

Chapter 9

PUEBLO III (A.D. 1150-1300)

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INTRODUCTION

As described in Chapter 3, the well-preserved cliff dwellings and large open sites of the Pueblo III period first drew wide public attention to the archaeology of southwestern Colorado in the late nineteenth century, and these site types have played a large role in archaeological research in the area ever since. The cliff dwellings and canyon-rim towers of the study area have also come to represent Southwestern archaeology to a significant segment of the American and international public. Hundreds of thousands of people visit Mesa Verde National Park annually, and striking images of Pueblo III architecture are presented to many thousands more in videos, books, articles, lectures, and classes. Generations of archaeologists, including some of the more prominent figures in the field, have labored to understand the archaeological record of this period in the study area, and to construct accounts of how these Pueblo people lived and why they left the area late in the thirteenth century.

Pueblo III research has both reflected and influenced the emphases and interpretations characteristic of various periods in the history of the area's archaeology (see Chapter 3). Although Pueblo III research has continued through each of these periods, it has been a larger component in some than in others. Certainly Pueblo III sites were the predominant focus of what was recognized in Chapter 3 as the "period of initial exploration and reconnaissance (1776-1912)." Between about 1912 and 1957, Southwestern archaeologists focused on developing regional chronological sequences and filling gaps in archaeological coverage of at least the Formative stage of the record. Although research during that period continued on Pueblo III manifestations in the study area (e.g., Fewkes' numerous reports on sites at Mesa Verde National Park; Morris 1919b; Martin 1929, 1930; O'Bryan 1950; Leh 1942), the prevailing attitude was that the Pueblo III period was "well-known" and that the greatest contributions were to be made by dating and documenting sites of earlier periods.

Pueblo III research received a significant boost in the late 1950s and early 1960s with the work of the Wetherill Mesa project, which included 1) the systematic excavation and reporting of two large cliff dwellings—Mug House (Rohn 1971) and Long House (Cattanach 1980)—and a Pueblo III component at Badger House (Hayes and Lancaster 1975); 2) a series of studies of cultural ecology (see Osborne 1965); and 3) analyses of settlement patterns and population trends (Hayes 1964). Pueblo III data also contributed significantly to Arthur Rohn's pioneering work on community patterns and social organization, both in studies done for the Wetherill Mesa project (Rohn 1965, 1971), and in his dissertation research, based on previous work on Chapin Mesa (Rohn 1966, 1977).

Since the early 1970s, the virtual explosion of CRM-oriented work in the study area has yielded a large amount of new survey data on the distribution of Pueblo III sites (e.g., Fetterman and Honeycutt 1987). Several CRM-based projects have also resulted in excavation of sites of this period to mitigate the effects of federally funded or permitted projects. These include the canals and laterals portion of the DAP (e.g., Morris 1991; Hurley 2000) and the Ute Mountain Irrigated

Lands project (e.g., Billman ed., 1998). In addition, development of the Ute Mountain Ute Tribal Park resulted in excavations of cliff dwellings in Johnson Canyon preparatory to stabilization (Nickens 1981).

In the middle 1980s, the Crow Canyon Archaeological Center, a private non-profit education and research center based in Cortez, initiated a long-term, interdisciplinary, regionally based investigation of the Pueblo III period (Lipe, ed. 1992; Varien et al. 1996; Varien 1997, 1999b, ed. 1999). This project has made significant contributions to understandings of community organization, demography, mobility patterns, environmental relationships, and change through time in all these categories.

In general, research in the study area has shifted from an interest in individual sites to regional populations of sites, and from a concern with reconstruction of static culture units to an interest in the operation through time of social entities such as households and communities. The goals of chronological analysis have shifted from placing site components into phases to providing a fine-grained framework for the study of social, demographic, and environmental dynamics at the site, region, and interregional levels. Studies of assemblage and site formation processes have become increasingly sophisticated, so that the archaeological record is no longer seen as a direct repository of "fossilized" past behavior.

Building on earlier studies that used architectural and spatial analyses to infer social units (see historical survey in Lipe and Hegmon 1989), recent work in the study area has made strides in identifying and analyzing the archaeological signature of households and of "first-order" or face-to-face communities in the Pueblo II and III periods (Adler 1989, 1990, 1996b; Adler and Varien 1994; Varien 1999b). In brief, the archaeological signature of the residence of a household is usually taken to be the "Prudden unit" consisting of a kiva and a small number of directly associated surface rooms. The face-to-face or "first-order" community is identified as a spatial cluster of such residences; this community cluster can range from dispersed to highly aggregated. Furthermore, the community ordinarily has a recognizable center marked by at least some degree of residential aggregation (ranging from slight to including nearly the entire community), as well as by elements of public architecture. Public architecture varies through time, but can include among other features: great kivas, great houses, plazas, D-shaped structures, and tower complexes (Churchill et al. 1998; Kelley 1996; Varien 1999b). Communities are usually associated with concentrations of suitable agricultural land and a reliable domestic water supply, and they may persist for numerous generations even though individual households or groups of households may move in or out, as well as frequently change their residential location within the community territory (Varien 1999b).

Adler (1990, 1996b; Adler and Varien 1994) has argued that in nonstratified horticultural societies, first-order communities become more important as a distinct level of social organization (and become more visible archaeologically) when population density and agricultural intensification increase to the point at which disputes over land use and ownership become a problem, and land tenure systems must be maintained. Conflicts of this sort are not easily resolved at the household level; hence, community-level institutions are developed or given greater prominence to facilitate their resolution. In the absence of formal centralized political control, such institutions often employ religion and ritual to reinforce rules or values applicable to conflict resolution, and to support such leadership authority as exists. The strengthening of such institutions may be reflected archaeologically in the construction of features or structures loosely termed "public architecture."

Because of the large amount of previous work on both archaeology and past environments, the strong surface “signatures” of its masonry sites, a tree-ring based chronology second to none in the Southwest, and the variety exhibited by the archaeological record in both space and time, the Pueblo III period in the study area continues to provide an extremely attractive context for research on social, cultural, demographic, and environmental dynamics of past societies. Archaeologists working in the Pueblo III period in southwestern Colorado have often been able to pursue complex and demanding problems that could realistically be addressed in few if any other areas in North America. As a result, the literature of the area is exciting to review and summarize. At the same time, however, its volume and complexity make such a review a daunting task.

BROAD TRENDS IN THE PUEBLO III PERIOD

Early Pueblo III (A.D. 1150-1225)

Figure 9-1 shows 36 sites that can be dated on a variety of grounds to the period A.D. 1150-1225, and Table 9-1 provides additional information about them. Sites 1-27 are thought to have functioned as community centers, either because they represent significant residential aggregations (>50 structures), because they have significant public architectural elements such as a great kiva, or both. The majority of early Pueblo III period habitation sites are small and occur in widely dispersed distributions around and between the community centers. During early Pueblo III, there is, however, a trend to residential aggregation through time; a number of the “large” sites listed in Table 9-1 may not have become “visible” in terms of the 50-structure threshold until the later part of this period, though they may have been established earlier. One of the sites listed in Table 9-1 is in the Ute drainage unit; all the others are in the Mesa Verde-Mancos or the Montezuma-McElmo units. As discussed later in the section on regional site distribution and population, the shift of population into the western drainage units that was seen in the Pueblo II period is even more pronounced in Pueblo III. The Upper San Juan-Piedra drainage unit, which had a modest concentration of sites in Pueblo II times, now joins with the Animas, La Plata, and Dolores units in having very low site numbers. Although there are few Pueblo III sites recorded for the La Plata River valley north of the Colorado-New Mexico border, Pueblo III sites are fairly numerous in the New Mexico portion of the valley, especially after about A.D. 1180 (Hannaford 1993).

As indicated in Chapter 8, the archaeological record of the middle A.D. 1100s in the study area is something of a puzzle. Tree-ring evidence indicates that the population of southwestern Colorado was either stable or declining during these years. Figure 9-2 (based on Varien 1997:Figure 7.17) plots all tree-ring cutting dates for the central Mesa Verde region from A.D. 900 through the early 1280s. The area covered extends into southeastern Utah as far west as Cedar Mesa; in Colorado, it includes the Monument-McElmo, Dolores, Ute, and Mancos-Mesa Verde drainage units, as well as the western part of the La Plata unit. There are moderate numbers of cutting dates from the period A.D. 1100 to 1150, but in the decade centered on 1160, less than 10 dates are recorded, a level resembling those of the A.D. 900s. Cutting dates increase slightly in the decades centered on 1170 through 1190, then show a large increase around A.D. 1200. Although the preservation and subsequent archaeological recovery of beam samples that yield cutting dates are subject to a large number of variables, not all of them well understood, the pattern here is so marked that it seems likely to reflect a real decline in building activity in the mid-1100s.

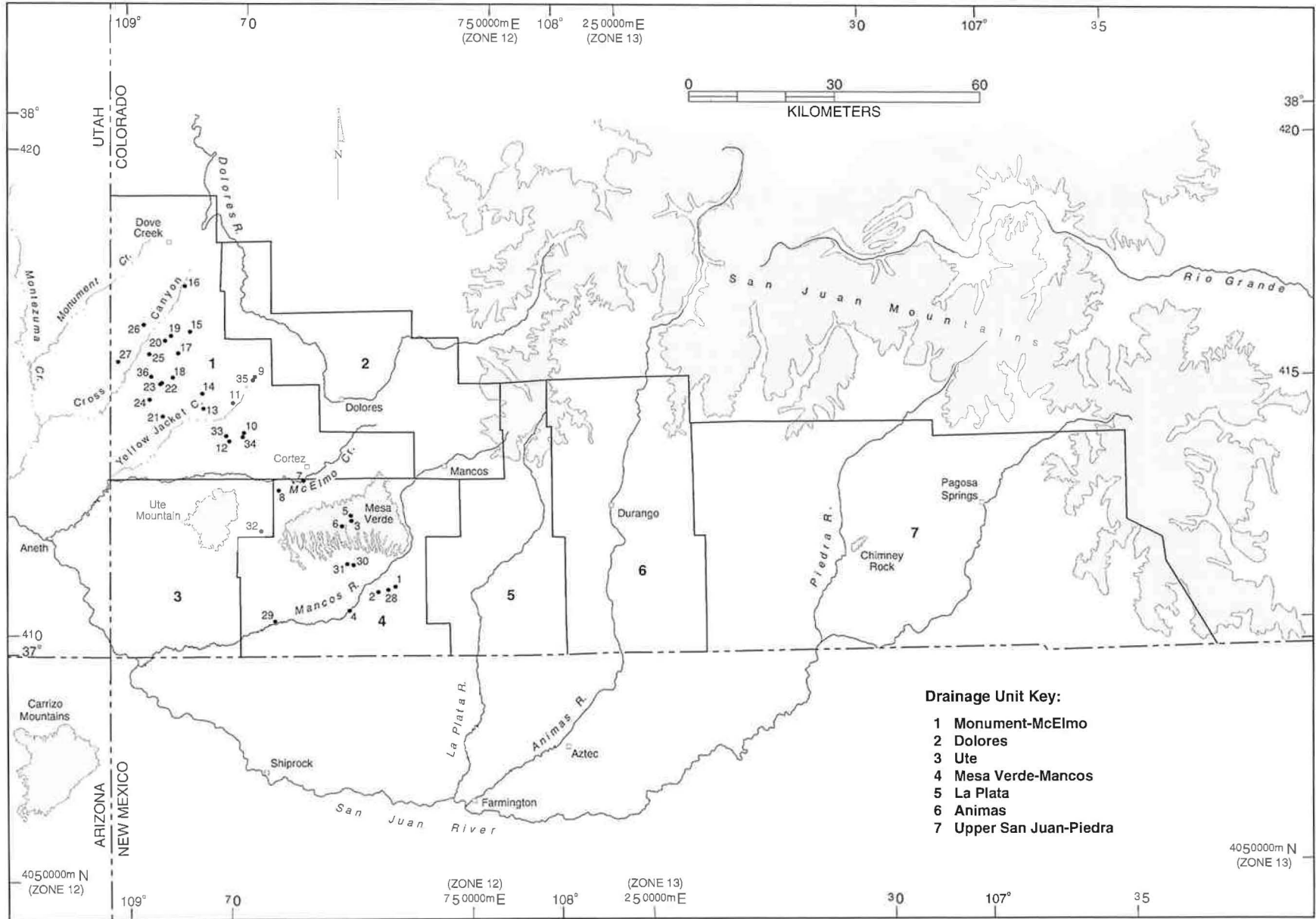


Figure 9-1. Map of community centers and well-known and/or well-dated sites in the study area, A.D. 1150-1225. (Reprinted with permission of Crow Canyon Archaeological Center.)

Table 9-1. Community Centers and Well-known and Well-dated Sites, A.D. 1150-1225.

Key ^a	Site/Project Name	Site Number	Drainage Unit	Dating Method	Public Architecture	Reference
1*	Lion House	5MT2156	Mesa Verde-Mancos	tree-ring		Nickens 1981
2*	Hoy House	5MT2150	Mesa Verde-Mancos	tree-ring		Nickens 1981
3*	Battleship Rock Cluster	5MV3749, 3733, 2472, 2481, etc.	Mesa Verde-Mancos	ceramics architecture		Smith 1987
4*	Kiva Point Reed Site 16	5MT2767, 2769, 2772, 2773, 2774-2787, 2788	Mesa Verde-Mancos	ceramics	2 great kivas; bi-wall tower	site forms Reed 1958
5*	Site 34	5MV34	Mesa Verde-Mancos	tree-ring		O'Bryan 1950
6*	Far View	MV139(GP), 5MV808	Mesa Verde-Mancos	tree-ring		Fewkes 1917, 1922
7*	Mitchell Springs	5MT10991	Montezuma-McElmo	tree-ring ceramics		Dove et al. 1997
8*	Mud Springs	5MT4466	Montezuma-McElmo	tree-ring ceramics	tri-wall	Fewkes 1919
9*	Yellow Jacket	5MT5	Montezuma-McElmo	tree-ring ceramics architecture	road	Kuckelman 1997
10*	Goodman Point Area: Shields Pueblo and isolated great kiva	5MT3807, CC87-411	Montezuma-McElmo	ceramics	great kiva road	Adler 1990; Duff and Ryan 1998
11*	Griffey Site	ROHN Y-149	Montezuma-McElmo	ceramics		site visit

Key ^a	Site/Project Name	Site Number	Drainage Unit	Dating Method	Public Architecture	Reference
12*	Casa Negra	5MT3925	Montezuma-McElmo	tree-ring ceramics architecture		Adler 1990
13*	Rich's Ruin	5MT4700	Montezuma-McElmo	ceramics architecture	possible great kiva	site form
14*	Bass Complex	5MT136	Montezuma-McElmo	ceramics architecture	possible bi-wall	site form
15*	Lancaster/Pharo Ruin	5MT4803, 5MT3805	Montezuma-McElmo	ceramics		site form
16*	Carvell Ruin	Not Recorded	Montezuma-McElmo	ceramics	great kiva	site visit
17*	Herren Farms	5MT2516	Montezuma-McElmo	ceramics architecture		Martin 1929
18*	Head of Hovenweep Mesa Top Ruin	5MT1648	Montezuma-McElmo	ceramics architecture		site form
19*	Finley Farm/ Charnel House/ Ray Ruin	Unknown	Montezuma-McElmo	ceramics architecture		Martin 1929
20*	Pigge Site	5MT4802	Montezuma-McElmo	ceramics architecture	road	site form
21*	Mockingbird Mesa Top Ruin	5MT1541	Montezuma-McElmo	ceramics		Fetterman and Honeycutt 1987
22*	Kristie's Ruin	5MT4421	Montezuma-McElmo	ceramics architecture	great kiva	site form

Key ^a	Site/Project Name	Site Number	Drainage Unit	Dating Method	Public Architecture	Reference
23*	Carol's Ruin	5MT10581	Montezuma-McElmo	ceramics architecture	possible great kiva	site form
24*	Kearns' Site	5MT532(?)	Montezuma-McElmo	ceramics architecture		site visit, site form
25*	Lower Cow Canyon Ruin	5MT4813	Montezuma-McElmo	ceramics architecture	great kiva	site form
26*	Brewer Pueblo	Unknown	Montezuma-McElmo	ceramics		Agenbroad 1978
27*	Lower Squaw Mesa Village	5DL488, 717, 995	Montezuma-McElmo	ceramics architecture		site forms
28	Johnson Canyon Small Cliff Dwellings: Morris Site 5, Fortified House	5MTUMR2155, 5MTUMR2158	Mesa Verde-Mancos	tree-ring		Morris 1919a, 1919b; Nickens 1981
29	Reed Site 1	LA 2390	Mesa Verde-Mancos	tree-ring		Reed 1958
30	Oak Tree House	MV123(GP), 5MV522	Mesa Verde-Mancos	tree-ring		Fewkes 1916a, 1922
31	Far View Area: Fewkes Unit Pueblo, Pipe Shrine House, Coyote Village, Site 499	MV149(GP), 5MV119, MV138(GP), 5MV809, 5MV820, 5MV499	Mesa Verde-Mancos	tree-ring		O'Bryan 1950; Fewkes 1923a; Lister 1964

Key ^a	Site/Project Name	Site Number	Drainage Unit	Dating Method	Public Architecture	Reference
32	Yucca House Area: Lancaster Site, Watson Site, and Ismay Site	Unknown	Ute	tree-ring		Luebber 1982
33	Sand Canyon Testing Program: Roy's, Lillian's, Shorlene's, Kenzie Dawn, and G and G Hamlet	5MT3901, 3930, 3936, 3918, 5152, 11338	Montezuma-McElmo	tree-ring ceramics		Varien, ed. 1999
34	Mustoe Site	Unknown	Montezuma-McElmo	tree-ring		Gould 1982
35	Yellow Jacket Area	5MT2, Y-54	Montezuma-McElmo	tree-ring		Cater 1989; Fine 1976
36	Hovenweep Laterals: Knobby Knee Stockade, Forest Frenzy Complex	5MT2525, 5MT9368	Montezuma-McElmo	tree-ring		Morris 1991

^a This table includes sites that are interpreted as community centers and sites that are either well-known or well-dated. The community centers are designated with an asterisk (*).

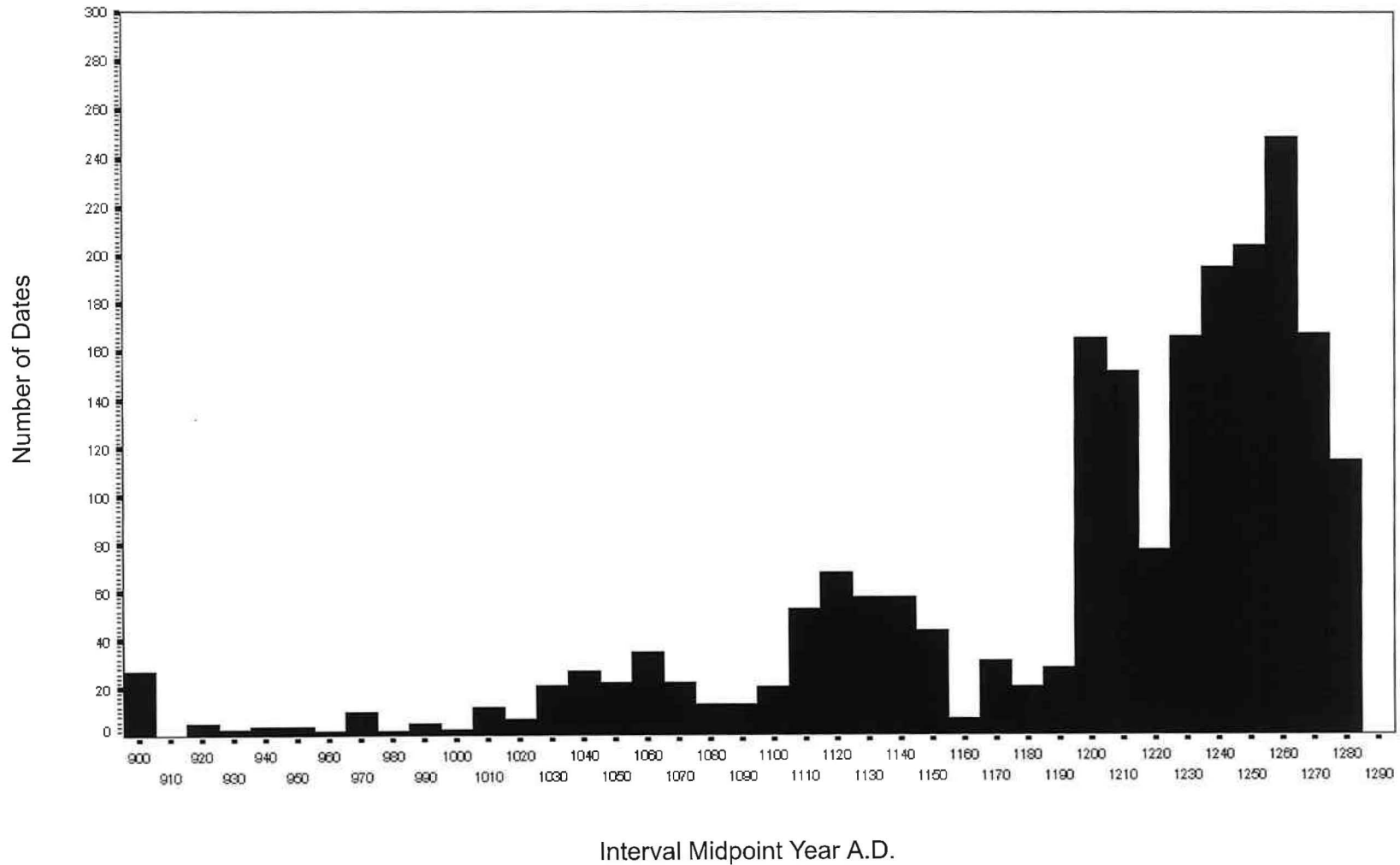


Figure 9-2. All tree-ring cutting dates from the central Mesa Verde region (portions of southwestern Colorado and southeastern Utah) between A.D. 900 and 1300 (Varien 1997:Figure 7.17). (Reprinted with permission.)

It might be argued that the rapid increase about A.D. 1200 primarily reflects a shift to construction of cliff dwellings with a concomitant increase in the preservation of construction timbers. Although some cliff dwellings were constructed in the early 1200s or even earlier, most appear to have been built after A.D. 1225 or 1230. Furthermore, the widespread and persistent recycling of beams that characterizes this area often resulted in timbers cut for earlier constructions being preserved by incorporation in later sites, including cliff dwellings. Through recycling, beams cut to build a particular structure often remain in the archaeological record long after that structure has been abandoned and destroyed (Lipe 1995; Varien 1997:146-147). Hence the record of cutting dates for the study area is to some extent a cumulative record of building activity. It is possible, though not likely, that the scarcity of tree-ring dates for the middle 1100s is a result of some type of sampling error, relating to the kinds of sites subjected to excavation or beam-sampling.

As also discussed in Chapter 8, the decline in building activity in the middle A.D. 1100s may be related to the onset of a severe drought. Van West's (1994a:Figure 5.1) model of potential maize production for southwestern Colorado shows a prolonged period of low productivity that started about A.D. 1130 and extended until about 1180. Dean and Robinson (1977) show that tree-rings in the Mesa Verde chronology remain more than one standard deviation below the mean from about A.D. 1130 to 1180. Sebastian's (1992:Figure 15) model of potential stored maize at Chaco Canyon shows a major drop in stores about 1135, with some recovery between 1155 and 1165, then very low values again until about A.D. 1180. Petersen (1988:Figures 40 and 43) presents palynological data indicating that in the A.D. 1100s, there was a significant upward movement of the lower spruce forest border in the La Plata Mountains, which he attributes to lower winter precipitation. He also provides data indicating that a weakening of the summer rainfall pattern began in the early A.D. 1100s (Petersen 1988:83-94).

