

Chapter 3



Settlement Pattern and the Chaco Region

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SETTLEMENT pattern is architecture writ large. This is particularly true for Chaco, an archaeological entity defined first by its architecture and finally, as I will argue here, by its settlement pattern. Pueblo Bonito and its kindred great houses at Chaco Canyon are spectacular buildings, world famous architectural monuments. But if the Chaco Canyon great houses are the apex of Chacoan architecture, what about less spectacular Chacoan buildings? To understand the *range* of Chacoan building, we must look at architecture not just in Chaco Canyon but within the whole of the Chaco region—and the region will be defined by a particular settlement pattern, the community.

In early Southwestern archaeology, regions were defined by architecture and pottery, with primary emphasis on pottery. Pottery was (and is) the medium of choice for measuring cultural interaction over space. Judge (this volume) defined regional systems in behavioral terms of mutual dependence through the exchange of goods and services. The goods most amenable to archaeological observation are ceramics, but because pottery moved through the region in astonishingly high volumes, it may not be the most useful marker of the Chaco region. Recent studies have shown that much (and during some periods, most) of the pottery found at Chaco Canyon was not made there, but was imported from other areas within and beyond the textbook Chaco district (H. Toll 1985). And the particular pottery found at Chaco Canyon, whatever its origins, is rare or absent at several sites traditionally considered Chaco outliers. Given these intriguing (if slightly disconcerting) dynamics, the use of pottery as a calling-card criterion for regional definition becomes problematic.

Does ceramic exchange map all aspects of regional systems? If not, behavioral models of regional systems based on ceramic distributions will be framed within inappropriate regions. A regional system might be better defined by complementary lines of evidence, combining portable artifacts, architecture, and setting. Such a strategy runs the risk of simply redefining traditional culture areas, but new approaches to the empirical patterning of archaeological remains can avoid that pitfall. Specifically, relational or contextual approaches to key features, such as ballcourts or great houses, allow us to use those long-recognized traits to redefine regions of significantly different dimension than realms of ceramic exchange. Are architecturally defined regions preferable to ceramically defined regions? The answer to this question depends on the type of inquiry being pursued. Ceramics may be more appropriate for some issues, architecture for others. I find it interesting that the two classes of data delimit rather different geographic areas. This chapter defines a Chaco region architecturally, but I do not mean to suggest that this is *the* Chaco region. The architectural region is simply one geographic scale within which models of exchange or adaptation should be evaluated.

Architecture is one key to the Chaco region. In recent studies, the region has been defined by Chaco “outliers”: great houses found outside the confines of Chaco Canyon proper (Lekson et al. 1988; Fowler, Stein, and Anyon 1987; Marshall et al. 1979; Powers, Gillespie, and Lekson 1983). Thus, the main problem in defining the Chaco region lies in defining what is and what is not an outlying Chaco great house. The circularity of defining, by architectural criteria, a region in which to study a range of architectural settlement patterns is a critical issue in contemporary Chaco studies—and is the topic of this paper. To examine this question, we must first review the architectural variety present in Chacoan settlement.

ELEMENTS OF CHACOAN SETTLEMENT

Chaco Canyon contains a surprising variety of architectural forms (Lekson 1986; McKenna and Truell 1986; Vivian and Mathews 1965). Only a few of those building types will be discussed here: great houses, great kivas, and unit houses—the three basic elements of the Chaco community.

GREAT HOUSES

Great houses, the *sine qua non* of Chaco archaeology, are typified by the huge ruins of Chaco Canyon, such as Pueblo Bonito. The massiveness of these ruins (fig. 3.1), their regular and symmetrical layouts, and (perhaps most of all) the banded “core-and-veneer” masonry were taken,

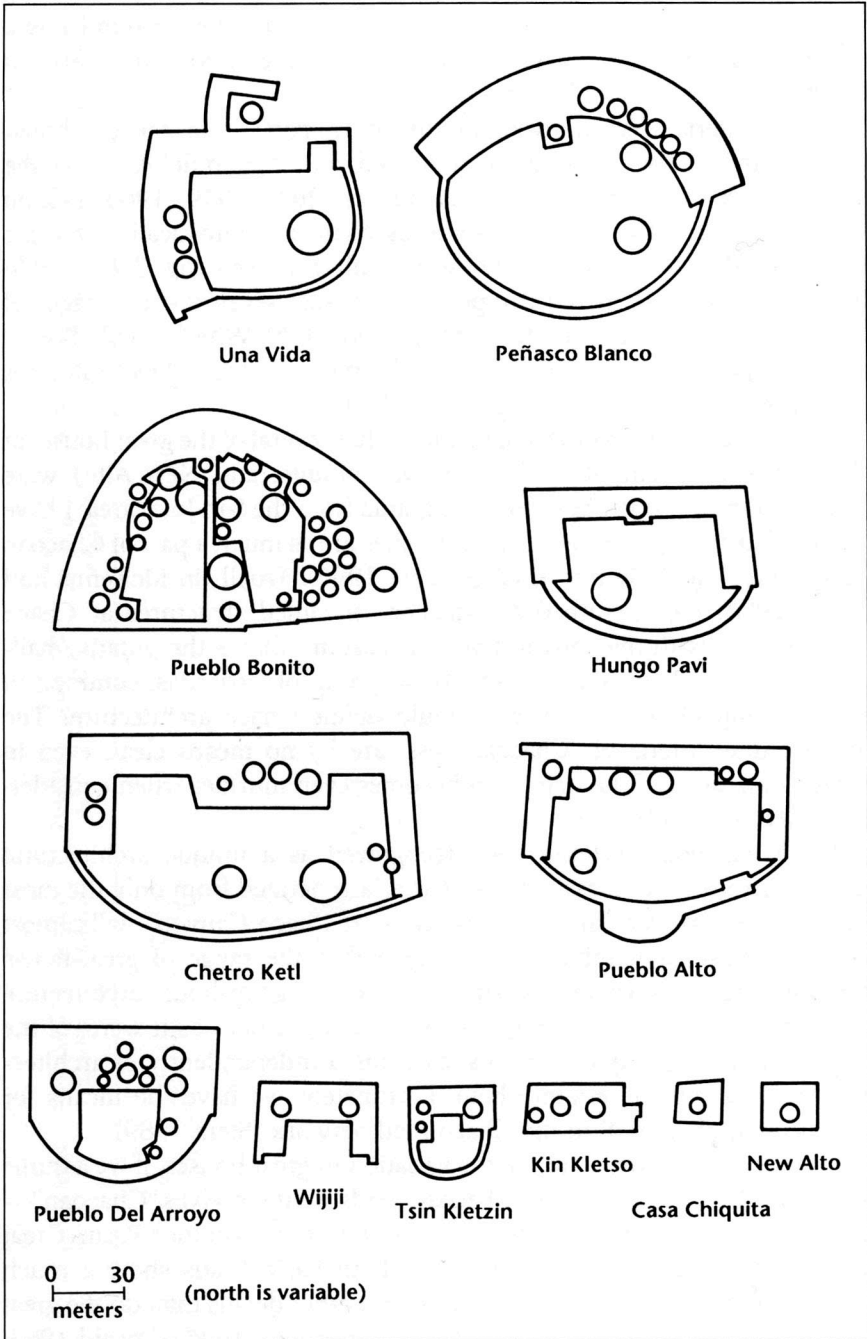


Figure 3.1. Great houses at Chaco Canyon.

traditionally, as definitive; details such as enclosed above-ground kivas, tower kivas, large room size, and so on, constituted additional Chacoan criteria (e.g., Vivian and Mathews 1965).

These criteria were derived, for the most part, from the combined architectures of Pueblo Bonito, Chetro Ketl, and Pueblo del Arroyo—the three largest excavated Chaco great houses (Judd 1959, 1964; Lekson 1983). However, those three structures changed dramatically over the many decades during which they were built and used (fig. 3.2). Pueblo Bonito, for example, is the composite of at least seven distinct stages of construction spanning two centuries (Lekson 1986). Which Pueblo Bonito are we supposed to be looking at? And were any of the Pueblo Bonitos typical of the full range of Chacoan building?

Vivian and Mathews (1965) concluded that several of the great houses at Chaco (Tsin Kletzin, Kin Kletso, Casa Chiquita, and New Alto) were actually intrusive units built by immigrants from the San Juan area. I have argued that these supposedly intrusive sites are as much a part of Chacoan building as Pueblo Bonito itself (Lekson 1986). Truell (in McKenna and Truell 1986) has identified 60 smaller, unnamed structures at Chaco Canyon built with the core-and-veneer masonry that is the putative hallmark of great-house construction. What group of attributes, common to which group of sites at Chaco, should define Chaco architecture? The architectural criteria of “Chacoan-ness” are by no means clear, even in Chaco Canyon, and the definition becomes even murkier when considering outlying great houses.

