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## Investigations at the Pueblo Alto Complex

# Chaco Canyon

New Mexico 1975-1979

Volume II Part 2

### **ARCHITECTURE AND STRATIGRAPHY**

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With a Contribution by H. Wolcott Toll

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As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under United States administration.





Front cover: Pueblo Alto and New Alto on the mesa overlooking Chaco Canyon to the southeast (Courtesy of David Brill @1980).

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## Chapter Four East Wing and Associated Areas of Plaza I

#### Overall Plan

Two large rooms (44 and 48  $m^2$ ) opening onto Plaza 1 are the dominant structures in the East Wing (or East Roomblock). Both also have door access to a pair of smaller rooms (14-15  $m^2$ ) built directly behind them in a plan similar to small-house, living room/storage room arrangements and to the large empty suite investigated in the Central Roomblock. A circular structure (Kiva 6), which probably was either a kiva or a tower, separates the two large rooms. Although the manner in which Kiva 6 was placed directly in the center of the projected wall dividing the two large rooms appears to be secondary construction, wall bonding suggests the room and kiva walls were coeval. No testing was done in this area, so we were unable to resolve the function and temporal placement of the various structures.

Room 192, another large room  $(35 \text{ m}^2)$ , at the southern end of the wing and perpendicular to the placement of most other wing rooms, mirrors others in the West Wing in position, shape, and size. Lithic debris from chipping activities that was found in the plaza adjacent to the room appears to have been cast from the Room 192 door. Another set of rooms directly north of Room 192 (Rooms 189-191) could conceivably have been a similar large room before subdivision into three smaller rooms. Again, wall bonding thwarts this possibility if we trust their apparent means of construction. The three rooms provoke added interest as the only apparent access between Plaza 2, exterior to the East Wing, and Plaza 1 within Pueblo Alto. Not only was Plaza 2 crossed by prehistoric roads, but access from Plaza 2 directly into the interior plaza (Plaza 1) was possible through the row of doors across the East Wing. The exterior row of small wing rooms was linked north-south by doors, like its counterparts in the West Wing. Several gaps in the exterior walls of these small rooms probably mark collapsed door lintels and indicate a link with outdoor activities and road traffic.

No room excavations were conducted in the East Wing, although the plaza areas adjacent to it on both sides received much attention. Work in Plaza 1 along the wing's western side is incorporated in this section, whereas that of Plaza 2 to the east is discussed under a separate section (see Plaza 2).

#### Excavated and Tested Units Associated East Wing Interior Plaza Area (Figure 4.1)

In 1976, testing of Plaza 1 adjacent to the East Wing (East Roomblock) was inaugurated to examine the stratigraphy and to locate features and kivas. A meter-wide trench was run from the exterior of Kiva 5 south to Other Structure 12 about 4 to 5 m west of the East Wing. Next to Kiva 5 the trench reached its greatest depth of 103 cm, which rapidly decreased toward the south. This trench (TT 4) cut primarily to the upper plaza surface (Surface 1) and revealed a firepit, a masonry wall (Plaza Feature 3), and a suspected pitstructure (Plaza Feature 4). We decided to broaden the investigation of this area in 1977 to verify the type of features uncovered the year before, examine activities associated with the eastern rooms, and locate new features in what was suspected to be a complex area. Our suspicions were confirmed with the discovery of at least three small kivas, several plaza features, a jacal/masonry wall windbreak, and a work area scattered with ceramics and lithics.

Our clearing revealed aspects of the latest occupation at Pueblo Alto, but little that went with the construction and initial occupation of the East Wing rooms. Deep-testing to sterile deposits, however, was made in the northeastern area in Grid 35 (see TT 3 below). Deep-testing elsewhere was impractical because of the profusion of major architectural units and our desire to avoid destroying areas with little benefit to our understanding of the plaza history. Unlike the northern and western areas of Plaza 1, surfaces in the eastern area were generally ephemeral units formed by weathering and traffic compaction and separated by aeolian sands. Unfortunately, no rooms were excavated in the East Wing, so we are unable to correlate events in the plaza to room occupations and activities.

#### Strategy

The difficulty in interpreting the 1976 testing prompted a change to broadside stripping adjacent to the East Wing. The postoccupational, blown sand and wall fall at first were removed by hand but this proved too time-consuming, so a backhoe was eventually used. The fill was cleared by hand down to Surface 1 along the room walls, and then the material remaining to the west for about 16 m was removed by backhoe. The lower 10 to 20 cm of fill protecting Surface 1 were left for hand-removal. Eventually, all fill above Surface 1 between the rooms and TT 4 was removed. A balk of fill with the rubble scraped off, directly south of Kiva 4 (and west of TT 4), was never removed because of lack of time. When a masonry structure was discovered, wall trenching was initiated to expose its form and to map it. Features were generally defined in plan view but left unexcavated.

Except for select areas, screening was not done and would have proved impractical for the wall fall and postoccupational, blown sand. Dirt samples were secured from plaza surfaces within each grid. During wall



Figure 4.1. Plaza 1, features along the east side, plans and profiles.

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clearing natural depositional units were often crosscut and the cultural materials bagged as one. Outside architectural units, horizontal control was maintained by Plaza 1 grid number and vertical control by reference to Datum 13 located at the corner of Room 145 (7 cm above the site datum). Plaza grids were 4 by 4 m and subdivided into quarters (i.e., NE quarter, etc.) for better control during work in the eastern plaza area.

#### Postoccupational Fill

Layer 1. A thin veneer of aeolian sand, averaging 10 cm deep, had accumulated since major structural collapse of the adjacent East Wing upper walls. There was a paucity of cultural material, including charcoal and ash, in this unit. Altogether, about 17.5  $m^3$  were removed.

Layer 2. Wall mortar and stone comprised the bulk of the material lying above Surface 1 in this area. In places it reached 57 cm deep but usually was 20-25 cm thick. This deposit extended from the rooms west for about 10 m before disappearing. Because of the backhoe removal, we have no good estimates of the volume.

Layer 3. A mantle, varying in depth between 5 and 35 cm, rested directly on Surface 1 and was the first accumulation of aeolian sand after abandonment. In the southeastern part of the east plaza area, wall chinking from initial, exterior-wall deterioration littered the layer. This area also yielded sherds, lithics, adobe chunks, and isolated bunches of decomposed juniper splints and bark that were uncommon to the northern part. To the north it was more pure sand that was particularly deep in the northeastern corner (40-60 cm deep) where it had been banked by prevailing southwesterly winds. Except for the southeastern part, cultural material was sparse for the volume removed (approximately 25  $m^3$ ).

Layer 4. Where sands had piled up in the northeastern corner, Layer 3 was subdivided into two units. The upper deposit was aeolian sand mixed with some wall rubble (Layer 3) whereas underneath the fill was almost all sand (Layer 4). In Grid 55 the sand had mounded into a small dune. Despite the paucity of artifacts, charcoal content was relatively high (15 flecks per 100 cm<sup>2</sup>) throughout Layer 4. Much of the upper part was removed with the backhoe and the lower 30 cm by hand and then screened. About 9.6 m<sup>3</sup> of Layer 4 were removed.

#### Surface 1

This was the uppermost, last-used, cultural surface before the plaza was abandoned. Because of the extent of Surface 1 and the distribution of features, it is described in three subsections of the plaza.

Surface 1, Southeastern Area (Figure 4.2). This area is bounded to the east by Room 192, on the south by OS 12, on the north by a wall (Plaza Feature 3), and continues unobstructed west into the central plaza. Overall, the three walls enclose an area of about 15  $m^2$ . Despite the evidence of work areas and the protection afforded by the three walls, the surface was little more than an ephemeral, compacted, walking surface. It



Figure 4.2. Plaza 1, Surface 1 areas outside Rooms 189 and 192, plan view.

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was relatively flat but dipped slightly down toward the central plaza. Only closest to the walls was the surface in good condition. Beyond the walls and toward the west the compacted surface became soft, aeolian sands, unrecognizable as a use surface.

Surface 1, Southeastern Area Features. First impressions suggested that the area was one of high use, but pit features were notably absent. A single heating pit (HP 1) came to light in the southeastern quarter of Grid 175 and was left unexcavated and unsampled. It had been plugged with adobe and was the sole pit feature for the southeastern area. A nearby floor burn was sampled for archeomagnetic dating and yielded a date (A.D. 1250 + 21; see Volume I, Chapter 8) later than expected but probably indicative of post-A.D. 1100s use.

Surface 1, Southeastern Area Artifacts. Sherd and chipped stone fragments littered the area (Plate 4.1). The ceramics came from a large number of unrestorable vessels represented by only a fragment or two and, therefore, must be considered secondary material. On the other hand, the profusion of lithics on the occupational surface may represent the remains of tool-making activities. Ten hammerstones just above the surface (in Layers 1 and 3) probably were used in creating the debris. An open door leads into unexcavated Room 192 nearby and invites suspicion that the source for the artifact scatter may lie within. Where Surface 1 was badly eroded, we could observe at least three lower surfaces covered with similar debris, suggesting that workshop discard had continued to accumulate for some time without recourse to cleanup.

Ceramics indicate that deposition on the upper surfaces occurred in the early A.D. 1100s. Faunal remains from the fill and surfaces occurred in low numbers (46) with almost none exhibiting heat discoloration (Akins 1985a:183-184). The remains were dominated by prairie dogs and rabbits, although most of the latter were derived from a single, partially articulated cottontail. This articulation and the low incidence of cooking evidence suggest that the remains were primarily postoccupational. The presence of the turkey and red-tailed hawk ulnas and a mountain sheep cranium fragment, however, must be culturally derived.

Southeastern Area Walls. Walls enclosed three sides of the area. On the southern side, the OS 12 wall was composed of large, soft, sandstone blocks--a late masonry style. Surface 1 overlay the wall foundation that extended beyond the masonry above it. Surface 2 was even with the foundation top and may be coeval with it or slightly later.

The northern side of the area was separated from Kiva 12 and two firepits by a curious jacal, slab and masonry (Plaza Feature 3) wall (Plate 4.1). For 360 cm it extended east from the edge of the Room 192 doorway. This part was made of upright slabs and small blocks (probably the foundation) backed on the northern side by 5-10-cm-diameter poles set 20-30 cm apart. We did not probe for the postholes but exposed some only by accident and where Surface 1 had worn away. The remains suggest a jacal wall or one of wattle-and-daub. Adobe chunks and juniper bark scattered over the southeastern area may have derived from disintegration of



Plate 4.1. Eastern plaza area (Plaza 1, Grids 175-176, 195-196) opposite Room 192 (broom head rests in rubble-filled door). White tags mark artifacts (mostly chipped stones and ceramics) scattered across uppermost surface. Other Structure 12 wall at top and slabs and masonry marking another wall bordering a firepit and the Kiva 12 ventilator at the bottom. 2-m board and 50-cm north arrow. Marty Britt pictured. (NPS#15781) this wall or a ramada overhead. At the western end, the jacal wall was butted by a 35-cm-wide, compound, masonry wall, three or more courses high, that continued west another 160 cm before turning north for a meter as a simple masonry wall. Overall, this partition appears to have been built in three stages shortly before the formation of Surface 1.

<u>Surface 1, around Kivas 12 and 14 and Plaza Feature 4</u>. Surfaces in the vicinity of the three kivas were spotty, discontinuous, and badly eroded. Small areas appeared plastered, but for the most part they revealed a lack of formal preparation. The best-prepared area was a thin, plastered, clayey sand surface between Kiva 12 and Room 189 that extended south to Firepit 1. Around the latter it was ash-stained. We can expect the area between the kivas and rooms to have supported much foot traffic that may have destroyed the vestiges of floor construction. The area was similar to that around the small kivas along the West Roomblock where the upper surfaces were very ephemeral and lacked formal preparation.

Surface 1, Features Around the Three Kivas. All the masonry plaza pits associated with Surface 1 were located next to Kiva 12. Square, slab-lined firepits (FP 1-2) were located in the corners of the partition wall (Plaza Feature 3) separating this area from the adjacent southeastern area. Powers' interpretation of the partition wall as a windbreak to shelter outdoor activities and the firepits is a logical one. East of Kiva 12, next to the door of Room 188, was a masonry box of unknown function. None of these features were excavated. Finally, next to FP 2 in the southwestern crook of the partition wall were two postholes (PH 1-2) of unknown function. Three doors opened into the adjacent rooms next to the kivas, suggesting that the room-plaza-kiva activities in this area were integrated spatially.

Surface 1, Artifacts Around the Three Kivas. Generally, cultural material was sparse and unmatched by the quantities noted for the southeastern area. Densities increased around the northern two kivas and probably mark trash spillage destined for the kivas. The trash ceramics reflect an early A.D. 1100s accumulation. The relatively high frequency of turkey remains [53 elements, 3 minimal number of individuals (MNI)] from the fill and surfaces of this area is striking given the total assemblage (158 elements, 16 MNI), and is higher than the trash fill in the associated kivas (Akins 1985a). Turkey remains, however, were most common in the early A.D. 1100s at Pueblo Alto.

Surface 1, Northeastern Area (North of the northern half of Grids 75 and 274). Multiple replasterings of Surface 1 complicated the area and were difficult to follow as they interdigitated with one another. Erosional truncation of the southern extents had also occurred. The multiple repairs with coats of thin clayey sand marked a much-used area similar to the northern plaza tested in Plaza Grid 8 (next to the excavated part of the Central Roomblock). Intervening deposits of aeolian sand often separated replasterings. This area was 30-40 cm higher than Surface 1 in the southeastern area because of its ability to trap blowing sands. Surface 1, Northeastern Area Artifacts. Unlike the profusion of artifacts in the southeastern area, cultural material here was sparse and probably from secondary deposition.

<u>Surface 1, Northeastern Area Features</u>. A number of possible pits were noted in the area, almost all in Grid 55. Ten other pits and three postholes were recorded and three in each class excavated. Despite excavation, these could not be confirmed as manmade features. OP 10 appeared to be the most authentic, but most may be the result of rodent activity.

Three doors led into rooms of the East Wing from this part of the plaza, but all had been closed with large, soft blocks of sandstone indicative of masonry work occurring around A.D. 1100 or slightly later. The lack of substantial cultural material and verified features apparently reflects disuse of the area once the doors were sealed. This event may signal a period of remodeling that includes placement of Kivas 4 and 5 in the adjacent corner of the roomblock. Nevertheless, Surface 1 here appears to articulate with the upper surface along the rest of the East Wing and, despite the lack of artifacts and features, reveals much use and repair. Thus, we must conclude that foot traffic was substantial, but that the northeastern area was not the focus of much outdoor work activity compared to other areas of the eastern plaza area.

#### Test Trench 3 (Plates 4.2-4.3)

A small test pit was placed in Grid 35 for locating Surface 1 beneath the wall rubble and aeolian sands. Deeper testing, however, revealed a deposit of trash and burned material at a depth of 65-70 cm below Surface 1. With this discovery, the test pit was enlarged (now designated TT 3--TT 1 and TT 2 were used elsewhere in Plaza 1), removing the southern one-quarter of Grids 35 and 272 and reaching depths up to 160 cm at sterile level. An effort was made to remove fill in natural units (Figure 4.3) that became progressively blurred as the depth increased. Cultural material collected from these were recorded with their original excavation Later examination of the trench profile resulted in wholesale reunits. numbering of units. In this case it is not worth assaulting the reader with the descriptive minutiae involved with the final 22 surfaces and 57 layers noted in the profile. It will suffice to say that almost all units were of aeolian sand and clayey laminae, primarily from natural deposition (Plate 4.3). There were no thick, clay or adobe layers exposed that could be attributed to surface preparation like those noted in the northern and western areas of Plaza 1. If any surfaces in Test Trench 3 were manmade, they consisted of very fine, minimally prepared, clayey surfaces. The lowest units excavated yielded Red Mesa Black-on-white ceramic assemblages that filled two, unused, wall-foundation trenches.

Test Trench 3 Artifacts. All surfaces defined during excavation of TT 3 were in the upper 50 cm of the trench that ceramics suggest were deposited in the late A.D. 1000s and early A.D. 1100s. The regularity of aeolian layers alternating with possible cultural units (surfaces or deposits of construction debris) suggested seasonal accumulations to Powers.



Plate 4.2. Eastern plaza area (Plaza 1, Grid 35), Test Trench 3. Note blocked doors of Room 177. Kiva 5 retaining wall to left. 30-cm scale. (NPS#15616)



Plate 4.3. Eastern plaza area (Plaza 1, Grids 25, 272). Test Trench 3 stratigraphy. Note numerous aeolian and alluviated sandy deposits, and disturbed fill to lower right and left. 15-cm scale. Looking north. (NPS#15608)

PLAZA I

ROOM 177

West wall



Figure 4.3. Plaza 1, Grid 35, Test Trench 3, profile (as excavated).

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Overall, cultural material was sparse except above the uppermost surface (Surface 1) and around the wall-foundation trenches cut into sterile deposits.

Test Trench 3 Features. A crude masonry structure, designated Storage Pit 1, was built against the blocked door of Room 177 (Plate 4.4). It was built with Surface 11, as defined from the trench profile. The interior stonework of the feature formed a relatively smooth facing but the irregular, exterior stone indicates that the pit was built down into the ground. In truth, it appeared to more closely resemble a ventilator shaft than a storage pit, although a pitstructure was not found in association. More work would be needed to confirm the various possibilities.

Two wall-foundation trenches were cut into sterile soil at the bottom of TT 3. Digging-stick marks along the sides of the trenches plainly indicate the excavation tools. Both trenches were intentionally filled with a clayey sand and bits of adobe and stone, overlain by a natural accumulation of aeolian sand marking a period of inactivity.

#### Kiva 12

During plaza clearing, a small, oval-shaped kiva outline was defined, 400 cm long and 365 cm wide with a narrow southern recess. The kiva-ventilator orientation is south. The kiva wall tops were cleared to define the architectural plan, but then the kiva was not further disturbed.

#### Postoccupational Fill

The uppermost units filling the kiva were part of those covering the entire eastern plaza (Layers 1-3). Within the kiva, Layer 3 was waterwashed and lensed with gravel from natural filling of the kiva depression. A small pit placed inside the western edge of the kiva showed that aeolian sand had accumulated to a depth of 150 cm. In all liklihood, the kiva had been abandoned at the end of the eastern plaza occupation and had filled naturally. The fill removed was not screened. Ceramics recovered from the fill are typical of those from the upper fill and surfaces nearby (post-A.D. 1100). Faunal remains of rabbit are the most prevalent elements. The overall lack of cooked bones and the high degree of weatherchecking of the faunal assemblage suggests that the bulk are postoccupational occurrences and not associated with the use surfaces underneath.

#### Floors

None observed. An educated guess as to its depth is 150-200 cm below the present surface.

#### Walls

<u>Wall Masonry</u>. Wall masonry was composed of unshaped blocks and slabs set in moderate amounts of sandy, clayey mortar (Figure 4.4A). The stone



Plate 4.4. Plaza 1, Test Trench 3, Storage Pit 1 built against Room 177. 30-cm north arrow. (NPS#15684a)



Plate 4.5. Eastern plaza area, Kiva 12 niche above southern recess. 30-cm north arrow. (NPS#14773)

KIVA 12 (INTERIOR EAST WALL)











KIVA 14 (INTERIOR SOUTHEAST WALL)





Figure 4.4. Plaza 1, eastern plaza area kivas. Masonry styles. A) Kiva 12 (interior east wal1). B) Plaza Feature 4 (initial interior east wall).

- C) Plaza Feature 4 (northeastern interior addition).
- D) Kiva 14 (interior southeastern wall).

Α

В

С

D

had the appearance of salvaged material and conformed to Hawley's (1934) Type IV style. According to Hawley, this style occurs after A.D. 1116, which accords closely with our estimates of an early A.D. 1100s use.

<u>Wall Features:</u> Southern Recess. An arc-shaped recess, 20-55 cm wide (mean width = 50 cm) and 2 m long, was located along the southern end. This recess had been later filled with masonry to conform with the inner arc of the kiva wall. High in the southeastern corner of the recess, probably initially close to the roof, was a half-moon, storage niche 30 cm wide, 65 cm long, and 30-35 cm high (Plate 4.5).

<u>Wall Plaster</u>. Two coats of brown plaster on the kiva walls seem to reflect a relatively short period of kiva use. A single coat had been applied over the southern recess masonry and, when the recess was filled, a second coat was applied to the kiva walls and the new masonry. Both coats were smoke-blackened, presumably from use of the kiva firepit.

#### Ventilator

The ventilating system could not be investigated, although the rectangular, masonry-lined, shaft opening (interior = 30 cm by 36 cm) appeared through Surface 1, 40 cm south, behind the southern recess.

#### Summary and Conclusions

Kiva 12 is a small "clan" kiva probably used by a small group of people. It is dwarfed by the huge court kivas built and used during the A.D. 1000s at Pueblo Alto. By all indications, Kiva 12 was built, occupied, and abandoned near the end of the Pueblo Alto occupation between about A.D. 1120 and 1140. Its fill of aeolian sand indicates few or no subsequent cultural activities nearby once the kiva was abandoned. We cannot be positive which rooms may have been used (if any) in conjunction with Kiva 12, but it is presumed that the closest open doors leading into Rooms 188 and 189 pinpoint the most likely prospects. The windbreak/partition wall (Plaza Feature 3) south of Kiva 12 and the three masonry features in close proximity to the kiva mark a discrete work space associated with the kiva-room(s) use. Of the latter, the two firepits suggest that cooking was done during the warmer parts of the year. The firepits look like a matched set, and both associate with Surface 1, perhaps marking the coeval use of this plaza space by two social groups. It must be cautioned, though, that the nearby room construction clearly predates Kiva 12. Thus, room use associated with the kiva may entail room functions different from initial use or a modification of the room space. This may be an example of a late occupation that is similar to that in Chacoan small-house sites but adapted to the architectural confines of the earlier Pueblo Alto construction.
#### Kiva 14

The northern kiva of the trio aligned along the Plaza 1 side of the East Wing should not be confused with the kiva excavated in the East Ruin and coded as "Room" 14. Kiva 14 measured 470 cm (north-south) by 445 cm in size and had a ventilator oriented slightly west of south. Like the others, it was trash-filled but exhibited a simpler architectural history than its southern neighbor, Plaza Feature 4. Trenching, 45-70 cm deep, was necessary along the inside perimeter to define the kiva walls (Plate 4.6).