This profound mid-twelfth century drought in the Four Corners area is frequently cited as the reasons, or one of the reasons, for the halt in construction of classic Chaco-style great houses in the San Juan River drainage after about A.D. 1130 or 1135. Farther west, there is a possible hiatus in occupation during the middle A.D. 1100s on Cedar Mesa in southeastern Utah (Matson et al. 1988) and a probable hiatus at this time in the Red Rock Plateau area adjacent to Glen Canyon (Lipe 1970).

Although few excavated archaeological contexts are securely dated to the period A.D. 1150 to 1180 in the study area, it seems unlikely that it was totally depopulated during this time. To investigate this question, Varien (1997, 1999b) examined patterns of beam cutting in the Sand Canyon, Chapin Mesa, and Wetherill Mesa communities; he shows that beam harvesting was probably continuous, though at a very low level, during the middle A.D. 1100s. He concludes that in the study area, a number of communities persisted in the same general locations from the A.D. 1000s through most of the A.D. 1200s. It may be that in such communities, building activity was merely curtailed during the period of drought in the middle 1100s, accounting for the paucity of cutting dates in the tree-ring record. If times were hard and populations were declining, Pueblo people may have "made do" with existing structures, and may have satisfied most of their need for building timbers by robbing structures that were no longer needed or that had become unusable. Varien (1997) also suggests that households having access to poorer lands might have been forced to emigrate to other areas or to fend for themselves without community support in such difficult times.

Settlements become more common in the study area in the A.D. 1180s and 1190s, evidently as a result of rapid population increase. These early Pueblo III communities consist of loose clusters of dispersed small habitations in mesa-top locations associated with good agricultural land. Habitations usually consist of a single “Prudden unit” composed of a small surface room block with a kiva and a midden located south or southeast of the room block. In some cases, habitations consist of multiple-unit room blocks. Community centers can sometimes be detected in the form of a great kiva, a remodeled Chaco-style great house, a semi-aggregated cluster of habitations, or some combination of these (Adler and Varien 1994; Varien 1999b).

Chaco-style great houses that had been built in the late A.D. 1000s or early 1100s are centrally located in some of the communities of the late A.D. 1100s and early 1200s. The question arises as to whether these great houses were continuously occupied through the middle 1100s, were reoccupied in the late 1100s after a period of disuse, or remained unused. Figure 9-3 shows Albert Porter Pueblo (5MT123), an unexcavated site in the Woods Canyon drainage in the Montezuma-McElmo drainage unit. The main structure conforms in a number of ways to the “Chacoan great house model,” and it seems likely that it was built during the early A.D. 1100s. On the other hand, associated sherds and the architectural characteristics of the smaller units south of the main structure suggest that these units were built sometime in the Pueblo III period. Survey evidence also indicates a flourishing community in the surrounding area during the early A.D. 1200s. It seems likely that after the early A.D. 1000s, the Albert Porter great house continued to play some role in the community that occupied the Woods Canyon locality. On the other hand, survey data also indicate that by the early 1200s, the center of this community had shifted to the Bass site complex (Figure 9-4), approximately 2 km (1.25 mi) to the west-southwest.

Excavations from the study area provide a modest amount of information about whether Chaco-era great houses were used during the Pueblo III period. Excavations at one Chaco-era great house in the Monument-McElmo drainage unit, Wallace Ruin, clearly show that it was reoccupied, but probably not until sometime in the A.D. 1200s (Bradley 1988). The excavated great house and great kiva at the Lowry site—also in the Monument-McElmo unit—appear to have been built in the late A.D. 1000s, but associated ceramics and evidence of remodeling indicates that the great house was used or reoccupied into at least the early A.D. 1200s (Martin 1936; Ahlstrom et al. 1985). A single tree-ring date in the early A.D. 1170s from the great kiva (Ahlstrom et al. 1985) indicates that this structure continued to be used during the period of low building activity noted above. The Escalante Ruin near Dolores (Hallasi 1979) does not seem to have been reoccupied at all after Late Pueblo II, except in the most ephemeral way—only a single sherd of Mesa Verde Black-on-white is reported. On the other hand, there was little occupation of the Dolores drainage unit as a whole in the Pueblo III period.

Farther west, the Bluff great house on the San Juan River in Bluff, Utah, appears to have been remodeled and lived in during the A.D. 1200s, although the precise chronology of occupation is not yet clear (Cameron and Lekson 1998). The thirteenth century reoccupations of the large Chaco great houses at Aztec West (Morris 1919a) and Salmon Ruin (Adams 1980) in the San Juan Valley in northwestern New Mexico are well-known. The occupation of the Salmon site by people who made Mesa Verde tradition pottery appears to have occurred after a number of decades of abandonment or very low population. Morris also thought that the Aztec West Ruin had stood empty for some time between the Chacoan and later Mesa Verdean occupations. Morris (1928:419) notes that “the Pueblo must have remained vacant for a long time to have permitted the elements to have brought about the advanced degree of destruction in various places to be observed beneath the lowest levels at which the second pottery [e.g., Mesa Verde] occurs.” On the

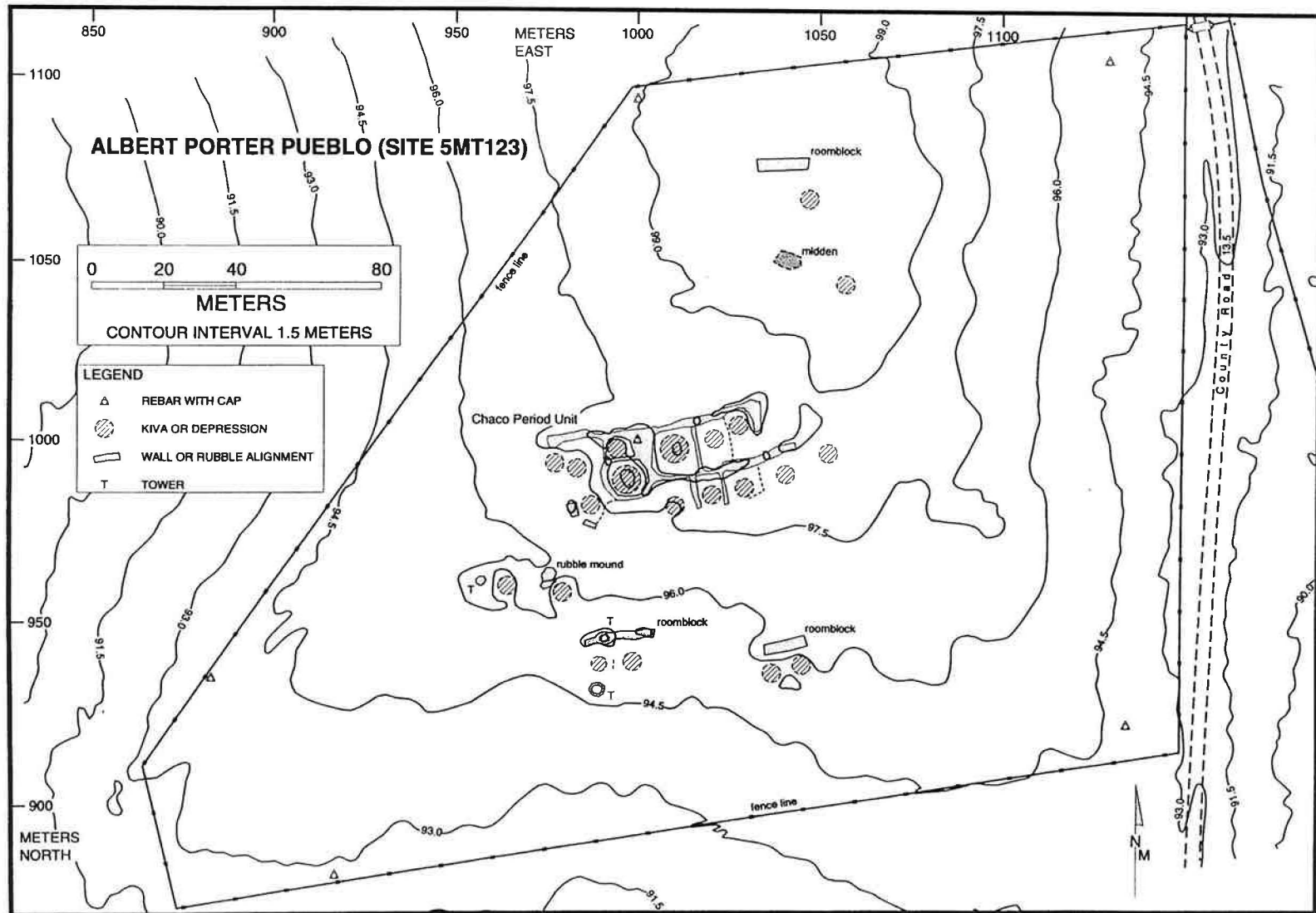


Figure 9-3. Plan map of Albert Porter Pueblo (5MT123). (Reprinted with permission of Crow Canyon Archaeological Center.)

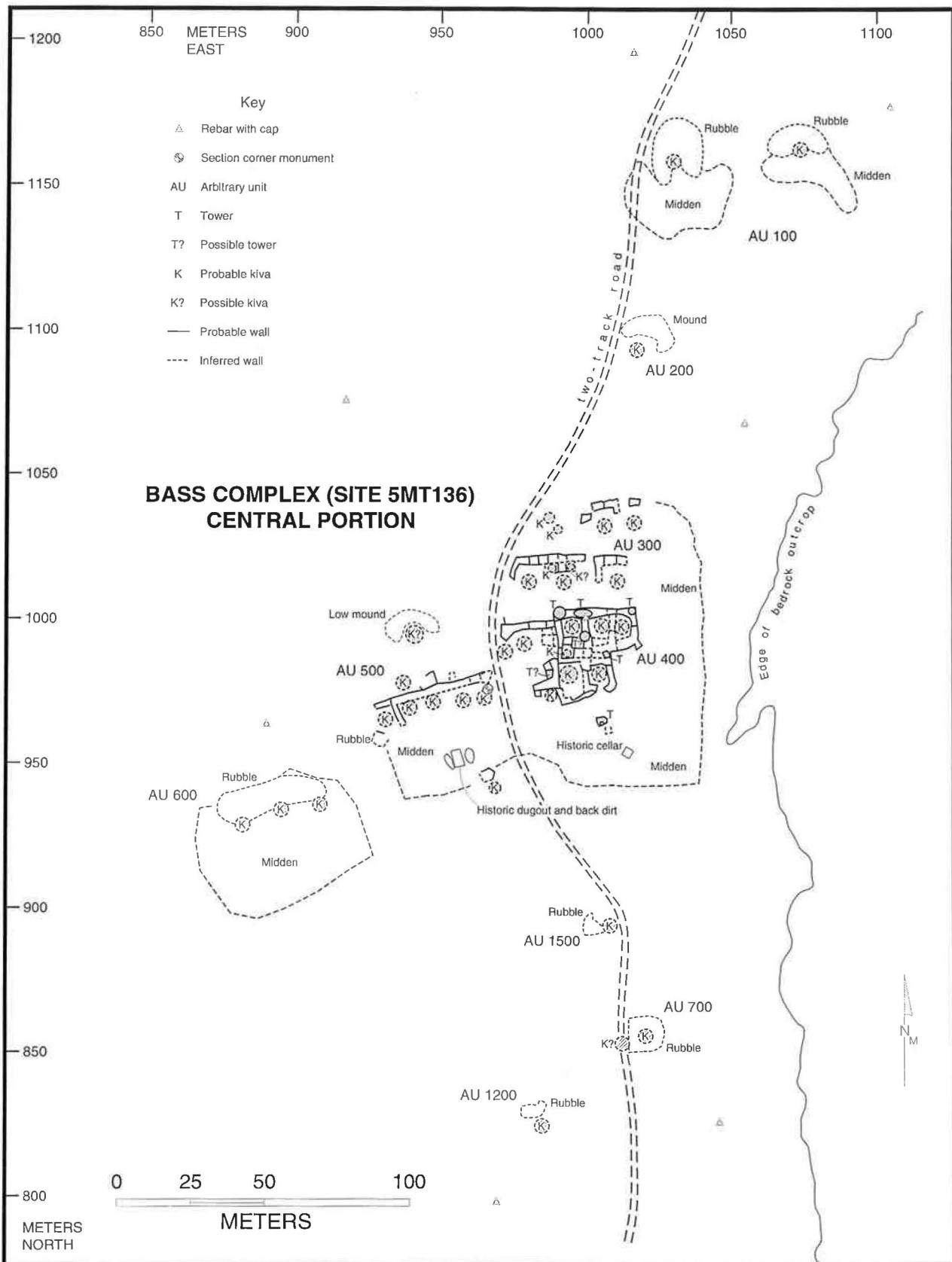


Figure 9-4. Plan map of central portion of the Bass Site Complex (5MT136). (Reprinted with permission of Crow Canyon Archaeological Center.)

other hand, Aztec West is now known to be part of a much larger complex of unexcavated sites, including a number of apparently contemporaneous large structures on the first major Pleistocene cobble terrace above the Animas River (Stein and McKenna 1988). There may have been continuity of occupation through the middle 1100s in some of the unexcavated portions of the complex.

In the Sand Canyon locality in the study area, Adler (1990, 1996b) reports that in early Pueblo III, individual habitation sites become larger through time, and more often consist of multiple Prudden units. In addition, community centers become larger, and by ca. A.D. 1225, a number of them show a significant degree of aggregation, with a densely settled core and smaller habitation room blocks at varying distances from the core. Varien (1997:176) characterizes these trends as constituting both increased household clustering and increased settlement clustering. Figure 9-4 shows the central portion of the Bass site complex (5MT136), located in the Woods Canyon drainage north of Yellow Jacket canyon, and approximately 2 km (1.25 mi) west-southwest of the Albert Porter site (see Figure 9-3). The Bass complex appears to date primarily to the first half of the thirteenth century. A portion of the central room block is two-storied, and includes towers that would have risen above that level. This in some way resembles a “latter-day great house” embedded in a residential room block.

Late Pueblo III (A.D. 1225-1300)

Figure 9-5 displays the locations of 62 large and/or well-known sites or site clusters in the study area that appear to date to the late Pueblo III period. Table 9-2 provides additional information about them. Of these sites, 51 have more than 50 structures, and are likely to have served as community centers. Some of the other entries represent clusters of smaller sites.

For Late Pueblo III, Varien (1997:177) notes two major changes in settlement patterns. “First, the location of most residential sites changed. In previous periods, most residential sites were located on mesa tops where they were associated with deep aeolian soils; however, residential sites in Period Four [A.D. 1226-1290] were predominantly in or near canyon environments....Second, large, tightly aggregated villages were common in this period, and the majority of members of each community appear to have been living in these large sites.”

The process of aggregation and the shift to canyon-oriented locations seems to have occurred over a period of perhaps 20 to 30 years—rapid in archaeological terms, but possibly perceived as fairly gradual by the people involved. Some of the canyon-oriented settlements began receiving population while most people were still living in mesa-top settlements; with time, the canyon settlements became the community centers. Likewise, mesa-top aggregates probably retained some population after the main community center had shifted to a nearby canyon head or canyon rim. The relocation of most community centers to canyon-oriented locations appears to have occurred by about A.D. 1240 or 1250. Likewise, aggregation did not occur instantaneously. The authors estimate that before A.D. 1225, most households were living in dispersed single or small multiple-room block habitations that were not part of the community center, but that after about A.D. 1250, a majority of households was living in highly aggregated villages.

On the Mesa Verde proper, the late, canyon-oriented, aggregated villages tended to be clusters of cliff dwellings, usually focused on a large cliff site such as Cliff Palace (Fewkes 1909; Rohn 1977) or Mug House (Rohn 1971) (Figure 9-6). In the Monument-McElmo and Ute drainage units, these late Pueblo III villages tended to be built in the open on a canyon rim (and often at the

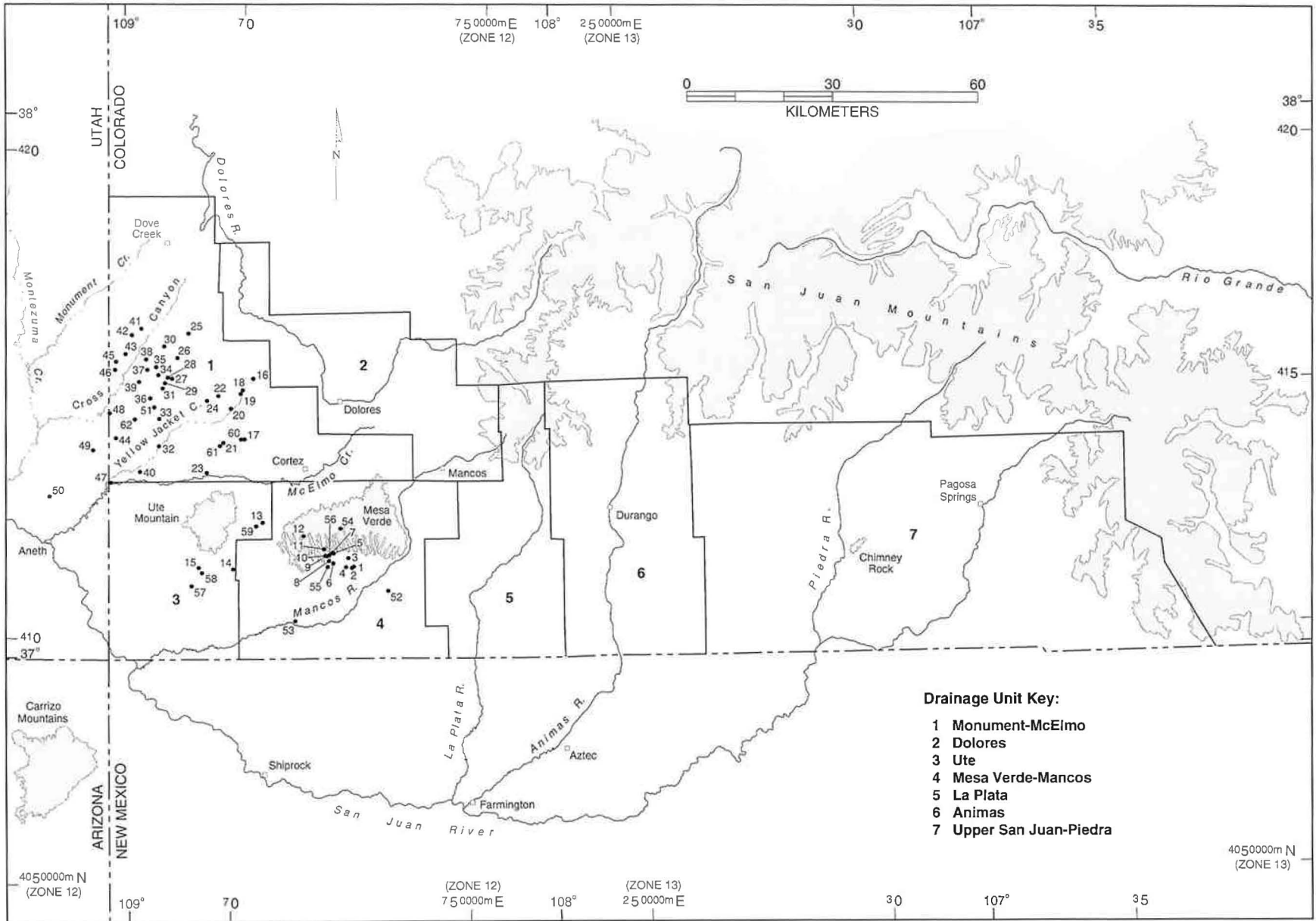


Figure 9-5. Map of community centers and well-known and/or well-dated sites in the study area, A.D. 1225-1300. (Reprinted with permission of Crow Canyon Archaeological Center.)

Table 9-2. Community Centers and Well-known or Well-dated Sites, A.D. 1225-1300.

