

small house sites in its surrounding community (Figure 3). Thus, using avifaunal remains as a marker for ritual activity, such activity appears to have been more intense at great houses than at nearby small house sites. Although some rituals likely also occurred in small houses and their associated kivas, the abundance of avifauna at the great houses in Chaco Canyon suggests that a wider variety and higher frequency of rituals occurred at these structures. This supports the idea that great houses had a ritual function with a type of artifact that would be present in the trash at most Chaco-era structures whether or not they were re-occupied in the post-Chaco period. In addition, this idea could easily be tested through the analysis of faunal remains from other great houses.

### **THE CHACO 'SYSTEM?'**

Evidence from the Red Mesa Valley (Kantner 1996) as well as the Chaco region as a whole (Nelson 1995) suggests that the Chaco phenomenon may not have been an integrated, regional system. Yet if this was true, why did so many communities across such a large area construct great houses? Many of the outlier communities already had ritual structures in the form of great kivas, so why did they also need to construct great houses? It seems plausible that some form of emulation of Chaco Canyon great houses was occurring at the outliers, similar to that in a peer polity interaction model (Renfrew and Cherry 1986). Peer polity interaction has been used to understand relationships among polities which do not have dominant/subordinate relationships (Kintigh 1994; Renfrew and Cherry 1986). In Renfrew's view, the interactions among polities may take several forms, including competitive emulation and symbolic entrainment. Competitive emulation involves increasingly greater displays of wealth and power by aspiring leaders in order to bolster their status either within or between polities (Renfrew 1986:8). These displays may take the form of great feasts or monument construction. Renfrew (1986:8) suggests that competitive emulation "may help account for [the] otherwise rather puzzling scale" of many monuments. He also notes that this process would help explain general similarities in form among monuments in a region (such as seen in great houses in the Chaco region).

Not all forms of emulation represent competition between polities. Through the process of symbolic entrainment (Renfrew 1986:8), the symbolic system of a more advanced polity (such as Chaco Canyon) is adopted by less advanced polities in its region (such as the outlier communities). This is not the result of coercion on the part of the more advanced polity, or competition between polities, but stems from voluntary emulation on the part of the less advanced polities. The latter groups adopt the symbolic system because "a well-developed symbolic system carries with it an assurance and prestige which a less developed and less elaborate system may not share" (Renfrew 1986:8).

Whether through competitive emulation or symbolic entrainment, the peer polity interaction model appears to fit the architectural and other artifact patterning in the Chaco region. The importance of monumental architecture at Chacoan sites also fits within a peer polity model. Renfrew (1986:8) notes the importance of monuments, and Marcus (1995) describes the widespread presence of pyramid temples in the Maya region centuries before palaces and other administrative buildings appear. Kantner (1996:56–59) provides numerous examples (including cultures in Oceania, New Guinea, Africa, India, and North and South America) of the importance of ritual structures for helping aspiring leaders build their authority. There is ample evidence that the construction of ceremonial structures is an important tool for aspiring leaders to use to achieve greater power and status. As Kantner points out, since such structures are ritually important to a community, “a community may be much more willing to build a ceremonial center or help to sponsor a major social event than directly provide the leader with the economic means to dominate them” (Kantner 1996:51).

The ritual nature of great houses would have made it easier to rally the community to help in their construction (Kantner 1996; Marcus 1995; Sanders 1974), and their very construction would have accrued greater prestige to the aspiring leader(s) who instigated the projects. Such a process, once it had taken hold in Chaco Canyon, attracted the attention of those in outlying areas who adopted the belief system and the structures that accompanied it. This could have happened either through competitive emulation, with various outlier communities in each area constructing bigger great houses, or symbolic entrainment, a non-competitive adoption of the belief system of the Chaco Canyon communities. Either way, a peer polity interaction model could be used to explain the Chaco phenomenon. Based on the diversity among the outlying great houses, it is likely that competitive emulation occurred in some areas, while symbolic entrainment took place in others.