# Postoccupational Fill

Layer 1. Except for a trashy, pluvial lens on the southwestern side, the uppermost deposit in the kiva was merely an extension of Layer 3 overlying the uppermost plaza surface (Surface 1) that filled the kiva to a depth of 40-55 cm.

Layer 1 Features. Two large roasting pits had been built in the aeolian sand over Kiva 14. The top of the intact roasting pit (FP 3) was even with the surrounding kiva wall tops and Plaza Surface 1 (Plate 4.7). Just south at the same level were several thin slabs and fire-reddened sand that must mark the former location of another roasting pit (FP 4). Although FP 3 was not excavated, the oxidized sand surrounding the burned slab walls was sampled for archeomagnetic dating and yielded a date of Despite our problems with other dates at the site, this one A.D. 1370. appears reasonable, considering the placement of the roasting pit high in the postoccupational fill of a kiva probably built in the early A.D. A similar roasting pit found high in the fill of Room 103 also 1100s. yielded a similar magnetic direction, but the results were too dispersed to give a reliable date. Nevertheless, the stratigraphic placement of the roasting pits marks some activity at the site long after its probable abandonment.

Layer 2. Underneath Layer 1 and exposed only along the western side was a 15-cm-deep deposit of discarded artifacts, burned adobe, stones, charcoal, and ash lenses. I presume that this trash fills much of the kiva. Artifact totals from Kiva 14, however, are from the combined collections rather than from just Layer 2. Faunal remains were common (103 elements, 9 MNI), considering the small amount dug, although the high degree of checking and low incidence of heat discoloration (Akins 1985a) suggest that much of the bone came originally from deposits elsewhere.

#### Floors

No floor was reached during the testing, although one probably exists at a depth comparable to the other kivas, perhaps 150 to 200 cm below the present ground surface.



Plate 4.6. Eastern plaza area (Plaza 1, Grids 75, 95, 274, 275). Kiva 14 outlined. Note Firepit 3 in top of kiva fill. Masonry box is probable ventilator shaft for Kiva 6. Door opens into Room 183. Tags mark artifact locations on uppermost surface. 50-cm north arrow. (NPS#14766)



Plate 4.7. Eastern plaza area (Plaza 1, Grids 92-93). Unnamed Wall Complex 1, marking a number of possible kivas. 30-cm north arrow. (NPS#15699)

#### Walls

<u>Wall Masonry</u>. Unmodified, irregular, large blocks surrounded by smaller, irregular blocks and moderate amounts of mortar comprised the kiva wall masonry (Figure 4.4D). Courses were poorly aligned and some blocks appeared to have been reused stone. The use of soft, friable, yellowish sandstone, ground smooth on the exposed face in the kiva, is a trait attributed to "McElmo" style masonry of the early A.D. 1100s. This style matches Hawley's (1934) Inferior Type III masonry, which accords with the temporal estimate. Parts of the exterior edge of the wall tops were capped by Surface 1 plaster, which may link kiva construction to the latest surface use.

<u>Wall Features</u>. A masonry, half-moon niche may exist in the southeastern arc of the wall as it did in Kiva 12. This feature was not verified but a short arc of stones beyond the wall suggested its existence.

Wall Plaster. None noted.

# Ventilator

The ventilator tunnel was not uncovered, but the shaft opening (48 by 55 cm) was found about 100 cm south of the walls. An unexcavated, oval pit next to the ventilator opening contained sand and charcoal and may postdate the kiva use.

# Summary and Conclusions

The size and masonry style of Kiva 14 indicate contemporaneity with Kiva 12 and Plaza Feature 4. It, like Plaza Feature 4, was abandoned and filled with trash while Kiva 12 continued in use. The kiva appears to be an early A.D. 1100s model, and, because it is filled with trash of the same general period, we can surmise that the occupation was a short one. The proximity of Kiva 14 to the East Wing associates the nearby rooms within the larger realm of activities that incorporated Kiva 14.

#### Plaza Feature 3

In 1976, about 3 m north of OS 12, a wall was encountered that cut diagonally across a Plaza 1 test trench. A slab-lined firepit was found in the corner where the wall made a right turn. It was thought that the features represented a room isolated from the main roomblock, and so it was designated Plaza Feature 3. A year later the area was stripped of overburden and the remains found to be part of a walled enclosure along one side of Kiva 12 and in front of Room 192 (see the East Wing, associated plaza notes above). After this discovery, the PF 3 designation was dropped.

#### Plaza Feature 4

Six meters north of Plaza Feature 3, the same test trench that revealed Plaza Feature 3 hit deep, stratified, trash deposits that marked the filled interior of a small kiva. At the time, no walls could be located without deep trenching, so the feature was simply designated Plaza Feature 4 until more intensive investigation of the area was later undertaken. Despite its later confirmation as a kiva, the initial field designation was retained to avoid confusion.

This kiva had undergone considerably more remodeling than its neighbors, so intensive testing was required to discern its true nature. Initially the kiva was circular, 500 to 510 cm in diameter, but later reduced to 420 cm in diameter, although its floor diameter may have remained unchanged. Masonry style suggests that this kiva is the earliest of the three in the row. Although considerable probing of its walls was done, the bulk of the fill in the main structure was left unexcavated. All excavated fill was screened.

#### Postoccupational Fill

Five units of deposition were identified during clearing and testing, although others must exist below where we tested.

Layer 1. The uppermost fill covering the kiva was part of the overall deposit of aeolian sand covering the eastern plaza area as Layer 3.

Layer 2. Erosion of the fill surrounding the periphery of the kiva was responsible for the formation of the pluvial sands intermixed with gravelly material. The latter appeared to have been intentionally placed around the exterior kiva wall during construction. The unit was 10-30 cm deep where it was defined along the western kiva wall. It gradually tapered out to the east and covered Layers 3 and 4.

Layer 3. A quantity of artifacts and lenses of charcoal and ash identify this deposit in the kiva as de facto trash. The assortment of artifacts, the firepit remains, and the high frequency of heat-discolored bone (40 percent of 69 elements; Akins 1985a:163) indicate household refuse. The faunal remains were dominated by rabbit, mule deer, and turkey. Trash rose highest in the northeastern corner to spill out onto Plaza Surface 1. At this point it is a short distance to the open door of Room 183, where the trash may have originated. In places, the kiva trash reached depths of 70-80 cm and sloped down toward the center of the kiva along the eastern arc. The trash covered part of the collapsed, secondary masonry, which shows that the kiva had fallen to ruin during or before the episode of trash deposition.

Layer 4. This unit appeared along the western and southwestern edge of the kiva in depths up to 30 cm. It was a mixture of building debris and quarried, sterile chunks of clay and caliche, apparently from the discard of construction material.

Layer 5. Under Layer 4, but exposed only in a deep test next to the ventilator tunnel opening, was another deposit of trash, 10 cm deep, of charcoal, ash and oxidized soil that may be an extension of Layer 3.

Layer 6. In the same deep test was a unit more than 35 cm deep of aeolian and pluvial sands mixed with some cultural material (primarily small stones, charcoal, and adobe). This deposit resembled Plaza Layer 3 (overlying Surface 1) and may be part of the first filling of the kiva after abandonment.

# Floors

No floors were uncovered except in Ventilator 2. Judging from the vertical placement of the ventilators, we presume the floor(s) are about 150 cm below Surface 1.

# Walls

Two periods of wall construction were evident. The original kiva was built of small and large blocks set in rough courses (Figure 4.4B). Spaces between blocks were filled with chinks, and the overall appearance was similar to the Type II style observed in the Central Roomblock with some differences. Plaza Surface 1 extended over a small area of the original wall. The wall thickness was 30 cm. Built against the northern and southern arcs was a later, core-veneer wall, 60 cm thick (Figure 4.4C). The latter was much collapsed and could not be defined for much of the circumference. Its workmanship was similar to the initial wall and better than that exposed in Kiva 12. The style suggests Hawley's (1934:Plate 12) Inferior Type III masonry.

This kiva may have been built like those observed in the small sites excavated around Casa Rinconada in the 1930s, with a narrow bench and slim pilasters. The late wall, then, could have resulted from filling in the space between pilasters. Where the late wall could not be followed is about where pilasters should be located. Powers observed that the late wall at the northwestern side, "neatly cuts back to the early wall face" (i.e., it had a finished end), and he tentatively proposed a wall niche to explain the break. The clean termination of the late wall is exactly what is expected if it butted against a pilaster. Often the pilasters are not tied to the walls they stand against, and collapse, in this case, is not unexpected. Interestingly, a desire to create a continuous inner wall may have also prompted the filling of the southern recess of adjacent Kiva 12.

<u>Wall Plaster</u>. A single coat of brown, clayey sand plaster covered the walls before remodeling. A few smudges of red hematite were also noted, perhaps part of a wall painting. No plaster was noted on the later walls in the areas of our tests.

#### Ventilators

The most complex architecture in the kiva was in the construction of the two above-floor ventilators.

<u>Ventilator 1</u>. The first tunnel built for Ventilator 1 was oriented slightly northeast-southwest and extended an unknown distance but for at least 3 m. We never reached its bottom, although testing revealed an unusual double-decker affair (Figure 4.5). The tunnel entrance into the kiva was blocked by an arc of late masonry, but what could be seen of the aperture was traditional. Two, small, horizontal, lintel poles supported a layer of adobe roofing. The western side of the tunnel consisted of masonry identical to the initial walls; the eastern side could not be seen. Overall width of the tunnel was 45 cm.

It is the tunnel overlying the traditional tunnel that is an enigma. This later tunnel was enclosed by masonry along the western side (and presumably the eastern side) like its counterpart below, except that the walls were set back from the lower tunnel walls by 20-25 cm to create a tunnel 80 cm wide. A maze of rotting, small, pine and spruce or fir posts, 3-5 cm in diameter, covered the upper tunnel floor (the roof of the lower tunnel), which presumably supported the upper tunnel roof. One of the floor posts, a pinyon, yielded a tree-ring date of A.D. 1044vv.

The west tunnel wall was followed south for 3 m before it disappeared. A test pit next to the end revealed that the small forest of posts continued south, bordered by the adobe foundation for the west tunnel wall. The test also brought to light a row of upright slabs paralleling the inside of the west wall that may be part of the lower tunnel lining. Premature backfilling prevented further testing and completion of the tunnel map. No tunnel shaft openings were found for Ventilator 1, and they probably no longer exist.

Ventilator 1 Fill. After abandonment, the upper tunnel filled with 20-25 cm of aeolian sand before erosion and decomposition of the surrounding intentional fill and parts of the ventilating system filled the remaining 35 cm of space to the surface with clayey sand, clay, adobe chunks and stones. Artifacts were sparse. Collapse of the tunnel system may have occurred before Ventilator 2 was built, which suggests a period of kiva disuse, or after final abandonment.

Ventilator 2. When Plaza Feature 4 was remodeled, Ventilator 1 was blocked off and Ventilator 2 built just to the east. It extended 160 cm south where a masonry-lined box (interior = 45 by 48 cm) marked the shaft opening. The tunnel mouth into the kiva was 40-45 cm wide and lined with an adobe coping or collar.

Ventilator 2 Fill. The ventilator fill was merely an extension of Layer 6 described above for the main chamber. A few flat slabs found in the tunnel fill may have been from a collapsed, stone, tunnel roof.

#### Summary and Conclusions

The small diameter of Plaza Feature 4 and the probable use of a narrow bench and tall pilasters suggest construction and use in the early A.D. 1100s, approximately coeval with the adjacent two small kivas (Kivas 12 and 14). The major evidence against an early A.D. 1100s construction



Figure 4.5. Plaza 1, Plaza Feature 4 (kiva) ventilating system, plan and profile. Note upper and lower ventilator tunnels. (Not to scale.)

is the seemingly late A.D. 1000s masonry. Perhaps the kiva was built in the late A.D. 1000s with major remodeling in the early A.D. 1100s. Be that as it may, after abandonment the kiva filled with natural deposits before being used as a trash receptacle while nearby Kiva 12 was still occupied. Doors leading into Rooms 183 and 188 may have integrated use of the nearby interior room space with plaza activities and the use of Plaza Feature 4.

#### Miscellaneous Features

#### Unnamed Wall Complex (Plate 4.7)

A complex masonry wall, also designated as Wall Complex 1, leading off in several directions was found in Grids 72 and 73, and 92 and 93 west of Kiva 14. Masonry appeared crude and incorporated both core and veneer as well as simple and compound masonry construction. A number of kivas and/or rooms are probably part of this complex. Cultural debris was common and suggests trash-filled units. The age of the structures is unknown but presumed to be late because of the ceramic types in association, the estimated size of the postulated kivas (i.e., small), and the contiguous connections. We did no further work on it because of the deep testing required for identifying the structures. Perhaps the complex is similar to the cluster of late kivas and rooms along the southern enclosing arc of Pueblo Alto and in the southeastern corner of Chetro Ketl (see Lekson and McKenna 1983:Figure I.2).

The isolated ventilator shaft noted above was close enough to the complex that the hidden adjoining kiva could be part of it. A ground radar map of the plaza pinpointing a possible kiva in the vicinity of the complex (Vickers et al. 1976:Figure 7) almost certainly was verified by Loose's test trench that yielded subsurface trash deposits. Thus, a number of kivas or subsurface structures must exist west of Kiva 14.

# Other Kivas and Walls

A number of anomalous features found west of the trio of small kivas indicates that much remained buried in this area. Probably at least two or three more kivas exist to be identified. Due west of the ventilator shaft opening of Kiva 14, in Grid 114 (NW quarter), was a rectangular, masonry box (36 by 37 cm inside opening) that could only be another kiva ventilator shaft. We did not test for a kiva but it must lie to the north and next to Kiva 14.

To the south of the complex, in Grids 153 and 154, was a simple, masonry (one-course-wide), wall about 2 m long and 2-5 courses high that ran northeast-southwest. No apparent function could be ascertained for the wall.



Plate 4.8. Plaza 1, Grid 193. Roasting Pit 1 (unexcavated). 30-cm north arrow. (NPS#15696)



Plate 4.9. Plaza 1, Grids 73-74. Roasting Pit 2 (unexcavated). 30-cm north arrow. (NPS#15695)

# Roasting Pits

Two roasting pits, in addition to those described in the fill of Kiva 14, were located in the eastern Plaza 1 area. Roasting Pit 1 (Plate 4.8) was a burned, slab-lined, ovoid pit placed in Grids 192 and 193 probably during the terminal occupation or afterwards. It was placed in the aeolian sands of Layer 1 and measured 127 by 111 cm. Surface area of the pit was 13,240 cm<sup>2</sup>, but if it were at least 30 cm deep, its volume would have been about 397 liters. A second, slightly larger, burned pit (145 by 110 cm) was cleared in Grids 73 and 74 with a surface area of 13,650  $cm^2$ . Roasting Pit 2 (Plate 4.9) had also been placed in the Layer 1 sands of the plaza. Both were similar to those found in the upper postoccupational deposits in Room 103 and Kiva 14 and built against the exterior wall of the East Wing (in Plaza 2). Vivian and Mathews (1965:61, 64) noted a number of others in the postoccupational deposits in Pueblo Bonito and Kin Kletso that may mark late ephemeral activities at the site in the A.D. 1200s or later.

# Summary and Conclusions

Our work along the plaza margins of the East Wing exposed primarily the last use of that area. Whatever earlier use of the space had been, the latest was devoted to small kiva construction and use, specialized lithic workshop activities south of the kivas, and remodeling of the southeastern area of the plaza into a number of irregularly shaped, walled-in spaces (OS 4, OS 6, and OS 12) that reduced the former plaza space. The latter structures all yielded trash dating in the early A.D. 1100s. Aside from testing, none of the structures were excavated, nor were any rooms investigated in the East Wing.

All doors adjacent to the kivas and lithic work area were not blocked and must have integrated the indoor and outdoor activities and the groups that used them. Although the East Wing rooms predate the small plaza kivas by 50 years or more, remodeling and restructuring of the room space is suspected to have been undertaken to fit the restructuring of the spatial and, by inference, the social organization suggested during the last use of the plaza along the East Wing. From several lines of evidence, we believe the last major use of the plaza occurred between A.D. 1100 and 1140.

# Chapter Five

# Miscellaneous Features and Tests Associated with the Main Houseblock

# Exploratory Backhoe Trenches Against the Primary Houseblock

In 1976 a series of backhoe trenches were cut to the room walls through the fill surrounding the house exterior. These were placed to examine the stratigraphy, the depths of walls, and the foundations for the three primary roomblocks. Material from these tests was not screened or saved. All trenches reached sterile and soft, bedrock deposits, so the stratigraphy could only be examined in profile. Descriptions of the stratigraphy are given below for each trench and correlated, when possible, to one another. A fourth trench was cut in 1977 behind Room 138 to assist removal of fill during the excavation of Room 139, but this was later expanded by hand as part of the work in the Central Roomblock (see below).

> North Trench (North of Room 132, Central Roomblock) (Figure 5.1)

Fill (Figure 5.1)

Layer 1. Wall fall from the Central Roomblock comprised the uppermost deposit outside the north room walls. Much of the rubble was in units of sharply-pitched stone from relatively intact, fallen walls. Clay and adobe wall mortar was mixed with the rubble, along with occasional pockets of aeolian sand. Near the walls the deposit reached depths of about 1 m and had fallen on a relatively flat accumulation of sand (Layer 2). This rubble deposit was the same as Layer 1 in the East and West Trenches.

Layer 2. A thin mantle (5 cm thick) of clean, aeolian sand had blown across the last walking surfaces after site abandonment, but before deterioration of the walls. The thin, even thickness of the deposit suggested that the time interval between abandonment and wall collapse was minimal. Because roofing timbers were absent from our excavations, we suspect wall collapse may have been hastened by structural weaknesses resulting from dismantled roofs. This unit may be the same as Layer 3 in the West Trench.



Figure 5.1. North Trench (outside and north of Room 132), profile.

Layer 3. Near the base of the wall veneer, and covering the offset piece of the wall foundation, was a relatively flat deposit of gray clay that appeared similar to the material poured into foundation trenches. This layer extended out 225 cm from the walls and beyond the profile record. The two deposits above this unit are clearly postoccupational, but the evenness and stratigraphic position of the clay would seem to be from human intervention. Its uneven thickness, between 25 and 65 cm, was due to the irregular, underlying deposits, although it did thicken away from the walls. The lower part of Layer 3 was sandier and more heterogeneous than the upper part, with inclusions of charcoal, small pebbles, and tiny lumps of gray adobe.

Layer 4. This was recorded as a thin lens of ashy sand and carbonized brush within Layer 3, probably heating pit contents.

Layer 5. Another trashy inclusion within Layer 3, 10 cm thick and under Layer 4, was a deposit of orange sand, small stone, adobe, and charcoal.

Layer 6. A sterile lens of poorly compacted, fine sand, 7-11 cm thick, with lumps of clay, extended out from the wall foundation under Layer 3.

Layer 7. Where Layer 6 pinched out, another lens of possibly heating pit contents had been spread, resulting in Layer 7.

Layer 8. The lowermost, cultural use of the area was a compacted surface of thin, construction mortar overlying the sterile deposits into which the wall foundation had been placed. A few spalls stuck in the surface attested to use of the surface during wall construction.

Layer 9. This sterile deposit consisted of compacted, clayey sand that directly overlay natural clays and bedrock in the area. This is the same deposit as Layer 7 in the East Trench.

Layer 10. Resilient, white clay that lay directly over the bedrock was the lowermost unit trenched. This was recorded as Layer 8 in the East Trench and Layer 4 in the West Trench.

### Walls

<u>Wall Foundation</u>. The Room 132 foundation was different from other primary-wall foundations, because it was started on top of sterile soil, and the trench was formed for it by piling other deposits against it. Otherwise, the method of construction was similar to others reported here.

# North Trench (North of Room 138, Central Roomblock) (Figures 5.2-5.3)

The North Trench was intended to extend the continuous profile that ran through Rooms 138, 139, 142, and 143 as well as to examine a slice of the suite exterior. The profile had to be offset 1 m to the west because a very large trench had been placed against the exterior of Room 138 to allow the backhoe access for removing backdirt from the excavation of Room 139.

#### Strategy

Most of the postoccupational fill (primarily wall rubble) had been removed by the backhoe on the alignment needed for the profile, so the test trench was placed against the west side of the older trench to map the remaining fill. Below the backhoe cut, an 80-100-cm-wide, 3.4-m-long trench was sunk to sterile soil. Fill was removed in four levels. Eleven major units of deposition were defined in the resulting overall profile, but no further excavation was done except to extend the trench an additional 7.5 m north to follow Surface 1. In the main trench only Level 1 was not screened.

Level 1. This included all the fill (postoccupational) above Surface 1. Layers 1 through 6 comprised this deposit.

Level 2. This arbitrary 20-cm-thick unit removed all of Layer 7 and the upper half of Layer 8.

Level 3. The lower half of Layer 8, Layers 9-10, and structural Surface 2 were caught in this 20-cm-thick unit.

Level 4. Finally, the remaining fill (Layer 11) under Surface 2 to sterile deposits was removed in this 10-cm-thick unit.

Fill (Figure 5.3)

Deposits in the North Trench were similar to those in the adjacent rooms.

Layer 1 (Plate 5.1). The uppermost deposit, like those elsewhere, was primarily a compacted layer of gray mortar and wall stone, probably part of the fallen north wall of Room 138.

Layer 2. Mounded against the north wall of Room 138 was more wall debris, including gray and reddish adobe fragments, in a reddish tan, sand matrix.

Layer 3. Under the wall fall was a relatively horizontal deposit of loosely compacted wall stone and roofing debris. Juniper bark strips and fragments of roof-impressed adobe were common. Considering the remaining height of the north wall (over 3 m), it is unlikely that much of the roof-



Figure 5.2. North Trench (north of Room 138), plan.