Chaco Canyon has long been recognized as a unique architectural development in the Anasazi world. Criteria generated from only the most unusual and spectacular sites (i.e., those at Chaco Canyon) will almost certainly mask or eliminate variability within the range of great-house building. How can we hope to know the range of great-house architecture with criteria defined from only the extreme “right tail,” as it were, of the distribution? An array of Chaco sites defined independently of architectural criteria would certainly help. Fortunately, we have the means for independent definition in the Chaco road network (Stein 1989).

Chaco’s roads allow us to see the variation in great houses, if we assume that large sites associated with Chacoan roads are themselves “Chacoan”—an assumption seldom challenged, at least within the San Juan Basin. Great houses associated with the major San Juan Basin roads show a much greater variety of plans, configurations, and other details than do the great houses in Chaco Canyon (Fowler, Stein, and Anyon 1987; Kincaid 1983; Marshall et al. 1979; Nials, Stein, and Roney 1987; Powers, Gillespie, and

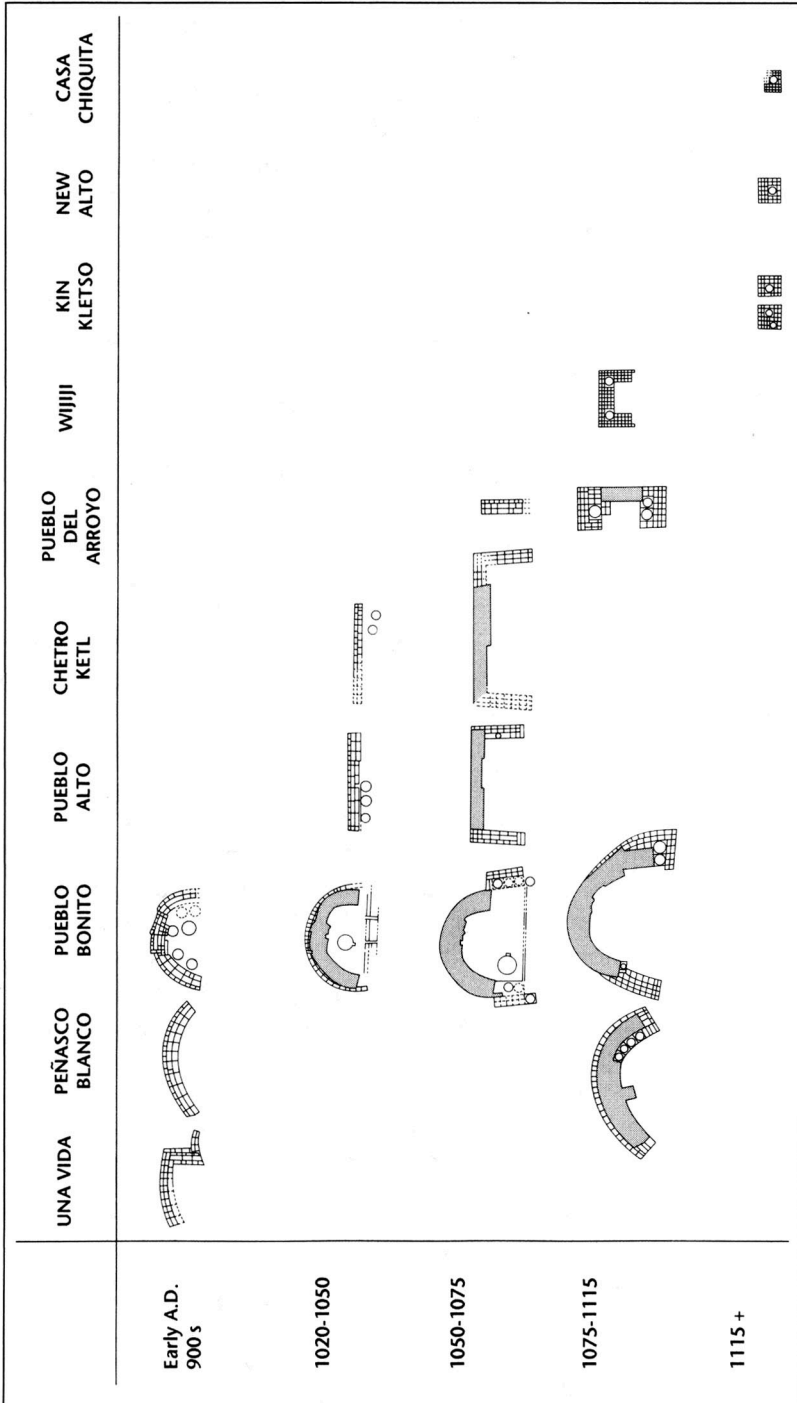


Figure 3.2. Architectural development over time of Chaco Canyon great houses.

Lekson 1983). Examples of San Juan Basin great houses, drawn from these sources and my own data, are shown in figure 3.3.

Very few outlying great houses have been excavated, but those that have show many of the architectural details of the Chaco Canyon sites (core-and-veneer walls, coursed masonry facings, elevated kivas, and so forth). But excavated data are rare and will remain so for the foreseeable future; therefore, the criteria generated from the road-defined array of great houses must refer to surface characteristics. Based on this road-defined array, the criteria of massive construction, a compact formal groundplan, and—most importantly—the structure’s architectural context have come to be used as standard common denominators. Powers, Gillespie, and Lekson (1983:308) note that “generally, if the layout and architectural features of a site are unclear or unknown, its recognition as a Chacoan structure is based on *its greater size relative to contemporary sites*” (emphasis added).

Thus, to a very large extent, great house criteria have shifted from intrinsic *traits* to extrinsic *contexts*. Given the appropriate time period, evidence of a compact plan, and massive construction, the deciding criterion is this: Is the candidate great house a significantly bigger “bump” than other contemporaneous bumps in its vicinity? (The smaller bumps will be discussed below.) Examples of sites identified as great houses based on these criteria (drawn from the sources cited above) are shown in figures 3.4 and 3.5.

Comparison of outlying great houses (figs. 3.3, 3.4, and 3.5) to the Chaco Canyon great houses (fig. 3.1) shows that most outlying great houses are rather small. Discounting the structures in Chaco Culture National Historic Park and the “Big Four” (Kin Bineola, Pueblo Pintado, Aztec Ruins, and Salmon Ruins), almost all of the great houses listed by Powers, Gillespie, and Lekson (1983:table 41) range in floor area from only about 2,000 square meters down to a paltry 200 square meters. In fact, most are under 1,000 square meters: that is, one-fifteenth to one-twentieth the size of buildings like Pueblo Bonito and Chetro Ketl. Outlying great houses are not large sites by either Chaco or later Anasazi standards (compare figs. 3.3, 3.4, and 3.5 to the contemporary and later non-Chacoan sites shown in figs. 3.6 and 3.7).

GREAT KIVAS

A second element of Chacoan building, which rivals great houses in its archaeological interest, is the great kiva. Great kivas are round, masonry-lined pit structures that are remarkable for their large size: during the A.D. 1000s and 1100s, they generally were greater than about 10 meters in