Key ^a	Site/Project Name	Site Numbers	Drainage Unit	Dating Method	Public Architecture	Reference
1*	Cliff Palace	5MV625, MV126(GP)	Mesa Verde-Mancos	tree-ring		Nordenskiold 1979; Fewkes 1911
2*	Oak Tree	5MV523, MV123(GP)	Mesa Verde-Mancos	tree-ring		Fewkes 1916a, 1922
3*	Spruce Tree House Nordenskiold 1	5MV640, MV120(GP)	Mesa Verde-Mancos	tree-ring		Nordenskiold 1979; Fewkes 1909
4*	Square Tower House Nordenskiold 8	5MV650, MV114(GP)	Mesa Verde-Mancos	tree-ring		Fewkes 1922
5*	Site 20 1/2	5MV1449, MV151(GP)	Mesa Verde-Mancos	tree-ring		O'Bryan 1950 Hayes 1964
6*	Double House Nordenskiold 14	5MV1385	Mesa Verde-Mancos	tree-ring		Nordenskiold 1979; Hayes 1964
7*	Spring House Nordenskiold 20	5MV1406, MV119(GP)	Mesa Verde-Mancos	tree-ring		Nordenskiold 1979; Hayes 1964
8*	Kodak House Nordenskiold 22	5MV1212, MV131(GP)	Mesa Verde-Mancos	tree-ring		Nordenskiold 1979; Hayes 1964
9*	Long House Nordenskiold 15	5MV1200, MV132(GP)	Mesa Verde-Mancos	tree-ring	court with great kiva-like features	Cattanach 1980
10*	Ruin 16 Nordenskiold 16	5MV124, MV125(GP)	Mesa Verde-Mancos	ceramics architecture		Nordenskiold 1979; Hayes 1964

Key ^a	Site/Project Name	Site Numbers	Drainage Unit	Dating Method	Public Architecture	Reference
11*	Mug House	5MV1229, MV118(GP)	Mesa Verde-Mancos	tree-ring		Rohn 1971; Nordenskiold 1979
12*	Bowman's Pueblo	Not Recorded	Mesa Verde-Mancos	ceramics architecture		site visit
13*	Yucca House	5MT4359, LA 686	Ute	tree-ring ceramics	great kiva; road	Holmes 1878; Fewkes 1919
14*	Moqui Spring Pueblo	5MT4474	Ute	ceramics	great kiva possible bi- wall possible road	Fuller 1984, 1988c
15*	Cowboy Wash	5MT7740	Ute	ceramics architecture	bi-wall tower	Billman 1998; Fuller 1984, 1988c
16*	Yellow Jacket	5MT5	Montezuma-McElmo	tree-ring		Kuckelman 1997
17*	Goodman Point Pueblo	5MT604	Montezuma-McElmo	ceramics architecture	tri-wall great kiva	Adler 1990
18*	Rohn 84	5MT121	Montezuma-McElmo	ceramics		site visit
19*	Stevenson Site	ROHN Y-68	Montezuma-McElmo	ceramics		Robinson and Harrill 1974
20*	Easter Ruin	5MT3793	Montezuma-McElmo	ceramics architecture	possible road	site visit
21*	Sand Canyon Pueblo	5MT765	Montezuma-McElmo	tree-ring	bi-wall great kiva	Bradley 1993a
22*	Rohn 150	5MT207	Montezuma-McElmo	ceramics		site visit

Key ^a	Site/Project Name	Site Numbers	Drainage Unit	Dating Method	Public Architecture	Reference
23*	Castle Rock Pueblo	5MT1825	Montezuma-McElmo	tree-ring	9m diameter D-shaped enclosure	Kuckelman 2000
24*	Woods Canyon Pueblo	5MT11842	Montezuma-McElmo	tree-ring ceramics	D-shaped bi-wall	Blomster and Churchill 1996
25*	Lancaster/Pharo Ruin	5MT4803 5MT3805	Montezuma-McElmo	ceramics architecture		site form
26*	Beartooth Ruin	5MT2299 5MT2302	Montezuma-McElmo	ceramics architecture		Martin 1930
27*	Gardner Ruin	5MT1647	Montezuma-McElmo	ceramics	great kiva nearby	site visit
28*	Miller Pueblo	5MT875	Montezuma-McElmo	ceramics	D-shaped building	site form
29*	McVicker Homestead Ruin	Not Recorded	Montezuma-McElmo	ceramics architecture	D-shaped building	site visit
30*	Little Cow Canyon. Pueblo	5MT834 5MT835	Montezuma-McElmo	ceramics architecture		Kenzle 1993
31*	Thompson Site	5MT1655	Montezuma-McElmo	ceramics architecture		site form
32*	Yellow Jacket Floodplain Mesita	5MT6359	Montezuma-McElmo	ceramics		Fetterman and Honeycutt 1982
33*	Seven Towers Ruin	5MT1000	Montezuma-McElmo	ceramics architecture	great kiva	site form
34*	Fuller Ruin	5MT1637	Montezuma-McElmo	architecture		site form

Key ^a	Site/Project Name	Site Numbers	Drainage Unit	Dating Method	Public Architecture	Reference
35*	Ruin Canyon Rim Pueblo	SMT10438	Montezuma-McElmo	ceramics architecture		site form
36*	Big Spring Pueblo	SMT7088	Montezuma-McElmo	ceramics architecture		site form
37*	Cow Mesa 40	Neily CM40	Montezuma-McElmo	ceramics architecture		Neily 1983
38*	Cottonwood Ruin	SMT808 Rerecorded as SMT11601	Montezuma-McElmo	ceramics architecture		Martin 1929
39*	Lew Matis Village	Not Recorded	Montezuma-McElmo	ceramics architecture		site visit
40*	Cannonball Ruin	SMT338	Montezuma-McElmo	ceramics architecture	D-shaped building	Morley 1908
41*	Berkley Bryant Site	Unknown	Montezuma-McElmo	ceramics architecture		Crow Canyon site map
42*	Bob Hampton Ruin	SDL859	Montezuma-McElmo	architecture		site form
43*	Brewer Well Site	SDL506	Montezuma-McElmo	ceramics architecture		site form
44*	Hovenweep Horseshoe/ Hackberry	Hov 57	Montezuma-McElmo	ceramics	bi-wall	Winter 1975, 1976, 1977; Thompson 1993
45*	Papoose Canyon Talus Pueblo	Unknown	Montezuma-McElmo	ceramics architecture		site visit

Key ^a	Site/Project Name	Site Numbers	Drainage Unit	Dating Method	Public Architecture	Reference
46*	Spook Point Pueblo	Neily SP13	Montezuma-McElmo	ceramics		Neily 1983
47*	Morley-Kidder 1917	Not Recorded	Montezuma-McElmo	ceramics architecture	possible rectangular great kiva	Morley and Kidder 1917
48*	Pedro Point Pueblo	5MT4575	Montezuma-McElmo	ceramics architecture		site form
49*	Hovenweep Square Tower Complex	Hov 2, 4, 12, 13	Utah-just outside the study area	ceramics architecture	multi-walled tower	Winter 1975, 1976, 1977; Thompson 1993
50*	Hovenweep Cajon Ruin	Hov 52	Utah-just outside the study area	ceramics architecture		
51*	Hibbets Pueblo	5MT7656	Montezuma-McElmo	ceramics architecture		site form
52	Johnson Canyon Small Cliff Dwellings: Tree House, Fortified House	5MTUMR2157, 5MTUMR2158	Mesa Verde-Mancos	tree ring		Nickens 1981
53	Reed Site 4	5MT1238, LA 2387	Mesa Verde-Mancos	tree-ring		Reed 1958
54	Far View House	MV139(GP), MV808(NPS)	Mesa Verde-Mancos	tree-ring		Fewkes 1917, 1922

Key ^a	Site/Project Name	Site Numbers	Drainage Unit	Dating Method	Public Architecture	Reference
55	Mesa Verde Small Cliff Dwellings: Nordenskiold Sites 11, 12, 13	MV146(GP)/5MV1325, MV147(GP)/5MV132, MV148(GP)/5MV1320	Mesa Verde-Mancos	tree-ring		Nordenskiold 1979
56	Badger House	5MV91452	Mesa Verde-Mancos	tree-ring		Hayes and Lancaster 1975
57	Ute Irrigated Lands Sites	5MT9541, 5MT8651	Ute	tree-ring		Billman 1998
58	Towaoc Reach III	5MT10206	Ute	tree-ring		Erickson 1993
59	Grinnell Site	Unknown	Ute	tree-ring		Luebben and Nickens 1982
60	Mustoe Site	Unknown	Montezuma-McElmo	tree-ring		Gould 1982
61	Sand Canyon Testing Program (Green Lizard, Lester's, Lookout, Stanton's, Catherine's, Troy's, Mad Dog, Saddlehorn)	5MT3901, 10246, 10459, 10508, 3967, 3951, 181, 262,	Montezuma-McElmo	tree-ring		Huber and Lipe 1992; Varien, ed. 1999
62	Hovenweep Area Sites: Cut Throat Castle, Holly House	Hov 70 Hov 53	Montezuma-McElmo	tree-ring		Winter 1977

^a This table includes sites that are interpreted as community centers and sites that are either well-known or well-dated. The community centers are designated with an asterisk (*).

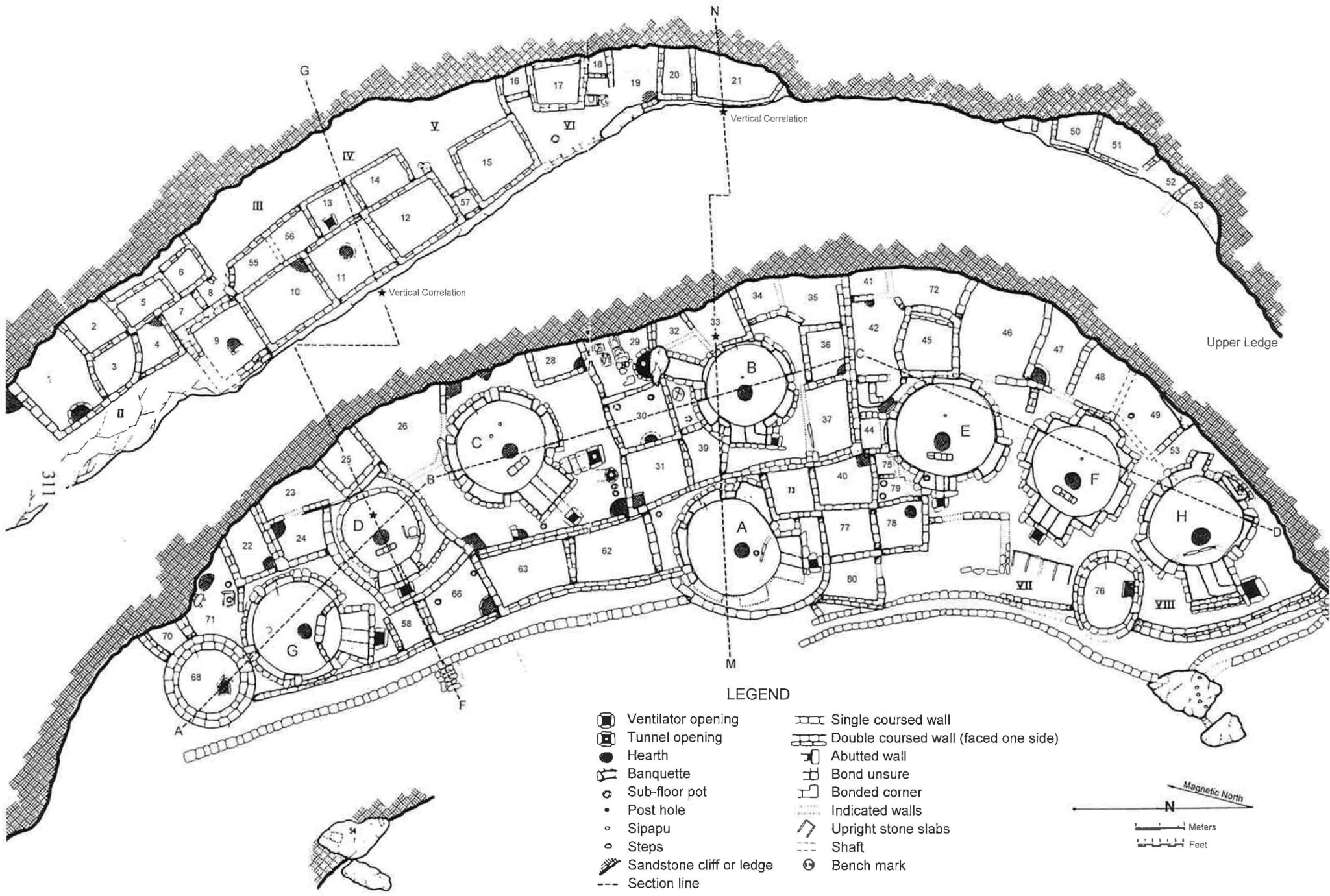


Figure 9-6. Plan map of lower and upper ledge portions of Mug House, Mesa Verde National Park (after Rohn 1971:Figure 23).

head of a canyon), with structures built both on the rim and below the rim in shelters and/or on talus slopes below the rim. Cliff dwellings are often an architectural component of such villages, but are not their primary architectural expression. Towers, located both on the canyon rim and on large boulders below the rim, are present in late Pueblo III sites on the Mesa Verde, but are much more common in the Monument-McElmo drainage unit, and are especially well expressed near the Utah-Colorado border. Several of the canyon-rim complexes in this area have been set aside as elements of Hovenweep National Monument, but there are many others that were not so designated. Seven Towers Pueblo is an excellent example of an unexcavated late thirteenth century village, built in the open on the rim of a small canyon (Figure 9-7). It has a number of towers, some of which have collapsed, and some of which are still partially standing, and thus resembles the sites preserved nearby as part of Hovenweep National Monument. Most of the canyon-oriented complexes—whether open sites or cliff dwellings—are built in proximity to reliable springs; quite often, the spring is actually enclosed within the site itself.

Sand Canyon Pueblo (Figure 9-8) is an example of a village site that is larger and somewhat more densely settled than Seven Towers. Careful surface mapping indicates that it has approximately “420 rooms, 90 kivas, 14 towers, an enclosed plaza, a D-shaped multiwalled structure, a great kiva, and various peripheral structures and features” (Bradley 1992:79). Excavations by the Crow Canyon Archaeological Center at this site have yielded numerous tree-ring dates, which indicate that construction probably began in the A.D. 1240s and certainly by the 1250s. The last cutting dates are in the mid-1270s, and the site was probably abandoned by the early A.D. 1280s.

It seems likely that the population peak in the study area was in the first half of the thirteenth century (Lipe 1995), but it is clear that large populations remained in the area in the 1260s and 1270s. Depopulation of the area, which appears to have accelerated in the late 1270s and to have been completed sometime in the 1280s, was thus relatively rapid (Lipe 1995). The best evidence for rapid and complete or near-complete depopulation of the northern San Juan region, including the study area, comes from the tree-ring record, which indicates that beam-cutting declined rapidly from a high level in the A.D. 1260s and 1270s, to virtually none in the 1280s (Lipe 1995). The drop-off in dates occurred a few years earlier in southeastern Utah than in southwestern Colorado. The latest recorded dates in the region are from Mesa Verde National Park.

The inference that the region was nearly or completely depopulated by A.D. 1290 or 1300 rests on the lack of dated construction timbers after the early A.D. 1280s. Hantman (1983) and Ahlstrom (1985) have explored the use of tree-ring dates to infer abandonment of individual sites. Hantman (1983) suggests that a site that has a good tree-ring date record can be considered to have been abandoned by 10 years after the latest date. Ahlstrom (1985) argues that the overall pattern of dates from a site is a better guide; if dates are abundant, continuously distributed through time, and decline rapidly in frequency, then site abandonment is likely to have occurred at about the time of the latest date. Inferences of abandonment at particular sites are strengthened if other nearby sites show similar patterns. Lipe (1995:147-148) extends Ahlstrom’s principles to the entire northern San Juan culture area by noting that “...dates are abundant and continuously distributed through time in the regions surveyed, their frequency declines rapidly, numerous localities show similar patterns, and no dates at all are recorded for the latter years of the thirteenth century. Given the large number of sites that have been sampled, it seems extremely unlikely that if occupation had continued at some of these sites, additional timbers would not have been cut for construction or

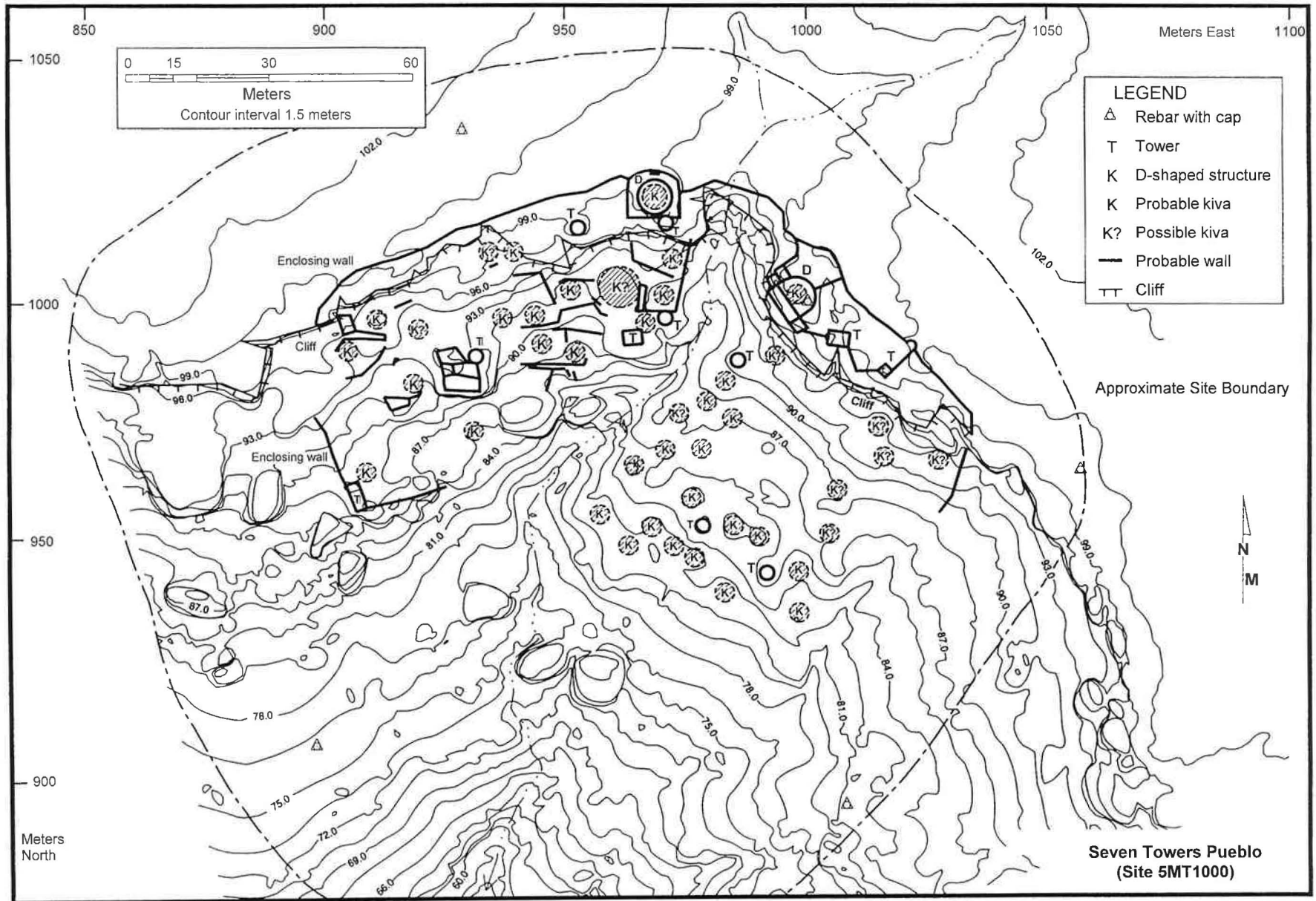


Figure 9-7. Plan map of Seven Towers Pueblo (5MT1000). (Reprinted with permission of Crow Canyon Archaeological Center.)

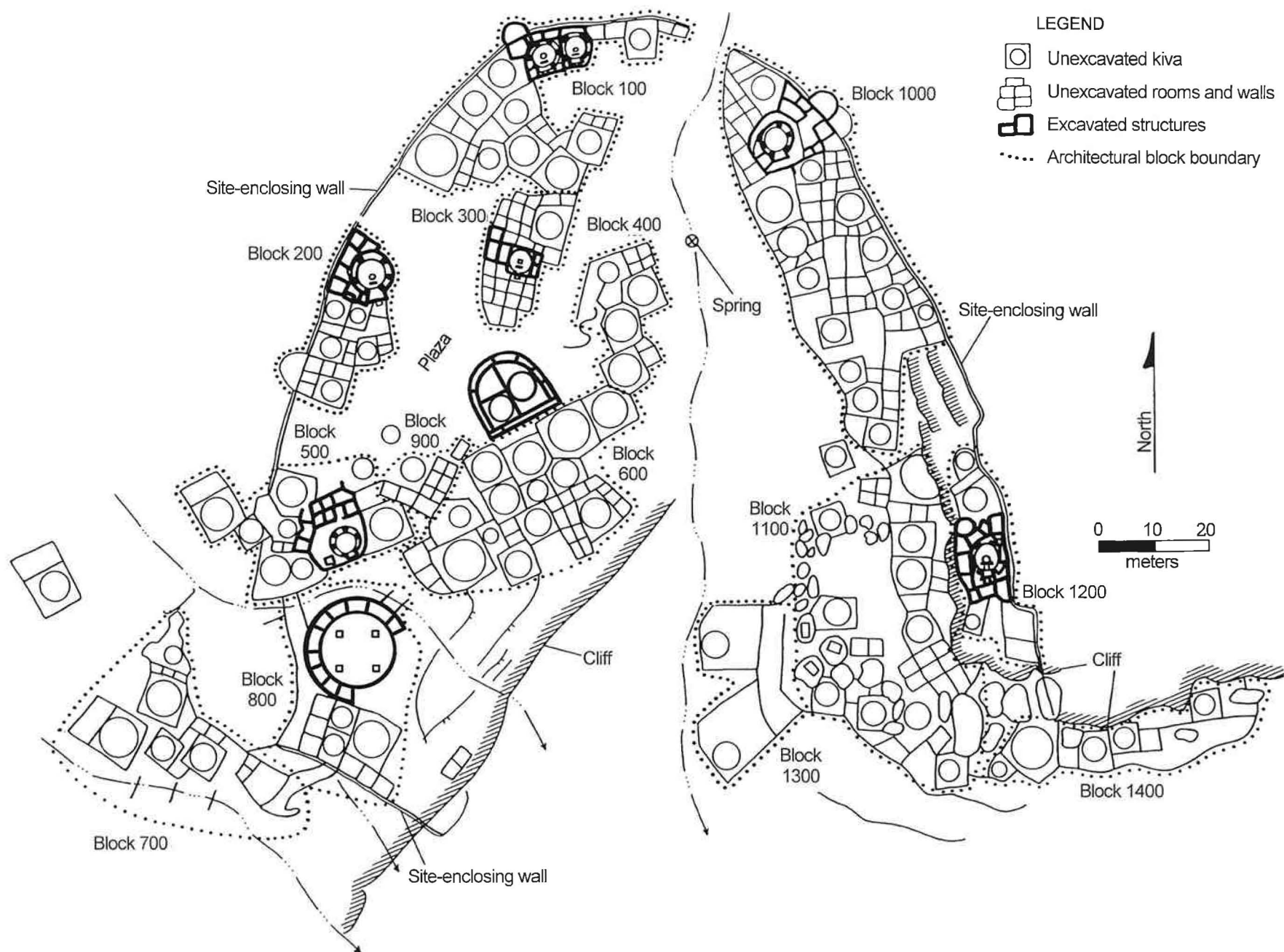


Figure 9-8. Plan map of Sand Canyon Pueblo (5MT765). (Reprinted with permission of Crow Canyon Archaeological Center.)

remodeling, or that archaeologists would have failed to collect and date at least a few of these timbers.”

CHRONOLOGICAL INDICATORS AND TRENDS

Tree-ring Dating

Pueblo III period sites in the study area have yielded large numbers of dated tree-ring samples and dates, from both open and sheltered sites. If the latest growth ring is preserved, it is often possible to obtain a calendar year date for the death of the tree from which the sample came. In some cases, it is possible to identify the season in which the tree died. As Dean (1978) and Ahlstrom (1985) point out, however, it is the archaeologist's job to relate the dated sample to an event or events of archaeological interest. Because stone axes can cut live trees, but are not suitable for cutting the harder dry wood of dead trees (Robinson 1967), a tight cluster of cutting dates associated with a particular structure is often good evidence that the death of the trees involved was a result of cutting the beams that yielded the samples that were actually dated. The Laboratory of Tree-Ring Research assigns noncutting dates if the last ring to be added before the tree's death is not preserved. Noncutting dates can still contribute to the development of fine-grained chronologies if large numbers of dates are available, and chronological arguments can be based on the clustering of dates (e.g., Varien 1997:148-149). When combined with the analysis of architectural and stratigraphic sequences, tree-ring dates provide an excellent basis for developing a fine-grained intrasite chronology. Regional histograms of tree-ring cutting dates (e.g., Berry 1982; Lipe 1995; Varien 1997, 1999b) can provide an index to varying levels of construction activity. Using such data to infer relative levels of regional population is somewhat more problematic (Dean 1985). Tree-ring dating has contributed a great deal to chronological analysis of Pueblo III period events in the study area by dating particular building events directly, and also by providing a calendar-based chronology of archaeological contexts that can be used to date patterned stylistic changes in the pottery and architecture associated with these contexts. Styles thus dated can then be used to date additional contexts that lack tree-ring dates.

Pottery Styles

Changes in pottery style have long been used in the study area to establish temporally sensitive typologies (e.g., Morris 1921a; Abel 1955; Breternitz et al. 1974; Blinman and Wilson 1989; Wilson and Blinman 1991a). The reader is referred to these works for detailed descriptions of particular pottery types. Wilson and Blinman (1991a) recognize several temporally distinctive pottery assemblages or complexes for the Mesa Verde or northern San Juan region. Three complexes are recognized for the Pueblo III period:

A.D. 1140-1180--Dolores Corrugated is the dominant corrugated type, with some Mesa Verde Corrugated and only traces of Mancos Corrugated. McElmo Black-on-white is the dominant white ware type to the near exclusion of Mancos Black-on-white. Red wares are rare, are dominated by Tsegi Orange Ware polychromes, and may include small amounts of White Mountain Red ware sherds.