Figure 5.3. North Trench profile outside Room 138.



Plate 5.1. North Trench stratigraphy outside Room 138. Uppermost deposit of wall rubble is Layer 1. Vertical strings are 1 m apart. Looking west. (NPS#17296)



Plate 5.2. West Trench (exploratory backhoe trench to the exterior of Room 229). Above and to left of scale is wall foundation resting on sterile white clays (Layer 4). 15-cm scale sits above bedrock. (NPS#13613)

ing from Room 138 could have collapsed into the North Trench. If the roof timbering was robbed, as seems likely, then much of the adobe roof covering might easily have been tossed northward during the dismantling process. Some evidence suggests that the roofing remains possibly indicate that a balcony or covered area extended north from the rooms. Such balconies were common to the north-facing exterior wall of other canyon greathouses (Holsinger 1901; Lekson 1984:37). Holes for new braces set behind the north wall of Pueblo Bonito in 1981 yielded compacted surfaces and vegetal matter, which was interpreted as evidence of a collapsed balcony (C. Randall Morrison, personal communication 1981).

Layer 4. A series of weakly laminated sands and clays, 20-25 cm thick, underlay the roofing. It was in this layer that the first distinct linear path 1.3 m wide, 12-14 cm deep, and apparently running parallel to the north room walls was evident.

Layer 5. This unit had slightly larger sand grains, but otherwise was identical to Layers 4 and 6. A shallow heating pit (HP 1), mostly destroyed during backhoe operations, had been scooped into the top of this deposit. Although the strip pinched out to the north and south, it appeared to conform to the linear path evident in Layer 4.

Layer 6. This was identical to Layer 4 and overlay Surface 1.

#### Surface 1 (Layer 7)

A thick, multiple-surfaced floor of pure gray clay similar to that used in the Central Roomblock wall mortar extended 4.5 m and possibly 8 m north of Room 138. In the northern half of the test trench, it was overlain by less than 2 cm of fine tan sand similar to wall plaster. The bulk of the unit was formed by two or possibly three layers of gray clay separated by discontinuous lenses of clean sand less than 1 cm thick. Each layer was between 4 and 5 cm thick.

Under the southern part and separated from it by 6 cm or less of clean sand was another similar layer of gray clay. It extended north 225 cm before pinching out. It varied from 7 cm thick at the southern end to less than 1 cm at the northern end. It lacked the finished upper surface and regularity of Surface 1 and was not designated as a separate unit.

<u>Surface 1 Features</u>. Three pits were found in the surface when it was cleared. A pair were located about 60 cm north of the wall, 28 cm apart. OP 1 was a shallow, basin-shaped pit whereas OP 2 appeared to have been a posthole. A third pit (OP 3), 186 cm north of the wall, was discovered in the profile and it, too, appeared to have been a posthole. If the latter two pits were postholes, then this suggests a roofed structure that once paralleled the back wall. Only further excavation along the back wall could help substantiate evidence for a balcony.

Surface 1 Artifacts. None.

#### Layer 8

Trash, abundant small, charred brush fragments, and small nodules of adobe comprised this läyer directly under Surface 1. The lack of internal layering suggested to Lekson that the layer had been intentionally placed or redeposited. Ceramics were limited to a Red Mesa assemblage that seriated in the early A.D. 1000s (Volume I, Chapter 8).

# Surface 2

This was a poorly defined, unprepared, use surface that separated Layer 8 from Layers 9 and 10. It was best defined near the wall of Room 138.

Surface 2 Features. Against and paralleling the outside of the wall was a narrow, 20-30-cm-wide trench filled with lumps of clay and spall fragments. A "cap" of gray clay covered the west end of the exposed trench. WT 1, like others of its kind in the Central Roomblock, appears to have been associated with the construction of the adjacent wall.

Surface 2 Artifacts. None. Two sherds and a corncob came from the fill of the wall trench.

#### Layer 9

Clean sand, like that in Layers 4 and 6, underlay Surface 2 and seemed to mark the northern periphery of a linear convexity paralleling the wall.

#### Layer 10

A layer of clean, probably aeolian sand that directly underlay Surface 2, in part, and Layer 9 also appeared modified by the linear convexity seen in later deposits. It was slightly more red than others above it.

#### Layer 11

The earliest cultural deposit in the series was composed of sandstone spalls, tan and gray mortar fragments, and other debris from construction activities mixed in a tan, sand matrix. Some of the mortar, however, appeared to have come from dismantled walls. Few artifacts were recovered from the deposit, but ceramics indicated it was a Red Mesa assemblage dating to the early A.D. 1000s.

#### Surface 3

The earliest surface of use appeared to be the leveled and smoothed top of sterile soil. As such, it was identical to Floor 2 in nearby Rooms 138 and 139 and common to all three areas before room construction partitioned the area.

Surface 3 Features and Artifacts. None.

#### Walls

<u>Wall Plaster</u>. Apparently the remains of a single, brown coat of plaster were found along the base of the wall exposed in the trench but other details are lacking.

West Trench (West of Room 229, West Wing) (Figure 5.4 and Plate 5.2)

Fill (Figure 5.4)

Layer 1. Adjacent to the room walls was a thick mass, almost 2 m deep, of wall stone and mortar overlain in places by a thin mantle of aeolian sand.

Layer 2. Underlying the wall fall was a 10-cm-thick layer of clean, clayey sand with some lumps of gray clay (2-4 cm in diameter) scattered through the upper part. Because the material rested on the clean, aeolian sands of Layer 3, the deposit might mark some deterioration of the adjacent walls and roofs, in conjunction with natural accumulations of sand.

Layer 3. The fine, clean, aeolian sands of this deposit, 6-10 cm thick, apparently indicate natural accumulations occurring after site abandonment. This fill was the same as Layer 2 in the North Trench (north of Room 132) and Layers 3 through 5 in the East Trench.

Layer 4. Although the recorders did not recognize a use surface on top of Layer 4, several aspects of the profile suggest otherwise. The top of the deposit was unusually flat and probably was artificially flattened. The material coped up slightly to meet the wall foundation and was in the same stratigraphic position as the use surface identified as Layer 3 in the North Trench outside Room 132. If it was a use surface, then it was nearly 1 m deeper than the initial ones in the other trenches. Layer 4 was composed of natural sterile deposits of white clay identical to Layer 8 in the East Trench and Layer 10 in the North Trench (north of Room 132).

Layer 5. The bottommost sterile unit was fossiliferous sandstone bedrock.

East Trench (east of Room 181, East Wing) (Figure 5.5)

This backhoe trench in Plaza 2, Grid 121, revealed stratigraphy more complex than that noted in the North and West Trenches. Highlights of the results included discovery in the fill of a huge firepit that was one of a series built against the East Wing (see Plaza 2 notes), possibly in conjunction with road activities. In addition, a remnant strip of brown wall plaster, 45 cm high, articulated with a thin, adobe, plaza surface (Layer 5) near the base of the exterior room wall.



Figure 5.4. West Trench (outside and west of Room 229), profile.



Figure 5.5. East Trench in Plaza 2, Grid 121 (outside and east of Room 181), profile.

Fill (Figure 5.5)

Layer 1. Stone rubble and clays from fallen room walls characterized the uppermost deposit, as they did in the other backhoe trenches. The deposit reached a maximum depth of almost 1 m.

Layer 2 (Firepit). A large depression sunk into Layer 3 was filled with ash, burned sand, and slabs, and oxidized brush and fragments of ponderosa pine. One of the latter yielded a tree-ring date of A.D. 1021vv. For 150 cm above the pit, the exterior room masonry had been burned red. In profile, the pit was 125 cm wide and 53 cm deep with a stone resting at its eastern lip. Initially, the feature went unrecognized as a firepit, but later excavations in Plaza 2 near the southern end of the East Wing revealed others (OP 2 and OP 3) of similar proportions, contents, and location. All had been crudely lined with stone blocks emplaced with little or no mortar, and each revealed a lens of burned material, to the east downslope, that may have resulted from cleaning out the contents. A break in the center of the exterior, Room 185 wall marked the position of a col-Thus, all the firepits along the East Wing flanked lapsed door lintel. doors that opened onto Plaza 2. Much of the firepit was destroyed by the backhoe before its existence was noted.

Layer 3. A pile of aeolian sands up to 75 cm deep, and sprinkled with charcoal flecks, was banked against the room walls. This unit was interspersed with lenses of clay and sand, probably water deposited, and of charcoal that resulted from impromptu fires built on the sands, or from cleaning out heating pits. Excavations in Plaza 2 (Layers 2 through 5) revealed numerous use and natural surfaces in the same deposit.

Layer 4. This was another deposit of fine sand mixed with some pieces of small, rounded stone, calcium carbonate, charcoal flecks, and adobe and clay lumps. This thin, 5-12-cm-thick strip may be water deposited and natural. Reexamination of the stratigraphy by Toll, however, suggests that it was the same unit as Layer 5, Level 2 in the Plaza 2 excavations, which was thought to have been intentionally deposited.

Layer 5. Like Layer 3, this material was primarily natural sands, but close to the wall a number of laminae may mark remnants of use surfaces, because of their evenness and similarity to other plaza surfaces. There was no charcoal. The bottom of the 2-20-cm-thick unit overlay an application of adobe that extended out from the wall 27 cm and merged with the base of the wall veneer. Given its location at the bottom of the wall, this surface was probably used in conjunction with the wall construction.

Layer 6. Similar to Layer 4, this accumulation was composed of fine sand, but with more compaction, sandstone, and adobe nodules. Charcoal was absent. The unit was 5 cm thick and could be traced 150 cm out from the walls. It may have been formed from the deposition of construction material.

Layer 7. Hard, sterile sands, 60 cm deep, underlay Layer 6. The wall foundation trench was cut almost entirely (48 cm depth) into this

deposit. The top was very flat, as if it had been deliberately leveled. This unit corresponded to Layer 9 in the North Trench (north of Room 132).

Layer 8. A natural deposit of sterile, resilient, white clay rested directly over the soft, decomposing bedrock. This was also found in the West Trench (Layer 4) and the North Trench outside of Room 132 (Layer 10).

# Summary and Conclusions

Overall, in kind and depth the stratigraphy was, not surprisingly, very similar to that exposed in Grids 181 and 201 during excavation of part of Plaza 2 (see notes on Plaza 2).

# <u>Plaza l</u>

Plaza 1 was the second largest bounded, outdoor area at Pueblo Alto and initially covered approximately 4.6 hectares. With the addition of kivas and other structures, this area had been reduced to about 3.4 hectares by A.D. 1100. The immensity of the area precluded random sampling Instead, testing was designed on a scale large enough to be meaningful. to answer specific questions. Two phases of testing were implemented for Plaza 1. Exploratory testing was conducted the first year to locate major architectural units (e.g., kivas, rooms, etc.), to ascertain the nature of the stratigraphy, and to probe the depth of plaza deposits. Four trenches, 1 m wide, were run parallel to the Central Roomblock and the East Wing, along the southern part of the plaza, and north-south across the eastern third of the plaza in the area of a suspected great kiva. These trenches were limited primarily to testing of the uppermost surfaces and postoccupational fill. An additional quest for the great kiva resulted in numerous pits being sunk to bedrock in the central area in 1977.

Ground radar studies conducted in the plaza and at other canyon greathouses between 1974 and 1975 produced numerous indications of buried structures (Vickers et al. 1976) Three potential areas in Plaza 1 were suggested for testing from radar results and two (Plaza Feature 5 and a probable kiva in Grid 71) were verified in 1975. The test into the kiva revealed deep stratified trash deposits (Vickers et al. 1976:Figure 7), from the late A.D. 1000s, that yielded, among others things, a copper bell. Radar echoes suggested the structure was about 7.5 m across--the size of a potential court kiva. The Unnamed Wall Complex (see above), found two years later close by, may have been part of the eastern side of this kiva. A third structure predicted by radar was later found as Kiva 11 in 1976.

More specific plaza testing, including wide-scale stripping and deep probing, was initiated in 1977 and 1978 to increase our understanding of outdoor areas adjacent to the room excavations.

#### Postoccupational Fill

All testing in the plaza revealed a mantle of 10-15 cm of light tan, aeolian sand that contained little cultural debris. Away from the collapsed walls, only one or two use surfaces could be discerned that had not been eroded away. Accumulations between these few surfaces were generally aeolian sand without much cultural material. Belabored discussion of these surfaces and deposits from the 1976 testing will not be missed (see Windes 1977, instead). Perhaps the single most informative piece of information gained from the initial plaza testing was the surprising absence of a great kiva. Given the shallowness of bedrock under most of the plaza, perhaps 40 cm deep or so, it is now certain that a great Away from the walls, appreciable cultural structure did not escape us. material not filling pitstructures came only from Plaza 1, Grids 202 and This material dated to the construction of the site or earlier, but 203. we could not explain its presence for the location (south central area of the plaza) in which it was found.

Most extensive testing close to the roomblocks revealed deep, stratified deposits, which are described with the various roomblocks adjacent to the tests. Miscellanous tests and findings for Plaza 1 are covered below.

#### Kiva 2

Kiva 2 is a large court kiva, approximately 8.6 m in diameter, located in the northwestern corner of Plaza 1. Just east of the kiva were five beams, lying east to west, that may have been part of the wall or pilaster construction (intramural beams?). All were badly rotted and of ponderosa pine or pinyon. The visible walls of the kiva butt against the corridor rooms of one of the five, original, Central Roomblock suites (Rooms 123 and 126-129). The arrangement of the kiva and the adjacent northern rooms is very similar to that of the excavated suite (D) in the Central Roomblock. For this reason, it is probable that the initial kiva was once larger but was then reduced in size when the narrow, corridor rooms (Rooms 130-131) were added. Either way, it is evident that access to the suite behind the kiva was always from the kiva, because the central door of Room 127 opened directly onto the Kiva 2 roof.

Use of Kiva 2 may have been superseded by a very small kiva built into Room 223 next to Kiva 2 in the early A.D. 1100s. Two, small, rectangular, masonry boxes (OS 1 and OS 2) in Room 223 (south wall) were probably the small kiva's ventilator-shaft openings. A door connected Room 127 to Room 223, directly behind Kiva 2. The door was probably secondary, because it was not centrally placed. Trash recovered during corner testing and wall clearing of Kiva 2 was deposited in the early A.D. 1100s, but the abandonment of a large court kiva in favor of a very small kiva is the main reason for postulating the early A.D. 1100s shift.

# Kiva 3

Between Kiva 2 and Kiva 10 was a large, saucer-shaped depression that clearly marked a large, court kiva. Initial shallow testing failed to expose any walls, so a 190-cm-deep, test pit was placed at the western edge of the depression. This revealed a deep pit cut into the soft bedrock. At the bottom of the test pit, a small pocket extending horizontally into the bedrock revealed decayed wood and a cache of 5 shell beads (3 elongated and 2 disc-shaped) and 52 pieces of turquoise scrap (25 were ground). Although a kiva bench could not be identified within the small test pit, the pocket probably marked the remains of a pilaster log stuffed with offerings in a manner described for kivas at Pueblo del Arroyo and Pueblo Bonito (Judd 1959, 1964). Apparently, the masonry wall liner and pilaster had fallen from their bedrock footings into the kiva.

A sharp rise in surface elevation toward the east must mark the eastern side of the kiva, although this was not verified by testing. From the test pit on the west to the sharp rise on the east, the kiva diameter is approximately 11.1 m. Of course, this marks the excavation into bedrock for the kiva, not the inside diameter; nevertheless, it is indicative of a very large, court kiva similar in size to the small great kiva at Chetro Ketl (Vivian and Reiter 1960:45). Fill within the test pit was clean, aeolian sand, indicating that the kiva may have been in use until site abandonment.

Kiva 3 is fascinating for its relationship to the Central Roomblock, which mirrors the adjacent excavated suite (D). Apparently Kiva 3, like Kiva 10, once nearly connected to the huge,  $40-m^2$  rooms directly to the north. We did not conduct deep testing next to the roomblock behind Kiva 3, but the kiva must have eventually been made smaller to accommodate additions (Room 141) to the corridor room (Room 135) that overlay the kiva's projected wall arc. Room 135 was of identical masonry to Room 143 (behind Kiva 10), and also revealed a finished eastern end of its south wall that would have left the room open at one end during its initial occupation. We can only surmise that the arrangement was changed when Rooms 140 and 141 were added to provide direct access between these latter rooms and Kiva 3. In short, the arrangement of the rooms and the associated plaza (on the west side), adjacent to Kiva 3, is seen as being almost identical to that for Kiva 10 and its associated areas.

#### Kiva 8

In the southwestern corner of Plaza 1 was a large depression marking a court kiva about 9.5 m in diameter. Wall clearing revealed that the kiva had undergone remodeling. Four pilasters were exposed during trenching, and probably two more exist, if all were evenly spaced. The ones we exposed were 104-128 cm long and 20 cm thick. Large Chacoan court kivas rarely exhibit elevated pilasters, so these are thought to be late-A.D. 1000s or early-A.D. 1100s additions similar to the one found in Kiva 10. The masonry of both the pilasters and the kiva walls, however, is generally of small and medium-sized, tabular, slab stones exhibiting little grinding and separated by occasional use of spalls. This type of masonry is regarded as a style prevalent in the A.D. 1000s, rather than the early A.D. 1100s.

A curving wall, parallel to the main kiva wall, connected the two western pilasters, 246 cm apart. It was built of small, hard, tabular stones and left a space 111 cm wide that had been intentionally filled. Another wall, discovered extending into the kiva from the east-southeast side, must have been built after the kiva was abandoned. We could not follow the wall to its termination without recourse to deep testing, which was not done. Finally, the masonry-lined, ventilator shaft, measuring 43 by 32 cm on the inside, was discovered south of the kiva. After mapping, the kiva was filled with backdirt.

Ceramics discovered during trenching suggest that the structure had served as a trash receptacle in the early A.D. 1100s. Based on its size, the kiva construction and use can be tentatively placed with the initial construction of the greathouse, or shortly afterwards, in the middle A.D. 1000s, although its placement does not spatially link it to a particular room suite. It is closest to Rooms 101 and 102 at the end of the West Wing. The cluster of small rooms and kivas (Kiva 9) partly around, but not over Kiva 8, suggested that the court kiva may have been incorporated with this early A.D. 1100s addition before it was abandoned. Despite the style of masonry in the Kiva 8 remodeling, the tall pilasters and wall cutting across the fill in Kiva 8 are consistent with the typical, early-A.D. 1100s rehabilitation of older structures.

# Kiva ll

Exploratory trenching in 1976 revealed a ring of masonry, just below the surface, about 3.3 m across in the area examined by ground radar by Vickers et al. (1976). Radar echoes suggested a structure about 4 m across and less than 2.5 m deep. Our wall clearing barely removed the upper 10 cm of fill, but trash deposits and a ventilator were not found. Based on size, the kiva undoubtedly was built and occupied in the early A.D. 1100s or later.

# Kiva 13 (Figures 5.6-5.7)

Backhoe testing for a great kiva in Plaza 1, Grid 159, revealed trashy fill that extended deeper than the known depth for bedrock nearby. A small pit excavated by hand failed to resolve the mystery, so it was expanded into a trench 330 cm long and 85 cm wide across half the northern end of the grid. Eventually, depths of 198 cm below the present ground surface were reached in a small pit at the bottom of the trench (not shown on the profile) without reaching sterile deposits. A total of  $4.2 \text{ m}^3$  of



300







300



Figure 5.7. Plaza Feature 1 and associated tests, overall plan.

fill was removed from the trench, all of it 1/4 inch screened. The fill was removed in arbitrary units (levels), but the cultural material was not correlated to the natural units of deposition that are described below.

Based on the slope of the stratigraphy, we may have been halfway across a very large, trash-filled pitstructure, which would make it a large court kiva about 9.3 m in diameter. An estimate of its overall location places it partly under Room 5 of Plaza Feature 1. The eastern end of the trench was at or near the eastern periphery of the kiva, although no structural remains were discovered. Although the structure could have served as a great kiva, like any of the large court kivas, other plaza tests nearby insure that the structure could not be in the same size category of the classic great kivas of this time period that exceed 10 m in diameter.

Fill (Figure 5.6)

Layer 0. The uppermost deposit in the trench was unconsolidated aeolian sand, 10-15 cm deep.

Layer 1. A compacted, clayey sand with a number of small stones, lots of stone or clay nodules, and a low density of charcoal flecks was the last cultural deposit filling the kiva.

Layer 2. This unit was essentially the same as Layer 1, except for greater hardness and more stones.

Layer 3. Fine, tan sand with 10-20 flecks of charcoal per 100  $\text{cm}^2$  comprised this layer.

Layer 4. The last major episode of trash deposition in the kiva was revealed as Layer 4. A matrix of ashy, sandy fill yielded chunks of charcoal, stone, and clay along with a high density of charcoal (30 per 100 cm<sup>2</sup>). Occasional pockets of soft, gray ash and carbonized corncobs marked heating pit contents. Chipped stones were recovered in clusters, indicative of individual dumps. Both sherds and bones were also common.

Layer 5. A deposit similar to Layer 3, with slightly larger charcoal pieces and occasional lenses of gray ash, occurred under Layer 4. In Level 5, several pieces of an adobe collar covered with gray ash were re-covered that probably came from Layer 5 or Layer 4.

Layer 6. Fine sand speckled with charcoal flecks (20 per  $100 \text{ cm}^2$ ) and chunks of possibly roofing clay defined this deposit. This deposit may represent the remains of a razed structure.

Layer 7. This was a thin lens of yellowish clay.

Layer 8. This layer comprised a lens of gray ash and charcoal that was derived from a singular episode of heating pit content discard.

Layer 9. Like Layer 8, this was another lens of charcoal in tan sand.

Layers 10 and 11. Both units were lenses of gray ash and charcoal.

Layer 12. Unlike those directly above, this was a major deposit, of brown sand and a moderate density of charcoal flecks and calcium carbonate nodules.

Layer 13. A hard, clayey sand similar to Layer 2 contained fragments of soft, white bedrock, a little charcoal, and some stone and sherds.