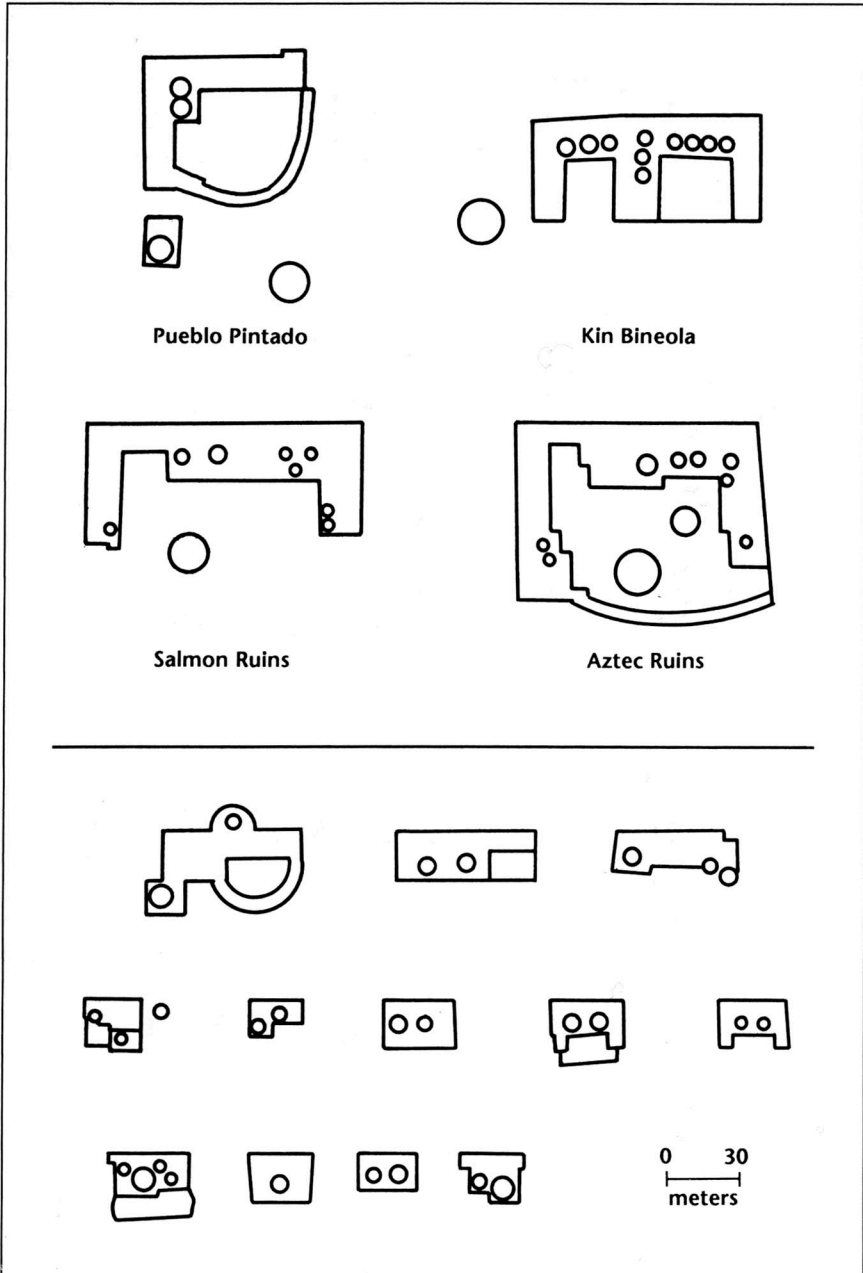


Figure 3.3. Great houses: the “Big Four” (Pueblo Pintado, Kin Bineola, Salmon Ruins, and Aztec Ruins) and selected great houses from areas north of the Chaco drainage.

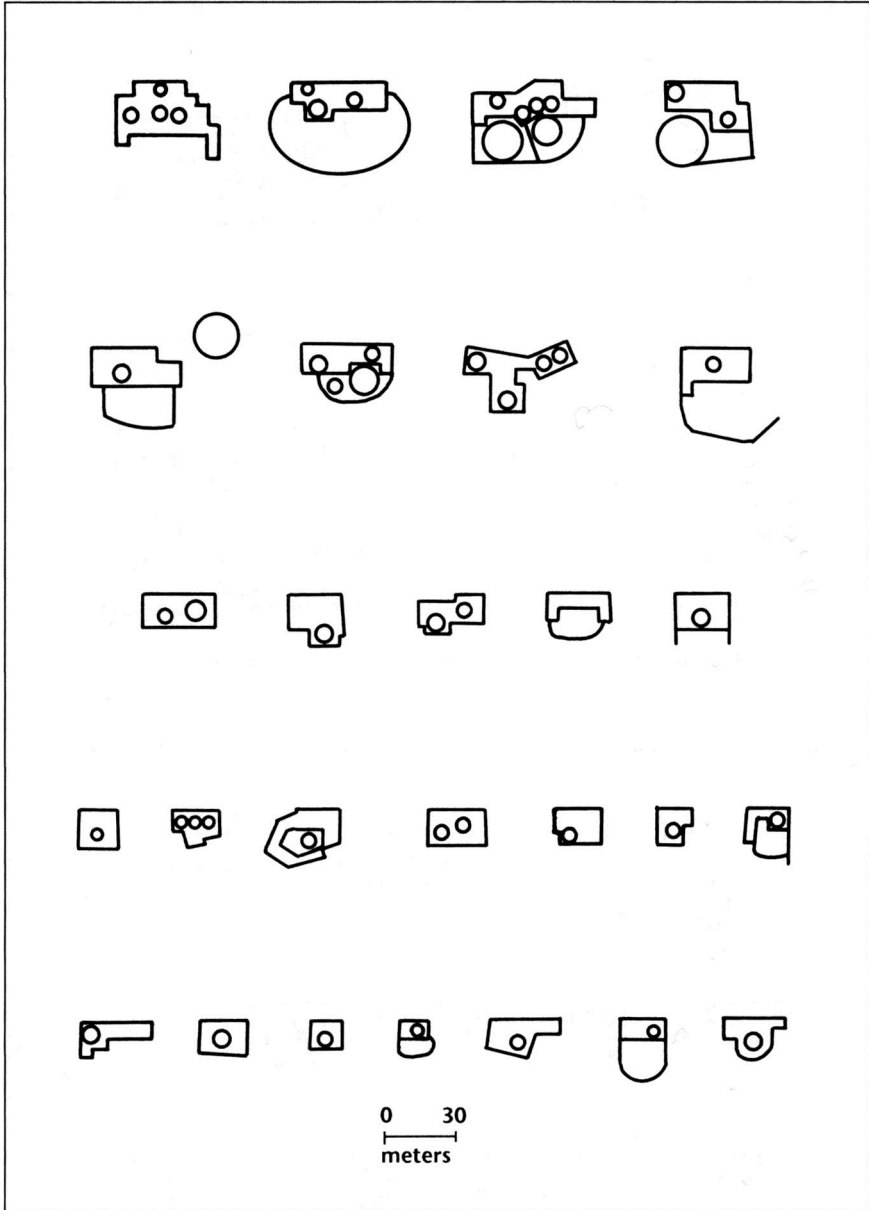


Figure 3.4. Great houses: selected examples from the Chaco drainage.

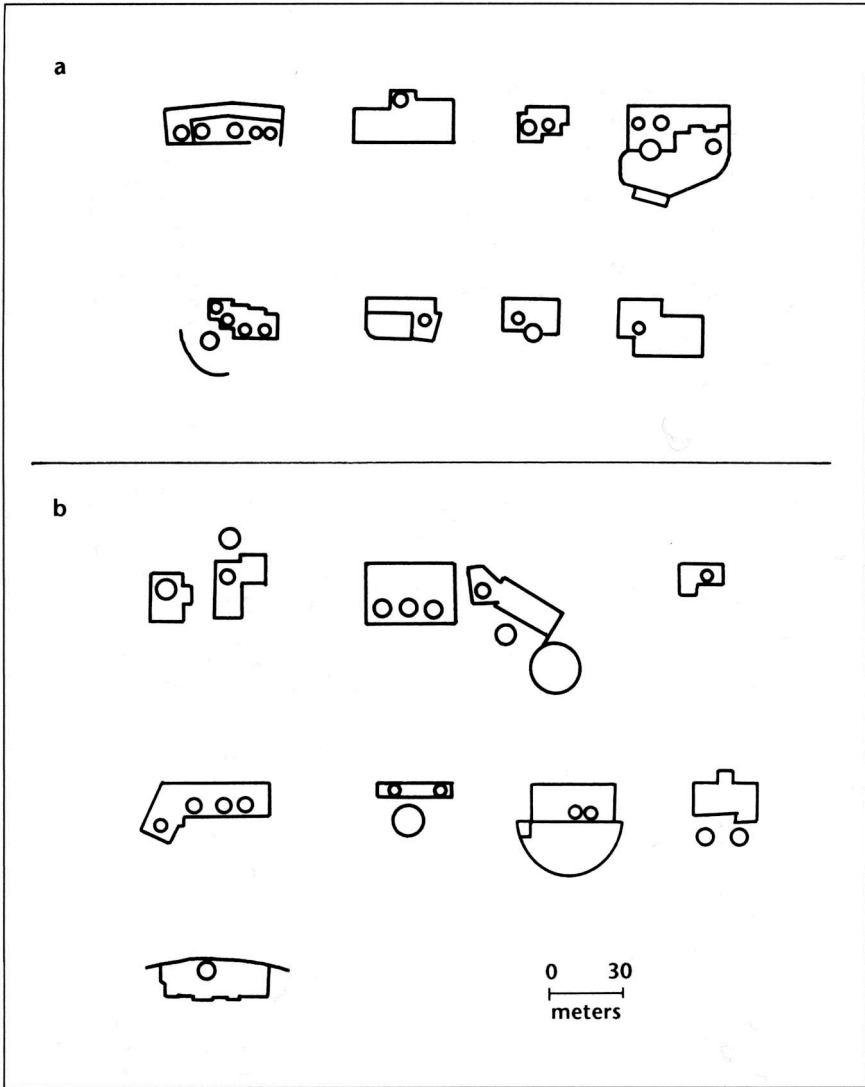


Figure 3.5. Great houses: a, selected examples from areas east of the Chaco drainage; b, selected examples from areas south and west of the Chaco drainage.