A.D. 1180-1225--Both Dolores Corrugated and Mesa Verde Corrugated are abundant, and white ware sherds include an equal mixture of McElmo Black-on-white and Mesa Verde Black-on-white sherds. Red ware sherds are scarce to absent, and when present are limited to White Mountain Red wares.

A.D. 1225-1300--Mesa Verde Corrugated sherds are more abundant than Dolores Corrugated. Mesa Verde Black-on-white is more abundant than McElmo Black-on-white, and the former type increases in abundance toward the end of the period. Red wares are usually absent, but if present they consist of White Mountain Redwares. [Wilson and Blinman 1991a:47]

As one moves west through the Mesa Verde culture area, there are some changes in the relative frequencies of some of the types and wares noted above. In particular, Mesa Verde Black-on-white is seldom common in the far western part of the northern San Juan or Mesa Verde culture area (e.g., Cedar Mesa and the Glen Canyon region) even in contexts which can be assigned to late Pueblo III by tree-ring dating or cross-dating with distinctive Kayenta tradition pottery types. On the other hand, Wilson and Blinman's (1991a) characterization of Pueblo III appears to hold up well for southwestern Colorado and southeastern Utah east of Blanding.

Hegmon (1991) and Ortman (1995a, 1995b) have attempted, with some success, to develop attribute-based seriations of late Pueblo II and Pueblo III white ware types for the central part of the Monument-McElmo drainage unit. In both studies, assemblages are seriated on the basis of frequency of selected rim sherd attributes; the resulting sequences have received support from tree-ring dates and other temporal indicators. There appears to be the potential for discriminating assemblages that differ by no more than about 25 years. Hegmon (1991) found that several attributes increased in frequency through time as follows: rim ticks, thick bowl walls, combination of hatched and solid elements, exterior designs on bowls, interior framing lines of any sort immediately below rim, combination of thick and thin framing lines, and squared rims. She ultimately focused on four indices as providing the best prospects for temporal placement of assemblages: the percentage of sherds with 1) thick-and-thin framing lines, 2) framing lines of any kind, 3) painted designs on bowl exteriors, and 4) hachure and solid designs on the same sherd. Hegmon (1991) used the sum of the four indices to assign calendar dates, using tree-ring-dated assemblages to calibrate the scale.

Ortman (1995a, 1995b) relied on a somewhat larger set of variables, including the ones utilized by Hegmon. He tabulated 32 design attributes, grouped as 9 variables: wall thickness, rim taper, profile shape, rim form, rim decoration, paint type, framing pattern, external treatment, and external preparation. Like Hegmon, he relied on well-dated assemblages to calibrate his seriation to calendar years. For some parts of the Pueblo III period, his results seem in better agreement with other lines of evidence that do Hegmon's. These studies suggest that further work along these lines will be productive in refining the chronological analysis of pottery style. Ortman is currently engaged in a larger study that attempts to control for geographic as well as temporal variation in Pueblo II and III black-on-white Mesa Verde tradition pottery for the entire northern San Juan area.

Stone Artifacts

Types of projectile points, metates, and stone axes that are characteristic of Pueblo II appear in low frequencies in some late Pueblo II contexts, but become much more common after A.D. 1150. In addition, tchamahias, though never common, are more likely to be encountered in Pueblo III contexts than in those of Pueblo II.

Projectile points are rare in most Pueblo III contexts. For example, Bradley (1988:23) reports a ratio of one point to approximately 800 and 1,200 decorated sherds, respectively, at Mug House and Long House, large cliff dwellings in the Mancos-Mesa Verde drainage unit. At Wallace Ruin in the Monument-McElmo unit, however, projectile points occur at a ratio of one point to every 57 decorated sherds in late Pueblo II and Pueblo III contexts (Bradley 1988:23). It is the authors' impression that the Mug House and Long House ratios are more typical for large Pueblo III period sites.

Small stemmed projectile points occur in Pueblo III contexts, but more common are unstemmed triangular arrow points. These typically have straight to slightly concave bases and small side notches. As one moves west through the Monument-McElmo drainage unit and into southeastern Utah, there is an increasing frequency of similar points that lack the side notches. Rohn (1971) depicts several examples of the side-notched form (Figure 128 a-e; i-k) and one example of the unnotched form (Figure 128 m) from Mug House. The Nawthis Side-notched and Bull Creek types described by Holmer and Weder (1980) and Holmer (1986) resemble the notched and unnotched forms prevalent in Pueblo III times in the northern San Juan culture area.

Flat or slab metates set in metate bins and accompanying two-hand manos comprise the typical corn-grinding equipment of the Pueblo III period in the study area. Examples of troughed metates set in grinding bins occur at some sites in Pueblo II, and flat metates set in bins apparently make their appearance in late Pueblo II, but do not become common until Pueblo III. From Big Juniper House, a well-dated late Pueblo II site in the Mancos-Mesa Verde drainage unit, Swannack (1969) reports five complete troughed metates, three complete "plain-faced" metates (equivalent to flat metates), and three complete plain/troughed metates. This last form is interpreted as troughed metates that have been reworked into plain-faced (flat) form (Swannack 1969:115). This indicates that the late Pueblo II period was a time of transition between troughed forms, which were predominant through most of the Pueblo II period, and the flat form, which was most common in Pueblo III.

Most Pueblo III stone axes are fully grooved and are made on blanks of hard fine-grained stone that were flaked to a rough axe-shape before the bit was shaped by grinding and the groove by pecking. Some were made by grooving and sharpening cobbles that had been primarily shaped by natural erosion. These fully-grooved axes contrast with earlier forms, which were usually made by notching two edges of a relatively flat river cobble and grinding a sharp edge on one end of the stone. A variant of the notched form was made by roughly flaking a naturally tabular piece of stone followed by flaking or pecking the notches and grinding the bit. The notched form is typical of both the Pueblo I and II periods, but the grooved type makes its appearance in late Pueblo II. O'Bryan (1950) places the appearance of the grooved axe in the McElmo phase, which he dates to A.D. 1050-1150. Wilson and Blinman (1991a) suggest that McElmo pottery does not appear until about A.D. 1100, and does not become common until after about A.D. 1150, however. The assemblages on which O'Bryan is basing his assignment may be somewhat later than he estimated. At the late Pueblo II site of Big Juniper House, Swannack (1969:130-131) reports two grooved and one notched axe. The two grooved specimens are made on naturally-smoothed river cobbles, rather than on flaked blanks.

Mills (1987:9-13) notes that axes are rare in Pueblo II contexts in the northern San Juan, but increase markedly in frequency in Pueblo III. On the basis of experimental studies and the examination of use-wear on Pueblo III axes from Sand Canyon Pueblo (in the Monument-McElmo drainage unit), Mills (1987, 1993) concluded that the axes were probably not single-purpose tools

devoted exclusively to cutting wood. The majority of the 44 axes he examined from Sand Canyon Pueblo were too dull to cut wood effectively. The wear pattern on many of the archaeological axes indicated the working edge had been in frequent contact with an abrasive medium. Thirty of the Sand Canyon axes had a wear pattern similar to that produced on replicated axes by chopping sagebrush at ground level; only six had wear patterns similar to those produced on the replicated axes by chopping wood (Mills 1993).

The tcamahia is a stone tool type that, while never abundant, appears regularly in Pueblo III contexts. These finely-made celt-like implements have use-wear consistent with use as a hoe (Woodbury 1954: 166-169; Ellis 1967). In post-Pueblo III times, they became symbolically important in Puebloan ritual and evidently ceased to have a utilitarian function (Ellis 1967). Mills (1993) examined several tcamahias from Sand Canyon Pueblo and noted that their manufacture represented considerably more time investment than did grooved stone axes. Mills (1993:409) infers that tcamahias “do not appear to be designed for forceful work such as chopping or prying; their long, thin blades make them prone to breakage from lateral stress and end-shock.”

Morris (1939:138-139) refers to these implements as “skinning knives” following local usage in northwestern New Mexico, but suggests that they actually functioned as hoes, and were hafted on the distal ends of digging sticks. He thinks that this tool type does not make its appearance until “at or shortly before the beginning of Pueblo III” (Morris 1939:138). Shelley (1979) reports that at Salmon Ruin, a large Chacoan great house on the San Juan River near Bloomfield, New Mexico, “tchamajillas” occur in the deposits associated with the largely post A.D. 1200 Mesa Verdean re-occupation of the site, but are absent in deposits associated with the Chacoan occupation, which dates to the late A.D. 1000s and early 1100s.

Architectural Styles

Architectural variation also provides some useful chronological information, though this must be used with care because of both geographic and functional variability. For example, it is the authors’ impression that large sites that functioned as community centers are likely to have a somewhat higher investment in architectural construction and in formality of architectural style than are contemporaneous smaller habitation sites. The frequency of various architectural elements also varies geographically to some degree.

Pecked-face “McElmo”-style masonry may occur as early as the late A.D. 1000s in the Mancos-Mesa Verde drainage unit (see Lancaster and Pinkley 1954; Hayes and Lancaster 1975) and outside the study area, it appears at Chaco Canyon in the early A.D. 1100s (Lekson 1986:15-24). In the study area, the use of pecked-face block masonry appears to be most frequent and widespread after A.D. 1150 than prior to that date. This masonry style relies on large sandstone blocks that are selected for appropriate size, shaped by percussion flaking with a hammerstone, then finished on one or more faces by pecking with a hammerstone. The result is that one or sometimes several of the exposed surfaces of the building stone are relatively smooth and display “dimple-marks” from having been pecked. The blocks are laid up with relatively small amounts of mortar, so that it is predominantly stone that is exposed in the resulting wall surface.

In the study area in the A.D. 1200s, and perhaps earlier, building stones are given this pecked facing primarily in certain contexts. The style is used on the outside of a high proportion of towers and D-shaped buildings. If it is used in kivas, it appears on the inward-facing surfaces of pilasters and the lining walls below the kiva bench. Frequently, some of the outward-facing

surfaces of the walls of surface habitation or storage rooms also display pecked-face building stones. It thus appears that this treatment is designed to lend an air of formality and finish to the “public” surfaces of towers and rooms and to the interior walls of kivas. The interior surfaces of rectangular habitation and storage rooms typically are not finished in this way, nor are the interior walls of towers. The low enclosing walls that surround portions of many of the large, late, canyon-rim villages seldom employ pecked finish on their building stones. Because the pecked finish often is found on the curving walls of towers or D-shaped buildings, it seems possible that this was done after the walls had been laid, and that it served in these cases to help make the wall curvature smooth and uniform. Pecking also continues around the jambs of doors that penetrate walls that have pecked exteriors. Here again, it appears likely that the pecking was done to finish the surface after the stones had been laid in place. There appears to be some geographic variation in the use of pecked-face masonry in the northern San Juan, with frequency decreasing west of Montezuma Creek, Utah. Within the study area, the style seems more common at the larger central sites having public architecture than at smaller residential outliers.

In a recent analysis, Smith (1998) reviewed architectural data on excavated kivas from the northern San Juan region. She found several trends from A.D. 1150 to 1300: full interior masonry lining increased from less than half to more than 90 percent of the cases; pecked interior wall facings increased from less than a third to more than 40 percent; a six-pilaster roof support system was strongly predominant throughout, but increased slightly in frequency in the 1200s; and the presence of a southern recess increased from approximately half the cases prior to A.D. 1240 to nearly 80 percent after that; although orientations were generally southerly throughout, the post-1240 kivas were most consistently south-oriented with the least variability in orientation.

The shift in settlement from mesa-tops to canyons is also characterized by some shifts in the inventory and frequency of various types of structures. A complex of characteristics distinguishes the late canyon-head and canyon-rim aggregates (Kelley 1996, Kenzle 1993, 1997). These include low site enclosing walls, towers built on detached boulders below the canyon rim, informally bounded plazas enclosed by room blocks, D-shaped structures, and structures built on the talus slope as well as on the canyon rim. In the sample of 20 late Pueblo III canyon-rim sites that Kelley (1996) studied, he found that only 2 had great kivas, and none had Chaco-style great houses. The D-shaped structures (represented, for example, by Horseshoe House at Hovenweep National Monument and Sun Temple on the canyon rim near Cliff Palace at Mesa Verde National Park) are architecturally quite variable, but generally are two-storied, and frequently have an exterior row of small rooms around the periphery of the “D.” Hence, some of these can be characterized as “bi-walled structures” (as in Churchill et al. 1998). Inside the “D” is an open space that is usually bisected by a wall, separating the space into two courtyards. Some of these structures have a kiva in each courtyard (e.g., at Sand Canyon Pueblo), while at others, round, towerlike structures occur in this location (e.g., at Sun Temple). In still others, the courtyards appear to have been left open.

In a recent study of late Pueblo II and Pueblo III public architecture throughout the Mesa Verde region, Churchill et al. (1998) found a consistent decrease through time in the frequency of great kivas at community center sites, and an increase in “multi-walled” structures, with most of the latter occurring in late Pueblo III (A.D. 1225 to 1300). This structure class apparently includes circular-plan bi-walls and tri-walls as well as D-shaped multiwalled structures.

Towers appear on the Mesa Verde in the Mancos-Mesa Verde drainage unit as early as the late Pueblo II period (Lancaster and Pinkley 1954; Hayes and Lancaster 1975), most

commonly in association with residential architecture. Tunnels often connect them to kivas; this trait continues into the Pueblo III period. Towers become more common and more varied in architectural form, location, and site context in the Pueblo III period (Winter 1981), and especially after A.D. 1225. The term “tower” may obscure a good deal of functional variability. Limited excavations by Winter (1981) in late Pueblo III towers at Hovenweep National Monument in the western Monument-McElmo area indicated that some of them housed domestic/residential functions.

Towers occur singly and in groups at many if not most late Pueblo III sites, and often are ostentatious (e.g., built on canyon rims where they can be seen from across the canyon and from the canyon floor). It seems likely that at least some of these complexes represent not only defensive features, but visible symbols of community strength and preparedness, designed to be impressive to those outside the community as well as those within it (Tainter and Tainter 1991).

Site Layout

As noted above, settlement pattern and community center layout also change through time (also see Varien 1999a and Lipe and Ortman 1999). To summarize, most large sites before about A.D. 1225 are in mesa-top settings on or near good dry-farming lands; after about A.D. 1240 or 1250, most large sites are on canyon rims, in shelters just under the canyon rim, or on canyon talus slopes, and many display some combination of the above settings. A sequence of overlapping patterns of aggregation also emerges through time. The earliest Pueblo III aggregates are loose clusters of small room blocks. By the 1220s or 1230s, some of the larger central sites display multiple east/west-trending linear room blocks arranged in parallel rows, with “streetlike” spaces between the rows.

After about A.D. 1240 or 1250, however, the most common central aggregate away from the Mesa Verde proper is a grouping of structures on a canyon rim and the talus below. These sites generally are bifurcated by a drainage, and they usually have a definable area where public architecture is clustered. The settlements sometimes display a tight packing of structures, as at Sand Canyon Pueblo (see Figure 9-8), or may have a somewhat looser arrangement, as at the Seven Towers site (see Figure 9-7). On the Mesa Verde, large late Pueblo III cliff dwellings are often divided into two portions by walls that reduce access between the two segments, as at Mug House (see Figure 9-6) (Rohn 1965, 1971), Balcony House (Parks and Dean 1998) and Cliff Palace (Roberts 1999; Nordby 1999). This partitioning may be equivalent to the separation of large, open, canyon-rim sites into two parts by a central drainage.

The Yellow Jacket site, located in the Monument-McElmo drainage unit, reveals elements of several different temporal patterns of settlement layout (Figure 9-9); the sequence that can be inferred from surface analysis of the architecture receives considerable support from recent test excavations undertaken by the Crow Canyon Archaeological Center (Kuckelman 1997). In the northern portion of the site is a large mound that appears to be a Chaco-era great house. South of this structure is a large great kiva. Although neither the great house nor the great kiva has been tested or excavated, recent test excavations elsewhere at the site have produced small amounts of ceramics consistent with a light residential occupation in the late Pueblo II period (Kuckelman 1997). The north/south “avenue” that links the great kiva to a probable reservoir may also date to this period, or it may have been established in the A.D. 1200s to divide the growing settlement into two parts. That is, it may be analogous to the bifurcation of late Pueblo III open sites by drainages and the large cliff dwellings by central partitioning walls. The majority of the masonry

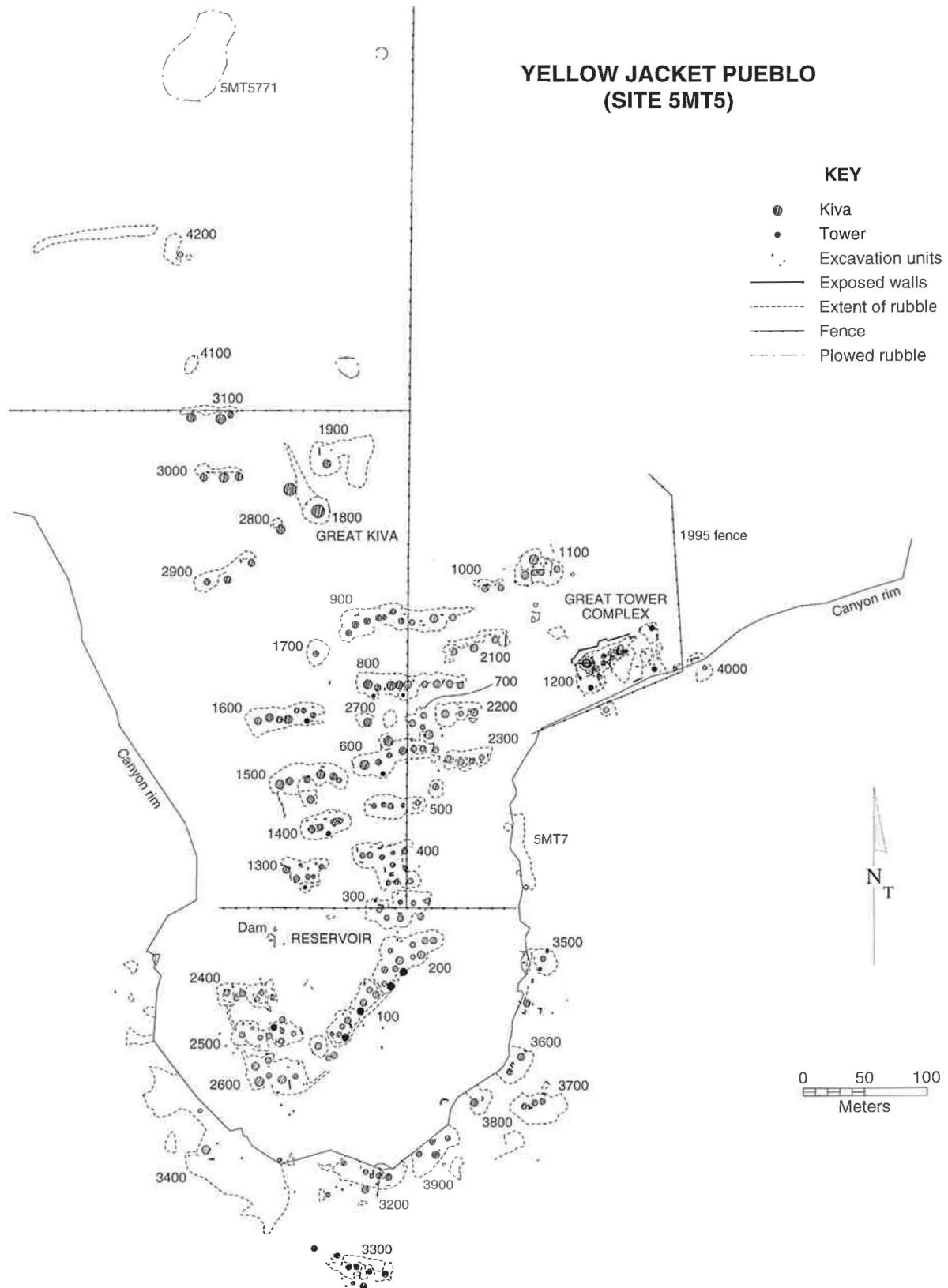


Figure 9-9. Plan map of Yellow Jacket Pueblo (5MT5) (after Kuckelman 1997:Figure 3). (Reprinted with permission of Crow Canyon Archaeological Center.)

room blocks at Yellow Jacket appear to have been established in the early to middle A.D. 1200s, judging by the pottery complex associated with them. Whether the great house and great kiva continued to be utilized in the 1200s is unknown.

Yellow Jacket Pueblo appears to have been occupied until the late A.D. 1200s, with construction continuing in the late Pueblo III period. The “Great Tower” complex on the eastern edge of the site apparently dates to the late A.D. 1200s and was probably built after the development of most of the linear room blocks that comprise the central part of the site (see Figure 9-9; Figure 9-10). The multistoried great tower consists of a concentric ring of small rooms surrounding an interior courtyard where a kiva is located. In addition, the complex includes a number of other standard kivas but few surface rooms. At the southern end of the site are residential room blocks and habitation units that also appear to represent new construction in the late A.D. 1200s. Whether the residential population was concentrated in these newer units in the late A.D. 1200s, or whether the linear room blocks in the central portion of the site also continued to be occupied is not yet clear.

Small habitation sites consisting of a single Prudden unit (kiva and associated rooms) or a small cluster or room block of multiple Prudden units are present throughout the Pueblo III period. There is a tendency for multiple-unit sites to become more common through time as aggregation proceeds. Even after the formation of large villages, however, some families continued to live in smaller habitations dispersed around the community center. The Green Lizard site (Huber and Lipe 1992; Figure 9-11) is located approximately 1 km (0.6 mi) down Sand Canyon from Sand Canyon Pueblo; both are in the Monument-McElmo drainage unit. Several lines of evidence indicate that the Green Lizard site was established in the early A.D. 1200s, and that its occupation continued some years past A.D. 1240 or 1250, thus overlapping with the earlier part of the occupation of Sand Canyon Pueblo.

REGIONAL SITE DISTRIBUTION AND POPULATION

Table 9-3 shows that the distribution of sites among the drainage units in the Pueblo III period is strongly skewed toward the western drainage units, continuing the trends visible in the Pueblo II period. Nearly 97 percent of the recorded Pueblo III sites are in three drainage units: Mesa Verde-Mancos, Monument-McElmo, and Ute. A comparison of the community center maps shows that during the Pueblo III period, the eastern or upper McElmo portion of the Monument-McElmo drainage unit lost several centers, perhaps as part of the westward movement of population in the Montezuma Valley (see Figures 9-1 and 9-5). The Johnson Canyon cliff dwelling complex south of Mesa Verde also appears to have declined by the middle A.D. 1200s, with few cutting dates after A.D. 1230, and none later than the A.D. 1240s. This pattern suggests that there was a widening “settlement gap” between the large Pueblo III Mesa Verde population in the Totah region of New Mexico and the contemporaneous and largely upland-oriented Mesa Verde populations of southwestern Colorado.