Layer 14. Similar to Layer 6, this unit consisted of brown sand and numerous lumps of clay. At the base of the trench's western end in Level 6 a number of wall plaster fragments, 3 cm thick and sooted, probably came from Layer 6.

# Summary and Conclusions

Many of the layers can be identified as major episodes of trash discard from individual container loads. Structural debris from razed buildings, heating pit contents, debris from stone tool-making, and other activities were the primary trash constituents. Ceramics mark deposition between A.D. 1050 and 1100 at a time when the Trash Mound was the focal point of trash discard. In the early A.D. 1100s, Plaza Feature 1 was built over the abandoned structure. Thus, the kiva, if it can be so called, was one of the earliest to be abandoned at the site, before the end of the primary occupation. The high frequency of Washington Pass chert (material type 1080) coincides with its use and discard in Room 110 and the Trash Mound (Cameron 1985: Table 25). Morrison Formation material, however, occurred in higher frequencies than in other coeval units, and it reduced the proportion of the 1080 chert. The lack of turkey remains is also consistent with the period of deposition (Akins 1985a), whereas rabbit remains were plentiful, followed by prairie dog and mule deer, and were frequently stained brown from cooking. The moderate amount of checking (15 percent) suggests the bone, at least, was not exposed for long periods of time. Bone density for the trench was 124 pieces per cubic meter and preservation was good.

The stratigraphy and depth of the deposits almost certainly fill a large, court kiva built during or shortly after the primary construction of the greathouse in the early or mid-A.D. 1000s. The period of trash in-filling attests to a relatively short use, however. Perhaps the use of Kiva 13 was transferred to Kiva 8 nearby, which enjoyed a somewhat longer span of use. Neither Kiva 8 nor Kiva 13 was spatially linked to specific room suites, in contrast to those along the Central Roomblock. Nevertheless, their location close to the West Wing and far from the other roomblocks suggests an association with the West Wing households. Plaza Feature 1 (Figures 5.7-5.8)

A small mound of rubble in the western end of Pueblo Alto's central plaza (Plaza 1) was wishfully envisioned as a possible platform mound, irrefutable testimony of a Mesoamerican connection. Wall clearing revealed, instead, a five-room structure that had grown by accretion (Figure 5.7). The ground plan, haphazard room additions, and the Red Mesa ceramic refuse area 11.5 m to the southeast of Room 5 (in Grids 202-203) suggested an early Pueblo II house. Excavation, however, revealed a special-use structure built in the early A.D. 1100s.

#### Strategy

The fragile walls were difficult to outline by trenching. Therefore, a test trench 33 cm wide and 120 cm long was cut through the rubble from the north until a wall was encountered. From there, the wall perimeters were expanded by sweeping the surface of the suspected alignments. The test trench yielded much stone from collapsed walls including trough metate fragments (12) and a rare, whole metate with a hole punched through the bottom. Trash was also common. After we cleared walls and took overhead photos, we mapped the structure with alidade and plane table.

The plan was reminiscent of a small house with the large (and potential living area) rooms to the south backed by smaller, storage-sized Thus, the southernmost room was selected for testing first. Α rooms. north-south test trench across the midpoint of Room 5 yielded wall fall and trash but no evidence for a south wall. Under the trash was a poorly compacted, clayey, use surface. Room 5, thus, appeared to have been a partially enclosed, outdoor area that overlay part of Kiva 13. The area and kiva may not be contemporary, however. The test trench was then extended north across Room 3, which was subsequently excavated in its entirety. The unusual nature of Room 3 prompted further investigation the following season into Room 4 directly to the east. Door access between Rooms 3 and 4 suggested that Room 4 might aid in the interpretation of Room 3, but it contained little relevant information. The remaining rooms were not tested.

All material was screened through 1/4 in. mesh except for features and floor fill, which went through 1/8 in. mesh. Horizontal control was maintained by test trench and grid number (Figure 5.8), feature, or point location. Vertical control was kept from a datum near the northwestern wall-top corner (259 cm below Datum 8). Backdirt from the room excavations was piled just east of Plaza Feature 1 and then used to refill the rooms along with backdirt from the Central Roomblock.

#### Walls

The walls of all rooms were typically a single or double stone course wide without a separate core. Walls were 35-50 cm wide. Abutments suggest that Rooms 3-5 were built first, followed by Room 1 against the north



Figure 5.8. Plaza Feature 1, grid plans.

wall of Room 3 and then Room 2 to the northeast. The fine workmanship of the main roomblocks was not evident here. A high proportion of stone was soft, friable, and of varying colors from whites and grays to reds and Burned stone (20 percent in one wall) and broken, ground stone browns. tools were plentiful and indicate much recycling of building materials. Grinding and pecking of the exposed stone faces was infrequent and limited primarily to the very large stones. Little attempt was made to maintain courses or bands of similar-sized stone. Instead, a variety of sizes was incorporated into the same face and course. The most even wall facing was found in the north wall of Room 3 where large and medium-sized, tabular stones and few chinks gave the appearance of Hawley's (1934) Type 2 style. The remainder was similar to her Inferior Type 3. The stone was generally unmodified except for one side that was fractured and left exposed in the wall. A variety of chinks and spalls were employed primarily to fill gaps created by the irregularities of larger stones.

> Room 3 (Figures 5.9-5.10 and Plate 5.3)

# Strategy

The extension of the Room 5 test trench across Room 3 was designated Test Trench 1. This was excavated in natural units instead of levels. The remaining bulk fill to the east and west was subdivided and removed. The room was excavated in its entirety but plaza deposits underneath were only sampled. Subfloor tests 1 m<sup>2</sup> were limited to the ends of the east-west profile against the walls. The western one was only 25 cm deep, and the eastern one extended 50 cm down. Neither reached to sterile deposits. An additional pit was put at the northern end of the north-south profile line against the wall. In this one, consolidated bedrock was reached at a depth of about 155 cm below Floor 2. Room 3 is 625 by 355 cm (22.2 m<sup>2</sup>) in size.

# Postoccupational Fill (Figure 5.9)

The room fill was barely 60 cm deep, and the clear sequence of deposits evident in the primary Pueblo Alto rooms was absent here. The room appeared to have filled rapidly without major accumulations of aeolian sand. The bulk of the fill was characterized by wall fall (3.5  $m^3$  of stone) and light trash.

Layer 1. The uppermost unit in the room consisted of aeolian sand with little cultural material, aside from occasional sherds and stone spalls. It averaged about 10 cm or less in thickness and blanketed the room.

Layer 2. This deposit was characterized primarily by the relatively intact remains of the north wall that fell across the room. Thickness ranged between about 30 and 45 cm. Mortar from the wall was brownish in color rather than the gray shale clay used for the initial Pueblo Alto



Figure 5.9. Plaza Feature 1, Room 3, profiles.



Figure 5.10. Plaza Feature 1, Room 3 (Floors 1 and 2), plan view.


Plate 5.3. Plaza Feature 1, Room 3, with uppermost floor cleared. Note the three huge firepits or ovens. 30-cm north arrow. (NPS#15814)

foundations. Cultural material was scarce and may have derived from wall construction.

Layer 3. The lowest major accumulation occurring after abandonment of the room was a trashy unit of brown sand marked by concentrations of whitish, decomposed bedrock, charcoal, juniper splints, and roofing impressions. The roofing occurred primarily along the north wall. Nearly 60 percent (n = 33) was within 1 m of the wall and 76 percent within 2 m of the wall. Stones were common nearest the walls in both Layers 3 and 4 and may derive from deterioration of the wall tops. Much of the stone was burned (49 percent of the 757 pieces), although before its use for construction. Layer 3 rested on the floor in the northern half and the western third of the room and covered the entire room from 25-45 cm thick. Ceramics reflect deposition after A.D. 1100. Faunal remains were limited primarily to this deposit and Layer 4. Cottontail and jack rabbits. prairie dogs, and turkeys comprised 11 of the 17 individuals documented in the postoccupational fill (Akins 1985a). Fragments of two mule deer antlers were also recovered.

Layer 4. The first trash deposition in the room occurred when burned debris was dumped along the northern half and the eastern side of the room. Ash, burned brush, tree wood, adobe, and trash extended in a sheet 10 to 17 cm thick and 160 cm out from the east wall. The material was similar in composition to that recovered from the room firepits, although the incidence of burned bone was slightly higher in Layer 4 than for material recovered from the firepits (26 percent versus 17 percent). A film of ash resting directly on the floor extended across the southeastern corner and northeastern quarter of the room and down the center, almost reaching the west wall. Its extension across the large firepits postdates their last use. Ceramic matches (pieces fitting together) recovered from both Layers 3 and 4 and from the firepit contents, however, indicate approximate coeval deposition for all these units. A small, scruffy heating pit on top of the debris indicates continued intermittent use of the room similar to the use on postoccupational deposits noted in other rooms. Eleven pieces of ponderosa pine charcoal from Grid 6 yielded seven noncutting dates between A.D. 1010 and 1027 (Volume I, Table 8.4). Grid 18 yielded four pieces of undatable pinyon, and burned brush and other tree wood came from other grids. Although probably once structural wood, the charcoal probably came from firepit cleaning.

### Floor 1 (Figure 5.10)

A single, continuous flooring was difficult to follow, given the numerous replasterings and plaster patches scattered among and between the huge, floor firepits. The initial flooring (Replastering 9) was marked by a film of calcium carbonate. It coped onto the plasterless walls near the base of the masonry. On the western side the floor plaster tied to the top of the foundation. Up to eight fragile replasterings of limited extent and 3-10 mm thick coalesced with the original surfacing. Each was separated by an accumulation of clean sand (occasionally ash and charcoal) ranging from a few millimeters to 6 cm thick. These were not recorded as "layers" except for a strip of sand north of Firepit 2 designated Layer 5. Replasterings were generally found along the walls and tapered to extinction a few centimeters away from the walls. In two cases the plaster lapped onto the wall a few centimeters and was protected by later replasterings. Although this may be evidence for plastered walls, the complete absence of wall plaster above the last replastering suggests otherwise. The number of plastering episodes reveals that floors were kept in good repair.

Floor 1 Features. The floor had a number of pits, the most impressive being three, huge firepits or ovens (Figures 5.11-5.13, Plate 5.4). Two (FP 1-2) were centrally located whereas the third was placed near the southeastern corner. All were rectangular with rounded corners, 102-130 cm by 71-99 cm and 76-125 cm deep. A narrow shelf or lip, 10-15 cm wide and about 10 cm below the top, encircled Firepits 1 and 2 and the long sides of Firepit 3 (Plate 5.5). These evidently were for placing stone covers, although the lids were not found. Each was lined with small, tabular stones set horizontally and covered with many coats of adobe plaster. Tops were plastered flush with the flooring, although large, unmodified stones partly encircled each firepit along the top edge. Firepit 3 had been reduced in size by additional masonry in the eastern end.

The fill of all three firepits, or ovens, contained multiple layers of ash and brush and tree charcoal. These yielded a myriad of wood species and the latest tree-ring cutting dates of any canyon site (A.D. 1132r; Volume I, Table 8.4). The association of dates with wood species is nonrandom and suggests at least two sources of procurement (see Volume I, Chapter 7).

At the bottom of each of the two central firepits were two small, unfired, mud bowls (Plate 5.6). These offerings may have been placed when the pits were first built or after the last replastering. A similar unfired mud bowl was found in a firepit at Mug House (Rohn 1971:245). Fill layers within each oven probably mark a single or group of related firings, although there is no evidence of cleaning once the last series of layers started to accumulate. In FP 2, major episodes of use were marked by a stone-lined bottom (Plate 5.4B), with three liners being set in the fill before abandonment. Earlier plasterings (at least 4-5 in Firepit 1), however, mark periodic cleanings. The contrast in fill deposition among the three firepits suggests that they were not used concurrently for the same function, although sherd matches reveal that Layers 2 and 3 in FP 1 and Layers 1 to 7 in FP 2 (along with postoccupational Layers 3 and 4) were formed nearly simultaneously.

Clearly, the three ovens were unlikely to have served purely household needs. Evidence of high temperatures (oxidation extended at least 10 cm deep into the stone and plaster liners and often spread well beyond the firepits), the number and size of the pits, and their location in the plaza does not suggest use as ordinary firepits. Instead, their use may have involved all the site residents. Although pollen and flotation studies of the fill contents did not aid in identifying possible uses for the ovens, high-temperature baking or pottery-making are reasonable options. The hot temperatures, construction that allowed the fires to be



Figure 5.11. Plaza Feature 1, Room 3, Firepits 1 and 2, plans and eastwest profiles.



Figure 5.12. Plaza Feature 1, Room 3, Firepits 1 and 2, north-south profiles.



Figure 5.13. Plaza Feature 1, Room 3, Firepit 3, plan and profiles.



Plate 5.4. Plaza Feature 1, Room 3, Floor 1, firepits with 30-cm north arrows. A) Firepit 1. Note recessed opening for a possible lid and the plaster applications. (NPS#15309) B) Firepit 2 showing the uppermost lining of stone. (NPS#15267)



Plate 5.5. Plaza Feature 1, Room 3, Firepit 3, revealing stones in bottom. Note recessed lip remnant along right side. 30-cm north arrow. (NPS#15265)





easily smothered with lids, and the small bowl offerings suggest potterymaking, although a lack of ceramic wastage and raw materials weakens this hypothesis. Large, deep, baking pits for corn gruel and agave are historically important among the Zuni (Stevenson 1970:367) and Hopi (Parsons 1936) and are possible analogs for these. Maintaining separate bake houses also has been documented for historic pueblos (e.g., Parsons 1936:1195).

Huge firepits were not unique to Pueblo Alto (others exist in Plazas 1 and 2) nor to other canyon greathouses (Table 5.1). Two clusters at Pueblo Bonito, in particular, are reminiscent of the Pueblo Alto group. A number of room and pre-room ovens, highly burned with recessed lips, were found between plaza Kiva B and Great Kiva A at Pueblo Bonito (Judd 1964: 31). Their location appears analogous to Pueblo Alto's ovens. Seven more were sunk into the postoccupational fill of the partially built Northeast Foundation Complex extension to Pueblo Bonito (Plate 5.7; Judd 1964:148). In 1974 these were re-examined by the author for cremations but no calcined bone was found (Hayes 1981:62). In 1980 two were re-excavated again to obtain archeomagnetic dates. Like at Pueblo Alto, these ovens were separated from the domestic living areas (the latter may have been associated with nearby Hillside Ruin) and suggest communal use. Only the single one at the small house of Bc362 (Bradley 1971:24-25) contained a flue that would have enhanced firing. The flue was discovered in 1976 when the pit was investigated for archeomagnetic sampling. Others that may have served similar functions were found under Room 65 in Pueblo del Arroyo (Judd 1959:49), in the southeastern corner of Chetro Ketl (Lekson and McKenna 1983: Figure I.2, Plate 13), and along the exterior north wall of Salmon Ruins (Cynthia Irwin-Williams, personal communication 1978). Τn Chaco, all were apparently built in the early A.D. 1100s or later.

Seven miscellaneous other pits of uncertain function were recorded. All were filled with postoccupational deposits that added little to our understanding of their use. OP 2, the largest at 46.8 liters and oblong, was dug in next to the south wall opposite the central ovens. Its location may relate to oven use. The remaining pits were much smaller and unsuitable for bulk storage. Several, small, cylindrical pits (OP 3, 6-7) and OP 5 (a bell-shaped pit) may be postholes.

Cylindrical pits were designated postholes. All but one of the eight occurred near the east room wall. PH 4 contained the skeleton of a horned lark ( $\underline{E}$ . <u>alpestris</u>). Except for the pit near the northwestern corner (PH 1, 19 cm in diameter), all would have held small posts (<13 cm in diameter) stretching across the eastern end of the room. OP 6 and 7, shallow cylindrical pits, may also belong to this grouping. Because the alignment ties to the eastern termination of the north and south walls, a jacal wall is suspected. The east wall was a later addition to the room, and the two postholes under the door ramp obviously predate that feature's construction. The nine probable postholes (including OP 6-7) are only a mean 14.2 cm (sd = 8.8 cm) from the posthole centers to a hypothetical east wall alignment drawn between the north and south walls. A jacal wall, then, appears to have been the original eastern enclosure for the room and was

		Size (cm)			Construction	Volume		
Site	Location	length	width	depth	Туре	(liters)	Dateb	Reference
Pueblo Alto	Room 3, FP 1 <sup>C</sup>	130	99	116	masonry	765 <sup>.</sup>	TR:1132r	this volume
	Room 3, FP 2 <sup>C</sup>	120	78	125	masonry	588	TR:1132r	this volume
	Room 3, FP 3 <sup>c</sup>	102	71	76	masonry	419	Cr:1100s	this volume
Pueblo del Arroyo	Room 63	79	76	79	masonry	474		Judd 59:210
	under Room 65	94+	?	71	masonry	500+		Judd 59:49
Pueblo Bonito	Room 150, F1.4?	167 d	ia.	25	unlined	548		Judd 64:270
	Room 215, F1.5	109	99	101	masonry	1,089		Judd 64:280
	Room 215, F1.5	93	88	91	masonry	745	AM:1215+33	Judd 64:280
	Room 220, F1.3 <sup>c</sup>	104	86	127	masonry	1,136	AM:1170+16	Judd 64:281
	Room 221, F1.1	109	71	79	masonry	611	AM:1190+49	Judd 64:282
	Room 309, F1.1	99 d	ia.top	55	masonry	256	_	Judd 64:317
	55 dia.bottom							
	outside Room 330	106	66	?	masonry/slab	?		Judd 64:120
	outside Room 330	171	112	?	masonry	?		Judd 64:120
	outside Kivas Y & Z	152	91	124	masonry	1,730		Judd 64:174
Pueblo Bonito	FP 1	101	86	73	masonry	634	AM:na	Judd n.d.
(NE Found. Complex	FP 2	137	104	68	masonry	969	AM:na	Judd n.d.
in postocc. fill)	FP 3	96	83	71	masonry	566		Judd n.d.
	FP 4	101	86	55	masonry	478		Judd n.d.
	FP 5	101	96	40	masonry	388		Judd n.d.
	FP 6 (circular)	106 d	ia.top	109	masonry	1,169		Judd 64:148
		127 dia.bottom						
	FP 7	74	66	64	masonry	308		Judd n.d.
Chetro Ketl	outside Room 96, SE plaza complex;	112	97	?	masonry	?	Cr:1100s?	Postlewaite 33:6
	between Kivas B and C:	102	80 <u>+</u>	?	masonry	?	**	field verif'd
	470 m north of Room 130:	230+	132-152	?	masonry (room	?) ?	••	field verif'd
	west of Kiva B (2);	?	?	?	masonry	?	**	Lekson 1983
	Room 12.	?	?	?		?		photo
Bc 236	Outside Deep Firepit	155 d	ia.	145	masonry	2,736	TR:1113vv AM:1125 <u>+</u> 9	Bradley 71: 24-25

# Table 5.1. Large lined firepits in Chaco exceeding 250 liters capacity.<sup>a</sup>

<sup>a</sup>Some are estimated to exceed 250 liters capacity based on their unexcavated size. <sup>b</sup>AM = archeomagnetic; Cr = ceramic; TR = tree-ring.

<sup>&</sup>lt;sup>C</sup>Built with a recessed lip for a cover (most are unknown).



Plate 5.7. Seven ovens found in the postoccupational fill of the Northeast Foundation Complex at Pueblo Bonito. Masonry wall behind ovens is part of the "foundation" complex. Rubble in the background is part of the Hillside Ruin that postdates the foundation complex. Photo by O. C. Havens. (©National Geographic Society) later replaced by a masonry wall. A V-shaped alignment of pits (OP 3, 5, and 7 and PH 1) suggests an additional post structure of unknown function.

The northeastern corner of the room (Plate 5.8) is difficult to interpret because of superimposed pits and rodent disturbance. The lastused feature may have been a slab-lined bin (Figure 5.14). Thin, burned, upright slabs affixed to the initial Floor 1 plaster and set perpendicularly to the walls attest to the possible presence of the bin. The floor enclosed by the slabs is a scooped-out area of soft sand without plastering.

The stubs of upright slabs covered with plaster within the possible bin were earlier remains of another feature. Possibly they formed a screen to direct air flow coming through the gap left between the north and east walls. The eastern end of the north wall stopped abruptly, 40 cm from the east wall, where it was nicely finished flush at the termination point. The gap left between the north and east walls was capped by a large flat stone at the back, 55 cm above the floor. The gap may have served as a ventilator after the east masonry wall was completed but before Room 1 was built. Such a feature is not unexpected in a room where an ample supply of oxygen would have been required for the three ovens. The possible bin, however, postdates use of the ventilator. Furthermore. the east wall of Room 1 does not bond with Room 3 but terminates directly at the back of the gap with a smooth end of finished masonry (Plate 5.9). The finished appearance of the masonry-lined cavity indicates that a niche or storage facility was planned when Room 1 was built and that a ventilator, if it existed, was short-lived.

In the southeastern corner another cavity existed between the walls (Figure 5.15). It was formed when the east wall was built and extended around the corner and west for 37 cm until it butted against the original, finished, eastern end of the south wall. The extension butting against the south wall was flush with the latter on the exterior but only half its 50-cm width, which left a recess more than 55 cm high, 26 cm deep, 37 cm across the mouth, and 32 cm across the back. The recess exhibited finished masonry on all three sides. This cavity was later filled with unshaped, burned stone, presumably from the ovens, and reddish brown, ashstained sand. A mano fragment, a pot cover, and a Puerco Black-on-white jar sherd came from the ashy fill. A slight change in the east wall masonry 26 cm from its southern end may indicate that a piece of the east wall was added after the primary construction to join with the south wall. If this were true, then a gap between the walls, like that in the northeastern corner, possibly existed for a time.