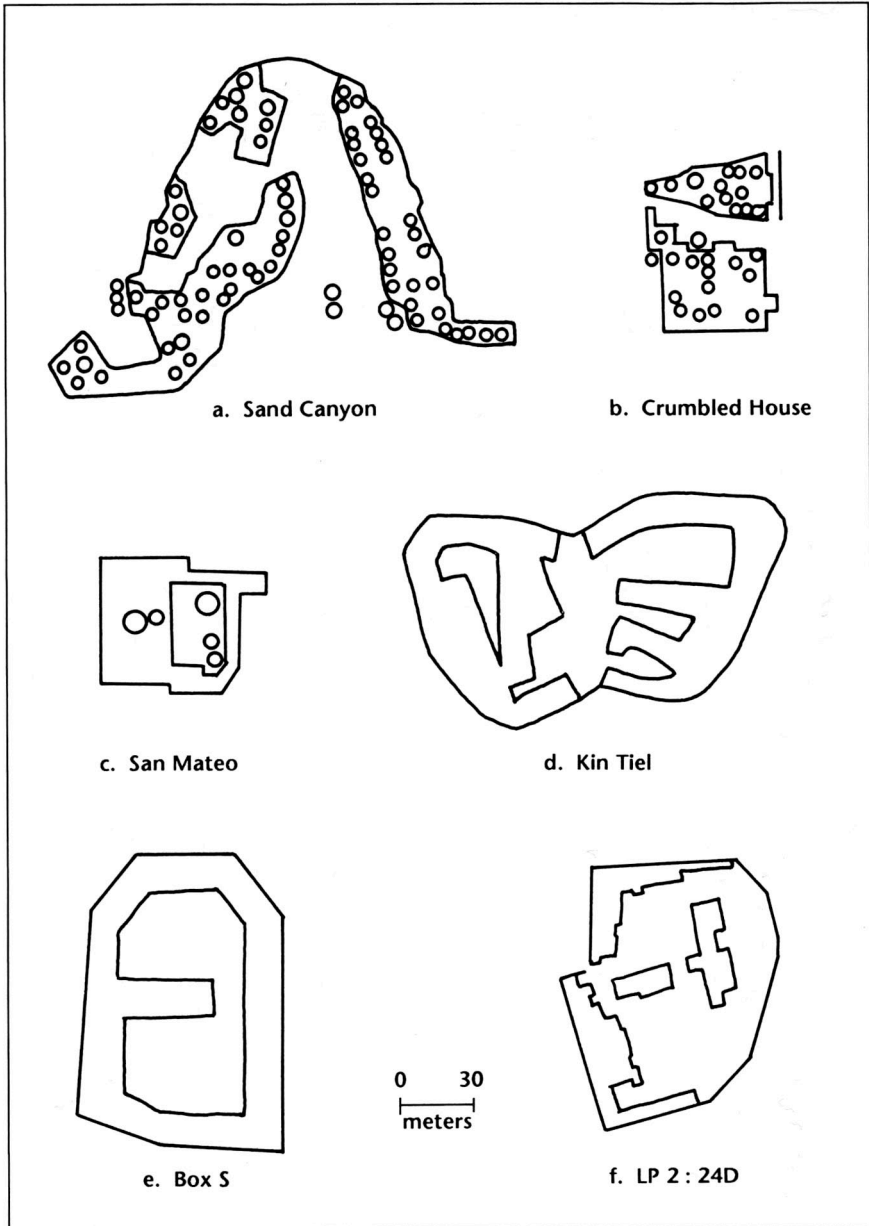


Figure 3.6. Selected thirteenth- and early fourteenth-century Anasazi sites, for comparison with eleventh- and twelfth-century Chacoan sites shown in figures 3.1 through 3.5. a, Sand Canyon near Cortez, Colorado; b, Crumbled House; c, San Mateo; d, Kin Tiel; e, Box S Site, near El Morro, New Mexico; f, LP 2:24D, near Acoma, New Mexico.

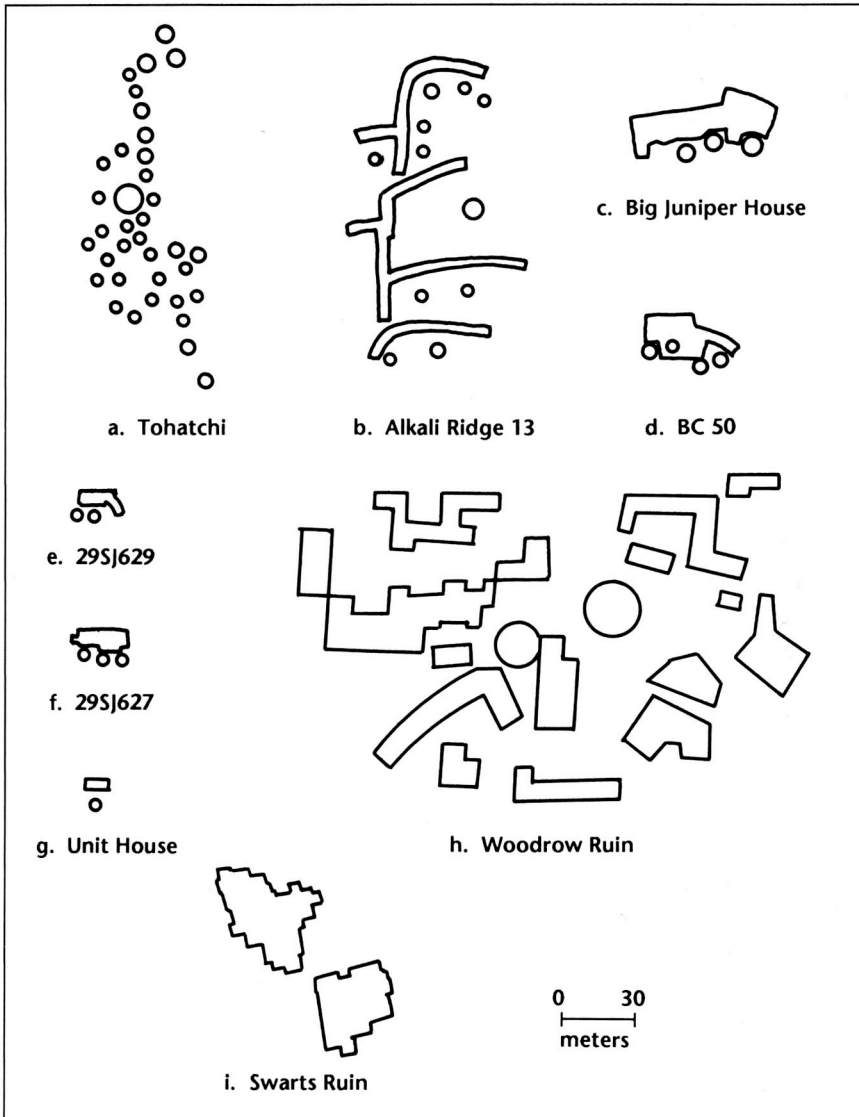


Figure 3.7. Selected pre-thirteenth-century sites, for comparison with eleventh- and twelfth-century Chacoan sites shown in figures 3.1 through 3.5. a, Tohatchi Basketmaker III village, near Tohatchi, New Mexico; b, Alkali Ridge Pueblo I site, near Blanding, Utah; c, Big Juniper House, Pueblo II site at Mesa Verde, Colorado; d, BC 50, Pueblo II–III site at Chaco Canyon; e, 29SJ629, Pueblo II–III site at Chaco Canyon; f, 29SJ627, Pueblo II–III site at Chaco Canyon; g, Prudden (1918) “unit house”; h, Woodrow Ruin, Mimbres site near Cliff, New Mexico; i, Swarts Ruin, Mimbres site near Silver City, New Mexico.

diameter (McLellen 1969; Vivian and Reiter 1960; Marshall et al. 1979), compared to contemporaneous pit structures and small kivas which averaged about 4 meters in diameter (McKenna and Truell 1986).