## **CONCLUSIONS**

The preponderance of the evidence from a variety of sources supports an interpretation of Chaco-era great houses as ritual centers. This is not to say that no other activities took place in these structures. In fact, a small number of individuals may have inhabited many of the great houses (Bernardini 1999; Windes 1984), and some administrative activities likely occurred there as well. Nevertheless, the evidence presented here supports the idea that the primary purpose for great houses was as ritual/religious structures. Other activities taking place in these structures were secondary to the buildings’ primary purpose.

Among other lines of evidence, the purpose of great houses is reflected in the wide variety of ritually related artifacts they contain, including the avifaunal remains. In the analysis presented here, avifaunal remains were more abundant

and diverse at great houses in Chaco Canyon than they were at nearby small house sites. The assemblage from the outlying great house of Guadalupe Ruin was not as diverse as that from great houses in Chaco Canyon, but the Guadalupe Ruin assemblage was more diverse than the assemblages from the small house sites in its surrounding community. Thus, in Chaco Canyon and the Guadalupe community it appears that ritual activities took place more often at great houses than at the surrounding small houses. Additionally, the berms, ceremonial entryways (roads), and other constructed features associated with outlying great houses would have made these structures ideal locations for rituals. The degree to which Chacoan beliefs and ritual practices were adopted likely differed among outlying communities, as some outlying great houses appear to have had closer connections to great houses in Chaco Canyon than others (e.g., Jalbert and Cameron 2000; Kantner 1996). I argue here and elsewhere (Roler 1999) that the spread and variable expression of Chacoan traits across the San Juan Basin is due to competitive emulation and symbolic entrainment of ritual practices from Chaco Canyon by the inhabitants of the outlying communities (Renfrew and Cherry 1986).

Clearly, there was tremendous variability among great houses across the San Juan Basin, suggesting there may have been variability in their function. The Chaco Canyon great houses, with their grand scale and wealth of avifaunal and other ritual artifacts, may have been central places for rituals and pilgrimage activities for the entire region (Judge 1989; Lekson 1999; Lekson et al. 1988; Mills 2002; Renfrew 2001; Roney 1992; Stein and Lekson 1992; Toll 1985). The many great houses within Chaco Canyon also show a lot of variability and each may well have played a slightly different role within this sacred center. This variability is reflected in the artifacts recovered from these structures. By far, the highest concentration of ritual artifacts was found at Pueblo Bonito, fewer at the neighboring great houses of Chetro Ketl and Pueblo del Arroyo, and fewer still at the other great houses in Chaco Canyon (such as Pueblo Alto and Kin Kletso). Moving out from Chaco Canyon, the outlying great houses, such as Guadalupe Ruin, likely played a central role in the ritual life of each of their local communities. Based on the variability among outliers, ritual activities were likely more centralized at some communities than at others.

Many ritual artifacts used for Chacoan ceremonies would have been composed of fragile materials such as wood, fiber, and feathers and therefore may not be recovered from outlying great houses. Fortunately, the ideas presented here could be further tested using avifaunal remains which are more likely both to survive to the present and to have been deposited in the trash middens (Gnabasiak 1981:182–224), thus leaving them undisturbed by any post-Chaco occupation. More excavation at outlying great houses and their surrounding communities (Stuart 1996), where possible, and a thorough reanalysis of earlier work (published and archival) may provide further support for these ideas.

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## NOTE

- <sup>1</sup> Despite the observation that bird bones were more likely to be saved and identified than mammal bones during early excavations in Chaco Canyon (Akins 1985:305) these patterns are robust. Using only the largest, most secure samples for each cluster (29SJ 627, 29SJ 629, 29SJ 633 for Cluster 2; Bc51 and Una Vida for Cluster 3), Cluster 2 has an average of 8 bird taxa and 4,491 NISP, while Cluster 3 has 14.5 bird taxa and a NISP of only 3,599.

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