A door ramp was centered against the east wall (Figure 5.16). The location and ascent up to a blocked door suggested its use as a doorrelated ramp. Again, the implied function is not clearly evident. Construction of the ramp began with Replastering 6 or 7 and covered Postholes 6 and 7. The original ramp is like a masonry wall partly offset to the north of the door, just like its counterpart on the opposite side of the wall. The position of the ramp would hamper its usefulness. The initial ramp was 36 cm wide and jutted into the room for 59 cm. It rose sharply



Plate 5.8. Plaza Feature 1, Room 3, northeastern corner. 30-cm scale. Compare with Plate 5.9. (NPS#15576)



Plate 5.9. Plaza Feature 1, Room 3, northeastern corner excavated. Back end of wall recess is faced with masonry from the southern trminal end of Room 1's east wall. North arrow is in 5-cm increments. Compare with Plate 5.8. (NPS#16581).



Figure 5.14. Plaza Feature 1, Room 3, Bin 1, in the northeastern corner, plan and profile.

SE CORNER PLAN VIEW (looking down)



Figure 5.15. Plaza Feature 1, Room 3, modifications of the southeastern corner, plans and profiles.



Figure 5.16. Plaza Feature 1. A) Room 3, Door Ramp 1, plan and profile. B) Room 4, Door Step 1 and Other Pit 2, plans and profiles.

10 cm above the floor at the toe, ascending another 11 cm to where it met the east wall. A series of plaster additions extended the feature another 50 cm west. Later five, fine, clayey plasterings along the southern side widened the feature by 60 cm. These were capped by a serviceable 6-7-cmthick layer of plaster that centered the feature on the door. The many lenses of hard sand separating various clay and plaster episodes were designated Layers 6 to 13 but are not described here.

<u>Floor 1 Artifacts</u>. Floor artifacts and dirt samples were not informative regarding room function. The majority derive from postoccupational refuse. Only six sherds and a bone came from the floor. Otherwise, the primary contact material was a mass of stone (including a mano and six metate fragments) scattered primarily within 1 m of the west wall (41 of 46 pieces). Except for the ground stone fragments, most appear to be unshaped, building stones related to those in the floor fill. The distribution is unusual but probably was postoccupational and related to the numerous stones from wall fall in the floor fill.

## Plaza Surfaces and Deposits under Room 3 (Figure 5.9, Plate 5.10)

Layer 17. Along the western side of the room was a layer of pinkish brown, sandy adobe, 4-5 cm thick, with inclusions of large and small gray and white clay lumps. This unit was not found in the northern and eastern subfloor tests and must, therefore, represent a separate preparation and leveling for Floor 1. It lay on Layer 18.

Layer 18. In the eastern and western test pits, this deposit was a hard, 4-5-cm-thick, compacted, pinkish tan, sandy adobe with light-colored clays similar to Layer 17. Against the north wall, however, seemingly the same unit was primarily a hard, tan sand with bits of white clay (<2 mm) and occasional flecks of charcoal. Sealed in Grid 19 of the deposit was the only gray fox (U. cinerargentes) remains (a mandible) from the site (Akins 1985a). The small number of ceramics tenuously dates deposition to the late A.D. 1000s. This deposit was the same as Layer 4B in the western plaza area.

#### Floor 2 (Figure 5.10)

Underneath Layer 18 was an uneven, compacted, clayey film barely a millimeter or two thick, which was covered with a sheet of calcium carbonate ( $CaCO_3$ ). The compacted surface is the trampled top of Layer 19 (construction debris) and may have been created during construction work. The surface and debris continued under the east wall and into Room 4 as Surface 4 and Layer 13. In the western plaza area this was Surface 4A.

<u>Floor 2 Features</u>. A large storage basin (140 liters) just beneath the east door was the only one of its kind (OP 1). It was filled with Layer 18 material and may have been used in a similar fashion as those filled with construction debris in Room 103. Its exact relationship to Floor 2 is unclear, and it might postdate the room construction.



Plate 5.10. Plaza Feature 1, Room 3, Grid 18. Subfloor test in southeastern corner of room revealing western plaza area stratigraphy (Layers 19-23). 30-cm scale points west. (NPS#16586)



Plate 5.11. Plaza Feature 1, Room 4. View of Surface 3 (southern end) and Surface 4 (northern end), looking southwest. Room 3 covered with black plastic. (NPS#16306)

Five postholes occurred in the same area as those associated with Floor 1. Postholes 1 through 3 were placed as a group in and next to OP 1 after the latter had filled. All would have contained small (<7-cm-diameter) posts for an undetermined use. Postholes 4 through 5 were also for small posts set in front of the gap between the north and east walls. Both sets align well with the hypothesized Floor 1 jacal wall alignment [mean distance from a line connecting the ends of the north and south walls is 5.5 cm (sd = 4.5 cm) for the five postholes] and may belong with the Floor 1 features.

Floor 2 Artifacts were limited to two, plain gray, jar sherds. Material from Layer 19 suggested accumulation before A.D. 1050.

#### Layer 19

Floor 2 was trampled deposits, 8 cm thick, of pinkish-tan sand, decomposed bedrock fragments, spalls, gray lumps in a pink clay to the west and a pinkish clay in the east that rested on a gray clay, and white clay and spalls. Charcoal and refuse were sparse. In Room 4 this unit was Layer 13 and in the western plaza area it was Layer 4C.

### Layer 20

This was a 5-12-cm-thick accumulation of clean, hard, reddish tan sand. Spots of CaCO<sub>3</sub> and charcoal flecks (6 per 100 cm<sup>2</sup>) were common. This deposit was Layer 6 in the western plaza area.

#### Floor 3

A plaza surface unrelated to the room was uncovered only in the northern test pit. It was the compacted top of Layer 21 and continued under the room walls. No features or artifacts were found on or in it.

#### Layer 21

This unit was composed of redeposited, sterile material consisting of tiny fragments of selenite and soft, reddish tan bedrock in a matrix of semiplastic yellow, gray, and white clay sandwiched between accumulations of a yellowish brown sand. This kind of clay is typically found just above bedrock in the plaza center nearby. Refuse and charcoal were sparse. Ceramics were from a Red Mesa assemblage dating to the early A.D. 1000s and the deposit was similar to Layer 7 in the western plaza area.

#### Floor 4

Presumably this was another compacted plaza surface, although it was difficult to tell because it was wet when excavated. The top of Layer 22 appeared compacted as if from foot traffic, but the clay matrix of the layer may appear as such naturally. No features or artifacts were noted for the small area cleared.

### Layer 22

About a 4-cm-thick deposit of sterile, yellow and brown clay underlay Floor 4. It was limited to the east test pit and, therefore, may not be widespread. No cultural material was observed.

#### Layer 23

A nearly sterile layer of brown, sandy clay under Layer 22 was also limited to the eastern test pit. Occasional small pieces of stone and a little charcoal suggest that the layer had been moved. This deposit resembles Layer 8 in the western plaza area.

## Layer 24

The clays rested upon about 15 cm of hard, tan sand. It was relatively clean looking with little charcoal staining but with a high density of Red Mesa assemblage sherds. In the western plaza area this unit was designated Layer 9 but contained more charcoal.

#### Layer 25

Under the sand was a sterile deposit of mottled, gray and white clay about 15 cm thick.

#### Layer 26

The lowest deposit in the northern test pit that yielded cultural material consisted of yellowish brown clay. Charcoal and refuse were scattered in small numbers throughout the unit. The deposit rested directly on 3-5 cm of undisturbed white clay and decomposed sandstone that, in turn, sat on solid, soft, tan, sandstone bedrock.

#### Walls

<u>Wall Foundations</u>. Only a section of the exterior west wall was examined in detail. It revealed a construction similar to the surrounding early Pueblo Alto rooms. A trench 40-47 cm deep had been cut down vertically and then filled with wet, light brown clay and a scattering of sandstone blocks. The stone was unshaped and appeared randomly placed in the clay. Pockets of air trapped under the stone indicated that the clay was poured in a thickened, plastic condition. The foundation was footed on construction debris (Layer 8 in Plaza 1, Grid 117) spread over the plaza from some early work, possibly on the West Wing rooms. The upper two western plaza area surfaces (Surfaces 1 and 2) lapped up against the west foundation, an indication that Room 3 was built late in the Pueblo Alto occupation.

The north and south walls appeared bonded to the west wall and were expected to share similar foundations. Testing in the southeastern corner revealed that the south wall foundation terminated vertically flush with the masonry above it. This foundation, of mortar and stone, was at least 20 cm deep. A foundation trench was encountered 15 cm below Floor 1 under the north wall but, presumably, the foundation runs deeper. The east wall, which was not bonded to the others, had no foundation. Instead, the wall masonry stopped a few centimeters below Floor 1 on or just above Floor 2.

<u>Wall Masonry</u>. The wall veneer did not exhibit the fine workmanship attributed to earlier construction at Pueblo Alto. Walls conformed to the descriptions for the Plaza Feature mentioned above, although there was a difference between the east wall (composed of irregularly sized soft stones with few spalls used and little or no grinding of the facing) and the others (short bands of spalls in two to four discontinuous rows separating rows of soft blocks with ground faces).

<u>Wall Plaster</u>. The walls of Room 3 were never plastered (however, see Floor 1 notes above).

<u>Wall Smoking/Burning</u>. Although there was no soot on the walls, several areas were oxidized. The southeastern corner and along the south wall opposite the ovens were well burned as if the oven fires had spread well beyond the pit confines. Burned floor between the walls and ovens strengthens this possibility, although it is difficult to imagine the utility of letting fires grow so large inside a room.

<u>Wall Features</u>. In the center of the east wall was a plugged door with a small niche incorporated into the southern side of the masonry plug. The bottom of the niche was gray clay. Postoccupational sand and some charcoal were the sole contents. Perhaps the plug was simply part of a raised sill and the niche a step for ascending to the door. The door appears to have been part of the initial wall construction because the jambs were unmodified, but it was not dug out. Wall recesses were present in the southeastern and northeastern corners (discussed under Floor Features).

<u>Wall Heights</u>. The original wall heights could be reconstructed from Room 3's fallen walls. The south wall fell almost intact to extend 280 cm into Room 5. The north wall of Room 3 was in poorer condition than the south wall but lay for 320 cm across the room. The west wall fell largely intact, 350 cm into the western plaza area. The extent of these fallen walls coupled with the remaining wall heights (about 50 cm) indicate the Room 3 walls originally stood between 330 and 400 cm high (probably closer to the former height).

#### Roof

Roofing impressions suggest a light or partial structural covering. Impressions were few (compared to other rooms) and clustered along the north wall (47 of 59). All were of reddish tan, sandy adobe less than 5 cm thick (57 of 59  $\leq$ 3 cm thick) with impressions of wood splints and grasses. A single specimen exhibited a pole impression (35-mm-diameter) perpendicular to the splint marks. Dense, thick, gray clay chunks and large-diameter pole impressions, common to the main Pueblo Alto rooms, were absent. Although the proposed jacal wall might have yielded similar fragments, the location of these suggests roofing.

## Room 4 (Figures 5.17-5.18 and Plate 5.11)

Attached to the east side of Room 3 and accessible to it through a door is Room 4 (584 by 260 cm;  $15.2 \text{ m}^2$ ). Room 4 was selected for excavation primarily because of the access to Room 3, which we believed would expand and complement our understanding of both rooms. If Room 3 was being used for communal activities, we hoped to find supportive evidence in adjoining Room 4. The postoccupational dumping of firepit contents along the eastern side of Room 3 also suggested possible firepits in Room 4. Alas, neither possibility materialized. Room 4 turned out to be relatively featureless and sterile with only the upper two surfaces related to the room use (Figure 5.17). Deeper deposits were all plaza related. The entire room area was excavated down until Floor 4 was reached and from there a test pit in Grid 4 (in front of the door ramp) was carried to sterile fill.

### Strategy

The small size of the room dictated a different approach for removal The room was divided into four test of the postoccupational fill. trenches following the east-west division of Room 3 and an arbitrary north-south division. An additional two trenches were added when it was discovered the room extended farther north than expected. Excavation started in the southeastern trench, TT 4, and then proceeded to the northwest (TT 5). All fill was removed in natural units (layers). Horizontal control was maintained for the postoccupational fill by test trench and, below Layer 9, by a grid system imposed primarily for floor and floor materials and for collection of dirt samples (Figure 5.8). Point location was reserved for floor artifacts. Vertical control was from Datum 4 (319 cm below Site Datum 8) on the northwestern corner of the room. All fill was sifted through 1/4 in. screen. Postoccupational deposits in the center of the room (as well as the excavators) were constantly threatened by an ant nest whose inhabitants ferociously resisted scientific progress.

## Postoccupational Fill (Figure 5.18)

Layer 1. The uppermost accumulation of fill was unconsolidated, tan, aeolian sand mixed with some backdirt from screening of Room 3 material. The deposit was practically devoid of cultural material. The layer ran a uniform 20-25 cm in thickness over the entire room.

Layer 2. A moderate amount of stone clustered along the western half of the room identified the origins of this deposit as primarily wall fall in a matrix of aeolian sand. Stone was generally horizontal and unpatterned, reflecting gradual wall disintegration. Most rubble probably originated from the west wall. The deposit reached depths of 50 cm but thinned to 10 and 30 cm at the east and south walls, respectively. Charcoal was sparse (0-4 pieces per  $100 \text{ cm}^2$ ) although lenses of burned adobe and trash persisted in the northern half of the room. Refuse was moderate



Figure 5.17. Plaza Feature 1, Room 4, plan view.









Figure 5.18. Plaza Feature 1, Room 4, profiles.

to dense, particularly in ceramics. Refuse was heaviest in the northern third of the room and decreased toward the south. The latter suggest deposition after A.D. 1100. Faunal remains were surprisingly infrequent and dominated by rabbit and prairie dog remains. In the southeastern corner was a deposit of 16 <u>Glycymeris</u> shell bracelet fragments. In the northern end of the room was a shallow, burned depression in the fill that resembled an expedient, once-used, heating pit.

Layer 3. This thin (<5 cm) deposit was limited to the southern half of the room. It was a heterogeneous mixture of small spalls and lenses of white, decomposed, native clay in a burned adobe matrix in the northern 120 cm of the unit. South of 120 cm, the unit changed to a predominantly mottled white clay with inclusions of burned adobe and spalls. Charcoal and refuse were moderate to heavy. Another burned spot set in the irregular matrix in the southwestern corner was designated HP 2 although it was not a formal, prepared feature. Like the trash and burn in Layer 2, it attests to continued but sporadic activity at the structure following major abandonment.

Layer 4. Fine, aeolian, tan sand, 4 cm thick, with a fair amount of clay mixed in, characterized the initial postoccupational deposit after the final use of the room. It was limited to the northern middle section of the room and merged with Layer 3 beyond. Both Layers 3 and 4 rested directly on Surface 1. Cultural material was moderate, although charcoal was rare and had not discolored the sand.

#### Surface 1

The final use of Room 4 was marked by a 1-mm-thick, hard, plaster coating peppered with spots of white CaCO<sub>3</sub>. At least seven lenses of thin plaster separated by CaCO<sub>3</sub> or clay comprised the total surface. It was limited to an area along the west wall, south of the door, and in the northwestern corner, but did not cope onto the walls. Although the adjacent walls may have preserved the flooring, it is also possible that they may have been the prime contributors to its formation. Rainwashed walls may have been responsible for the character of the surface. More likely, Surface 1 originated as the unprepared, compacted top of Layer 5, but alluviation of the wall mortar created a partial "plastered" floor.

<u>Surface 1 Features</u>. Two features may be associated with the surface. In the north center was yet another burn in a shallow depression (Burn 1). The burn derived from hot coals tossed onto the surface and not from an intentional fire. An archeomagnetic sample yielded a date of A.D. 1130  $\pm$ 30 that is not unreasonable.

In the southeastern corner was a small-mouthed, bell-shaped, storage pit (OP 1) filled with ash, brush charcoal, inclusions of burned adobe, and pockets of clean, tan sand. There was no firepit in the room from which the pit contents could have derived. The ovens in Room 3 are the nearest known sources, although the volume of 27 liters for OP 1 is unsuitable for even a partial cleaning of one of the nearby ovens. Undoubtedly, OP 1 served for storage of other unknown materials before being used for dumping firepit contents. The surface association of OP 1 is uncertain and it may actually belong with Surface 2.

<u>Surface 1 Artifacts</u>. A single artifact, an indented corrugated sherd, came off the surface.

#### Layer 5

An irregular layer, 2-5 cm thick, of pinkish tan clay covering most of the room underlay Surface 1. It was without inclusions and contained little cultural material. It, instead of Surface 1, may be the true prepared flooring.

#### Layer 6

An accumulation of aeolian sand spotted with occasional flecks of charcoal suggested a period of disuse after abandonment of Surface 2. Cultural material was again sparse.

#### Surface 2

Two millimeters of hard, crackled, pinkish, smooth adobe suggested a prepared or trampled use surface. It was limited to approximately the same areas as Surface 1. The surface continued under the north wall and marked a late division of a single, large, rectangular room into Rooms 2 and 4.

<u>Surface 2 Features</u>. OP 2 was a long, narrow trench lined with a few small, upright, tabular stones that may have shimmed a light brush or pole screen (Figure 5.16). The only true floor preparation (plaster) is associated with this feature.

## Surface 2 Artifacts. None.

### Layer 7

This layer was up to 12 cm thick throughout most of the room. An aeolian origin is suspected for the tan sand, although it contains spalls and chunks of adobe with little cultural material. In the southernmost meter of the room, the deposit merged with Layer 3 directly above.

#### Layer 8

Another deposit of probably aeolian sand with little charcoal and few artifacts supported Layer 7. It was distinguished from Layer 7 by numerous, fossilized, insect burrows and clean sand.

#### Surface 3

In the southern half of the room was an area of compacted use with cultural material pressed into its surface. Ceramics (eight) were few but suggest deposition in the late A.D. 1000s.

The sole feature associated with this surface Surface 3 Features. was the construction of a low masonry and mud wall jutting 40 cm into the room below and east of the west wall door, although the upper part was inadvertently removed. Its position suggests a step for Door 1 (Figure 5.16) like its companion on the opposite side of the wall, although both are partly offset to the north of the door. Before modifications to the Room 3 ramp, both appeared as short, masonry stub walls. The poor alignment of the walls somewhat negates the usefulness of the ramp for Alternatively, if these features had been low assisting door traffic. walls, then Door 1 would certainly be of secondary construction, for which there is no evidence. Both ramps and door appear coeval, and we must presume that they are related in function, although the exact function of the ramps or steps is unclear. Surface 1 extends flush with the top of the lowest step and presumably continued in use with that surface.

Surface 3 Artifacts. Only four artifacts, in close proximity to one another, came from Surface 3: two indented corrugated sherds, a painted sherd, and a metate fragment. All must be considered refuse.

#### Layer 9

This was a small area of nearly sterile, hard, pinkish tan adobe, 1-4 cm thick, in the southwestern corner of the room. It was marked by a number of small fragments of decomposed bedrock. Despite its small extent, it appeared to be part of Surface 3.

### Layer 10

In the same area as Layer 9 were a 1-2-cm-thick lens of hard, clean sand with a number of small pieces of decomposed bedrock and spots of CaCO<sub>3</sub>. It was only between Surfaces 3 and 3.5.

### Layer 11

Just on top of Surface 3.5 and absent elsewhere was 1-2 cm of pinkish tan, aeolian sand with bits of decomposed bedrock and 2 flecks of charcoal per 100 cm<sup>2</sup>.

### Surface 3.5

Again in the southwestern corner was a localized plastering of pinkish tan mud a few millimeters thick that merged with Surface 3 about 1 m north of the south wall. The surface was devoid of artifacts.

Surface 3.5 Features. Two pits were found in the southwestern corner. The larger, 49.5 liters, was circular with unlined, straight, 17-cmhigh walls (OP 1). The other (OP 2) was 35 cm away from OP 1 and next to the west wall. Its small size would have been prohibitive for storage and its use, therefore, is problematical.

## Layer 12

Under Surfaces 3 and 3.5 in the southern half of the room was an accumulation of hard, aeolian sand with frequent spots of  $CaCO_3$  and charcoal flecks (more than 6 per 100 cm<sup>2</sup>).

### Surface 4

The top of Layer 13 was compacted, presumably, during a period of wall construction. The surface was augmented by a thin, pinkish tan plaster in the northern quarter and northeastern third of the room. The same surface extended into Room 3 as Floor 2. The surface was common to more than one room but also appeared to have continued in use within Rooms 3 and 4 after the wall was built dividing them.

<u>Surface 4 Features</u>. Two pits were associated with the surface within the room walls. All were unplastered pits scooped into Layer 13. OP 1 and OP 3 were pits of less than 16 liters capacity. The latter was filled with hardened, pinkish tan mortar. OP 1 contained firepit contents of gray ash, brush and wood charcoal, and burned sand.

Surface 4 Artifacts. Only five sherds were recovered from the surface. These suggest last use was at least late in the A.D. 1000s. In addition, two rabbit and one prairie dog bones were recovered. Considering their fragmentary condition, all artifacts must be considered unrelated to use of the room.

### Plaza Surfaces and Deposits under Room 4

Layer 13. This deposit was composed of construction debris in a fine, tan, sand matrix that also extended into Room 3 as Layer 19. Charcoal and refuse were sparse. Globs and chunks of gray clay, spalls, selenite, and small pieces of native clay were common. No masons' tools were found, although the sample was restricted to a test pit next to the door step. The layer averaged 8 to 9 cm thick and may mark construction of Room 3 before the addition of the cross wall between Rooms 3 and 4.

### Surface 5

A thin wash of naturally deposited clay was tentatively field-identified as a use surface. Its extent is unknown. It is probably a noncultural surface.

### Layer 14

Underneath the clay film is a layer of hard, pinkish tan adobe, some trash, occasional small stones, charcoal, and spots of  $CaCO_3$ . The deposit, 2 to 3 cm thick, pinches out toward the center of the room.

#### Layer 15

This is a natural accumulation of sand, 4 cm thick, with a few inclusions of white, native clay.

### Layer 16

The lowest cultural deposit in the test pit is an unconsolidated, reddish tan sand, 5 cm thick, with inclusions of native, white clay and sparse cultural material. Underneath is residual reddish clay, white clay, and consolidated sandstone bedrock. Sterile soil, then, is a scant 35 cm or so below the last surface of use (Surface 1).