Sites occupied in Pueblo III times in the Totah region include not only the Aztec and Salmon ruins, but a number of other settlements in the San Juan River valley and the lower Animas and the La Plata river valleys. Hannaford (1993) has assembled available survey data from the La Plata valley in New Mexico; they show a substantial decline in site numbers from late Pueblo II (which he defines as A.D. 1025 to 1125) to early Pueblo III (defined as A.D. 1125 to 1180). Site numbers rise again in late Pueblo III (A.D. 1180-1300), although they fall somewhat short of the peak numbers reached in late Pueblo II. As noted previously, both Aztec West and

**YELLOW JACKET PUEBLO (SITE 5MT5)
GREAT TOWER COMPLEX
BLOCK 1200**

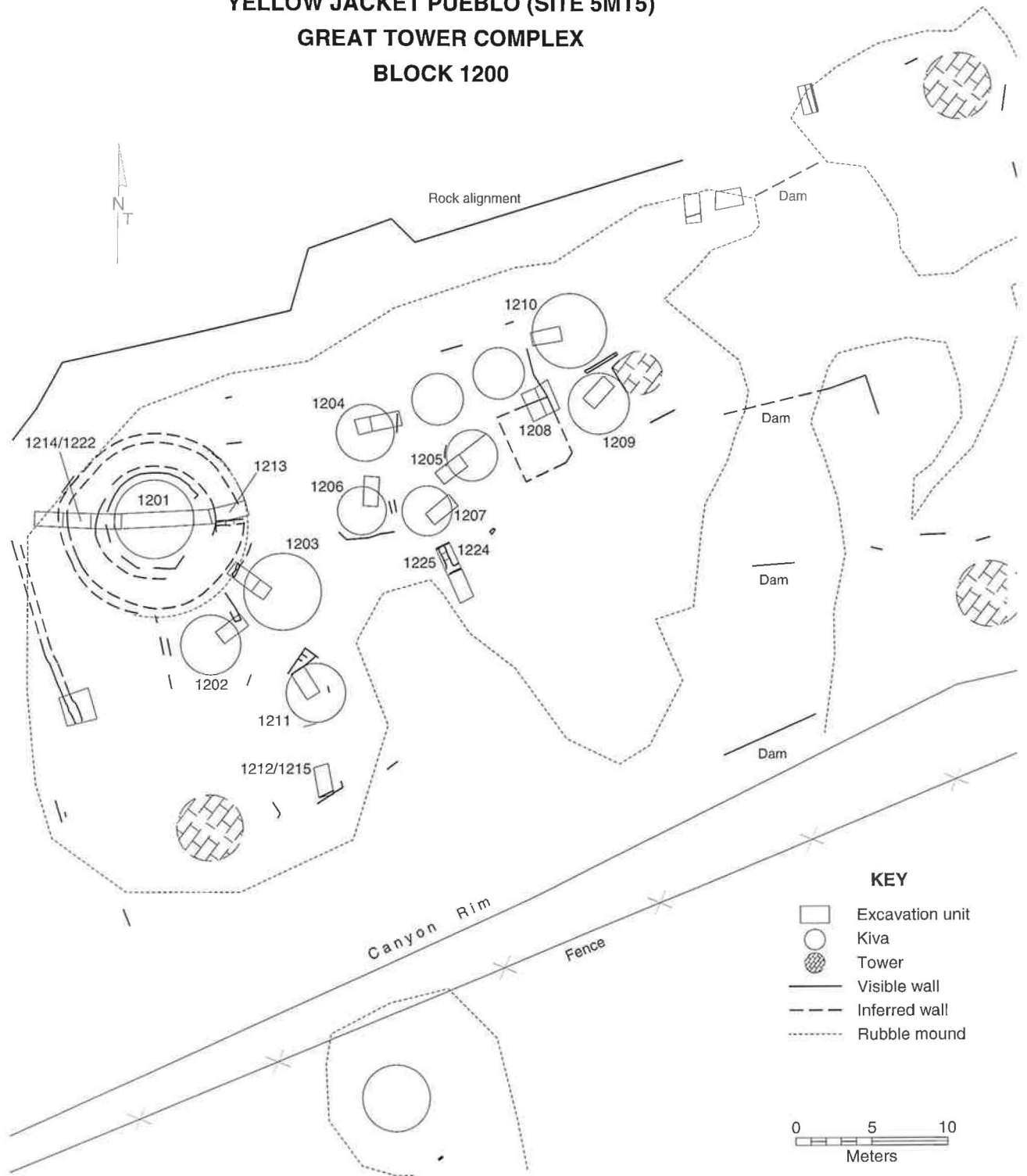


Figure 9-10. Plan map of identified structures at the Great Tower complex, Yellow Jacket Pueblo (5MT5) (after Kuckelman 1997:Figure 5). (Reprinted with permission of Crow Canyon Archaeological Center.)

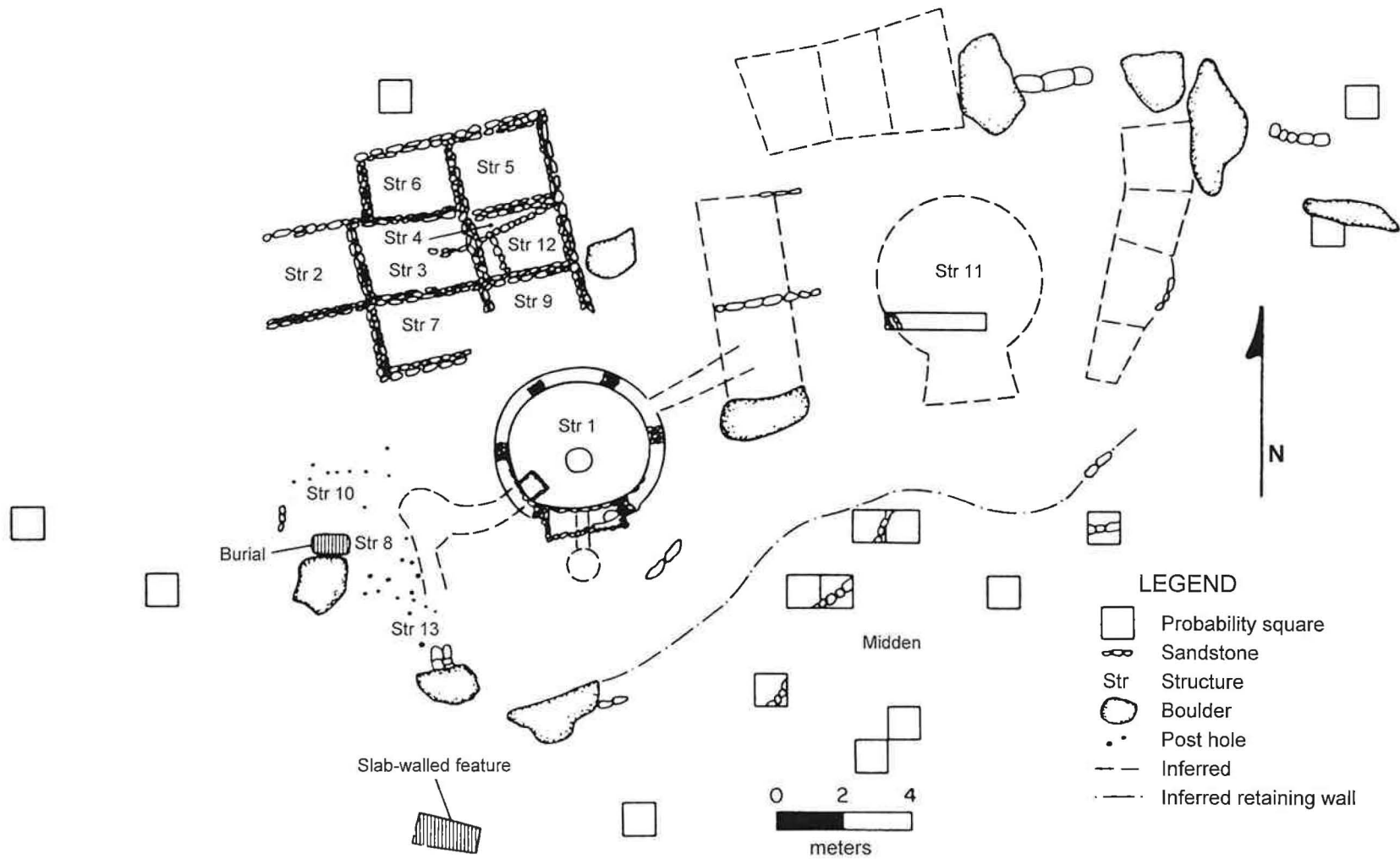


Figure 9-11. Plan map of the Green Lizard site (5MT3901) (after Huber and Lipe 1992:Figure 6.1). (Reprinted with permission of Crow Canyon Archaeological Center.)

Salmon ruins appear to have been abandoned or to have had much-reduced populations in the middle A.D. 1100s. Hannaford (1993) also notes that survey data indicate a sharp fall-off in numbers of Pueblo III sites in the La Plata valley just north of the Colorado-New Mexico border. The community focused on Morris' Site 41 appears to be the northernmost late Pueblo III concentration of population in the La Plata valley.

Table 9-3. Distribution of Pueblo III Period Sites in the Study Area by Drainage Unit.

	USJ- Piedra	Animas	La Plata	Mesa Verde- Mancos	Ute	Monument- McElmo	Dolores
Pueblo III Habitation	6	1	1	1,028	211	1,047	53
Pueblo III Nonhabitations	11	9	5	69	81	350	11
Pueblo III Site Totals	17	10	6	1,097	292	1,397	64
% of Sites in Drainage Unit	1.4	1.8	1.7	28.0	26.9	29.2	4.2

Regional population estimates are difficult to develop because of lack of block surveys with sufficiently well dated components, but Wilshusen (1996) has made a recent systematic effort to pull together data on prehistoric populations in southwestern Colorado. His estimates apply to an area that closely approximates the Mesa Verde-Mancos, Ute, and Monument-McElmo drainage units of the present study. Wilshusen relies on survey data and population estimates for Wetherill Mesa, the Sand Canyon locality, and Mockingbird Mesa, and extrapolates population densities for those areas to the other agriculturally suitable portions of the area. Most of the Pueblo III sites in the Lower Colorado River Basin study area fall within the area to which Wilshusen's estimates apply. For the Pueblo III period, he uses both a "conservative" estimate of 20 years for the use life of a residential structure, and 40 years as a "liberal" estimate, arriving at estimates of total population (Table 9-4) for the Mesa Verde-Mancos, Ute, and Monument-McElmo drainage units combined. The more liberal assumptions regarding structural use life receive support from Varien's (1997, 1999b, ed. 1999) recent study of the use lives of large and small Pueblo III habitations in the Sand Canyon locality. Wilshusen's totals represent average momentary population sizes for each period, that is, the average number of people in the area at any given point in time during the period in question. Wilshusen (1996) also provides estimates of average numbers of people occupying village centers, defined as community centers having 50 or more structures.

Wilshusen's population estimates for southwestern Colorado are generally comparable to those of Rohn (1989), who suggests that in the A.D. 1200s, there may have been as many as 30,000 people in the central northern San Juan region, including the heavily settled portions of both southwestern Colorado and southeastern Utah. The large populations that Wilshusen

Table 9-4. Average Momentary Population Estimates for Southwestern Colorado, A.D. 1160-1320 (from Wilshusen 1996).

	A.D. 1160-1200	A.D. 1200-1240	A.D. 1240-1280	A.D. 1280-1320
“Conservative” estimate	13,884	13,788	13,788	6,918
“Liberal” estimate	27,767	27,633	27,633	13,837
Village centers	840	3,265	6,611	-

estimates for the period A.D. 1280-1320 are undoubtedly inflated due to the assumptions about site use life; that is, sites established in the period A.D. 1240-1280 are assumed to have been occupied until their 20- or 40-year use lives were up. Lipe (1995) argues that the whole northern San Juan region was depopulated fairly rapidly in the A.D. 1280s.

Lipe (1994b, 1995) has made some inferences about regional population size on the basis of data on large sites (>50 structures) from southwestern Colorado and southeastern Utah that had been assembled by Varien and associates at the Crow Canyon Archaeological Center (also see Varien 1997; 1999b). Lipe (1994b) plotted 57 large sites for the period A.D. 1200-1250 and 65 for the period A.D. 1250-1300. A few large sites have been added to the Crow Canyon database since Lipe’s study, but not enough to affect his results in any significant way. Because these large sites are highly visible and difficult to destroy completely, the sample may represent a fairly high proportion of the large sites that ever existed in the area. Although the number of these presumed community centers increased slightly from the early to the late 1200s, the size of these aggregates stayed the same (an average of slightly more than 120 structures).

On the basis of these data, Lipe (1994b, 1995) argued that population in the central Mesa Verde culture area probably peaked in the early 1200s, then began a decline that accelerated rapidly after about A.D. 1270. Hence, migration out of the area may have characterized the middle A.D. 1200s as well as the late 1200s. This line of reasoning is based on the observation that the pre-and post-1250 community centers were the same size, but the later ones were more aggregated, and hence contained a larger proportion of the population of their respective communities.

Lipe (1994b) calculates that the post-1250 village sites contained approximately 8,000 structures. If all of these sites were occupied throughout the post-1250 period (a not-unreasonable assumption, since most appear to have been abandoned by A.D. 1280 or shortly thereafter), the northern San Juan population may not have exceeded 10,000 in the late 1200s. This line of reasoning suggests that Wilshusen’s population estimates—which are for southwestern Colorado only—may be somewhat high for the period A.D. 1240-1280.

Mahoney et al. (1999) have recently assembled data from several well-surveyed localities on what proportion of the population lived in small, medium, and large sites in the late Pueblo III period in the central part of the Mesa Verde culture area (data are drawn from the Mancos-Mesa Verde and Monument-McElmo drainage units, and one locality in southeastern Utah). Their large

sites are equivalent in size to those that Lipe (1994b) discussed, as described above. Although Lipe did not estimate the percentage of population living in large aggregates in Late Pueblo III times, he did infer that in most communities, it was a substantial majority. The data assembled by Mahoney et al. (1999) indicate, however, that large sites account for only about 40 to 60 percent of the inferred late Pueblo III population in the five localities they studied. This does not imply that the population outside the larger aggregates was as large as Wilshusen's estimates suggest (Table 9-4), but it does suggest that Lipe (1994b) overestimated the degree of population aggregation in late Pueblo III.

Duff and Wilshusen (1999) consider the problem of making momentary population estimates for the study area between A.D. 950 and 1300 and point out the sensitivity of such estimates to assumptions about 1) starting population size, 2) growth rates, and 3) use life of the habitation sites. They note that the state site file data base for the Lower Colorado River Basin study area as a whole indicates an average momentary population for the entire Pueblo III period of about 25,000 people, which is in line with Wilshusen's "liberal" estimates (Table 9-4). The community center database for the study area plus the Totah area indicates a lower level of population, one that reached about 8,000 by A.D. 1250. They then consider what starting population sizes and growth rates are plausible for the area, given what is known of its settlement history. They conclude that it is unlikely that population size reached the numbers inferred from the site file data base and represented by the "liberal" estimates of Table 9-4. In part, this is because they assume that migration out of the area began in the early A.D. 1200s; this is based on consideration of several lines of evidence (Duff and Wilshusen 1999).

SUBSISTENCE INTENSIFICATION AND RESOURCE DEPLETION

Direct evidence from coprolite analysis (Stiger 1979) and from stable carbon isotopes (Decker and Tieszen 1989) indicates that maize continued to be by far the most important source of food energy for the population of the study area during the Pueblo III period. Analyses of botanical remains from hearths and other contexts indicates that seeds and other plant parts from a number of weedy annuals are also consistently present (e.g., Adams 1999; Adams and Bowyer 1999). These ruderal (ruin-related) plants would have flourished in the disturbed environments created by clearing land for fields, and by the other impacts of humans on the landscape in the vicinity of sites. In addition, there frequently is evidence of use of pinyon nuts and the seeds of grasses and other plants not promoted by human disturbance of the landscape. Animal remains are consistently dominated by deer, cottontail, jack rabbit, and turkeys, suggesting that long-distance hunting for game such as elk was not widely practiced and that animals capable of tolerating high rates of harvesting were the ones predominantly taken.

Because populations grew rapidly in the Pueblo III period, and became increasingly aggregated, conditions were ripe both for agricultural intensification and for resource depletion, including depletion of soil fertility, firewood, and wild plants and animals. Check dams and agricultural terraces are indicators of agricultural intensification. These increased in some areas, continuing practices established in the Pueblo II period. Although the garden or farm plots created behind check dams or terraces may have been important locally in buffering risk or increasing production or both, it seems likely that in most places, most agricultural crops continued to be produced with relatively low intensity dry-farming or runoff-farming techniques. The Pueblo III period also saw increased manipulation and control of domestic water supplies. As noted in Chapter 8, reservoir building was underway by the early or middle Pueblo II period on the Mesa Verde proper. In late Pueblo III times, many sites—including most of the largest ones—were

situated to enclose or overlook the principal springs or seeps that served the community. These were often the same water sources that had served more dispersed settlements in the Pueblo II and early Pueblo III periods. These practices came into increased use in the Pueblo III period, and may indicate that domestic water supplies were in short supply in some locations relative to population size. The frequency of large, isolated pottery-firing kilns increased in Pueblo III (Figure 9-12), perhaps in response to the depletion of firewood in the vicinity of large habitation sites. Below, these topics are reviewed in somewhat more detail.

As noted, the Pueblos of the northern San Juan area were primarily upland dry-farmers. The most productive arable soils in the region were formed on the Mesa Verde loess (Arrhenius and Bonatti 1965), which forms a blanket of silt loam that extends from the Mesa Verde in Colorado as far west as Cedar Mesa in southeastern Utah. These soils are farmed commercially today, and although their yields decline somewhat with repeated cropping (Connolly 1992), they are not very susceptible to fertility depletion, especially at the low yield levels that must have characterized prehistoric maize agriculture in the area (Decker and Petersen 1987). In addition to the loess soils, alluvium and colluvium in valleys and canyons were locally important (Force and Howell 1997). In general, there appears to have been an abundance of arable soil relative to estimated population levels, if one considers the region as a whole (Van West 1994a; Van West and Lipe 1992). The principal limits on agricultural success were the timely availability of precipitation and the length of growing seasons at the higher elevations and in valleys susceptible to cold air drainage (Petersen 1988).

Despite the relative abundance of arable land, agriculture appears to have been locally intensified in the Pueblo II and Pueblo III periods. Rohn (1963, 1977) documents extensive check dam and terrace systems on Chapin Mesa at Mesa Verde National Park, and these have been observed in many other parts of the northern San Juan as well. Rohn (1963) provides only general date estimates for the systems he observed—the Pueblo II and III periods (A.D. 900-1300). Winter (1978) documents a number of check dam and terrace systems, as well as reservoirs, associated with Pueblo III settlements on Cajon Mesa in and around Hovenweep National Monument. Greubel (1991), in a survey of public lands surrounding several of the Hovenweep units, documented 20 sites having check dams, terraces, or reservoirs. Dating assignments ranged from late Pueblo II (5 sites) through Pueblo III (6 sites); 5 other sites were assigned to Pueblo II and III, and 4 to Pueblo II or III. In general, the impression is that in the study area as a whole, water control features are most likely to be associated with the larger population densities of the Pueblo III period. It is likely that population density was higher on the Mesa Verde proper in Pueblo II, and that check dam systems became common somewhat earlier there than in other parts of the study area.

Depletion of wild plants and animals is a definite possibility in densely settled localities, and especially in the vicinity of large settlements. Hence, it would not be surprising to find evidence of resource depletion in the Pueblo III period. Furthermore, Kohler and Matthews (1988) found evidence that in the Dolores drainage unit, fuel and construction wood was locally depleted around late Pueblo I villages as their populations increased. Kohler and Van West (1996) expect the larger and more stable communities of the Pueblo III period to have depleted some local resources due to land clearance, hunting and harvesting of wild foods, and collection of materials for construction and other manufactures.

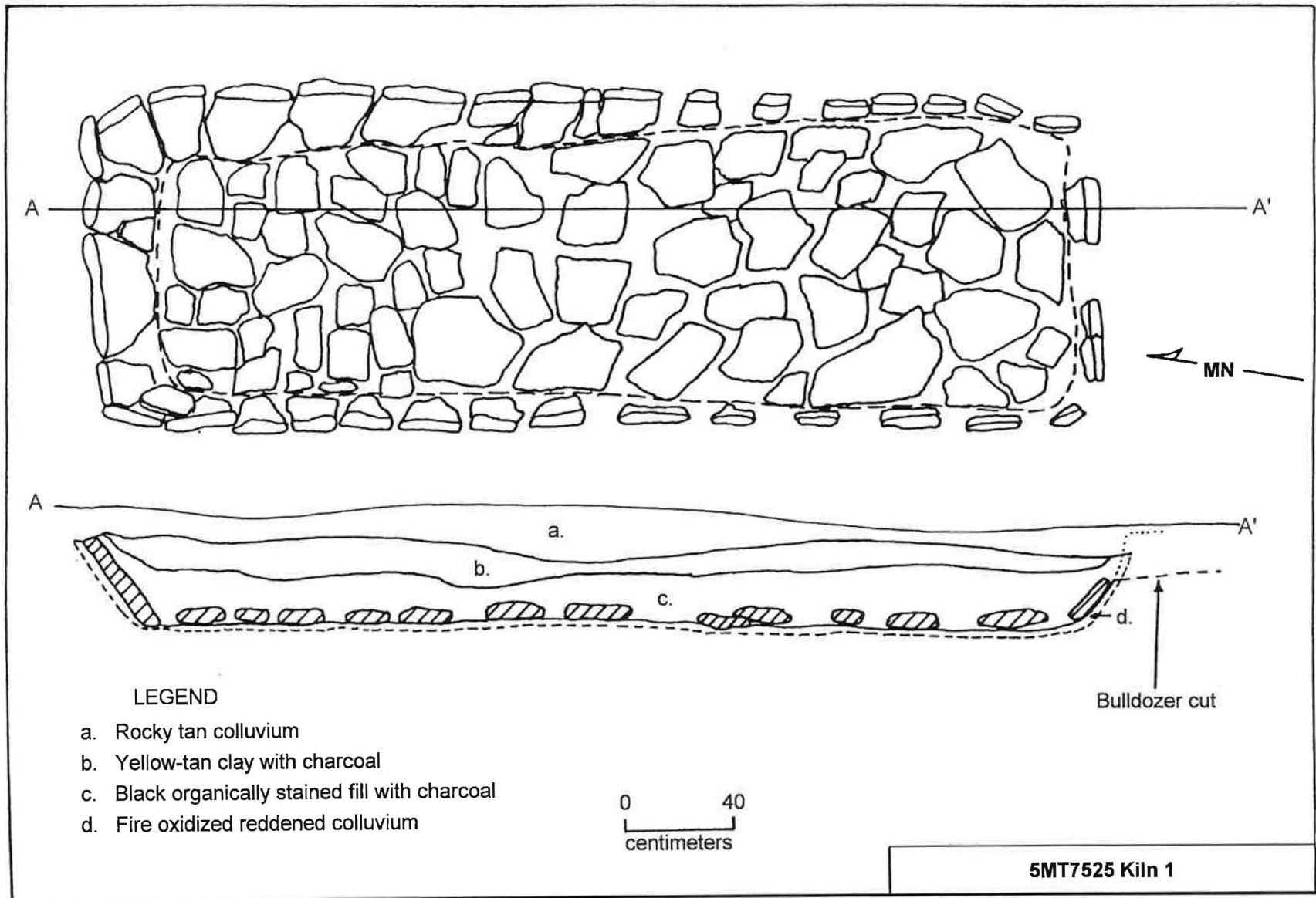


Figure 9-12. Plan and cross section of Kiln 1 at site 5MT7525 (after Fuller 1984:Figure 12).