Great kivas are often thought to be synonymous with Chaco (Roberts 1932; Vivian and Reiter 1960:106). Indeed, LeBlanc (1986:108) argues that “all, or almost all, of the masonry-lined great kivas known archaeologically in the Anasazi area are associated with Chaco big [great] houses.” I would amend this statement to refer to all great kivas built from A.D. 900 to 1200.

UNIT HOUSES

Unit houses, or unit pueblos, are small masonry pueblos of seven to ten rooms and one or two pit structures or kivas. They are the basic building blocks of Chaco (and probably general Anasazi) domestic architecture. There are, of course, many exceptions to the preceding statement (Gorman and Childs 1981), but the unit house (fig. 3.7g) is a proven and useful concept for the analysis of Anasazi settlement.

The unit house is the point of reference for Chacoan building; these are the “small bumps” to which the “big bumps” of great houses are compared. Just as Pueblo Bonito and the other great houses at Chaco shared the canyon with hundreds of smaller structures, so also do outlying great houses stand amid clusters of unit houses, or “communities.”

COMMUNITIES

A “community” is a cluster of unit houses around a great house, a great kiva, and other central features (Breternitz, Doyel, and Marshall 1982; Marshall et al. 1979; Powers, Gillespie, and Lekson 1983). If the unit house is the fundamental element of Anasazi architecture, the community is the fundamental element of Anasazi settlement.

Because unit houses are freestanding buildings, they have usually received separate site names or numbers and have been seen as separate settlements (e.g., Morris 1939:39). However, many (and, I believe, most) unit houses of the 1000s and 1100s were spatially clustered in communities (as suggested in Rohn 1977). Several such communities are illustrated in figure 3.8. Chaco Canyon, shown in figure 3.9, is itself a densely clustered community (Lekson 1986).

There is considerable variation within Chacoan communities, but little of this variation can be usefully quantified. During the great “outlier hunts” of the 1970s, communities were surveyed in the immediate vicinity of several outliers (Marshall et al. 1979; Powers, Gillespie, and Lekson 1983), but of the hundreds of communities that we know to exist, only a handful have in fact been fully defined and described.

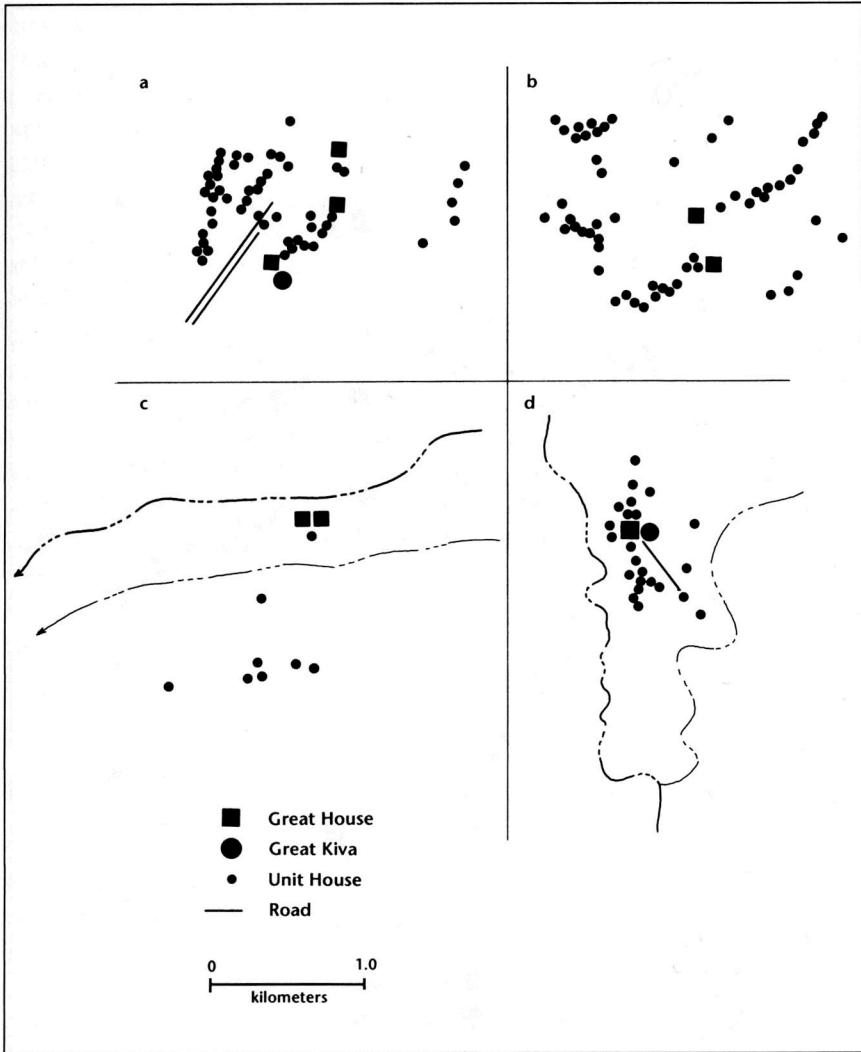


Figure 3.8. Examples of communities: a, Muddy Water; b, Kin Nizhoni; c, Bis sa'ani; d, the Holmes Group.

There is no clear association of great-house size and community size, although incomplete community definition and unresolved problems of contemporaneity make examination of this relationship difficult. For example, the Bis sa'ani great house is of approximately the same floor area as the combined floor areas of the unit houses in its surrounding community; the Skunk Springs great house, although only twice as big as Bis sa'ani, sits

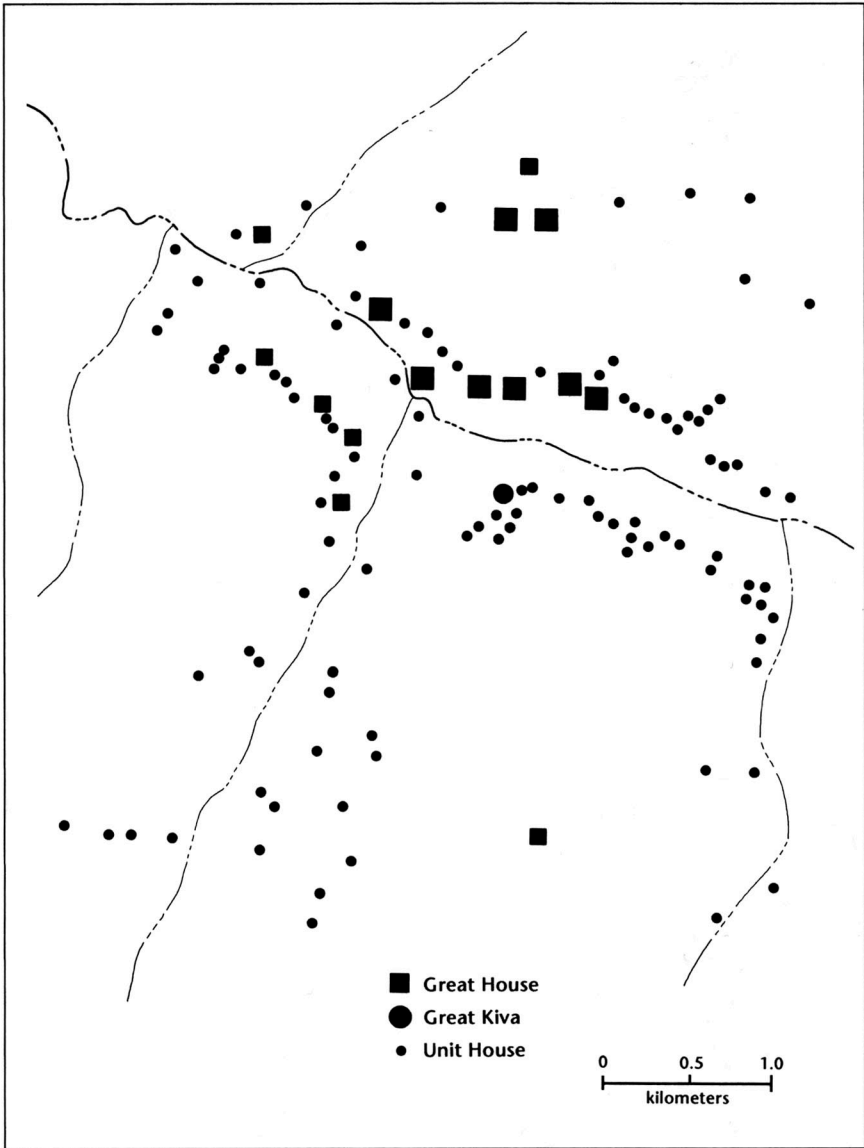


Figure 3.9. *Community organization of central Chaco Canyon.*

amid a community 30 to 40 times larger, of which an unknown portion is contemporary with the great house.