## Walls

Although the room was enclosed by walls, all but the western one may have been short enough to be seen over. It would seem that the room functioned more as a partitioned plaza area rather than a roofed space.

<u>Wall Foundations</u>. These were not closely investigated. No walls, however, appeared to have formal foundations. Masonry walls were simply set upon the sandy deposits a few centimeters below the top surface. The north wall (now 40-50 cm high) seemed to start on Surface 2, whereas the south one (15-35 cm high) may have been built on Surface 3.5. The east wall, a scant 20 to 30 cm high, may begin with Surface 3 whereas the west wall, the highest at 60 to 70 cm, may go with Surface 3.5. Overall, the room enclosure is best associated with Surface 3 or Surface 3.5.

<u>Wall Masonry</u>. The north and west walls are composed primarily of small, unshaped, rectangular stones, 3-5 cm thick, and a few large blocks set two blocks thick. The east wall is dominated by large, soft, irregular blocks of sandstone, but the south wall contains the large, irregular blocks as well as concentrations of small, rectangular slabs. Except for the west wall, all are poorly coursed. Mortar is relatively common between stone in the exposed wall faces, but there is little spall chinking, particularly in comparison with Room 3 walls.

#### Wall Plaster and Sooting. Neither was evident.

<u>Wall Features</u>. A door sealed with masonry in the west wall is discussed with Room 3. No other modifications of the walls were noted.

#### Roof

Roof impressions were few and limited to an area along the west wall. Many of the postoccupational deposits appeared wind- and water-deposited and, along with the low wall remnants, suggest an open room.

### Summary and Conclusions for Rooms 3 and 4

Originally, Room 3 was built as a three-walled structure, open to the east with perhaps little or no roof. A low jacal wall may have enclosed the east side, however. This unusual architectural arrangement was necessitated by three large firepits located within it that must have required high or no ceilings to prevent accidental fires but an ample draft to satisfy an enormous oxygen appetite. The size, extensive use, and location of the firepits far from residential buildings mark the room as one for communal activities. Proximity of the rooms to the West Wing and along the western end of the arc of walls enclosing the plaza where late residences may have been located, suggests that the communal use was shared among the various groups there, if not for the entire site. Based on historic analogy, the ovens could have been used for baking and roasting (e.g., corn) although clues for a specific function could not be identified. A number of huge, plaza firepits at other canyon greathouses attests to a similar, widespread, communal activity.

Stratigraphic contexts, ceramics, and absolute dates pin use of Room 3 to the early A.D. 1100s, in association with the latest two use surfaces in the western plaza area. Other large, outdoor, greathouse firepits in the canyon also date to the same period or slightly earlier but appear absent or unreported for earlier occupations. These firepits may offer tangible evidence, then, of a shift to some specific communal activities that formerly were practiced on an individual or household basis.

Room 3 was later enclosed with a wall on the east side, which perhaps did not match its neighbors in height. A door built in the wall reveals that entrance into Room 3 was through Room 4, an open room with low walls added onto Room 3. Little was found in Room 4 that implied functional associations with Room 3, however. Poorly prepared use surfaces, the low walls, and the lack of pits suggest that Room 4 was a partly enclosed outdoor area that may have served simply as an outdoor storage area for the activities in Room 3. Wood fuel, which the voluminous firepits would have demanded in quantity, could have been stacked in Room 4 but left no evidence. No determination could be made for the remaining unexcavated rooms but they, too, are suspected of being related to the use of Room 3.

Plaza Feature 5 (Figure 5.19)

In 1975, Richard Loose tested suspected features in Plaza 1 (Grids 144-145) that had been identified from subsurface radar results (Vickers et al. 1976). One of these was a squarish, C-shaped feature in the center of the plaza (Vickers et al. 1976:Figure 8). The results and location of this test (Plate 5.12), however, were not known to the later excavators of Pueblo Alto. Backhoe testing by set intervals in 1977 for a great kiva resulted in trenches that, incredibly, just bracketed the east and west walls of the backfilled feature. After reclearing the feature, we designated it Plaza Feature 5.

PF 5 was located just under the surface of the ground. It consisted of two courses of large, unshaped slabs of sandstone (about 15 by 30 cm and 20 cm thick) forming a structure running exactly east-west (670 cm) with wings at each end extending south. The west wing ran approximately 100-150 cm south and the east wing about 150-200 cm south. The walls varied in width between 35 and 50 cm. There was no wall debris in asso-



Figure 5.19. Plaza 1, Plaza Feature 5, a possible shrine in the center of the plaza, plan view.

Plate 5.12. Plaza Feature 5, a shrinelike structure in the middle of Plaza 1.

A



Plate 5.13. Exterior wall veneer of Room 194 (A) and the northeastern corner of adjoining Room 195 (B)--part of a double-paired room suite in the southern enclosing arc at Pueblo Alto. These rooms may be road related. (NPS#13265, 13263)

ciation with the feature to suggest that it might once have been higher, nor were foundation walls evident.

The structure opened directly to the south and resembled shrines located along the high points bordering Chaco Canyon (particularly 29SJ 706, visible to the southeast on South Mesa from Pueblo Alto; see Hayes and Windes 1975). A concentration of small stone may make a small arc bulging south from the center of the long wall, but this is uncertain. The area around the feature was devoid of any cultural material. The central location of PF 5 in the plaza and its resemblance to shrines suggest a feature of special significance. Small, walled features and piles of stone have been used as shrines or have had sacred significance in the central plazas of many historic pueblos (e.g., see Mindeleff 1891:71, 75; White 1962:49), and PF 5 may have served a similar function.

### Plaza Wall 1

About 4 m east of Kiva 10 a compound masonry wall was exposed during plaza testing. We were able to trace it to within 3 m of Room 160 before it disappeared under wall fall and the four uppermost plaza surfaces in Plaza Grid 12. At the other end the wall extended south into Plaza Grid 47 before it was lost. Its overall length was at least 6 m, and it was about 31 cm wide and several courses high.

## Plaza Grids 28-30 Features (Figures 5.20-5.22)

A cluster of slab- and masonry-lined firepits was uncovered during exploratory plaza testing in 1976 east of Kiva 10 and Plaza Wall 1 (Figure 4.20). All were exposed after the loose, aeolian sand had been removed. None were excavated, and the fill left in them was only the postoccupational, clayey deposits that probably overlie charcoal and ashes. Although firepits were found scattered around the outdoor areas of Pueblo Alto, none quite approached the likeness of this group.

## Firepit 1 (in Grids 28-29)

Only the uppermost circle of masonry, a single stone thick (25-30 cm wide), marked the location of this feature 10 cm or so below the present surface. Its shape suggests the presence of a small kiva, but the wellburned interior facing of the masonry liner and the feature's small size (211 by 206 cm) seem more indicative of a huge firepit sunk into the plaza.

### Firepit 2 (in Grid 28)

Less than 50 cm west of FP 1 was an oval of burned, intermittent, upright slabs forming a firepit 143 by 130 cm. In places there were double



Figure 5.20. Plaza 1, Grids 28-29, firepits associated with Surface 1(?), plan.



Figure 5.21. Plaza 1, Grid 30, test trench and Other Pit 1, profiles.




Figure 5.22. Plaza 1, Grid 30, Other Pit 1, plan and profile.

rows of slabs that suggest two firepits were present, one inside the other.

# Firepit 3 (in Grid 28)

To the south 150 cm from FP 2 were the few remains of another slablined firepit, perhaps 92 cm in diameter.

# Firepit 4 (in Grids 28/48)

To the west and contiguous with FP 3 was another partially intact row of thin, burned, upright slabs that enclosed an area approximately 149 by 142 cm.

# Associated Ceramics

Ceramics recovered from clearing the grids and areas around the firepits reveal a curious temporal dichotomy. Those from around Firepits 2-4 (all in Grid 28) were dominated by early A.D. 1000s ceramic types, although a few were produced in the late A.D. 1000s and early A.D. 1100s. In the adjacent area (Grid 29) where FP 1 was located, ceramics from the late A.D. 1000s and early A.D. 1100s were more common. The dichotomy was best illustrated for the culinary ceramics (indented corrugated versus nonindented corrugated) and for Gallup and Red Mesa Black-on-whites. From the ceramic data we might deduce that the slab-lined firepits were used in the early A.D. 1000s whereas the masonry oven was used much later. The presence of so many early ceramics close to the surface is surprising, even though bedrock must be close underneath, for these ceramics were generally buried deep and should have been superseded by later ones if the area around the firepits was being used later on.

Overall, these four firepits differ from others recorded outdoors in construction, shape, and size. The majority of the other outdoor firepits were constructed of multiple layers of thick, slanting slabs and appear to be of late construction. Whether construction style was both functionally and temporally significant is at present unknown, but I suspect it is so.

# Other Pit 1 (in Grid 30)

Deep testing was initiated in the northern 75 cm of Plaza Grid 30 to ascertain the presence of a large, court kiva that should have completed the symmetry of court kiva and associated Central Roomblock suite associations. No kiva was found, but a large pit was found that had been dug into the very hard, caliche-impregnated, sterile sands and soft bedrock (Figures 5.21-5.22). This pit was unlined, irregularly shaped, and had been filled with an unusual variety of cultural material and much stone (43 pieces). Its shape was so irregular that it seemed to have been dug to procure soils rather than for a utilitarian use. Our trench cut through part (65 percent) of the pit, and the remainder was left unexcavated. Its estimated size was approximately 114 by 114 cm and 112 cm deep, with a volume of about 873 liters (0.873 m<sup>3</sup>). The pit fill was 1/4 in. and 1/8 in. screened. In this area, the pit mouth was associated with the third use surface (Floor 3) below the postoccupational deposits.

Ceramics overlying the pit (in Layer 6) and filling the pit were associated with a Red Mesa assemblage that places the period of deposition of the pit contents before A.D. 1040, probably in the early A.D. 1000s. Densities of material were unusually high, with 810 sherds, 101 pieces of chipped stone, and 1,021 bones per  $m^3$ . Chipped stones were dominated by fragments of splintery, petrified wood (material type 1140; 34 of 88 pieces, or 39 percent) that has been found in similar high quantities along with debris from bead manufacture (e.g., in Layer 15 of Plaza Grid 8 and from site 29SJ 629). In this instance, bead-making was not evident, although three beads of different materials (calcite, shell, and argillite) were recovered along with a quartz crystal (Mathien 1985:Table 1). Washington Pass chert (material type 1080) was also unusually prevalent (20 of 88 pieces or 23 percent) for the period of deposition, even though this material was quite common during the following decades.

The most unusual aspect of the pit material was the faunal assemblage (see Akins 1985a). Cottontail elements (246 of 891 or 28 percent of the total; 15 MNI) and bird elements (270 of 891 or 30 percent of the total; 21 MNI) represented the majority of bones recovered. Of species identified, these two classes were overwhelming (516 of 633 or 82 percent of the identifiable total; 36 of 60 MNI). Most of the golden eagle and hawk parts recovered at Pueblo Alto came from this pit, along with elements of mountain bluebird and raven. Parts from at least 4 golden eagles and 10 hawks were recognized. Typically, the birds were represented by entire wings that had been thrown into the pit; many of the elements revealed light butchering marks. The small amount of weathering and checking of the bones indicated that deposition had been rapid, perhaps in a single episode.

Because of the unusual nature of the pit material, it may relate to the pre-greathouse occupation at Pueblo Alto or to a specific discard of materials buried during the greathouse construction. As trash, densities were similar to that found in Layer 15 in Plaza Grid 8. Bird parts, including hawks and eagles, were also associated with Red Mesa ceramic assemblages in the Central Roomblock but in much lower frequencies than in OP 1.

#### Plaza 1 Tests to Sterile Fill

During the course of probing for a great kiva, a number of small pits were dug to sterile fill. For the most part, these tests revealed very little cultural deposition within Plaza 1 away from the rooms and kivas. This finding is in contrast to the open-air areas within Pueblo Bonito and Chetro Ketl, for instance, that revealed considerable depths and depositional histories beneath the present surface. At Pueblo Alto, the nearness of sterile deposits to the surface is clearly conditioned by Pueblo Alto's location on top of the mesa rather than in the canyon bottom. Except for filled pits and kivas, the Alto plaza generally revealed sterile 454 Pueblo Alto

clays and sands within 10-50 cm of the surface. Often, the uppermost sterile deposit was of very hard, pinkish, sandy clay underlain by a layer of white clay (or sometimes orange or gray clays) and decomposed white bedrock.

At first, the tests were dug by hand, but the deposits were so hard in some cases that we finally resorted to a backhoe. If cultural material was struck by the backhoe bucket, then we returned to hand excavation. For this strategy we wished to avoid collecting cultural material, so the tests were kept deliberately small (about 30 by 40 cm when dug by hand). The fill was not screened unless the tests were expanded for further explorations. The strategy was to test every other grid (i.e., every 8 m) in the central part of the plaza to insure that a great kiva did not escape notice. This spacing was not always possible for a variety of reasons (e.g., stone cairns, backdirt), but, given the shallowness of bedrock, it is extremely improbable that a great kiva existed (of normal size). These tests are listed for future reference and to give the sample-minded strategist an idea of the area covered (Table 5.2).

# Plaza 1 Enclosing Arc of Walls and Rooms (Figures 5.23-5.24)

Plaza 1 was enclosed by a number of curving parallel walls with two complexes of rooms and odd-shaped structures appended to it. Abutments. the masonry style, and the hodge-podge arrangement of the various structures indicate that much of the architecture was added long after the primary houseblock had been completed, probably in the early A.D. 1100s. There are exceptions to this, however, that may have been part of the original, or a little later, greathouse construction in the A.D. 1040s and 1050s. A block of four rooms (Rooms 194-197) set astride the arc walls reveal an orderly plan and wall veneer of the A.D. 1000s (Plate 5.13). Elsewhere, it has been suggested that these rooms were used in conjunction with road traffic in and out of the plaza that passed nearby (Volume I, Chapter 5). The late arc walls butt the four rooms but the latter were set askew from the primary roomblock alignments, which suggests an attachment to earlier arc walls (Figure 5.23).

A second set of rooms (Rooms 208-209) exhibit early spall and thin tabular slab masonry that contrasts with the adjoining arc walls and closely resembled the masonry in Room 143. In addition, both rooms had initial doors (57 and 63 cm wide) that opened directly onto a large court kiva (Kiva 7) in a manner reminiscent of the Central Roomblock arrangement. The second room has been truncated by the arc walls so it clearly predates the latter. Thus, these traits may mean that the small complex (of two rooms and Kiva 7) incorporated into the arc were early structures, perhaps, again, related to prehistoric road traffic.

The remaining structures are presumably late and have yielded quantities of trash with ceramics dating in the early A.D. 1100s. The complexity of the southern arc, the deep deposits, and the fragile nature of much

		Test Size	Depth to	Depth to Bedrock	Maximum Depth	
Grid No.	<u>Grid</u> Quarter	(cm)	<u>Sterile (cm)</u>	<u>(cm)</u>	of Test	Comments
19	_	?	?	82	82	
38	SW	120 x 65	?	130	130	Some trash
60	NW	130 x 70	22	34	37	
84	NW	130 x 72	33	50	59	
86	NW	159 x 76	26	88	92	
102	NW	40 x 38	17	?	37	
10 <b>9</b>	-	?	25	45	45	
122	NW	140 x 80	20	20	37	
124	NW	140 x 80	31	46	51	
126	NW	150 x 82	28	52	64	
128	NW	140 x 75	25	?	55	
142	NW	38 x 33	12	26	83	
144	NW	40 x 35	10	?	29	
149		?	?	40	40	
156	NW	40 x 36	60	?	60	Some trash
159	NE	?	not reached	?	198	In Kiva 13
160	NW	42 x 33	not reached	?	100	In Kiva 13
162	NW	130 x 37	22	22	40	
164	NW	140 x 70	9	32	50	
166	NW	166 x 78	22	39	60	
168	NW	135 x 90	25	42	52	
189	-	?	35	?	35	
200	-	?	ca.52	78	78	
203	-	?	20	56	63	
204	SW	158 x 86	?	34	70	
205	NC	?	29	73	73	
206	SW	165 x 75	37	37	65	
208	SW	150 x 70	22	46	65	



Figure 5.23. Southern arc walls and rooms, southeastern area. A) Initial structures. B) Later arc walls joining the initial structures.



Figure 5.24. Southern arc, architectural complex in the southeastern corner, plan and profiles.

of the architecture meant that deep wall clearing and probing would have been too destructive to have been justified. Presumably some architectural units associated with the arc, therefore, remain unmapped.

#### Other Structures

Closely-spaced walls, 40-70 cm apart, comprised much of the southern arc. These have been designated either rooms (Rooms 198, 200 and 203) or Other Structures (OS 4, OS 7, OS 10, and OS 11), but in any case, probably none of them enclosed space used for cultural activities. Instead, the narrow double walls probably were designed to be relatively free standing and to act as barriers to entry into Plaza 1. Many are filled with trash that may have constituted the original core material, as if the narrow structures were a modified version of the standard core-and-veneer walls. Overall, the masonry employed for the arc wall construction consisted of mostly hard, gray, rectangular spalls (range of length 10-15 cm and 3-5 cm high) interspersed among poorly coursed bands of large, irregularly shaped soft blocks (ranging between about 4-20 cm long and 10-20 cm high).

At the western end, however, the visible northern interior of OS 7 revealed greater regularity in shaping the large blocks to a rectangular shape and the predominant use of the hard gray sandstone. This style, then, appears earlier than the remaining construction of the double arc walls. In contrast, a tall (2-m) section of masonry located in about the middle of the exterior OS 11 wall (Volume I, Plate 6.8), nearly opposite the OS 7 wall mentioned above, was composed of large, unshaped, soft sandstone blocks with very few spalls. The latter appears to be a variant of the typical "McElmo" style of construction. This section of OS 11 was 5.5 m long and inordinately thick (76 cm) and appears to have been an early A.D. 1100s or later addition to the earlier OS 11 wall.

Irregularly shaped spaces, partly or wholly enclosed by walls, were also given Other Structure designations. A number are located adjacent to the double-walled arc and remain largely uninvestigated (i.e., OS 3, OS 6, OS 8, OS 9, and OS 12). Trenching across OS 3 (see Volume I, Chapter 5) seemed to confirm that it was a small courtyard without buried kivas. North of the gate (194-202 cm) leading into Plaza 1 was a curving wall foundation (60-61 cm wide) of gray and tan mortar and some small stones. This could be the early remains of a room or arc enclosing wall, although it was not investigated thoroughly. OS 5, in Plaza 2, was excavated. The remainder (OS 1 and OS 2) were small, masonry boxes built against the exterior of Kiva 1 that may represent ventilator shafts for a late kiva thought to exist in Room 223.

#### Circular Structures (i.e., CS)

There was a small masonry cubicle, designated CS 2, adjacent to OS 6. It had been filled with early A.D. 1100s trash but much of it was removed during wall trenching. The only other circular structure at Pueblo Alto was built against Room 110. Because of the pair of closely parallel curvilinear walls, the latter structure has often been loosely referred to as the "bi-wall structure," or CS 1. The blocky walls of CS 1 (Volume I, Plate 6.9) were built about 53 cm apart, and its interior covered about 25  $m^2$ .

# Southeastern Section (Figure 5.24)

The major building along the southeastern part of the arc consists of a complex of walls and enclosed areas that is dissimilar from the architectural complex in the southwestern corner. This area lacks the small kivas and rectangular rooms that mark potential zones of early A.D. 1100s domestic occupation seen elsewhere at Pueblo Alto and in other great-OS 6, a large square feature buttressed by a number of crude houses. walls along the western and northern sides, seemed a potential candidate for housing a small kiva. A test trench (175 by 45 by 55 cm deep) in its center revealed unusual, soft, humus-like deposits, sand, some rubble, and a crude wall along the northern interior of OS 6. We cannot rule out the presence of a kiva from our testing, although it appears that the fill may have been intentionally placed to fill up the interior space. A small, partly enclosed, masonry box (83 by 61 cm) adjacent to OS 6 in Room 193, however, looks suspiciously like a kiva ventilator shaft. Wall clearing of OS 6 yielded a profuse number of ground stone fragments, evidently scavenged and reused in the masonry, that are characteristic of late Ceramics associated with OS 6 and in the trash-filled construction. spaces of the adjoining structures revealed an early A.D. 1100s Wall abutments and masonry style reveal that the adjoining assemblage. structures (Circular Structure 2, Room 193, OS 4, and OS 12) were approximately coeval with OS 6, but it is difficult to interpret their function from the little work done in the complex.

# Southwestern Section (Figure 1.1)

A hodge-podge of small rooms and kivas was added to the latest southern arc walls in the early A.D. 1100s. The symmetrical arrangement and size of the rooms and kivas, characteristic of the initial greathouse construction, is absent for this complex. In many ways, the cluster of late buildings in the corner are reminiscent of early A.D. 1100s small habitation sites in the canyon. Clearing revealed small, shallow rooms of narrow, masonry walls with mutiple-plastered interiors, some sooted. Wall clearing of these revealed a combination of large, irregularly-shaped, soft blocks and hard, medium-sized, rectangular stones with cleanly fractured edges. The latter were not pecked or ground and resemble the very tidy masonry found in the early A.D. 1100s kivas adjacent to Casa Rinconada. Trash was common throughout the complex, and it was deposited during the early A.D. 1100s. One restorable Puerco Black-on-red bowl came from the trash along OS 7 (Plate 3.42B). Little trash came from Kiva 9, however, which suggests that it was used until the very end of the occupation. A second, small kiva might exist under small Rooms 214 through 216, whereas the double wall exposed in Kiva 9 suggests remodeling. The entire complex is tacked onto a trio of parallel walls (OS 7, OS 10, and OS 11) that enclosed the southwestern side of Plaza 1.