Analyses of macrofloral remains from excavations in twelfth and thirteenth century sites in the densely settled Sand Canyon locality of the Monument-McElmo drainage unit show only modest evidence of environmental disturbance and resource depletion, however (Adams and Bowyer 1999; K. Adams 1999). Adams and Bowyer (1999) compare botanical remains from Pueblo III small sites that pre-date A.D. 1240 with botanical remains from sites that are later. The later contexts include Sand Canyon Pueblo (a large village); small late sites located on talus slopes near Sand Canyon Pueblo; and small to medium-sized late sites in lower Sand Canyon. With regard to effects of human occupation on the surrounding pinyon-juniper woodland, they note that an analysis of charcoal from wood used as fuel indicates that "There was likely still a portion of the pinyon/juniper woodland available during the final century of occupation of the Sand Canyon Locality. Shrubs that play an early successional role in recently disturbed agricultural fields include big sagebrush and rabbitbrush. These shrubs occur at low levels in early and late sites suggesting some level of landscape disturbance. However, we detected no notable increase in these shrubs at later occupied sites" (Adams and Bowyer 1999). In the lower La Plata River valley just south of the Colorado line, macrobotanical analyses suggest there was some wood resource depletion through time, but that on the whole, there was considerable stability in wild plant use over a period of several hundred years (Toll 1993).

Adams and Bowyer (1999; also see K. Adams 1999) did find evidence of some shifts in food plant usage that may be related to buffering food scarcity and resource depletion. For example, comparison of pre-A.D. 1240 and post-A.D. 1240 contexts indicate that the diversity of weedy species increased through time and that there was a higher ratio of weedy to non-weedy plants. The latter are primarily perennials that require some environmental stability. This suggests that anthropogenic disturbance of the environment increased between the early and late A.D. 1200s. The use of lower-ranked foods, such as prickly pear seeds and purslane, increased slightly in the later contexts, suggesting some increased food stress. Adams and Bowyer (1999) note, however, that maize cobs continued to be used as fuel even in the last fires at sites abandoned in the late A.D. 1200s. Because maize cobs are often eaten during famines, this evidence indicates that the population was not experiencing starvation. Overall, the archaeobotanical evidence from Pueblo III contexts in the Sand Canyon locality indicates only small amounts of environmental disturbance, resource depletion, and food stress.

Faunal analyses from several projects in the central Mesa Verde region (e.g., Neusius 1986; Shelley 1993; Driver 1993, 1996; Driver et al. 1999) show that small mammal bones (primarily cottontail and/or jack rabbit) are usually more numerous than artiodactyl bones, and generally increase in relative frequency through time. Domestic turkey bones show a striking increase in relative frequency from the A.D. 600s through the 1200s (Munro 1994). In some site assemblages from the Sand Canyon area that date to the A.D. 1200s, turkey bones outnumber those of small mammals, and artiodactyls are virtually absent (Driver 1993). The trend toward the increasing importance through time of small game and turkey is probably a response to depletion of larger game in the vicinity of communities, and it was probably amplified by the settlement aggregation that took place in the late A.D. 1100s and 1200s. However, communities in the central Mesa Verde region were often only a few kilometers from upland areas that were not occupied, and that today attract large seasonal populations of hunters, many of whom are successful in bagging deer or elk. The general scarcity of elk and bear in prehistoric northern San Juan assemblages of various ages suggests, however, that the Mesa Verde people either did little long-distance big game hunting, or that they had depleted the accessible populations of these animals at an early date. Overall, the faunal record indicates a long term trend to greater reliance on small

game and turkeys, most likely in response to the continuing depletion of larger game. These trends show some acceleration in the Pueblo III period.

SOCIOPOLITICAL ORGANIZATION

Evidence of Supracommunity Integration

Cross-cultural surveys suggest that polities that integrate 2,500 or more people almost always have well-developed, formal, political hierarchies based on ascribed status (Kosse 1990, 1996). Hierarchies may be present at lower population sizes as well, but appear to be increasingly weak and more egalitarian as numbers decrease. Politically independent communities of about 500 or fewer individuals generally are egalitarian, without ascribed leadership, though they may have a headman, and “some competition for prestige is present. The headman is mostly responsible for ceremonial and economic tasks” (Kosse 1990:280; citing Johnson and Earle 1987:158). Such politically independent communities can also form regional alliances that incorporate as many as about 2,500 people (Kosse 1990:280-281) without having formal political hierarchies (i.e., without forming a regional polity in Johnson and Earle’s [1987] terms). Is there evidence that single communities or groups of politically integrated communities in the study area reached the 2,500-person threshold that Kosse describes?

To address this question, Lipe (1994b) analyzed data assembled by Varien for 81 settlements in the central Mesa Verde culture area in southwestern Colorado and southeastern Utah (this data set includes many of the large sites referenced in Figures 9-1 and 9-5 and Tables 9-1 and 9-2 in the current study). As noted earlier, the sites were assigned to two groups—those occupied between A.D. 1200 and 1250 (57 sites) and those occupied between 1250 and 1300 (65 sites). Obviously, a number of sites were occupied in both periods, although in some cases, it was possible to assign different numbers of structures to the two periods.

If the entire central part of the northern San Juan were a single, integrated polity, it would certainly be well above Kosse’s threshold, but what is the likelihood that the settlements in this area belong to a single polity? Rank-size analysis is applicable here (Figures 9-13 and 9-14). The rank-size rule suggests that a logarithmic plot of both settlement size and rank will be log-normal, i.e., will follow the diagonal, if the settlement system is well integrated, with a developed hierarchy of political or economic functions assigned to settlements of different size. Presence of a concave-upward distribution suggests dominance by a single “primate” settlement; a convex-upward distribution suggests a poorly integrated system, with settlement size responding to a number of factors, or perhaps to the presence of several competitive systems (Johnson 1977, 1980; Schelberg 1984; Tidswell 1978).

Clearly, the Mesa Verde distributions for both periods show the latter pattern, suggesting that there is not a single polity for the whole region. The rank-size pattern for the late A.D. 1200s is slightly more convex-upward than for the early 1200s, suggesting that political integration did not increase through time. This does not resolve the question of whether individual communities or groups of politically integrated communities exceeded the 2,500-person level.

In the early 1200s, the largest settlement (Yellow Jacket Pueblo) probably exceeded 500 residents (depending on what assumptions one makes about number of persons per kiva) and its dispersed community may have included an additional few hundred individuals. It is possible that this community was large enough to have supported some type of sociopolitical hierarchy with

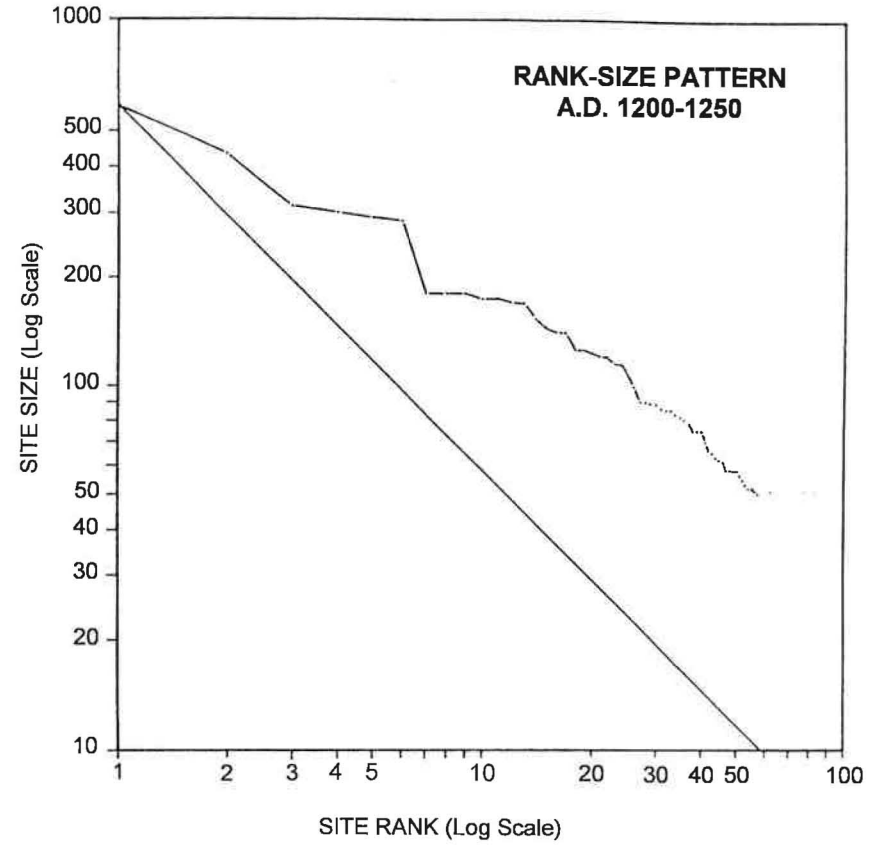
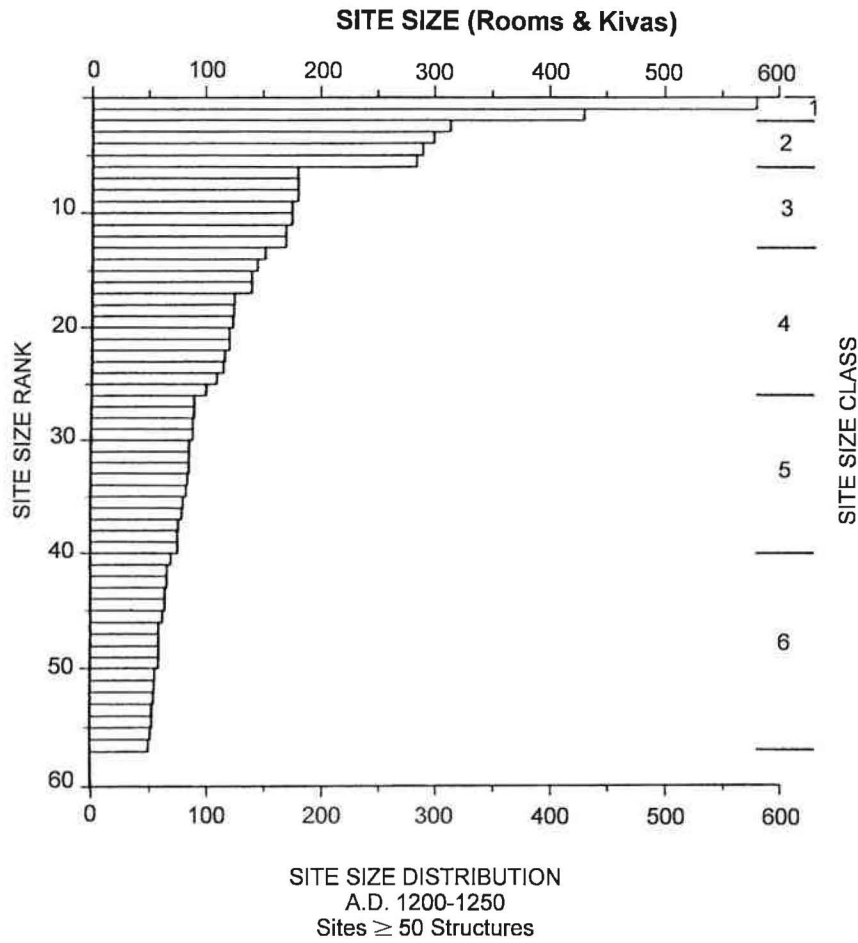


Figure 9-13. Site-size distribution and rank-size profile, central Mesa Verde region (portions of southwestern Colorado and southeastern Utah), A.D. 1200-1250 (after Lipe 1994b:Figures 7 and 8).

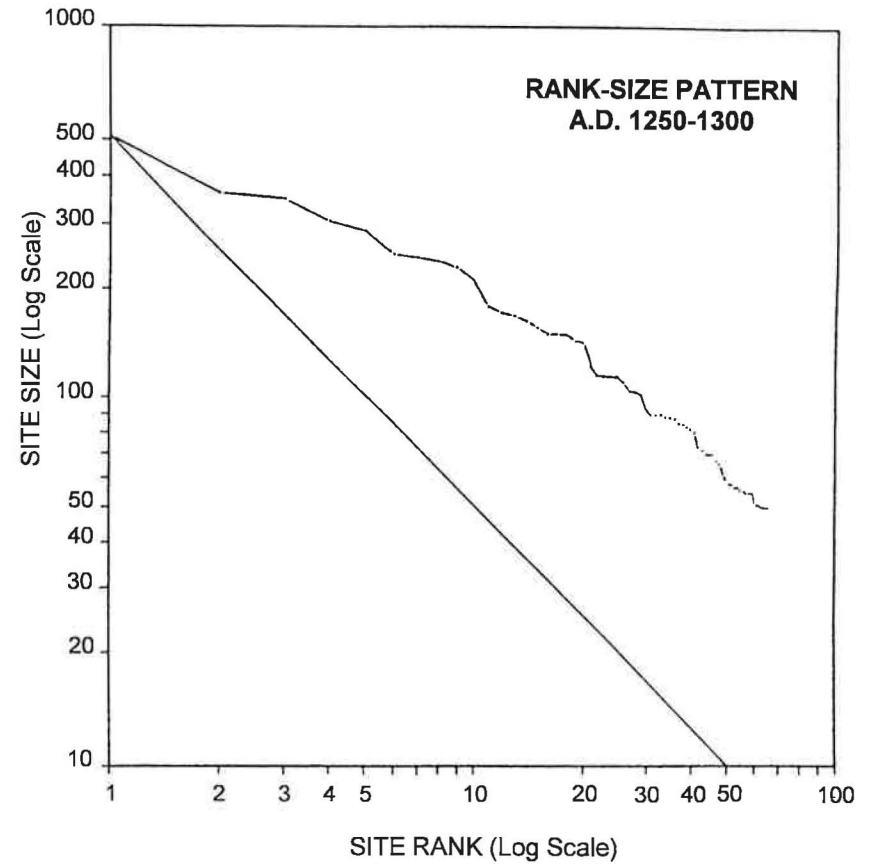
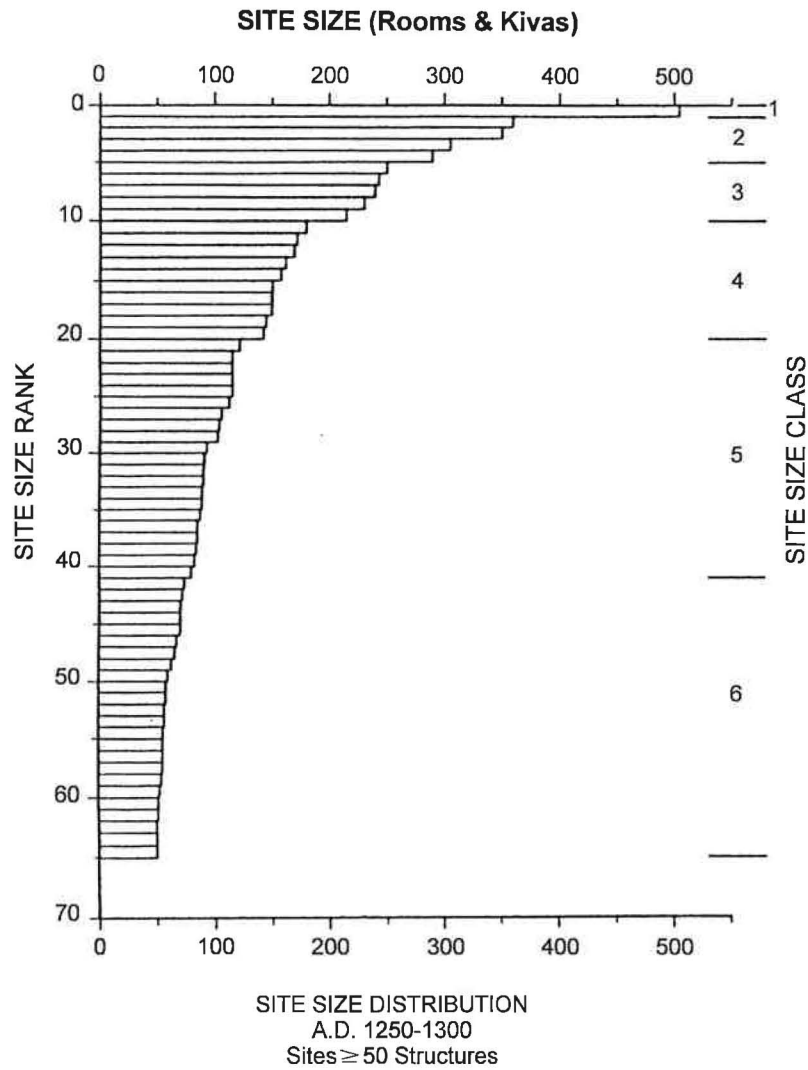


Figure 9-14. Site-size distribution and rank-size profile, central Mesa Verde region (portions of southwestern Colorado and southeastern Utah), A.D. 1250-1300 (after Lipe 1994b:Figures 11 and 12).

centralized political power, but the numbers do not appear to require this. The other central settlements for this period were considerably smaller than Yellow Jacket Pueblo and probably represent smaller communities as well. Individually, these first-order or face-to-face communities seem unlikely to have been complex polities having substantial internal differentials in social power.

In the late A.D. 1200s, the largest central site (Sand Canyon Pueblo) probably had a population of approximately 500 people; because of the high level of residential aggregation, the community it represents was not much larger. Hence, the first-order or face-to-face Sand Canyon Pueblo community was probably not as large as the Yellow Jacket community of the previous period. As has been previously noted, the community centers of the late A.D. 1200s average about the same size as those of the early 1200s, but because of settlement aggregation, they probably represent smaller communities. Hence, the argument that individual communities were large enough to have compelled the development of formal hierarchies receives no support.

Several clusters of closely spaced communities are apparent in both periods. Varien's (1997, 1999b) spatial analysis also shows that in the 1200s, a number of communities would have had overlapping catchments, if circles of uniform radius were drawn around their centers. It seems unlikely that communities in such proximity would have been fully independent socially and politically, although they almost certainly were independent in their subsistence economics. A formal rank-size analysis of these clusters has not been performed. However, inspection suggests that the distributions would be convex, suggesting a low level of integration within each cluster. On the other hand, if these clusters of communities represent individual polities, some of them might exceed 1,000 individuals, though perhaps not 2,500. More analysis needs to be directed toward these site clusters.

Does the distribution and character of public architecture reveal anything about whether there was a level of sociopolitical organization above that of the first-order community in the A.D. 1200s? The data are extremely weak, but it is the impression here that there are some changes from the early to late A.D. 1200s in the direction of less supracommunity integration. In the early 1200s, features that could have served as important symbols of political identity, as well as loci for major integrative activities, appear primarily at the largest sites. These features include earlier Chacoan-style great houses that have been incorporated into the community center, great kivas (some of which may also have been built earlier), a few large tri-wall or bi-wall structures, and several informally bounded plazas. The restriction of such features to the largest centers suggests that these sites were in control of the major symbols and loci of religious and political integration. If the smaller centers and the numerous dispersed habitations were in some way politically dependent on the large centers, there may have been several polities having more than 1,500 or 2,000 people.

In the post-1250 sites, the forms and distribution of public nondomestic architecture show more variety. Of these features, those most likely to have functioned as symbols or loci important in community or intercommunity integration are great kivas, tower complexes, D-shaped structures and other bi-walls, and plazas. The few great kivas that are present occur at the largest sites, but the other elements occur widely at the smaller as well as the larger sites. This suggests that decisions to construct such features could be made at the level of the individual first-order community, even if it was a small one, and did not depend on approval by a political or religious hierarchy based in the largest settlements. It is also the authors' impression that the public architecture of the late A.D. 1200s displays a great deal of variability in how particular types of

structures are designed and built, and how they are integrated into the layout of the site. These observations may indicate that most of the first-order communities were relatively independent politically. More work is necessary to determine if certain types or complexes of public architecture are associated with only a few large centers; such an association might indicate some level of supracommunity integration.

Because warfare appears to have been endemic during the late A.D. 1200s (Lightfoot and Kuckelman 1994; Lipe 1995), there must have been pressures for communities to form alliances (though not necessarily fully integrated polities). As LeBlanc (1999) has recently pointed out, once alliances began to form for the purposes of warfare and mutual defense, it would have been very difficult for small communities to “go it alone.” If they did not lead to the development of permanent hierarchies, however, such alliances might not have much archaeological expression.

Overall, the regional pattern suggests the likelihood that the first-order, face-to-face communities became both smaller and somewhat more socially and politically independent of one another during the late A.D. 1200s. This is consistent with Neily’s (1983) analysis of intercommunity variability in ceramics and lithic raw materials on Cow Mesa and Squaw Point, which indicated that differences between settlements increased in the late A.D. 1200s. He interpreted this as evidence for a decrease in intersettlement integration.

Community-level Status and Hierarchy

Over the past 15 years, the Crow Canyon Archaeological Center has conducted a number of field projects focused on the Pueblo III period in the Sand Canyon locality, including surveys (Adler 1990; Gleichman and Gleichman 1992); testing of 12 small sites (Varien, ed. 1999), and intensive excavations at three sites: Sand Canyon Pueblo, a settlement of more than 500 structures that dates primarily to the post-1250 period (Bradley 1992, 1993a); Castle Rock Pueblo, a contemporaneous site of about 75 structures located 5 km (3 mi) to the southwest where Sand Creek joins the McElmo (Lightfoot and Kuckelman 1993); and a small site, Green Lizard, that appears to date to the early and middle 1200s (Huber and Lipe 1992), and is located in Sand Canyon between Sand Canyon and Castle Rock pueblos. The results of this work were used by Lipe (1994b) to examine the question of whether there was significant sociopolitical hierarchy at the community level in the Sand Canyon locality. Lipe’s results are summarized below.

Evidence from Public Architecture

Much of the architecture at Sand Canyon Pueblo can be analyzed as clusters or blocks of habitation units, each consisting of a kiva and associated surface rooms which probably comprised the residence of a household. There also is a substantial amount of nondomestic, or public, architecture. Most significant is a central complex that consists of a plaza, great kiva, large D-shaped building, and a complex of small uniform-sized rooms (referred to as the 300 Block). Both the great kiva and the D-shaped building are partially or completely surrounded by enclosed rooms, which comprise two stories in some parts of these structures. These lack floor features, and ground-story floors are often sloping bedrock; they appear to have been storage rooms. The 300 Block also appears to have been a storage complex, at least initially (Bradley 1992). The combined storage capacity of these three structures is impressive—a total of more than 40 rooms—and probably equals the storage capacity of 5 to 10 habitation units. If food were stored in these three complexes, it would seem to indicate that a social surplus was being generated and managed. The spatial association between these storage facilities, the plaza, the great kiva, and the D-shaped

building suggests that management of central food stores (if food was in fact stored) was given ceremonial sanction. Control of these central stores would have been a significant source of social power, even if contributions were expected only in good crop years. Distribution, e.g., at large ceremonial events or when individual households had crop failures, must have been controlled by a relatively few individuals or a small group.

Evidence of Household Inequality

Huber (1993) attempted to compare the several excavated habitation units or kiva suites (each consisting of a kiva plus associated rooms) at Sand Canyon Pueblo with the single habitation unit he had excavated at the small Green Lizard site. Both sites are in the Sand Canyon locality in the Monument-McElmo drainage unit. On the basis of cross-cultural evidence, he reasoned that the households of influential leaders were likely to be larger than average, to represent more formality and labor investment in their architecture, and to display larger ceramic serving vessels. The latter expectation depends both on the presence of a larger household and on more frequent hosting of visitors. His results were mixed. Three habitation units had large, total roofed areas, but two of these were low with respect to labor investment and bowl size.