At the largest sites in Chaco Canyon, it appears that the number of great kivas may be indexed to great-house size (Lekson 1986:51). A ratio of total community size to number of great kivas may also exist at outliers (Breternitz, Doyel, and Marshall 1982:1233; Stein and McKenna 1988). Although the smallest communities, such as Bis sa'ani, have no great kivas, there are at least three great kivas at Skunk Springs. Thus, if contemporaneity can be established, the number of great kivas may be an index to the size of the community or the "service area" of outlying great houses. However, as figure 3.8 indicates, some large communities have no known great kivas, and this relationship is, therefore, not well established.

Almost all outlying great house–great kiva combinations have associated communities. But do all communities have either great houses, great kivas, or both? The major outlier surveys have focused on great houses, and therefore may have systematically excluded communities without these types of buildings. In my opinion, most and perhaps all large clusters of eleventh- through twelfth-century unit houses in the Chaco region (defined below) will be found to have a great house, a great kiva, or both.

THE LOGIC OF THE CHACO REGION

The Chaco region is usually mapped as the distribution of great houses, or outliers. As discussed above, outlying great houses were first defined by intrinsic criteria: technological features and formal elements that characterize the large sites in Chaco Canyon. Using intrinsic criteria, one could argue that only the so-called Big Four were really outliers: that is, only they were identical to Pueblo Bonito and Chetro Ketl. The taxonomic fate of scores of other Chaco-like sites has been largely a matter of the archaeologist's predilections and taste. In the absence of a scientific method for determining what agreement of which criteria was sufficient for taxonomic identity, determinations of the "Chacoan-ness" of candidate outliers was necessarily arbitrary, a matter for debate between Chaco enthusiasts and more moderate Anasazi archaeologists.

Chacoan roads offer an extrinsic, relational framework for defining great houses. Roads demonstrate an unambiguous physical relation between Chaco Canyon and outlying great houses. As discussed above, many of the great houses at the farthest ends of roads do not look very much like Pueblo Bonito or Chetro Ketl, giving us good reason to question and probably reject the most rigid intrinsic criteria. Unfortunately, our knowledge of roads is fragmentary. Roads themselves are not a panacea for regional definition, but

the relational criteria developed from the roads are a critical point of entry into the taxonomy of regional settlement patterning.

Roads demonstrate not only the variability of outlying great houses, but, more importantly, the patterned architectural context of great houses in communities. Contextual criteria can be defined from the community pattern to recognize outlying great houses for which associated roads are not evident. The community context defines great houses without reference to intrinsic architectural or formal criteria specific to the great house itself, or its relation to roads. Recall, moreover, that many outlying “big bumps” *do* display Chacoan architectural traits and features, and some of the big bumps farthest from Chaco have clearly associated road segments.

Contextual criteria are, of course, simply intrinsic criteria of the community (rather than of the great house), and they are subject to the same logical conundrums and taxonomic difficulties of any intrinsic definitional approach (some of these difficulties will be discussed below). Despite these problems, the community contextual approach offers a perspective that is startlingly different from previous approaches to defining the Chaco region.

Judge (this volume) describes the Chaco region as it was understood in the mid-1980s, defined by a combination of architectural and artifactual criteria, and by roads. The area he delimits is rather larger than the Chaco region as it was understood in the mid-1970s (Marshall et al. 1979; Powers, Gillespie, and Lekson 1983), but still smaller than the Chaco region suggested by LeBlanc (1986:112–13; Lekson et al. 1988). The Chaco region has grown enormously over the last 15 years, and its ultimate limits may not have been reached.

If the community pattern—great house, great kiva, unit houses, and (often) road segments—is used to define the Chaco region (fig. 3.10), the area included is very much larger than the San Juan Basin, and much larger than Judge’s region. Figure 3.10 is a very approximate map; the communities and great houses indicated are by no means all that are currently known or suspected, nor all that we may with confidence expect eventually to find. This is not the ultimate outlier map; it was prepared simply to show the probable extent of the Chacoan system, not the distribution and density of all communities within it. Indeed, voids on figure 3.10 within the Chaco region correspond largely to under-surveyed areas.

THE NEW MODEL CHACO

The Chaco region shown in figure 3.10 is about eight times larger than that defined in the 1970s and early 1980s; it is larger, even, than the large area perceptively suggested by LeBlanc (1986). The Chaco region has expanded

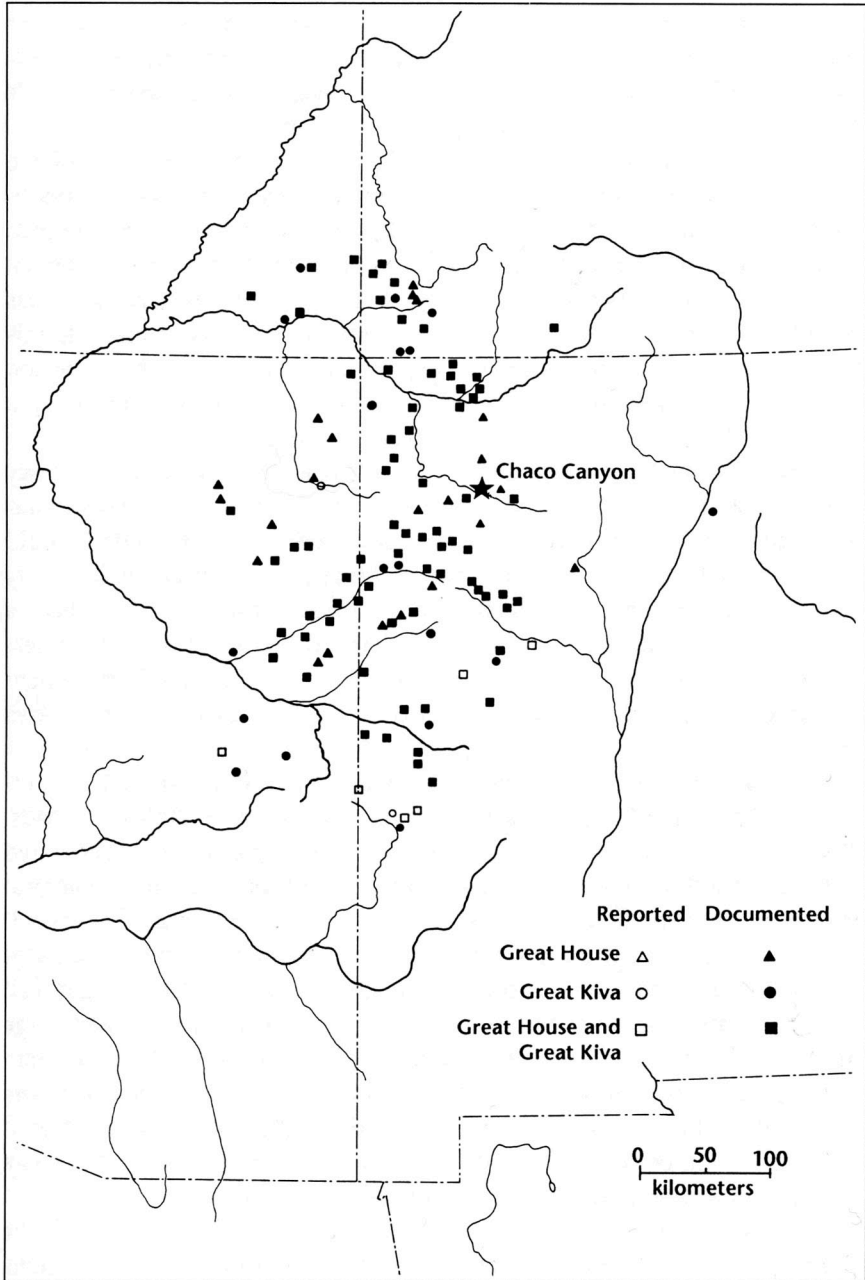


Figure 3.10. The Chaco region as indicated by great houses, great kivas, and the Chacoan community settlement pattern.

beyond Chaco Canyon, beyond the San Juan Basin, and almost beyond the limits of the Anasazi. This new scale is simply too large for the economic-ecologic underpinnings of existing Chaco scenarios—ecological models developed for the San Juan Basin scale (Lekson et al. 1988).