The presence of a single, large room (Room 211), perhaps for living, and a small kiva suggest construction and occupation by a family or two. 460 Pueblo Alto

Small occupational units appear to be common at Chaco greathouses of this period (early A.D. 1100s), although they are often obscure because of the deterioration of their fragile architecture. Similar building patterns are evident at Pueblo del Arroyo, for instance, where clusters of small contiguous rooms and kivas were built in the corners of the plaza (as at Pueblo Alto), over the early central roomblock, tacked on along the outside south wing, and clustered around the tri-wall structure in back of the main houseblock (see Judd 1959).

# Chapter Six

# **Extramural Plazas and Associated Features**

A number of areas and structures other than houses were examined around the peripheries of Pueblo Alto. Some of these are covered in other sections (i.e., roads and major exploratory trenches outside exterior rooms). Our primary work took place in Plaza 2, an area surrounded by a variety of barriers to channel traffic flow into and past Pueblo Alto along the east side.

# <u>Plaza 2</u> (Figures 6.1-6.5)

The immensity of Plaza 2 forced only limited testing of its environs (Figure 6.1). Its hallmark was a number of prehistoric roads that traversed it, particularly a major north-south route (Road Segment 40) that connected to Talus Unit-Chetro Ketl to the south and Pierre's community and eventually Salmon Ruins to the north. Plaza 2 is bounded along its west side by the East Wing, to the north by a massive, low-lying masonry wall (Major Wall 1), along the southwest by another masonry wall (Major Wall 2), and by a series of unnatural, earthern mounds for the remainder. The East Ruin sits at its northeastern corner.

A number of entries provided formal access to Plaza 2. Collapsed sections of the exterior East Wing wall mark at least five doors between the plaza and Pueblo Alto rooms. Gates were found in Major Wall 1, where a number of prehistoric roads converged from the north, and in Major Wall 2, and provided a thoroughfare between Plaza 2 and Plaza 3. Another gate may have existed next to the "blockhouse" at the jog in Major Wall 1. More roads entered the plaza along the Trash Mound from the south and past the East Ruin from the east flanked by the earthern mounds mentioned The southern road (Road Segment 40), originating in part from above. Chetro Ketl and the Talus Unit, aligns directly with the north gate in Major Wall 1. Color aerial imagery revealed a darkened strip of vegetation connecting the gate and south road entry across Plaza 2. The slight swale cut to sterile soil, revealed by testing for the road route across the plaza (see Road Test in Plaza 2 below), undoubtedly created slightly wetter conditions that are the likely cause of the vegetational differ-The route suggests that the bulk of traffic crossed the plaza ence. rather than diverting into it.







Figure 6.2. Plaza 2, Grids 181 and 201, plan view.



Figure 6.3. Plaza 2, east-west profile through Grid 201 and Other Pit 2 (a large firepit).



Figure 6.4. Plaza 2, east-west profile of Grids 181 and 201 (Profile No. 3).



Figure 6.5. Plaza 2, north-south profile through Grids 181 and 201, disecting a large rodent-hole pit.

Finally, a crude pile of stone, approximately 2 m in diameter and 47 cm high, in the northern center of the plaza, near Major Wall 1, may be of Navajo origin. It was located 24 m west-southwest of the gate in Major Wall 1 but was not investigated, although another possible historic feature (a small, stone-lined cist) was discovered during the road testing. Because parts of the plaza are not rigidly bounded, the area incorporated within it can only be approximated at about 4.8 hectares (4,800 m<sup>2</sup>; calculated with a digital planimeter). This area is somewhat larger than those calculated for Plaza 1 and Plaza 3.

# Previous Work

The first recorded work in Plaza 2 was conducted in 1967 by Gwinn Vivian, who regarded the bounded area as a large reservoir and sunk test pits into its center and the earthern mounds along its peripheries (Vivian 1983:A-5). His findings of the composition for the earthern mounds (primarily natural material presumably deposited from the plaza interior and a little construction debris and miniscule trash) mirrored our own from Plaza Feature 2. He tested mounds in Grids 159 (Test Pit 8), 297 (Test Pit 9), 191 (Test Pit 10), 411 and 412 (Trench 4), and 431 and 432 (Trench To test for the depth of the "reservoir" Vivian dug in Grids 126 3). (Test Pit 12), 207-208 (Test Pit 11), and 310, 330, and 331 (Trench 5). He found a thin mantle of unconsolidated, aeolian sands overlying shallow, hard, sterile, white clays. Vivian, and later the Chaco Center, trenched east-west across Road Segment 40, where it opened into the plaza at the termination of Major Wall 3 (in Grids 427-429). A definite swale, marking the road, was apparent from the latter tests.

Later, Loose (field notes 1975) tested some of the walls bounding the plaza as part of a prehistoric road study. In 1976 the Chaco Center began its investigation of the area by clearing the adjacent major walls, testing one of the earthern mounds (Plaza Feature 2), and backhoeing a trench to the exterior of Room 181. Despite this work, the discovery of Other Structure 5 (OS 5) during the clearing of Major Wall 2 was responsible for stimulating greater interest in the plaza. This led to expanded clearing around the southeastern corner of Pueblo Alto from 1977 and 1978. In addition, a number of small test pits were sunk in the interior plaza (Grids 85, 164-165, 205, and 224-225) to examine the underlying stratigraphy and to assess the potential for damage resulting from the anticipated use of the backhoe. The only feature recorded in these tests was a poorly defined one in the northwestern quarter of Grid 165. Short investigations in 1979 and 1980 in Plaza 2 concluded the excavations at Pueblo Alto. The area around OS 5 and the potential of Plaza 2 for a locus of exchange and interaction between the inhabitants of Pueblo Alto and the traffic along the roads prompted abidding dissertational interest by H. Toll (1978, 1985).

# Strategy

For overall control in Plaza 2, the area was overlain with a grid system, aligned to true north, that started at the northeastern corner of Pueblo Alto and Room 169. This system extended east 20 grids and south for 22 grids. Each grid was 4 m square with the grids numbered serially east to west starting with Grid 1 at Room 169 (Figure 6.1). North-south grid series thus became numbered in multiples of 20. Parts of some grids overlapped into ungridded Plaza 3 along the southwestern side because of the configuration of the plaza. For the most part, work covered here concentrated in Grids 161, 181, 201, and 221 north of 0S 5, and Grid 241 south of 0S 5. For finer control, these grids were subdivided into quarters, although all floor-contact materials were piece-plotted from subdatums set into the nearby room wall tops.

Pollen and flotation samples were collected from 1 by 1 m grids in checkerboard fashion. Preferential samples were taken from areas of best defined surfaces, however. Unfortunately, priorities given to other areas of the site, and the sparse ethnobotanical remains generally yielded by outdoor samples, left the Plaza 2 samples unanalyzed. They constitute a potentially valuable resource for future study and Plaza 2 interpretation.

All materials were screened through 1/4 in. mesh and volumes of fill crudely calculated from wheelbarrow loads (these were later recalculated from map measurements).

# Definitions

The problem of working with endless, ephemeral, outdoor surfaces was heightened by the strategy employed in Plaza 2. Unlike other outdoor areas, several years were spent clearing the various surfaces in the grids north of OS 5. For this reason, problems were exacerbated for the recognition and definition of surfaces and features that are particularly relevant to the final interpretation of the area. Thus, it is germane to cover some of these details here.

Features. Unlined, unburned pits filled with material nearly identical to the surrounding fill posed particular problems in identity for Plaza 2. Articulation with good surfaces adds a measure of certainty that was often lacking for the ephemeral outdoor surfaces common in Plaza 2. Thus, morphology and sometimes fill are the primary clues for the identity of cultural features, but these clues must be weighed against the problem of identifying rodent holes. Although most Other Pits and postholes in Plaza 2 are, by themselves, marginal features, they generally align as a group parallel to the room walls along a narrowly defined strip between 50 and 150 cm out from the walls. In this case, then, we can be confident that most of these are cultural rather than natural features.

Surfaces. Generally at Pueblo Alto, surfaces refer to unprepared, horizontal areas of use, naturally produced but culturally modified by compaction and feature placement, in contrast to those that are prepared and designated as floors. In Plaza 2, however, innumerable surfaces were defined that, for the most part, were naturally formed and buried without cultural modification (Plate 6.1). These were formed by varying degrees of aeolian and pluvial action. They were often smooth and flat, attributes generally signifying cultural formation, but devoid of features, cultural material, and enough tensile strength to withstand subsequent trampling by archeologists. Rough, uncompacted, and churned-up surfaces characterize modern use of the areas around Pueblo Alto and these may be characteristic of prehistoric surfaces as well (see Appendix MF-C). The finding that most features were associated with these surfaces was additional evidence for regarding the disturbed, uneven surfaces as cultural manifestations. Conversely, surfaces we had created and allowed to weather from sun and rain over a year became very hard, unlike most of those excavated. This suggests that the latter were exposed for only a short time, perhaps less than a year. Depending on soil moisture, surface compaction may also be an attribute of human use (see Appendix MF-D). Undoubtedly, both compaction and churning resulted from use of open spaces in and around Pueblo Alto, depending on the amount of moisture present, the amount of traffic, and the length of surface exposure.

Surfaces covering a large area were numbered and described here. Often minor, localized appendages to these were given the same number as the primary surface but with a letter suffix (e.g., Surface 3B). A total of at least 52 surfaces, 18 of them major, was recognized.

Of course, surface formation was not a uniform event, and often surfaces were so closely packed that it was difficult to distinguish between them. In an area where a centimeter of aeolian sand can easily accumulate from a wind storm, the temporal blurring caused by surface clearing mistakes must be considered irrelevant. Thus, it is best to examine combinations of adjacent surfaces to interpret use of the plaza. Postholes, in particular, may last through a succession of surface uses and be made more intelligible as supports for a structure by examining their pattern, along with "other pits," from adjacent surfaces. In summary, surface use as defined here incorporates both the defined horizontal planes of use and the churned deposits above and between them (e.g., the principal surface and the fill just above).

> Grids 161, 181, 182, and 201 (Figure 6.2)

Most of the work in Plaza 2 was limited to the grids north and around OS 5 (Plates 6.2-6.3). The greatest area (approximately  $52 \text{ m}^2$ ) was cleared in 1977 when the southwestern quarter of Grid 161, the northern quarter of Grid 221, all of Grids 181, 182, and 201, except the northeastern quarter of Grid 182, were cleared down into Layer 2. In 1978, work was limited to mostly the western half of Grid 201 and the southern



Plate 6.1. Plaza 2. Profile face of the southern half of Grid 181. Tags mark surfaces. 30cm scale. (NPS17281-17283)



Plate 6.2 Other Structure 5 built against the southeastern corner of Pueblo Alto in Plaza 2. Grids 181 and 201, north of OS 5, cleared to Surface 10. Note Trash Mound in background. 50cm north arrow. (NPS#18122)



Plate 6.3. Plaza 2, Grids 181 and 201 cleared to Surfaces 7 and 8A. Dark burn against wall marks bottom of a large firepit (OP 2). Note linear feature running next to wall (Other Unnamed Feature 1). Looking north. 30-cm north arrow. (NPS#17104)

half of Grid 181 (approximately 17.6  $m^2$ ), because of the time required following real and imaginary surfaces. Work concentrated in Grid 201 (16  $m^2$ ) and in and around OS 5 in 1979, with a little follow-up in 1980.

# Fill (Figures 6.3-6.5)

The thickest deposits were banked against the room because of wall collapse and because sands tend to accumulate along the leeward side of the site as a result of the prevailing southwesterly winds. The layers and surfaces described below refer to those units near the walls. Except its peripheries, the surface of Plaza 2 is relatively flat, varying as much as 24 cm but generally less than 13 cm in elevation. The majority of Plaza 2 is covered by a thin mantle of unconsolidated, clean, aeolian sand that rests on hard, sterile deposits. The sequence of deposition described below does not apply to Grid 221, which saw a number of different tests and sequence descriptions that are listed under OS 5.

Layer 1. Near the walls the primary overburden consisted of wall fall and some aeolian sands. Most of fill that was north of OS 5 and overlay the grids excavated was removed by backhoe and the remainder by hand.

Layer 2. This deposit consisted of numerous horizontal, alluvial laminations in a bed of fine, aeolian sands. Near the walls, this deposit underlay the wall fall and was quite thick but separated into smaller units by Surfaces 1 through 4.

# Surface 1

The uppermost definable surface revealed the greatest evidence of cultural use north of OS 5. Several features and artifacts articulated with the surface, and the fill directly above contained the highest density of artifacts (168 per  $m^3$ ) for any deposit north of OS 5. Patches of charcoal and ash along with spots of oxidized sand attest to the association of the surface with the large firepits built against the roomblock walls. The same surface extended north to Grid 121 where an exploratory backhoe trench exposed the surface and another associated firepit (see Exploratory Trench Outside Room 181). In keeping with our definition of what constitutes a cultural surface, this one was relatively rough, porous, and irregular.

Surface 1 Features. Four firepits were associated with the surface. Two (OP 2 and 3) were huge slab- and block-lined pits set against the outer wall of Room 185 (Figures 6.6-6.7, Plates 6.4-6.5). Another built against Room 181 was cut by the backhoe trench in Grid 121 (Figure 5.5). Fires in these had been built next to probable doors leading into the East Wing rooms, and each had scorched the wall stones high above. OP 4, a smaller firepit, had been built inside or formed a partition of OP 3. Fuel for these firepits was predominantly ponderosa pine with several tree-ring-dated pieces clustered in the mid-A.D. 1000s (Volume I, Chapter 8). The firepits, however, are much later in time, and the species and dates of the fuel suggest procurement from dismantled roofs nearby. A



Figure 6.6. Plaza 2, Other Pit 2 (firepit), plan and profile.



Figure 6.7. Plaza 2, Other Pits 3-4 (firepits), plan and profile.



Plate 6.4. Plaza 2, Grids 181 and 201 cleared to Surface 4. Note huge firepit (OP 2) built against Room 185. Deep break in wall marks collapsed door. Looking north. 30-cm north arrow. (NPS#16704)



Plate 6.5. Plaza 2, Other Pit 2 firepit built in Surface 1. Looking northwest. 30-cm north arrow. (NPS#16639)

concentration of ash and charcoal just downslope in front of each firepit suggests casual cleaning of the pits.

In addition, two other unlined, unburned pits were discovered. OP 1 was mostly destroyed by test trenches before its recognition in the profile. It was a large, basin-shaped pit filled with Layer 1 material and a hammerstone. A more dubious pit, OP 5, may have been natural or rodent disturbed, although the vegetal materials that helped define its shape were probably human coprolites. About 6 m east of the rooms in Grid 182 were found the tumbled remains of a crude stone wall that had once paralleled the East Wing for an unknown distance before falling across Surface 1. It was in such poor shape--perhaps it was deliberately demolished-that there was some reluctance over its designation as a wall (Plate 6.6). Apparently, it had been built on or close to Surface 1 without the benefit of an entrenched foundation. The spread of wall debris suggests a wall height of less than 150 cm and a length of at least 4 m where it crossed Grid 182.

<u>Surface 1 Artifacts</u>. Floor contact material was relatively sparse: 23 sherds and a piece of obsidian. An abundance of sherds in the immediate fill above marks deposition in the early A.D. 1100s. More than half of the total faunal remains north of OS 5 (864 bones) came from above Surface 1. A high percentage of the dominant species (jack and cottontail rabbits, prairie dogs) yielded lower limb and foot elements suggestive of small mammal processing (Akins 1985a). Although turkey elements were normally common in faunal deposits of this period, none were recovered. A high degree of bone checking (35 percent) for the total implies lengthy exposure to the elements, not unexpected for the terminal deposition. None of the elements were burned except for one of the 160 elements recovered from the huge firepits (OP 2 and OP 3).

The lack of burning, particularly with so convenient a place as the firepits to toss trash, and the finding of a articulated bunny body suggests at least some of the bone was postoccupational and noncultural. Nevertheless, the high bone frequencies parallel a like finding for other artifact classes. OP 2 yielded 8 pieces of chipped stone, and another 43 pieces occurred in the plaza surface fill. The relative abundance of exotic pieces, including Washington Pass chert and eight obsidian fragments, is consistent with an early A.D. 1100s deposition (Cameron and Sappington 1984). The number of lithic items for Surface 1 and the associated fill (5.4 per m<sup>3</sup>) was nearly twice that of any others, except for Surface 6 (2.8 items per m<sup>3</sup>) and Surface 11 (13.3 items per m<sup>3</sup> for a very small area excavated), but disproportionally low in formal tools and detected utilized flakes.

Although clearly there was some specific use of Surface 1, much of the cultural material may have derived from roof discard rather than from on-ground activities. The overall density of cultural material from Surface 1 and its fill was the highest of all units excavated in Plaza 2 (168 artifacts per  $m^3$ ). Early A.D. 1100s trash was commonly associated with roofs in the room excavations, and it would not be unusual behavior for some of it to have been tossed off the roofs.



Plate 6.6. Plaza 2. A collapsed isolated wall in Grid 182, Layer 2, running parallel and about 4 to 5 m from the exterior of the East Wing. 30-cm north arrow. (NPS#14846)

Plate 6.7. Plaza 2, test trench along northern side of Grid 201. Note partially blocked exterior door and exterior wall plaster at end of trench. 50-cm north arrow. (NPS#18236)

# Surface 2

This was a natural surface similar to Surface 1 and, in places, merged with it. It was slightly smoother and less irregular, however. The continued presence of charcoal and burns, despite the paucity of pits and the drop in artifact density (46 per  $m^3$  of fill), indicates its use, probably a reduced one compared to the surface above, in conjunction with the firepits.

<u>Surface 2 Features</u>. A solitary, shallow basin (OP 1) of moderate volume (14 liters) was discovered about 70 cm in front of the Room 186 door between two of the huge firepits. A high, clayey-sand collar, rising ll cm above the pit and adjacent surface, flanked its west side. The contents of sand and fine gray ash suggest its use as a receptacle for firepit contents, although it could have handled only a small portion of their total. Its position would have made passage through the door awkward, and yet we are sure that the door continued to be used despite masonry filling in the lower part of the door. Perhaps the pit was formed by inhabitants entering or exiting through the door, and the ashy fill was simply the result of wind-scattered, firepit contents.

<u>Surface 2 Artifacts</u>. Cultural remains on the surface were minimal (just three sherds). Ceramics in the fill above were similar to those above Surface 1. Turkey remains were present (7 elements), but total elements (94) were dominated by rabbit and prairie dog parts. Both obsidian and Washington Pass chert were present in the few lithics recovered. Overall density consisted of 46 artifacts per m<sup>3</sup>.

#### Surface 3

A continous surface could not be identified despite the findings of several burned spots and surface remnants. From this evidence, or lack thereof, repeated or sporadic use of the area for small fires is suggested.

Surface 3 Features. A single, small, deep pit was designated a posthole (PH 1) on the basis of morphology. Two other pits, assigned to Surface 4, created a row of pits with PH 1 that might have held some minor structural framework next to the OP 3 firepit.

Surface 3 Artifacts. A single element of unidentified mammal bone and 11 sherds were the only surface artifacts. Ceramics from the surface and fill came from an early A.D. 1100s assemblage. Chipped stones in the fill reflected high percentages of Washington Pass chert and obsidian, also indicative of early A.D. 1100s deposition. Of the scant 11 chippedstone fragments, 3 were projectile points. A large minnow vertebra (Gila sp.) from the fill was one of only two fish elements recovered from Pueblo Alto. The overall artifact density was 69 items per m<sup>3</sup> of fill.

# Surface 4

A good, continuous surface characterized much of Grids 181 and 201 closest to the walls, but was poorly defined and rodent torn along the eastern margins (Plate 6.4). Slight undulations in the surface in front of the door into Room 186 may have been caused by door traffic. Minor surface remnants in the fill revealed greater indications of activity than the principal surface, a finding mirrored for Surface 3. Concentrations of bird beaks, small sandstone and petrified wood flakes (from construction), and ash and charcoal marked a variety of activities for the deposit.

Surface 4 Features. Two small, shallow other pits (OP 1 and 2) were found close to the walls and, along with PH 1 on Surface 3, were suggestive of a small, post-supported framework of some sort.

Moderate amounts of cultural material were Surface 4 Artifacts. scattered over the surface, including 16 sherds, 14 bones and 1 piece of Ceramics marking early A.D. 1100s were absent, although chipped stone. they were found in deeper deposits. Nevertheless, obsidian, also an early A.D. 1100s marker, was absent from here on down. The construction debris of sandstone (5) and petrified wood (16) chips, concentrated in the southeastern quarter of Grid 181, probably was part of a larger pile of debris found below on Surface 5. Also found in the same quarter of Grid 181 were parts of eight bird beaks (mostly from orioles) in the fill, a turquoise chip, a turquoise-painted cylinder of wood, and a side-notched projectile point of spotted-yellow jasper. Single, bird-beak parts (Passeriformes) came from just above Surfaces 1, 2, and 5. This artifact assemblage suggests ceremonial associations, although Gillespie (in Akins 1985a:193) cautions us that the bird beaks may have derived from raptor pellets. The overall density of cultural material is 63 items per  $m^3$  but only 51 per  $m^3$  without the construction debris.

# Layer 3

A greater variegation of the sand under Surface 4 through Layer 7 occurred compared to the homogeneous sands above. This change in the sand matrix was associated with the use of OS 5. The greatest densities of cultural material were found at and above Level 1 of Layer 3.

#### Surface 5

In the northern half of the excavation another good, continuous surface was cleared that became irregular and rough at the southern end where the features were located. The surface exhibited a faint, reddish tint. Along with the features, charcoal concentrations and burned spots indicate repeated minimal use of small fires or a short, intensive period of use, if the accumulations of sand were nonrandom.

Surface 5 Features. The primary feature exposed in clearing Surfaces 5 through 10 was a long ribbon of elevated, soft sand running parallel and adjacent to the outer roomblock wall. This anomaly, called Other Unnamed

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Feature 1, or simply Feature 1 in the text, was marked by a distinct crack that separated it from other deposits along its eastern margin. This feature started as Layer 10 (see below) with later accumulations of sand covering both it and the outer areas of the grids.