One kiva suite complex in the 100 Block of Sand Canyon Pueblo was high on all three measures, however. This is an unusual architectural complex, consisting of two kivas, one structure that has been modified to resemble a kiva, and only a few additional rooms. It has little storage capacity relative to the other excavated units at this or other sites. Bradley (1992) suggests that it may not have been primarily residential at all and implies that it might have been a complex used by a larger group, perhaps a religious sodality. Driver (1993) also notes that units at Sand Canyon Pueblo that have a high ratio of kivas to rooms have a higher percentage of deer bones in their faunal assemblages; this suggests differential access to a valued resource. If the unusual kiva suite in the 100 Block is an elite residence, the inhabitants must have been secure in their access to stored food elsewhere. Perhaps this is not inconsistent with the presence of centralized storage in the central part of the site.

One intriguing possibility raised by the excavations at Sand Canyon Pueblo is that the large D-shaped structure was actually a residence. Its interior initially had two empty courtyards; some time (but probably not immediately) after the building was constructed, two standard small, kivas were built in these courtyards (Bradley and Churchill 1994). These resembled ordinary residential or household kivas; the only thing unusual is that one had a large floor vault that had been filled in. A fairly ordinary complex of domestic artifacts was abandoned on the floors of these two kivas, and one had a mealing bin. Perhaps the households that controlled both the religious and storage aspects of the D-shaped structure moved into it to more clearly assert their control. If so, they were probably not ordinary households in terms of status and power.

Evidence of Wealth Items

Lipe (1994b) tabulated data from the Sand Canon locality excavations on exotic materials, specifically jet, turquoise, shell, obsidian, and ornaments. The collections included 40 items of exotic material (including 3 pieces of turquoise) and 242 ornaments, mostly simple pendants or beads made of local materials. By comparison, the excavations yielded nearly 135,000 corrugated sherds. Items that could possibly have been indicators of wealth or status were extremely rare, were not elaborate, and were found at both Sand Canyon Pueblo and at the smaller sites.

If individuals or groups in the Sand Canyon locality had power and status, it was not sufficient to enable them to coax valued materials such as turquoise out of trading partners from other areas, and if differential social power existed among individuals, personal adornment was not an important way of advertising this difference. Overall, these data suggest that egalitarianism, or at least the appearance of egalitarianism, was an important value. The data also indicate that the populous Sand Canyon region had relatively little trade with the “outside world,” an inference bolstered by equally tiny frequencies of White Mountain Red Ware and Tsegi Orange Ware, pottery that was widely traded in other parts of the Southwest.

Subsistence Evidence

Driver (1993) found interesting variability in the frequencies (by count) of bones from the three major kinds of animals represented in these Sand Canyon locality excavations—lagomorphs (mainly cottontail), turkey, and artiodactyl (virtually all deer). In the late Pueblo III period, the Sand Canyon Pueblo fauna is about 50 percent lagomorph, 35 percent turkey, and 14 percent deer. Nearby, small, canyon-oriented sites that overlap with Sand Canyon Pueblo in time had strikingly different profiles—turkey was overwhelmingly predominant (70 percent), followed by lagomorph (30 percent), with deer almost nonexistent. Castle Rock Pueblo and one small late site near it had intermediate frequencies—about 60 percent lagomorph, 38 percent turkey, and small but consistent percentages of deer. These were also the frequencies that characterized the small, early Pueblo III mesa-top sites.

Driver (1993) systematically reviews multiple hypotheses and is able to eliminate several and cast doubt on others. The healthiest surviving hypotheses were the following. All of these hypotheses suggest varying degrees of differential access to deer meat among settlements and hence imply an unequal distribution of social power. As noted above, Driver also found some evidence of differences in meat access among kiva suites at Sand Canyon Pueblo.

- In the Sand Canyon community, deer meat was primarily consumed at feasts held in conjunction with ceremonies; these were confined to Sand Canyon Pueblo, and hence most deer bones were deposited at the larger site.
- Deer became depleted in the immediate vicinity of Sand Canyon Pueblo; the larger population of this site made it easier for long-distance hunts to be organized, and for some reason, inhabitants from the small nearby sites were excluded.
- The political and/or religious leadership of Sand Canyon Pueblo controlled hunting territories, hunting activities, or consumption and excluded inhabitants of the small sites peripheral to the main pueblo.

Mortuary Associations

Burials with elaborate offerings are often taken to indicate high status for the individual so honored. Excavations at the Sand Canyon locality have encountered few formal burials, and it has not been the practice of archaeologists to deliberately seek burials. Elaborate Pueblo III period burials do not appear to occur elsewhere in the study area, or at least they have not been reported.

Overall, the evidence from the Sand Canyon locality is equivocal with regard to whether there were individuals or groups who enjoyed high status and had control of economic, political, or religious sources of power. The strongest evidence of centralized control relates to the storage facilities associated with public architecture at Sand Canyon Pueblo. The scarcity of wealth and

Rim area about A.D. 1280 signaled the appearance of a widespread religious cult focused on earth and fertility symbolism. Given the chronology of abandonment proposed in this chapter and by Lipe (1995), these patterns appear a few years too late and too far south to have been major attractors of population from the northern San Juan. As Adams (1991) has argued, the spread of the katsina cult into the Rio Grande and Western Pueblo areas in the A.D. 1300s may in fact have been promoted by the need for new mechanisms of social cohesion brought on by the influx of migrants from the north. However, even if the new religious movements and organizations were not early enough to have influenced the abandonment of the northern San Juan, the existing religious practices of the middle and late A.D. 1200s in the upper Little Colorado and Rio Grande areas may still have exerted an attraction. Migrants from the northern San Juan did not impose most of their patterns of ritual architecture on the areas where they settled—rather, they adopted patterns already in place and/or they participated in the development of new forms that represented a syncretism of several influences.

Finally, it should be emphasized that movement—at scales ranging from the household to the regional population—was an established element in northern San Juan social and economic adaptations (see Varien 1999b). Large-scale, long-distance movements would have been facilitated by pre-existing social networks for obtaining information about other areas and for fostering reciprocity. The general similarities of thirteenth century pottery styles between the northern San Juan, the eastern San Juan Basin, and parts of the Rio Grande area (Roney 1995; Cordell 1995, 1997) may be the result of such networks. The late thirteenth century residents of the Mesa Verde area probably had ancestors who had come from the south at the time of the earliest agriculture in the area (Matson 1991); who had moved south of the San Juan and then back in the A.D. 900s (Wilshusen and Schlanger 1993); who had been part of the Chacoan system, which must have facilitated transfer of information, and perhaps of people, across a huge area (Lekson 1996); and who perhaps had relocated outside the area for a time in the middle A.D. 1100s. The population history of the study area, as described earlier (also see Duff and Wilshusen 1999) indicates that households may have begun to move out of the area in the early and middle 1200s, with the depopulation in the late 1200s representing an acceleration of an existing trend. Consequently, it seems likely that in the late A.D. 1200s, the Pueblo people of the northern San Juan had historical traditions about long-range movement, had friends or relatives in possible destination areas, and had a fair amount of information about conditions in these possible destinations. Relocation was undoubtedly a very difficult process, but not one that represented a journey into the unknown.

SITE TYPES

As models of community structure and settlement pattern have come to be more important in the study area, the individual site has become more problematic as a unit of analysis. In general, individual sites are likely to be considered significant primarily in relation to populations of sites in the locality or region. Even at the peak of settlement aggregation in the late A.D. 1200s, there remain some small residential outliers, as well as field stations, water control features, and other specialized kinds of sites. Hence, the community pattern always involves multiple sites. Some communities in the study area also remained relatively dispersed in the late Pueblo III period. For example, the Castle Rock community in lower Sand Canyon in the Monument-McElmo drainage unit included a number of dispersed residential cliff dwellings in addition to a central aggregate built around a *meseta* (Gleichman and Gleichman 1992; Lightfoot and Kuckelman 1993). In addition, in the far western reaches of the Mesa Verde culture area, a pattern of wide dispersal and flexible mobility at the household level appears to have been maintained throughout the Pueblo III period (Matson et al. 1988; Lipe 1970). In the Cedar Mesa

display items and the general uniformity of domestic architecture indicate a society in which egalitarianism was valued and the display of wealth was not. Some of the evidence reviewed above might be consistent with the development of religious sodalities (see Bradley 1992, 1993a). Such groups can, of course, also exercise a certain amount social power, but if a community has several of them, this would work against centralization of power.

EVIDENCE OF CONFLICT

LeBlanc (1999) has recently assembled abundant evidence that warfare exerted a powerful influence on social organization and settlement pattern at many times and places in the early Southwest (also see Wilcox and Haas [1994]; Haas and Creamer [1993, 1996]; and Turner and Turner [1999]). LeBlanc argues that a major cycle of warfare began in the northern Southwest in the A.D. 1200s and spread southward over the next several generations, eventually affecting the entire Pueblo world. Late Pueblo III settlement aggregation, widespread building of towers and defensive walls, the shift to more defensible canyon rim settings, and the creation of a settlement gap between the Animas-San Juan site cluster and the upland-oriented villages of southwestern Colorado are all consistent with the occurrence of warfare. These trends apparently continued until the depopulation of the region in the late A.D. 1200s. For example, construction at Balcony House in the A.D. 1270s resulted in further restriction of entry from outside the site (Parks and Dean 1998).

There is also evidence for large-scale loss of life at some northern San Juan sites about the time of regional abandonment. Recent excavations by the Crow Canyon Archaeological Center at the late Pueblo III Sand Canyon and Castle Rock pueblos show that human remains occur in a number of structures, most frequently in kivas (Bradley 1992; Lightfoot and Kuckelman 1994). Most of these individuals were not formally buried but appear to have been left in structures or on their roofs; the latter remains were incorporated in the fill as the roofs collapsed. A number of the remains show evidence of weathering or damage from scavengers, indicating they had not been buried. At Sand Canyon, a high proportion of the kiva roofs has been burned, and both kivas and rooms tend to have large assemblages of *de facto* refuse. These attributes are less common at the Castle Rock site. Although LeBlanc (1999) argues otherwise, the roof-burning does not necessarily indicate warfare; it can be credibly argued that the widespread burning of pit structure roofs in the central Mesa Verde region in the late A.D. 800s was often part of the "closing down" of sites by their inhabitants when they were abandoned (Lightfoot and Etzkorn 1993; Wilshusen 1986c).

Most individuals who died in the last days of Sand Canyon and Castle Rock pueblos may have succumbed to disease or starvation, and the archaeological record may be a product of conditions attending the collapse of community social organization and social control. However, several individuals at both Sand Canyon and Castle Rock apparently had suffered significant head injuries at or near their time of death (Lightfoot and Kuckelman 1994). The Castle Rock site is built on and around a small, steep-sided butte, and a petroglyph panel on the side of the butte depicts individuals facing one another with drawn bows and arrows (Lightfoot and Kuckelman 1994). Defensive features at Sand Canyon Pueblo include a low enclosing wall with towers located at intervals; such walls are fairly common at late Pueblo III sites in the northern San Juan (Kenzle 1993, 1997).

Elsewhere, the late Mesa Verde occupation at Salmon Ruin on the San Juan River near Bloomfield appears to have ended catastrophically. The site's central tower kiva was burned, and "between 45 and 55 individuals, mostly infants and adolescents with 16 possible adults, were

consumed by this fire” (Adams 1980:271). Many roofs were burned at this site at the end of occupation, sometime after A.D. 1263, the latest tree-ring date (Adams 1980).

Abandonment coincident with evidence of multiple deaths and roof-burning does not appear to have been universal in the Mesa Verde region in the late 1200s, although appropriate data are not very abundant. Other than those mentioned above, few large sites dating to the terminal period of occupation have been systematically excavated with detailed reporting of the excavated contexts; exceptions include Long House (Cattanach 1980) and Mug House (Rohn 1971) at Mesa Verde National Park. These two sites do not appear to have patterns similar to those at Sand Canyon and Castle Rock pueblos. At Long House, however, Cattanach (1980:144-146) reports that an unburied human body with likely carnivore disturbance was found on the floor of a burned kiva, and that several other sets of prehistorically disturbed human remains were also found in kivas and rooms; their contexts are not described in detail. Early workers at Mesa Verde, such as Nordenskiöld (1979), report finding human remains that were not formal burials in structures at several sites, but the contextual descriptions are too sketchy to allow these accounts to be evaluated.

REGIONAL DEPOPULATION

The depopulation of the Four Corners area by Puebloan peoples in the late A.D. 1200s is one of the classic problems of American archaeology (Kidder 1924; Bryan 1941; Jett 1964; Lipe 1995). An area of more than 60,000 km² (24,000 mi²), centered on the drainage basin of the San Juan River, was abandoned, in the sense that Pueblo people no longer maintained year-around residential settlements there, though they undoubtedly continued to be familiar with the area and to make occasional use of it. The geographic and demographic scale of the abandonment, and its rapidity and completeness, pose intriguing questions. The most densely settled part of the Four Corners in the 1200s was the northern San Juan, or Mesa Verde area. Lipe (1995) describes several “push” factors that may have made life in the northern San Juan uncomfortable or unsupportable during the late 1200s, as well as some possible “pull” factors that might have made relocation southward seem more attractive than it previously had been. The material below is based largely on Lipe’s 1995 article. Cordell (1997:365-397) provides a comprehensive, up-to-date review of regional abandonments in the period A.D. 1130-1450 from a Southwest-wide perspective.

Environmental Change and Adaptive Stress

The “great drought” of A.D. 1276-1299 that has been inferred from the tree-ring record (Douglass 1929) has a striking correlation with the final depopulation of the northern San Juan. As noted above, however, the western part of the area may have been depopulated by the early 1270s, and the regional population may have started an overall decline by A.D. 1250. It is possible that Lipe (1995) links depopulation too closely to the fall-off in tree-ring cutting dates. If people stayed on for five to 10 years after the last cutting dates were recorded, the correlation of depopulation with the “great drought” would be very strong. Whether this drought would have been sufficient to cause widespread and catastrophic crop failures can be questioned, however. Van West’s (1994a) recent model of effective soil moisture and crop productivity in southwestern Colorado indicates that the area as a whole could have supported a large population of maize farmers in drought years, although particular communities might have had difficulties. Aggregation and warfare would of course have magnified the effect of drought by restricting the ability of households or communities to move to more favorable locations in response to drought.

Petersen (1987d, 1988, 1992) has argued that the onset of the first pulse of the Little Ice Age in the middle 1200s may have shortened growing seasons enough to make upland dry-farming riskier over much of the Mesa Verde area. Petersen (1992) suggests that cooler conditions intensified during the late A.D. 1200s. This inference is based on extrapolation of temperature-sensitive bristlecone pine tree-ring series from the Front Range in Colorado, and it may be questioned because of the distance and different weather regimes involved. Whether or not temperatures in the study area were seriously lowered, the circulation pattern associated with the onset of the Little Ice Age would probably have weakened the summer monsoon (Petersen 1992). Summer rainfall is generally less reliable in the Four Corners area and the central Colorado Plateau than it is farther south and southeast. A further weakening of the summer monsoon would have had a negative impact on farmers in the northern San Juan because dry-farmed maize depends on summer rainfall to mature. Pollen evidence from lakes and bogs in the La Plata Mountains in southwestern Colorado indicates that summer moisture declined during the middle A.D. 1100s and stayed low until the nineteenth century (Petersen 1987c, 1988), but this decline predates the presumed onset of Little Ice Age conditions. There was, of course, a major population increase in the northern San Juan in the late A.D. 1100s and early 1200s, at a time when Petersen's pollen data indicate low summer moisture. Whether summer moisture was further reduced in the late A.D. 1200s cannot be determined from his data.

Recent research based on analysis of tree-ring series indicates that the Four Corners area's ordinarily bimodal pattern of annual precipitation became much more variable and unpredictable in the period A.D. 1250-1450 (Dean 1996; Ahlstrom et al. 1995). The summer-dominant pattern characteristic of the Rio Grande and upper Little Colorado River basin areas of New Mexico and eastern Arizona appears to have remained stable, however. This may have intensified an already existing northwest/southeast gradient in the strength and reliability of the late summer monsoon. As Ahlstrom et al. (1995) point out, a steepening of this gradient in the late A.D. 1200s would have increased the attractiveness of the Rio Grande and Mogollon Rim area relative to the Four Corners area.

Although these inferred climatic changes would have caused problems for northern San Juan Pueblo farmers in the A.D. 1200s, the area has such a variety of potentially arable locations that it is hard to imagine the whole regional population being driven off the landscape. Commercial dry-farmers in southwestern Colorado and southeastern Utah today do not suffer complete crop failures even when there are late frosts or the monsoon is weak and late (Connolly 1992; Van West 1994a). It seems likely that at least some Puebloan communities, in the most favored areas, would have been able to survive changes of the magnitudes reconstructed so far. On the basis of the evidence presented, it does not appear that climatic change in and of itself is sufficient to account for the complete abandonment of the region, although it is likely to have contributed to it.

Effects of Conflict

In addition to posing a direct threat, the escalation of intercommunity warfare in the A.D. 1200s may well have stressed social and adaptive systems of northern San Juan communities. By promoting aggregation, warfare would have curtailed household and community level mobility as solutions to both social and adaptive problems (see Varien 1999b). Recent work by Kohler and Van West (1996) is relevant here. Using Van West's tree-ring-based model of agricultural productivity in southwestern Colorado, Kohler and Van West identified patterns of spatial and temporal variability in production under which households would find it beneficial to share food

with at least some other households. They recognized other patterns of production variability under which it would be detrimental for households to share. Food sharing was assumed to be more likely in aggregated settlements; hence, aggregation could be used as an archaeologically visible indicator in increased food sharing. The model predicted periods of time when aggregation would be favored by households as an economic strategy, and when dispersion would be favored. “In the 400 years they model, the period A.D. 1272 to 1288 has the strongest negative value for resource pooling, and hence the strongest prediction for household dispersion. But households did not disperse during these years in the northern San Juan—in fact, aggregation appears to have continued or even intensified, and then the region was abandoned. Social as well as adaptive stress generated by the inability of households to disperse may have contributed to decisions to relocate. That is, if social and economic stresses increased in the northern San Juan, alternative social and economic conditions in the Rio Grande or Upper Little Colorado areas may have been seen as relatively more attractive” (Lipe 1995:161).

The direct effects of warfare would not seem adequate to explain all aspects of the depopulation of the study area. Intercommunity warfare may result in displacement of losers, but not of winners, nor should it result in displacement of population in a particular direction, in the absence of other factors. If warfare continued during the time the northern San Juan was being depopulated, however, it could help to ensure that individual families or small isolated communities did not stay behind, and that depopulation was complete.

In the older literature, the possibility of attacks by hostile nomads was often invoked to account for the withdrawal of Puebloans from the northern Southwest (e.g., Kidder 1924). The principal candidates for the role of “enemy people” have been the Athabaskan-speaking ancestors of the Navajo and Apache (Jett 1964), but more recently, Numic-speaking peoples ancestral to the Paiute and Ute have been more prominent in these hypotheses (Ambler and Sutton 1989). However, there is no archaeological evidence demonstrating the presence of Numic or Athapaskan groups in the Four Corners area prior to A.D. 1300, although they may have been in contact with Virgin branch Puebloans or Fremont people farther west and northwest. It appears to the authors that nomadic groups large enough to have displaced several thousand Pueblo III occupants of the study area would surely have left an archaeological record of their presence.

“Pull” Factors

As Cameron (1995) points out, groups deciding whether or not to migrate are likely to have made some kind of assessment of conditions in their existing location relative to conditions in potential relocation areas. Changes in either or both could eventually trigger a move. It is possible that environmental and social stresses of the sort described above were in themselves sufficient to make Pueblo III households and communities in the study area look for alternatives farther south. On the other hand, there may also have been new developments in the Rio Grande and/or Western Pueblo area that were attractive, and that contributed to decisions to relocate.

In the “big picture,” the center of gravity of the Pueblo world had been shifting south since the collapse of the Chacoan system in the early 1100s (see Adler 1996b, ed. 1996; Cordell 1997). The late A.D. 1200s was a time of contraction from the north, but there was also a substantial expansion of the Puebloan world to the south in the 1200s and 1300s. Perhaps the latter had something to do with the former, in the sense that the early stages of the Salado, Casas Grandes, and Classic Hohokam regional systems were underway by the late 1200s. These developments may have provided their participants with increased opportunities for trade, security,

sanctification, new social relationships, or membership in new kinds of religious societies. Lekson (1997, 1999b) has recently proposed that cultural and demographic changes in the Southwest in the period A.D. 1050 to 1450 were much influenced by where the principal center of religious and political power was located. He has argued that this principal center moved from Chaco to Aztec in the early A.D. 1100s, and from there to Paquime (Casas Grandes). These movements were along a precise north/south meridian that symbolized the continuity of that principal center through both time and space. This bold hypothesis promises to set the agenda for big-picture thinking about Southwestern archaeology for the foreseeable future.

With regard to environmental variables, the areas that were receiving population in the late 1200s and early 1300s are ones that today have more reliable summer rainfall than does the northern San Juan. If climatic shifts in the 1200s weakened the summer monsoon in the north, this may have made southerly areas look more attractive for agriculture, as Ahlstrom et al. (1995) suggest.

Among the characteristics of northern San Juan culture that did not accompany the movement of population to the south were some that probably had to do with religious symbolism and practice. The fact that these forms were not replicated in the areas to the south where people from the northern San Juan eventually settled may indicate that the migrants were receptive to new forms of religious practice, or at least to new variants of the forms they were familiar with. "For example, the small San Juan household-level kiva disappeared and was replaced by kivas that were associated with much larger social groups and that probably did not have domestic uses (Lipe 1989). The front-oriented settlement plan with its rigorous adherence to a north/south or northwest/southeast axis (Reed 1956) and occasional plaza gave way to an inward-looking settlement plan with plazas as primary orienting features (Adams 1989). And certain forms of public architecture that became prominent in the 1200s in the northern San Juan—for example, free-standing towers and multistoried, D-shaped buildings—never appear in the areas to the south or southeast that presumably were receiving migrants from the northern San Juan" (Lipe 1995:162). The adaptive problems or social stresses that northern San Juan people experienced in the A.D. 1200s may have weakened the perceived power of existing religious rituals or ideologies. The existing religious practices of the Rio Grande or Western Pueblo areas may have been seen as providing an opportunity for spiritual revitalization by peoples moving to those areas from the Mesa Verde area.

It seems likely that the emigration from the northern San Juan had an ideological component—i.e., that there were some widely held beliefs about the rightness or necessity of this move. Otherwise, it is hard to see how the region could have been so thoroughly depopulated. Warfare and environmental stresses either did not affect the entire area equally or were density dependent, in the sense that once some people left, the situation should have improved for those who remained. This would appear to be a case in which utilitarian hypotheses are inadequate to account for the full range of phenomena associated with the movement of population out of the study area to new locations farther south.

Archaeological evidence indicates that the very late A.D. 1200s through the 1300s was a time of dynamic change in Pueblo religious ideology, symbolism, and social organization in the areas south of the Four Corners area that continued to be occupied by Puebloan peoples. Adams (1991) argues that evidence of the distinctive katsina cult appeared in the upper Little Colorado area by about A.D. 1275 and that it spread through most of the Pueblo world in the 1300s and early 1400s. Crown (1994) argues that the appearance of the Pinedale style of ceramics in the Mogollon

and Red Rock Plateau regions of southeastern Utah, substantial settlement aggregation never occurred. Although field research ordinarily has to be carried out at the site level, researchers need to keep a range of community and settlement models in mind, so that their site-based work can contribute to testing and improving these models. For example, all the room blocks in the central part of the Bass complex were originally recorded as separate sites (see Figure 9-4), rather than as subdivisions of a single settlement aggregate. This practice does not seem consistent with an awareness that the archaeological record is structured by past patterns of social interaction and organization.