“Chacoan” is defined here by a distinctive settlement pattern of the eleventh through twelfth centuries: a community of unit houses focused on a great house and a great kiva. Does this usage of “Chacoan” have ethnic or sociopolitical implications? In the past, we assumed that Chaco Canyon was the center of a regional system and therefore the term “Chacoan” was intended to imply social or political connection to that center. If this assumption is still correct, then the expanded Chacoan, or Chaco, region shown in figure 3.10 suggests the existence of a sociopolitical entity on a scale previously unsuspected in the Anasazi Southwest.

The community pattern is so very widespread, however, that one may well wonder if this Chacoan community is in fact indicative of a sociopolitical entity. The community structure, identified here as Chacoan, could instead have been a nonspecific, pan-Anasazi pattern. Every village may have had a great house and a great kiva; those structures may have been a necessary part of any Anasazi settlement in the 1000s and 1100s (cf. Wheat 1983). If this were the case, Chaco Canyon was an unusual development within a widespread, pan-Anasazi distribution of great house–great kiva settlements.

Has the Chaco region become so large, then, that it is essentially meaningless? Arguing strongly against this dismal conclusion are the roads. Roads in the San Juan Basin trace the skeleton of a regional system centered on Chaco Canyon; indeed, roads are the least ambiguous archaeological evidence of a regional system we have ever found in the Anasazi Southwest. Several of the farthest outlying great houses also have evident road segments. If those roads connect the outlying great houses to Chaco (and if all the roads date to the eleventh and twelfth centuries), then the very large Chaco region (fig. 3.10) may indeed be real, however difficult it may be to explain. However, the physical connection of outermost roads with the Chaco center has not yet been made (with the exception of the Rio Puerco of the West outlier group). We do not know enough about roads—we may never know enough about roads—to resolve this problem.

There are alternate lines of inquiry that we can follow. Although the Chaco region as shown in figure 3.10 includes most of the Anasazi area, two important areas are excluded: the Kayenta and upper Rio Grande regions. The Kayenta area was, of course, as much Anasazi as Chaco, but had neither great kivas nor great houses in the 1000s and 1100s (Jeffrey S. Dean, personal communication, 1987; Alexander J. Lindsay, personal

communication, 1987; Jonathan Haas, personal communication, 1987). Nor, evidently, did the upper Rio Grande, although a single great kiva has been reported at the Pojoaque Grant Site (Peckham 1979) and an anomalous unit house community has been found near the Cerrillos turquoise mines (Wiseman and Darling 1986). Since the Kayenta and upper Rio Grande areas, presumably comprising the same Anasazi base population as the Chacoan, did not share this settlement organization, then these two notable exceptions may prove the Chacoan rule. If the great house–great kiva community pattern is not pan-Anasazi, then it represents a spatial division of the Anasazi and, arguably, a regional system.

ISSUES IN CHACOAN REGIONAL DEVELOPMENT

The topics suggested for the seminar that produced these papers structure my concluding remarks on Chacoan settlement patterns. On the most general level, three themes were addressed by the seminar: origins and growth, boundaries, and truncation. Topics specific to the analysis of Chaco and Hohokam settlement included hierarchies, aggregation, and internal regionalization.

ORIGINS AND GROWTH

This analysis of the Chaco region is based largely on surface data from various surveys. We know very little about the time depth of the sites and communities shown in figure 3.10; or rather, we know about time depth at only a few of those sites.

Many Chacoan communities were occupied from the Basketmaker III through Pueblo III periods. Others, such as Bis sa'ani (Breternitz, Doyel, and Marshall 1982), were occupied for only a short period during the last decades of the Chaco system. Breternitz, Doyel, and Marshall (1982) offer a good general discussion of great-house communities with both short and long time depth, but it is difficult to extend their ideas about differing occupation lengths to the many unexcavated sites of the entire Chaco system. Surface ceramics at great houses often fail to represent earlier (and sometimes later) occupations. For example, ceramics on the surface of Aztec and Salmon ruins evidence only the final, mid- to late-thirteenth-century use of these buildings, and they offer few if any hints that they were constructed in the late eleventh and early twelfth centuries. Conversely, sherds from the surface of middens at several outliers represent the eleventh-century occupations, and fail to reflect the later, thirteenth-century use of the structures (Windes 1982b).

Surface ceramics indicate that great houses were in use during the

eleventh and early twelfth centuries, but we cannot tell with certainty when many of those structures were originally built (and when they were finally abandoned); thus, settlement patterns, at this time, tell us surprisingly little about the history and dynamics of the Chaco regional system. The sites mapped in figure 3.10 represent the system at its peak, but the chronology, origins, and growth of that system will require much more extensive excavated data than are currently available.

BOUNDARIES

The boundaries of the Chaco region are perilously close to those of the Anasazi in the 1000s and 1100s, with the notable exceptions of the Kayenta and Rio Grande areas. The northern boundary is the Rockies; the southern boundary is the Mogollon Rim and the Mogollon Mountains. East and west, the boundaries are defined not by physiography but by archaeological units we are accustomed to thinking of as cultural: the Kayenta and the upper Rio Grande Anasazi.

The northern boundary is, in a real sense, absolute: the Rockies create a nearly impermeable border, beyond which there is little of interest, archaeologically, to the present study. To the south, however, was a “boundary” both permeable and interesting. The Mogollon Rim was no *Ultima Thule*; both the Mogollons and the land to their south were densely occupied by dynamic societies that may or may not have been impressed by things like Chacoan great houses.

Along corridors such as the San Francisco, upper Gila, and Mimbres rivers, some very large sites were contemporaneous with Chaco. Other than the huge buildings at Chaco Canyon, there are no contemporaneous Anasazi rivals to the size of 150-room (and larger) classic Mimbres sites like Swarts and Woodrow ruins (see fig. 3.7). A community organization, with small pueblos grouped around great kivas (rectangular, and therefore ignored in Chacoan studies), is also present in the Mogollon areas (Lekson 1988). The relationship of the Mogollon to Chaco and its implications for the Chaco region are currently far from clear, but future thinking should include this southern community pattern.

The boundary to the southwest, between Chaco and the Hohokam, seems clear and abrupt. That is, there appears to be very little architectural communication across the rugged Mogollon Rim of Arizona—an area of remarkably little recent work. Beyond a few very specialized forms, such as platform mounds (Lekson 1986), there are almost no architectural parallels between the two areas. Nor does Hohokam settlement (e.g., Wilcox, McGuire, and Sternberg 1981; Doyel ed. 1987) appear to resemble the Chaco community pattern. From existing architectural and settlement

data, it appears that Chaco was Chaco and Hohokam was Hohokam, and never the twain did meet.

ABANDONMENT AND TRUNCATION

Major building at Chaco Canyon ceased at about A.D. 1150, but neither the canyon nor the Chaco region was abandoned at that time. Truncation, in the sense of decapitation, might be the appropriate metaphor for this collapse. Indeed, the outer margins of the Chaco region, as defined in figure 3.10, experienced a spectacular florescence in the late 1100s and 1200s, immediately after construction ceased at Chaco Canyon. The Mesa Verde phase to the north and the Tularosa phase (and related phases at Zuni) to the south were periods that eclipsed the earlier Chaco period in these areas. Remarkable developments also occurred to both the east (upper Rio Grande) and to the west (Kayenta) of the old Chaco region. The peripheries of the region were quite healthy; only the central San Juan Basin was diminished.

Diminished, but not abandoned. The “horizon marker” for the San Juan Basin post-Chaco is Mesa Verde Black-on-white pottery (and local varieties of this type). Mesa Verde Black-on-white is found *beneath* the final floors of great kivas at several Chaco Canyon great houses. Presumably, small hunting parties do not re-floor great kivas, so in some way the old center was being maintained.

Great houses in Chaco Canyon were built to last; indeed, large sections of several great houses were intact as late as the 1880s, so we can be sure that great houses remained useful structures through the 1200s and 1300s. Although major construction in Chaco ceased in the mid-1100s, Chaco and its great houses probably continued to function in some fashion—for example, as a ceremonial center—for long beyond that date. Our problem is to define that function without Western preconceptions about building, growth, and entropy. If Chaco had been a city in 1150, it almost certainly was not one in 1250; but it may still have been a center.