It is also important to recognize that in some cases, architectural elements can occur together as part of a site or settlement complex, but can also sometimes occur as spatial isolates. Great kivas and isolated towers may occur at some distance from residential structures, even in areas of high population densities. In areas of low population density in the far western part of the Mesa Verde culture area, even habitation rooms, storage granaries, and kivas may not always occur together but comprise separate “sites” in a given canyon system.

Site types therefore will ordinarily need to be viewed as building blocks of community and settlement patterns, rather than as entities significant in their own right. Gleichman and Gleichman (1991) offer a site (actually, a historic property) typology for the McElmo drainage that adopts this approach. It is intended to apply to the period A.D. 1075-1300. They recognize seven property types: 1) habitation sites with public architecture, 2) habitation sites without public architecture, 3) temporary habitation sites, 4) isolated ceremonial or communication structures, 5) isolated storage facilities, 6) water and soil control features, and 7) resource procurement and processing sites (including pottery-firing kilns).

Below, is a slightly different set of site types that is considered here to be most appropriate for the Pueblo III period. These types also occur in Pueblo II and have been discussed more fully in Chapter 8. Their specific manifestations differ somewhat in Pueblo III, however.

Homesteads and Hamlets

Homesteads are considered to be Prudden units having a single kiva; hamlets have multiple kivas but are not large enough to be considered villages. These smaller settlements make up the majority of habitation sites throughout the Pueblo III period. Throughout the period, however, the percentage of the population that was living in the larger village sites increased. Hence, homesteads and hamlets were always the most numerous sites, but by late Pueblo III times, some communities had the majority of their population residing in a central village. Adler (1990) found that the frequency of hamlets increased through the Pueblo II and III periods relative to homesteads.

The surface expression of homesteads and hamlets includes rubble mounds, kiva depressions, and ashy midden areas. Kiva depressions are less likely to be masonry lined at these smaller sites, especially in early Pueblo III; hence the kiva depressions are sometimes rather shallow. Masonry rubble mounds also tend to be lower at early Pueblo III settlements of this type than at later ones, both because stone was often recycled to later buildings, and because large masonry blocks were less consistently used in construction.

The Green Lizard Site (Figure 9-11) is an example of a small hamlet (Huber and Lipe 1992; Huber 1993). It is located in Sand Canyon in the Montezuma-McElmo drainage unit, about 1

km south of Sand Canyon Pueblo, a major late Pueblo III village site built in the middle A.D. 1200s. The Green Lizard site has two kivas, approximately 20 masonry-walled surface rooms, and an extensive midden. Tunnels connect the kiva to what was probably an underground room, as well as to one of the surface room blocks. The principal period of occupation appears to have been in the early or middle A.D. 1200s, and very likely overlapped at least the earlier part of the occupation of Sand Canyon Pueblo. Test excavations at several other Pueblo III hamlets and homesteads in the Sand Canyon vicinity are described in Varien (ed., 1999).

Villages

Pueblo III habitation sites in the study area display a continuous range of sizes from a few rooms to more than 500 structures. Consequently, distinguishing “villages” from “hamlets and homesteads” represents a fairly arbitrary segmentation of this continuum into larger village sites and smaller hamlets and homesteads. Here, villages are defined as settlements having 50 or more structures, including surface rooms, kivas, and towers. This follows the definition used by the participants in the 1990 Conference on the Pueblo III period at the Crow Canyon Archaeological Center, which resulted in a book edited by Michael Adler (1996). When habitation sites have multiple, separate room blocks, the rule of thumb used at the conference was that they should be approximately contemporary and no more than 30 to 50 meters apart to be considered part of the same village (Adler, ed. 1996:vii-viii). In practice, it is usually easiest to count kiva depressions at the open sites; surface rooms are represented by mounds of fallen wall rubble, and individual rooms are not consistently recognizable. Using average room-to-kiva ratios (Lipe 1989) and amount of wall rubble present, 6 to 8 kivas can usually be considered indicative of a settlement having at least 50 structures.

In general, this way of recognizing village sites has worked well. These sites typically have public architecture and are the largest settlements in the vicinity (see Figures 9-2 and 9-5). On this basis, it can be argued that most or all served as community centers (Varien et al. 1996; Varien 1999b).

The principal subtypes of village sites from the Pueblo III period are the earlier, more dispersed settlements such as the Bass site complex, consisting of multiple room blocks and ordinarily located in mesa-top settings (see Figure 9-4), and the later, more aggregated canyon-oriented settlements. The latter group includes both large cliff dwellings (see Figure 9-6) and open canyon-rim-oriented sites (see Figures 9-7 and 9-8). Several examples of these village subtypes have been described in the earlier sections of this chapter.

Post-Chacoan Great Houses

Some of the Chaco-era great houses continued to be utilized, often with considerable remodeling, in the Pueblo III period (e.g., Lowry and Wallace ruins—Martin 1936; Bradley 1988). Some of these structures probably continued to play an important symbolic role in their community and to house important individuals, groups, or activities. A better understanding of how these structures functioned in the Pueblo III period is needed.

A related issue is whether structures functionally similar to great houses were built during Pueblo III times in some communities. At the Bass site complex (Figure 9.4), for example, a multiple-storied structure with blocked-in kivas and towers on its periphery was constructed in early Pueblo III (Lipe and Ortman 1999). Residential room blocks were built around and adjacent

to it, so that it did not stand alone, as would have been typical for a Chaco-era great house. On the other hand, it continued to be a highly visible, central structure throughout the life of the Bass village complex, and this aggregate appears to have served as the center or nucleus of a dispersed community.

Field Houses

These sites typically lack kivas and consist only of one or a few lightly built rooms. There is good evidence that in the Pueblo III period, homestead and hamlet sites were reused as field houses (Varien 1999b, ed. 1999). In these cases, it is usually difficult to identify the later field house function without test excavations. If large surface collections of pottery can be examined, it may be possible to detect evidence of low intensity reoccupation from the relative frequencies of datable pottery types.

Site 5MT8940 (Errickson 1995:175-183) in the Ute drainage unit is a good example of a probable field house. Associated pottery indicates an occupation between about A.D. 1175 and 1300. Surface architecture consists of the remains of two small, irregular-shaped rooms expediently constructed of unshaped stones. There were no fire features inside the rooms, but a small exterior hearth was immediately adjacent to one of them. A large roasting pit, over 2 m in diameter, was about 4 m southeast of the rooms. In considering the function of the site, Errickson (1993:182) concludes "The site may have functioned as a field house associated with agricultural tending. The lack of an interior hearth and the paucity of exterior features and cultural materials associated with the site suggests that it may represent a bi-seasonal or late season field house (Sebastian 1983). Bi-seasonal field houses were those occupied during the spring (planting) and late summer (harvesting) on an overnight basis....Architecture at these sites would be more substantial than at day-use field houses."

At Site 7723, also in the Ute drainage unit, Errickson (1993:141-144) reports on a small expediently-constructed masonry structure (Room 10) that had been built in a partially filled depression of an earlier kiva. The structure was dated to the late Pueblo III period on the basis of associated pottery. Room 10 did not have a prepared floor or formal hearth, but did have an oxidized area in the center of the floor that probably represented an ephemeral hearth. There was also evidence that another kiva depression at this site had been reused as a cooking and flaked lithic tool production area. Errickson (1993:144) suggests that Room 10 "was used for temporary shelter and storage, probably as a field house."

Errickson (1993) notes that a structure similar to Room 10 was found in the fill of a kiva depression at nearby site 5MT7704. At Big Juniper House, a late Pueblo II site in the Mancos-McElmo area, Swannack (1969) notes that circular masonry structures were built over three earlier kivas, evidently after they had partially filled. He notes that such structures were also found at several other sites on Wetherill Mesa (Swannack 1969:54). Andrew Duff (personal communication 1999) reports that several small expediently constructed masonry rooms were constructed in partially filled kivas at the Shields site (Duff and Ryan 1999) in the Montument-McElmo drainage unit. Duff reports that several of these were built in kivas that date to the late A.D. 1200s, and that had evidently been abandoned for some years before the enigmatic masonry rooms were built. Whether these structures functioned as field houses remains a question.

Water Control Features

As noted in the previous section on subsistence intensification, check dams and agricultural terraces occur in the Pueblo II period, but appear to be more widespread in the Pueblo III period. In the area around the units of Hovenweep National Monument on the western edge of the Monument-McElmo drainage unit, Winter (1978) and Gruebel (1991) document a number of check dam systems that clearly appear to be associated with Pueblo III period sites.

In the western part of the study area, a number of prehistoric reservoirs have been identified in physiographic settings that would catch runoff from slopes and preexisting channels. On the basis of several lines of evidence, these structures appear to have been used to store water for domestic, rather than agricultural, use. They range widely in size, but some could have stored more than 150,000 gallons of water (Wilshusen et al. 1997). As discussed in Chapter 8, it appears that reservoirs began to be constructed on the Mesa Verde proper in the early Pueblo II period (Smith and Zubrow 1999; Breternitz 1999). Haase (1985) reviewed the distribution of probable reservoirs in southwestern Colorado and southeastern Utah and concluded, on the basis of spatial proximity to habitation sites, that some of the structures in his survey were built in the late Pueblo II period, but that the majority were from Pueblo III. He found that 75 percent of the Pueblo III reservoirs were associated with villages having 10 or more kivas. In some cases, reservoirs were located within the boundaries of large late Pueblo III villages. Since such villages represent only a small fraction of the total number of Pueblo III habitation sites, he concluded that there is a clear association of reservoirs with the larger aggregates. The association of reservoirs with locally dense populations and with aggregated communities may indicate that water from springs and seeps was in relatively short supply and that domestic water was a scarce and valued resource.

Wilshusen et al. (1997) report on excavations at a reservoir in the Woods Canyon area of the Monument-McElmo drainage unit. The nearest large site (ca. 600 m) is Woods Canyon Pueblo, a late Pueblo III village (Blomster and Churchill 1996). Ceramic evidence indicates, however, that the reservoir was constructed in the early to middle A.D. 1100s, and that it continued to be used in the early Pueblo III period. The Woods Canyon reservoir probably initially served a dispersed community that was centered around Albert Porter Pueblo (Figure 9-3), a small great house located about 2 km (1.25 mi) to the northeast. By the early A.D. 1200s, the community center had moved west to the Bass site complex (Figure 9-4), but small habitations near the reservoir continue to be occupied at this time.

Special Purpose Sites and Structures

This category includes kilns (see Figure 9-12), shrines (Rohn 1977), and what Thompson et al. (1997) have called "architecture with unknown function" or "AWUF." The latter category includes enclosing walls, aligned stones, and rock circles. They often are spatially associated with habitation sites, but may occur at some distance as well. Thompson et al. (1997) suggest that many of them represent ways of symbolizing community boundaries or aspects of world view. These features are frequently associated with the large late Pueblo III canyon-rim villages. The best-defined of these features are enclosing walls, which surround parts of many of the late villages (Kenzle 1993, 1997). Many of these may have had defensive functions as well as serving to delimit boundaries of villages or of special precincts within villages.

Kilns may occur in the study area as early as the Pueblo I period (Purcell 1993), and several dating to the Pueblo II period have recently been excavated at Mesa Verde National Park in

the Mancos-Mesa Verde drainage unit (Ives et al. 1997). The majority of kilns known from the study area date to the Pueblo III period (Purcell 1993; Fuller 1984). These features are linear trenches, usually lined with stone slabs, that were used to fire small to large quantities of white ware pottery. They generally occur at some distance from habitation sites, perhaps because of the necessity of accessing abundant supplies of fuel wood. They are recognized by their slab outlines; they often have associated surface evidence of ash and charcoal, and sometimes have evidence of misfired white ware sherd “wasters.” They can be distinguished from slab hearths because they are usually quite long relative to their width. In general, Pueblo III kilns are larger than those dating earlier. A number of them appear to have been used to fire the pottery production of a number of potters—this indicates that at least the firing stage of white ware production was carried out by potters from multiple households. There is little or no evidence, however, that in the study area, pottery production was in the hands of specialists.

Varien (1999a) notes the occurrence in the Mancos-Mesa Verde and Monument-McElmo drainage units of occasional examples of isolated combinations of a single tower and kiva, with no associated room block. An excavated example at Mesa Verde National Park is Cedar Tree Tower (Fewkes 1920). Two examples of this site type, located in the Sand Canyon locality of the Monument-McElmo drainage unit, were tested by the Crow Canyon Archaeological Center (Varien, ed. 1999). These are Mad Dog Tower in lower Sand Canyon (Kleidon 1999b) and Troy’s Tower, located on the mesa top near Sand Canyon Pueblo in the upper Sand Canyon drainage (Varien 1999c). Both sites had a well-constructed tower, an associated kiva, a single surface room, a tunnel connecting the kiva with the tower, and a thin midden with an artifact assemblage that was quite small by comparison with habitation sites in the same area. In the study area, isolated tower-kiva combinations of this sort have usually been interpreted as serving a ritual function at a community level (e.g., Rohn 1977:116-117), and the sparseness of refuse and the lack of a surface room block is consistent with this explanation. On the other, hand, there is a great deal of variation in the ratio of surface rooms to kivas in the Pueblo III period. It is possible that these sites represent no more than homesteads that were briefly occupied by a small household. Further studies of the locations of this site type relative to more obviously habitation sites, and comparative analysis of associated artifacts and ecofacts is needed to help evaluate these competing hypotheses.

In some of the more sparsely settled parts of the Mesa Verde culture area—for example, in the canyons of southeastern Utah west of the Comb Ridge, it is fairly common for kivas, surface living rooms, and storage structures to occur in isolation, or in combinations of two of the three structure types. It is as if the elements of a “Prudden unit” or habitation unit had been disaggregated and distributed fairly widely over a portion of a canyon system or mesa top. This pattern may be the result of relatively high household-level mobility, and probably in some cases of locating storage structures and temporary living quarters close to scattered fields. This departure from the “standard” homestead pattern in the more heavily settled parts of the area does not imply that these are “special purpose” sites in the sense of not being residential; they probably represent combinations of short term habitations and seasonally used field houses and storage facilities.

Rock Art Panels

Both petroglyphs and pictographs occur in the study area, often in association with other site types, but also in isolation. In Chapter 8, rock art styles characteristic of the Pueblo II and Pueblo III periods were reviewed, following Cole (1990:138-148). McKern (1978) provides a

number of examples of rock art associated with Pueblo III period cliff dwellings in Mesa Verde National Park.

Limited Activity Sites

These sites do not have obvious surface evidence of architecture, although they may have evidence of features such as slab-lined hearths. This is a catchall site class that probably represents a variety of resource-processing stations, as well as field houses or habitations not recognized from surface evidence. The frequency of artifact scatters is in general inversely proportional to the density of habitation sites in an area.

RESEARCH ISSUES AND FUTURE DIRECTIONS

Population Dynamics

In Chapter 7, Wilshusen made a strong case that the study area was nearly depopulated in the A.D. 900s, with population rebounding in the A.D. 1000s as a result of both immigration and intrinsic growth. Varien (1999b) makes a good case that a number of communities established in the A.D. 1000s persisted in place through the profound drought of the middle A.D. 1100s. An alternative hypothesis would be that the area underwent another episodic abandonment or near-abandonment at this time. Of course, the long-term principal question for the study area is when, how, and why the area was depopulated in the late A.D. 1200s. These questions all have potential environmental and social dimensions, and require considering both regional and extraregional “push” and “pull” factors. In addition to temporal fluctuations, the study area saw some dramatic geographic shifts in population through time. Good hypotheses are lacking as to why nearly all Pueblo III population is concentrated in the three western drainage units, when other drainage units had heavy agricultural use in previous periods. Calibrating and then understanding population fluctuations through time and space has both substantive and theoretical importance and should continue to be a high priority for future research. The remarkable potential of the area both for the development of fine-grained chronologies and for making population estimates on the basis of survey data is just beginning to be tapped.

Testing Models of Sedentism and Mobility

Varien (1999b) has presented models of Pueblo II and III sedentism and mobility at the household, community, and regional population levels for the central Mesa Verde area, including the study area.

- To what extent do Varien’s models of relatively mobile households operating in relatively stable, long-lasting communities apply outside the most populous and agriculturally secure portions of the study area?
- To what extent do Varien’s models apply prior to Pueblo II in the study area?
- Were earlier communities more likely to follow a “frontier” pattern of exploiting a locality’s resources for a generation or two and then moving on?
- If Pueblo II and III communities were as stable as Varien suggests, and study area population as high as Wilshusen suggests, why isn’t there more evidence of agricultural intensification and biotic resource depletion?
- Or is the evidence there, but not yet recognized?

These models and their spin-off hypotheses need to be tested. Doing so will require further development of appropriate methodologies for assessing degrees of sedentism and length of site use, among others.

Community and Intercommunity Social Organization

Adler and Varien (1994) have proposed a spatial model of Pueblo II and III community organization that involves a more or less tethered center having public architecture and a relatively persistent residential population. The overall community pattern ranges from dispersed to aggregated. In the dispersed mode, community boundaries can be delineated by a dropoff in residential site density. Does this model apply to Pueblo II and III communities throughout the study area, or only in areas of relatively dense population, good arable soils, and reliable domestic water supplies? Do site densities really decline between the proposed centers? Are there times and places in the study area during the Pueblo III period where a more appropriate model would be a loose network of households, and where community-level institutions are not formal and important enough to have archaeological expression?

The discussion above has indicated that evidence is equivocal regarding the kind and degree of sociopolitical status differentiation in Pueblo III communities in the study area. Bradley (1992, 1993a) implies that “kiva-dominated” room blocks at Sand Canyon Pueblo (and presumably at other large late Pueblo III sites) may represent the emergence of something like historic Pueblo religious sodalities and religious leadership. The recurrent division of late Pueblo III villages into east and west halves suggests that some type of dual division may have been in place.

- Can this be related to the dual divisions present at the Tanoan and Keresan Pueblos in the Rio Grande area?
- Do analogies with historic Pueblo social organization apply, or did the Pueblo III communities of the study area include a level of social hierarchy not found in the historic Pueblos?
- Are some of the “public” structures at Pueblo III sites, e.g., D-shaped structures, actually elite residences or facilities controlled by a religious or political elite?
- Is the “great tower” complex at Yellow Jacket Pueblo functionally similar to any of the “kiva-dominated” room blocks at Sand Canyon Pueblo?
- Is there widespread evidence of centralized storage, or does this appear only at the largest sites?

Pursuing these kinds of questions would require careful evaluation of assemblage data associated with both residential and putative nonresidential or “public” architecture. The term “public” architecture, a vestige of the “benign functionalism” of the 1970s, may become a casualty of such investigations, as some of it may have been designed to exclude rather than include.

Aggregation

Aggregation is surely not a unitary process. That is, community settlement patterns are likely to be affected at all times by a number of environmental, economic, and social factors. There may be numerous combinations of these factors that can result in dispersed or aggregated patterns. Nonetheless, the dramatic changes in community settlement patterns that mark the Pueblo III period indicate that some of the factors controlling settlement decisions were

undergoing change. Kohler and Van West (1996) have made an impressive start on modeling the effect of social and environmental variables on household-level settlement decisions. They suggest that patterns of resource sharing under differing environmental conditions were important. An alternative hypothesis would be that aggregation or dispersion were primarily the result of whether warfare was widespread or not. If indicators of the incidence of warfare other than aggregation could be developed, it would be interesting to see if they provided as good a retrodiction of episodes of aggregation as do the social and environmental variables that Kohler and Van West use.

Warfare

After languishing through the middle part of the twentieth century, the hypothesis that warfare was an important factor in Pueblo culture history has been revived (Haas and Creamer 1993). This has also helped revive the hypothesis that many aspects of the study area's Pueblo III architecture and settlement patterns reflect defensive concerns. The challenge now is to find ways to investigate the latter hypothesis empirically, using evidence independent of that on which the hypothesis itself is based. More careful comparative studies of types of potentially defensive features, such as Kenzle's (1997) analysis of site-enclosing walls, are needed, as are evaluations of the contexts of human remains, and of multiple lines of evidence regarding warfare (e.g. Lightfoot and Kuckelman 1994). If warfare was in fact endemic in the study area in Pueblo III times, it would have had an influence on numerous aspects of settlement pattern and social organization.

Extraregional Relationships

One of the striking features of the Pueblo III period in the study area is the decline in frequency of nonlocal items such as turquoise, shell, and red ware pottery. These items were not common in previous periods, but they become almost nonexistent in the Pueblo III period. At the same time that there is evidence of declining trade and contact between the study area and the "outside world," the Mesa Verde Black-on-white design style is shared over a very wide area, from southeastern Utah through the study area to the Aztec Ruin complex and along the eastern edge of the San Juan Basin in New Mexico (Roney 1995). Maintenance of design similarity must indicate a pattern of contact and interaction over this large area. Cordell (1995) notes that pottery of the northern Rio Grande in the thirteenth century resembles San Juan types such as McElmo and Mesa Verde Black-on-white more than it does pottery of the Cibola area (e.g., the Tularosa and Gallup/Puerco styles). This suggests that Pueblo III occupants of the study area may have been at one end of a chain of contacts that extended to the Rio Grande, and that may have helped channel or facilitate movement from southwestern Colorado to the Rio Grande in the late 1300s. Better ceramic chronologies and more detailed studies of design similarities and differences across the northern Southwest are needed to follow up on Cordell's observations.

Lekson (1997, 1999b) has recently proposed that cultural and demographic change in the Southwest in the period A.D. 1050 to 1450 was much influenced by the locus of the center of religious and political power, which moved successively from Chaco to Aztec to Paquime along a north/south meridian that symbolized the continuity of that center through both time and space. This remarkable proposition promises to set the agenda for big-picture thinking about Southwestern archaeology for the foreseeable future. Surely there were "pull" factors that affected the movement of people out of the study area after A.D. 1250 (Lipe 1995). At the same time the Pueblo world was contracting from the north, it was expanding in the south (Adler, ed. 1996). Large Pueblo communities were flourishing in the Rio Grande and portions of the upper

Little Colorado drainage and the Mogollon Rim highlands, as well as in the Western Pueblo area. Lekson's bold thesis requires consideration of what was happening in the study area in the thirteenth century in relation to the major social, cultural, and demographic changes that were occurring throughout the Southwest at the same time.

Relationships to Contemporary Peoples

Constructing culture histories on the basis of archaeological evidence is difficult because language data are not accessible; culture traits change, diffuse, and drift; social groups break up and recombine; and genes spread due to gene flow among social groups and biological populations. Nonetheless, attempting to evaluate the degree of relationship between archaeological complexes on the one hand and historic period tribal groups on the other is a time-honored enterprise in Southwestern archaeology and anthropology, and one made more pressing by increased interest in archaeology on the part of Southwestern tribes and by passage in 1990 of the federal Native American Graves Protection and Repatriation Act (NAGPRA), which requires assessment of the cultural affiliation of human remains and certain archaeological materials as part of the process of decision-making about repatriation.

Although the historical relationships between the Pueblo III archaeology of southwestern Colorado and contemporary Native American groups are undoubtedly complex, it is also clear that relationships exist. The last major attempt by anthropologists to evaluate these relationships was more than 25 years ago (Ford et al. 1972). It is time for a new systematic attempt to construct a culture history that spans the 300-year gap between A.D. 1300 and 1600 and links the Puebloan archaeology of the Four Corners area with the historic record of native peoples in the Southwest. Such an attempt needs to employ multiple lines of evidence, including native oral traditions.