HIERARCHIES

Were there hierarchies within the Chaco region? On one level, the answer is obviously yes: Chaco Canyon itself was orders of magnitude larger than any other community in the region, and it incorporated a larger variety of building types and facilities. The only possible exception would be the Animas Valley complex, developed at the very end of the great-house building period (Stein and McKenna 1988). For most of the two and a half centuries of great-house building, Chaco was almost certainly preeminent in some sense.

Were there hierarchies among or between the other communities of the region? On this level, the answer is much less clear. As noted above, there are few data for useful analysis of communities. There is a range of sizes of Chacoan communities, but there do not appear to be marked *structural* differences between communities. The set of facilities that define communities—great houses, great kivas, and so forth—is shared by all communities. But of course, this is a circular argument, since those intrinsic features define Chacoan communities.

AGGREGATION

Over most of the Anasazi area, settlement was always characterized by communities: that is, clustered sites and settlements (e.g., Tohatchi and Alkali Ridge 13; fig. 3.7). Great houses were, presumably, a Chacoan addition to what was a long-standing settlement pattern. The notion of a “Pueblo II dispersion,” with unit houses scattered over the Southwest like corn-belt farmsteads, is almost certainly inaccurate. Thus on the regional scale, questions of aggregation and dispersion probably do not apply—unless Chaco itself is evidence of significant aggregation.

The question of aggregation at Chaco is complex. Blake, LeBlanc, and Minnis (1986:463) argue that Chaco Canyon had a population growth rate of 0.78 percent, too high to be accounted for by simple biological increase. They argue that immigration would have been necessary to attain the 5,652-person population peak suggested by Hayes (1981). However, Hayes’s population figures have since been questioned and reduced (Lekson 1986; Windes 1982a, 1984b, 1987b; Windes and Doleman 1985). Using lowered peak population estimates of 2,100 to 2,700 people (Lekson 1986:272), the annual growth rate need only have been 0.3 percent, which falls within the published ranges for Neolithic-level societies (Hassan 1981). The question may well be moot: population and population growth at Chaco Canyon are central to Chaco studies, but neither architecture nor settlement pattern provides unambiguous answers (Lekson 1986: 269–72).

Within individual outlier communities, the problems of determining contemporaneity between unit houses and between unit houses and great houses is acute. Early thinking about great houses envisioned them as housing the aggregated population of earlier unit houses (e.g., Gladwin 1945). At most known communities, the large numbers of unit houses and the relatively small floor area of great houses suggests that this scenario is unlikely—unless unit houses were not all contemporaneous.

That not all unit houses in a community are contemporaneous seems likely. The question then becomes what *proportion* of unit houses are

contemporaneous, and to this we have no answer. The only excavated Chaco community is Bis sa'ani, a late, very small settlement. Breternitz, Doyel, and Marshall (1982) argued that Bis sa'ani and the unit houses of its community were contemporaneous.

Bis sa'ani provides a very interesting opportunity to study a "single component" Chaco community. There are a number of striking parallels between the total floor areas, total number of kivas, hearths, and so forth, between the great house and the combined unit houses of its community (Breternitz, Doyel, and Marshall 1982; Lekson 1985). These parallels could be interpreted as the unit-house organization being reflected, one-to-one, in the great-house architecture; or, intriguingly, they could also be interpreted as the aggregation of the unit-house population into the great house itself. The degree of chronological resolution at Bis sa'ani—or any Southwestern site—is almost certainly too coarse to detect aggregation over a very short term, say a decade or so. Could the apparently small size of the Bis sa'ani Community represent the proportion of unit houses at larger communities that were actually occupied at one time? That is, of scores of unit houses at a large outlier community like Muddy Water, were only five or so actually occupied at any one time? If so, then outlier communities could indeed represent local aggregation into great houses, albeit within a very small area. Communities, by definition, are aggregates, but a great house would be a quantum leap in neighborly crowding over the older, more dispersed, Anasazi community pattern. Intracommunity aggregation into great houses is a possibility (and not one that I favor) that must be considered—a possibility that our crude chronological controls will not allow us to dismiss.

INTERNAL REGIONALIZATION

After A.D. 1150, the peripheries of the Chaco region were markedly regionalized by the comparative void of the San Juan Basin itself. The Mesa Verde, Kayenta, upper Rio Grande, and Tularosa areas were separated by the greatly diminished center, and this void fostered increasing differentiation in their archaeologies. But what of Chaco at its peak? Was there marked regionalization within the Chaco region in the 1000s and 1100s?

I have argued, from the perspective of settlement patterns, that there was homogeneity within the Chaco region. With the region potentially expanded to the point of identity with Anasazi, it is the center—the unique developments at Chaco Canyon—that gives the concept of a Chaco region whatever validity it may enjoy. Thus, the primary internal regionalization of the Chaco region was the differentiation of Chaco Canyon itself from the overwhelming homogeneity of the Anasazi world around it.

THE CHACO REGION AND THE HOHOKAM REGION

Chaco and Hohokam regional settlement patterns reflect the larger ecology of the Southwest. The Chaco system was a spatially extensive adaptation to the broad grasslands and piñon-juniper scrub forests of the Colorado Plateau; one conclusion of this paper is that Chacoan sites are found over almost all of this biotic region. In contrast, the central Hohokam region was tightly focused on the riverine oases of the Sonoran desert, and Hohokam settlement extended in a strongly linear pattern along rivers and canals. The different settlement patterns directly represent agricultural adaptations to the very different biotic settings of the two systems.

With sufficient moisture, most southwestern soils will support corn agriculture; water is the critical and controlling variable. On the Colorado Plateau, water for prehistoric farming came mainly from rainfall. Direct rainfall (“dry farming”) was the main source for agricultural water over most of the Anasazi area. Scattered over the region, thousands of small, very localized landforms might concentrate rainfall runoff, to create locally favorable farming areas. Very rarely, small creeks might be diverted by canal or ditch irrigation, but in the Anasazi world of the tenth and eleventh centuries, there appears to have been little or no use of major streams or rivers for farming water.

Topography affects the amount and distribution of rainfall, but within the broad plains of the Colorado Plateau, rainfall is effectively, if not statistically, random. This randomness led to a very widespread, seemingly uniform archaeology over the Colorado Plateau, mirrored today in the extensive Navajo settlement. Over the vast sameness of the plateau, anywhere and everywhere a wrinkle of terrain or hydrology concentrates rainfall, Navajos settle and the Anasazi settled before them. The terrain and climate of the plateau virtually predict a broad, even, extensive pattern of archaeological settlement—much like the Chaco pattern seen in figure 3.10.

The Hohokam adaptation to the Sonoran desert was quite different. Some upland Sonoran regions can support rainfall runoff farming, but in the Phoenix Basin and other central areas of Hohokam settlement, the scant rainfall is insufficient for dry farming and irrigation is necessary for successful agriculture. Irrigation must come from live water drainages, such as the Salt and the Gila rivers. The large size of the Sonoran streams required the major technological development of the canal systems that characterize the Hohokam. Settlement was tethered to the river courses and the canals that diverted water from those rivers. Thus, the strongly linear pattern of Hohokam settlement is predicted by the hydrology of the

canals that fed Hohokam fields, themselves necessitated by the extreme aridity of the Sonoran desert.

This basic ecological difference between Chaco Anasazi and Hohokam is reflected in the two systems' most extraordinary achievements: Chacoan roads and Hohokam canals. The Hohokam canal systems were starkly functional. They were required for farming, and their form and extent were dictated by hydrology. Canal systems dictated the pattern of Hohokam settlement, and they clearly demonstrate the economic interdependence of communities located along individual canal systems. Chaco roads, on the other hand, appear to be almost bewilderingly symbolic. In many instances, roads connected existing communities of considerable temporal depth (that is, the alignment of the roads was determined by the locations of sites). The Chacoans had no wheeled vehicles or domestic animals for pack trains. Since there were no transportation requirements for the large scale of Chacoan roads, it can reasonably be assumed that the scale and elaboration of the Chaco road network was not motivated by simple economic function. Indeed, certain roads have been suggested to be visible expressions of prehistoric cosmology (Sofaer, Marshall, and Sinclair 1989). It seems likely that the labor and effort that went into Chaco roads cemented intercommunity relationships between settlements at the ends of each road segment. Roads symbolically expressed the cohesiveness of the extensive Chaco regional system—a reading very different from the clear, unambiguous archaeological message of the Hohokam canal systems. Canals were the spine of Hohokam subsistence and settlement; roads were filaments in a larger yet looser web, at the center of which was Chaco Canyon.

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