A pair of small other pits (OP 1 and 2) cut into the top of Feature 1 could be considered (morphologically) postholes. In addition, two, poorly scooped-out, lightly burned, heating pits, filled with charcoal and ash, marked the remains of impromptu fires on Surface 5.

<u>Surface 5 Artifacts</u>. Thirty-three sherds came from Surface 5 and, along with those from the fill, reflect early A.D. 1100s deposition. The concentration of splintery petrified wood (159) and sandstone (46) flakes in Grid 181 along with the 21 found above in Layer 2 (above Surface 4) must have resulted from some limited dressing of masonry stone nearby that utilized petrified wood hammerstones. The majority of pieces were 1 cm or less in maximum size.

Except for a mule deer and a dog foot element, bones came from the usual species of small mammals. A bird beak (Passeriformes) fragment also came from the surface. The two samples of pollen analyzed yielded very low counts and only a single economic grain of prickly-pear cactus (Cully 1985:201). Except for two coprolites, no other palynological analysis was conducted for Plaza 2 samples. Construction debris inflates the overall density to 182 items per  $m^3$ , but the density without that debris is a mere 50 per  $m^3$ .

# Surface 6

This was a thin, alluvial surface with ragged holes. A number of pockets of organic material in the southern part of the excavation were later identified as human coprolites. At least six were present, but not all were collected because of the difficulty of detection. One was later analyzed and found to be loaded with <u>Portulaca</u>, <u>Cheno-am</u>, corn, and <u>Cucurbita</u> pollen (Clary 1984). The lack of features suggests relatively unspecialized use of the area except for defecation and, perhaps, incidental trash discard.

# Surface 6 Features. None.

<u>Surface 6 Artifacts</u>. A mere five sherds and three pieces of chipped stone rested on the surface, but higher frequencies were found in the fill above (86 sherds, 13 chipped stones, and 19 bones) including a core of Washington Pass without the associated shatter. The high incidence of bone checking (37 percent) for the small sample suggests a prolonged exposure to the elements and, thus, a surface life of some duration. Like Surface 7, this deposit yielded one of the highest artifact densities in Plaza 2 (83 items per m<sup>3</sup> of fill).

# Layer 4, Level 1

Between Surfaces 6 and 7 was a granular deposit of sand with inclusions of clay and small pieces of sandstone that could only be culturally derived. Level 1 was relatively less compacted than units directly above and below it. The homogeneity of the deposit was broken only by a single, minor surface of limited extent.

# Surface 7 (Plate 6.3)

Despite the lumpy appearance of Layer 4 that suggested cultural disturbance, there was little indication of intensive use of the deposit.

<u>Surface 7 Features</u>. A single, nondescript, unlined pit (OP 1) was found about 70 cm from the Room 186 wall and may have been a posthole related to others on the surface below.

<u>Surface 7 Artifacts</u>. A Puerco Black-on-red sherd and three pieces of chipped stone comprise the only contact materials. The sherd is from the early A.D. 1100s, although we can not be sure that it was originally deposited on this surface. Despite the lack of use intensity, artifact density was high (83 per  $m^3$ ).

#### Layer 4, Level 2

This deposit was less porous and more heterogeneous than Level 1 and contained several minor surfaces indicative of some cultural use.

#### Surface 8

Surface 8 was defined on the basis of many, closely spaced laminae of clean sand.

Surface 8 Features. Three pits were found in Grid 201, although one, OP 1, is culturally tenuous. A deep, cylindrical pit marked an apparent posthole, and the oxidized remains of a heating pit were situated in a depression at the base of the intentional mound banked against the northern end of OS 5.

<u>Surface 8 Artifacts</u>. All chipped stones (8) and bones (25) came from the fill. Half of the chipped stones were Washington Pass chert whereas, except for unidentifiables, the bones came from rabbits and prairie dogs. The small incidence of bone checking (6 percent) may indicate a relatively short period of surface use. A single, Gallup Black-on-white sherd was recovered from the surface, but 19 other sherds came from the fill that suggested deposition in the late A.D. 1000s. The artifact density for the surface and floor combined was 67 artifacts per m<sup>3</sup>.

#### Layer 5

Like Layer 4, this deposit of sand lacked internal laminae and may have been intentionally placed to fill the low spot in Layer 7. It also contained adobe chunks, charcoal, and small pieces of sandstone that concentrated in the lower part of the layer. This was one of the most distinctive deposits in Plaza 2, partly because of its reddish color. The deposit was restricted to the north-south center of the excavation area.

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#### Surface 9

Like so many others, this was an ephemeral, water-washed, naturally formed surface. Nevertheless, the character of Layer 5 and the remains of a small fire (HP 1) built in a natural depression indicate some use of it.

Surface 9 Features. A heating pit was the only feature.

Surface 9 Artifacts. Seven sherds, none of them temporally useful, came from the surface, whereas another 29 were scattered through the fill. The fill was dominated by indented corrugated and Gallup-on-white sherds, tentatively suggestive of a late A.D. 1000s deposition. All the bones (28) came from the fill and, as usual, were dominated by rabbit and prairie dog elements. Checking of the bones was low (12 percent). All nine pieces of chipped stone also came from the fill. Artifact density was a low 39 per m<sup>3</sup>.

#### Layer 6

A loose, unsorted, sandy unit within 2 m of the room walls contained an ephemeral remnant of Surface 10A. This unit of sand was part of the overburden resting above Other Unnamed Feature 1 (see below).

#### Layer 7

This deposit was composed of coarse, unsorted, unlaminated sands with much caliche and relatively abundant charcoal. It was similar in composition to Layer 5, including the inclusion of clay and small sandstone fragments attributed to cultural activity. The greatest concentration of Plaza 2 turquoise, five unmodified pieces, came from this deposit.

#### Surface 10

This was another intermittent, poorly defined, ephemeral surface, which eventually merged with Surface 9 (Plate 6.2). It was best defined in the southwestern quarter of Grid 201, where it was darkened by an increased clay and charcoal content. This surface can be combined with Surface 9 as one of an associated group of little-used surfaces.

#### Surface 10 Features. None.

<u>Surface 10 Artifacts</u>. A concentration of cucurbit seeds, bits of burned and unburned wood, and a fleck of turquoise that disintegrated on handling were noted in an area where the surface was poorly defined (i.e., found in the sand at the same level as the surrounding surface). Even the fill above contained little cultural material. Among the 19 bones, however, was a mule deer antler and a complete mandible from a less-than-aweek-old turkey. Chipped stones were absent, although the 21 sherds suggested late A.D. 1000s deposition.

# Layer 8

This was a laminated, brown, clayey sand. A cluster of spalls was found in the northeastern quarter of Grid 201. Cultural material was sparse, yielding just 9 sherds, 5 chipped stones, 8 bones, and a coprolite, except for a mass of 134 malachite flecks and fragments (Mathien 1985). Although the latter lot constituted 86 percent of the total malachite frequency recovered from Pueblo Alto, it was a paltry sample in terms of weight.

#### Surface 11

Unlike Surface 10, this one could be defined for most of Grid 201, except along the eastern 40-60 cm.

#### Surface 11 Features. None.

<u>Surface 11 Artifacts</u>. Surface 11 was distinguished by five coprolite remains, a few cucurbit seeds (possible from Layer 7), a small concentration of spalls in the northeastern quarter, and few other artifacts. A friable piece of malachite was also uncovered, along with 5 chipped stones, 3 corn cob fragments, sherds from the late A.D. 1000s, and 7 bones.

# Surfaces 12-18 and Layer 10

A number of depositional units were exposed beneath Surface 11 in a test trench (2 m north-south by 0.75 m east-west) at the northern end of Grid 201. Only a small part of these units could be examined and, thus, their descriptive treatment is merely summarized. Beginning with Layer 10 (see below), discernible alternations and marked variation of surfaces became common. Supposedly, these changes reveal extensive modification and use of the area compared to subsequent accumulations. There was a paucity of cultural material from the test, but this may be due to the greatly reduced area investigated.

Layer 10. Layer 10, overlain by Surface 12 and on top of Surface 13A, was a relatively large, intentional unit of soft, sandy fill. Its intentional nature was attested to by its homogeneous composition that contrasted with surrounding deposits, the inclusion of a few unusually large sherds, and a higher density of stone than is normal in the natural adjoining deposits of sand. The preservation of the wall plaster behind it (Plate 6.7), which extended up the exterior wall 10-14 cm above Surface 13, was testimony of the rapid deposition of Layer 10. The latter was up to 34 cm thick against the wall, but thinned rapidly toward the east to disappear after about 2 m. Roots and rodents had intruded into the soft deposits, but the reddish sands filling the rodent burrows with fill from the Surface 1 firepits clearly show the deposits' origins were postoccupational.

Layer 10 was responsible for years of consternation by the excavators because of its effect on later deposits that accumulated over it and on

the adjoining plaza surfaces. A noticeable crack had developed along its eastern periphery where it had mounded against the roomblock walls, which resulted in the identification of "Other Unnamed Feature 1" (OUF 1), a feature that included Layer 10 and all the deposits under Surface 5 and Layer 3 (Level 2) next to the wall. The sizable quantity of fill representing Layer 10 along the wall exterior, the possibility of surface preparation, and the flatness of part of the deposit suggest a well used walkway close to and paralleling the roomblock walls, similar to that found along the exterior Central Roomblock wall.

Surface 12 was an alluvial surface that appeared to have washed off Layer 10. It was found to the west of OUF 1, and had a hammerstone/ abrader sticking through it. Surface 12A revealed a small dump of heating pit contents. Surface 13 rested on a modified and intentionally placed deposit of sand characterized by blackening. The natural surface below it, Surface 14, contained a well made heating pit that contrasts with the shabby, burned depressions found on the larger exposures below Surface 1. Surface 15 was also natural, but Surface 16 had the appearance of a wet surface that had been walked on. Preservation of the latter surface may have been aided by the rapid, perhaps intentional, deposition of sand forming Layers 12 and 13 on top of it. All areas cleared to the base of the walls revealed the outer wall foundation dug into sterile soil with some spalls and clay building debris nearby on the hard surface (Surface 17) at the base of the wall veneer. South of OS 5 this surface corresponded to Surfaces 10 and 11. The lowermost level, Surface 18, revealed some minor activity or traffic before the wall construction. The few ceramics recovered from the deepest deposits gave no indication of pre-A.D. 1040 or 1050 use (i.e., Gallup Black-on-white was present).

# Road Test in Plaza 2

A brief test was conducted just north of the entry of Road Segment 37 into Plaza 2 from the east. The purpose of this test was to again examine the composition of the earthern mounds (see Plaza Feature 2 below) and to search for formal definition of the eastern edge of the plaza and the roads that crossed the plaza. Limited manpower, shallow deposits, and a paucity of cultural material restricted the testing to a 50-cm-wide trench across the southern quarter of Grids 152 through 158. The two mounds tested consisted primarily of sand with varying quantities of hard sandstone spalls piled in the upper deposits. These findings were consistent with Gwinn Vivian's (1983) results from his testing of the mounds as well as the earlier test across Plaza Feature 2. Two, parallel, swale-shaped, road depressions were separated by a definite ridge of hard soil and some stone, which may have been the remnants of curbing between the roads. The wider western depression, 30 cm deep, lay within the projected route across Plaza 2 between the north gate in Major Wall 1 and the road entering the plaza from the south (Road Segment 40). Its western margin was indistinct, but the approximate width of the route was about 14 m. The eastern swale was about 8.5 m wide. A circular, stone-lined cist (40 by 35 cm and about 12 cm deep) without mortar rested on and in the aeolian

Grids 155 and 175 above the western road surface. This was the only formal feature found during the testing and it probably was postoccupational.

### Plaza Feature 2

A series of low (less than 1 m high), earthen hummocks that enclose the eastern half of Plaza 2 were suspected of being intentionally created as barriers to direct traffic. Gwinn Vivian tested two of these in 1967, including the one we called Plaza Feature 2, and the latter was trenched again in 1976 and in 1979. In all cases the composition of the hummocks was revealed to be mostly sand covered by a sheet of small stones, spalls, and very little cultural material. Vivian's test pits were in Plaza 2, Grids 159 and 297, whereas our trenches were in 139 and 157-158. The latter was part of a 26.5-m trench (see above) to examine the prehistoric roads that seemed to pass by the eastern and western sides of a small mound in the middle of Plaza 2 (Grids 151 and 171).

Plaza Feature 2 was the northernmost of two hummocks that lay adjacent to the eastern entry of Road Segment 37 into Plaza 2 (Figure 6.1). In Grids 157-158, the trench revealed a maximum of about 60 cm of hard, clean sand overlying the very hard, calcium-carbonate-impregnated, sterile, clayey sand. The sand overburden contained almost no cultural material, but enough to suggest that it was redeposited. If Plaza 2 were cleaned and leveled off as an outdoor use area, particularly for the road traffic that unquestionably traversed it, then the hummocks could have been derived from these initial clearing and leveling efforts. A 6-12-cmthick layer consisting primarily of sand and construction debris overlay the sand deposits. Hard, light gray-green spalls comprised about 50 percent of the surface layer and, along with several hammerstone/abraders, the deposit indicated that some debris from major construction was deposited over the hummocks. The type of spalls suggested A.D. 1000s construction debris, not the softer, pastel stone that characterized late A.D. 1000s-early A.D. 1100s construction. The closest walls exhibiting similar multitudes of the hard tabular spalls are part of the East Wing and the East Ruin.

> Other Structure 5 (Figures 6.8-6.14)

A small masonry structure, 310 by 315 cm with a dual series of steps built against the southeast exterior of the East Wing (Figure 6.8, Plates 6.8-6.9), was the best evidence that the adjacent Plaza 2 area was important. Most of the work conducted in Plaza 2 was adjacent to OS 5 in Grids 181, 201, and 221. Discussion of Grids 181 and 201, however, is covered elsewhere in the Plaza 2 notes.



Figure 6.8. Other Structure 5, plan view.






Figure 6.10. Plaza 2, Grid 221, Test 2, showing the profiles of the fill and the masonry veneer of Major Wall 2 and Other Structure 5.



Figure 6.11. Other Structure 5, north-south profile, primarily of the south steps and the overlying fill.



Figure 6.12. Other Structure 5, interior masonry veneer of southwestern and mid-walls in Test Trench 3.



Figure 6.13. Other Structure 5, east-west profile of fill and Grid 241 TT 3.

Figure 6.14. Other Structure 5, sequence of construction and remodelling.

A) An early version of Major Wall 2 is butted to the East Wing.

B) Wall X is built approximately coeval with Major Wall 2, but may postdate it. At about the same time a layer of sand (Other Unnamed Feature 1) was deposited along the East Wing exterior.

C) Following some natural deposition, an enclosure was constructed leaving an open surface. It is not known whether the enclosure was used for some period of time or was a phase in the following construction.

D) Additional construction took place with the addition of the south stairs, the new version of Major Wall 2, and the West Wall at the southeastern corner of the site.

E) The enclosure is intentionally filled and the east stairs are added.

F) OS 5 begins to be covered by aeolian deposits but the lower steps are remodeled.

G) The majority of OS 5 is covered by aeolian deposits at the time of the last use of the area in the early  $A_*D_*$  1100s.



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Plate 6.8. Other Structure 5 built against southeastern corner of Pueblo Alto. Note masonry stairs and Major Wall 2 in background. Looking south-southwest. (NPS#18095)



Plate 6.9. The exterior facing of the outer wall of Circular Structure 1, built against the plaza side of Room 110 in the early A.D. 1100s. 30-cm scale. (NPS#15678.)

## Strategy

The stratigraphic and architectural relationship of OS 5 and the fill around it were of prime importance to our investigations in Plaza 2 outside the southeastern corner of Pueblo Alto. To satisfy these interests, several tests were placed in and around OS 5, mostly in Grid 221, which encompassed it. Stratigraphy similar to that found and described in Grids 181 and 201 nearby was noted in tests along the northern and eastern sides of OS 5 (Figure 6.9) as well as in a small test pit (Test 2, 104 by 66 cm) beside the outer juncture of Major Wall 2 and OS 5 on the southern side (Figure 6.10). Because of the similarities and the difficulties in correlating the various layers and surfaces uncovered in these three tests, they have not been described here. The interested reader may wish to consult the field notes and H. Toll (1985) instead.

A 30-cm-wide test trench south of OS 5 against the western side of Major Wall 2 was expanded to cover most of the area between OS 5, Major Wall 2, and the southeastern corner of the East Wing exterior wall (Figure 6.11). This provided a detailed examination of the stratigraphy that is covered below. Finally, a small pit (Test 3) was placed inside OS 5 to examine the internal stratigraphy and construction sequence (Figure 6.12). OS 5 was not completely probed nor dismantled, so that some of its constructional sequence and use is still uncertain.

Pollen and flotation samples were pinched from every surface defined in each test. Because of other priorities and anticipated poor results, none were analyzed.

All deposits were screened through 1/4 in. mesh. Depth control was provided by nearby Subdatum 14, which was tied to the site datum. A second subdatum on the nearby room wall top allowed piece-plotting of surface contact artifacts.

Stratigraphy South of OS 5 (Grids 221 and 241) (Figures 6.10-6.11)

The uppermost two layers covered OS 5, but Layers 2 and 3 did not extend south of the structure. The usual format of listing surface features and artifacts on separate lines has been omitted here because of their general paucity.

Layer 1. The uppermost deposit was one of two major depositional units covering OS 5. It consisted primarily of wall rubble and mortar together with lenses of aeolian sands. This unit, of course, is common throughout the site but had been much disturbed when the small structure was wall cleared in 1976.

Layer 2. A sand matrix mixed with reddish brown soil on top was also a major fill component covering OS 5 and its environs. This deposit appears to have been derived from the adjacent room wall core. Enough variability was evident in the deposit to allow its subdivision into three smaller units: Level 1 consisted of aeolian sand that covered the lowest two eastern steps of OS 5, whereas Level 2 was similar but also yielded

white, clayey material resembling the local subsurface clays. This covered the middle eastern steps (Steps 3 and 4). Level 3 rested on top of OS 5 and was composed of sandy clay lumps scattered in a sandy matrix.

Layer 3. See Test 3.

Layer 4. This was confined to the southern step area in the form of a gravelly deposit with many small pieces of sandstone. The layer was laden with early A.D. 1100s trash, including obsidian and carbon-painted sherds, as well as an <u>Olivella</u> shell bead. This deposit is the same as Layer 2, Level 1 in Grids 181 and 201. For the remainder of the deeper fill there was a general paucity of artifacts that tentatively derived from the late A.D. 1000s.

<u>Surface 1</u>. Near Step 7 was a distinctly red surface that became harder with greater caliche content as one moved south from the step. This represented the final surface associated with OS 5 use, although another surface that also must date to the early A.D. 1100s was noted along the top of OS 5 ("Step 5"). At this time, most of OS 5 up to the top of Step 7 was buried by aeolian sands.

Layer 5. This unit, 9-13 cm thick, contrasted with Layer 4 in the absence of gravel and a reduced density of artifacts. It was a sandy deposit sprinkled with small calcium carbonate (caliche) nodules, charcoal, and flecks of pulverized sherds.

<u>Surface 2</u>. There were numerous, well-packed, clayey surfaces in the center of the excavation area. The uppermost (S2) was easily defined and led off Step 8. Two concentrations of charcoal rested on it but without underlying oxidation of the soil. A gray body sherd was the only contact artifact.

<u>Surface 3</u>. This surface was similar to Surface 2 and was difficult to separate from it except that it was underlain by a bed of coarse gravel. Toward the eastern and western sides, the well-packed surfaces became marginal, suggesting that the surfaces were traffic related. The gravel probably was culturally related, perhaps from traffic wear of the soft sandstone steps.

Layer 6. This deposit was a heterogeneous unit of sand and some charcoal.

<u>Surface 4</u>. The base of Layer 6 was marked at Step 8 by a hard, clayey, red brown surface less than 1 cm thick and spotted with calcium carbonate. Toward the west the surface became gravelly and clayey, and this material extended under the well-preserved remnant plaster. It appeared that Step 8 and Surface 4 were plastered at the same time. A coprolite was found on the edge of Step 8 but was not analyzed.

Layer 7. A clean, aeolian, finely laminated sand, 4-7 cm thick, just under Surface 4, included two, poorly defined, surface remnants (5A and 5B). A coprolite that yielded high percentages of corn pollen (Clary 1984:Table 2, No. 2) was recovered from this unit, but otherwise the unit was nearly devoid of cultural material. This was the first of several thin, narrow deposits filling slight depressions north-south in front of the south steps.

<u>Surface 5.</u> A compacted surface extended 1-5 cm above Step 9. In the southeastern corner it merged with alluvial Surface 5A. No artifacts or features were observed in association.

Layer 8. This was a deposit of sandy fill, high caliche content, and larger pieces of charcoal relative to the other layers. It was thickest (13 cm) in the southwestern area. A gravelly deposit centering on the stairs may have resulted from deterioration of the sandstone steps.

<u>Surface 6.</u> Except in the southeastern area, where clay and gravel were abundant, this clayey surface was easily defined (Plate 6.10). The sole associated artifact was a hammerstone.

Layer 9. Multiple surfaces and an area of rodent disturbance comprised the 4-9-cm thickness of Layer 9. A small burned spot covered with a 40-cm-diameter pile of ash and twig charcoal was found just under Surface 6. Layer 9 revealed a slightly increased artifact and stone density compared to the deposits above (including 2 sherds, 1 chipped stone, and chunks of hard and soft sandstone up to 10 cm long).

Surface 7. An alluvial surface defined in the eastern half of the excavation area was marked primarily by an increase in caliche, gravel, and clay in the western area. It had no features or artifacts.

Layer 10. A narrow strip of aeolian sand, 3 cm thick, with some gravel that extended south from the center of the steps defined Layer 10. Like Layer 8, it filled a trough-like depression 23 cm south of Step 9.

Layer 11. Slightly under Layer 10 and extending to the west of it was a granular, caliche-laden deposit that rested on Surface 8 along with Layer 10. In the same vicinity of the ash concentration noted for Layer 9 was a small pocket of ash (14 by 7 by 1 cm) that was separated from the concentration by a lens of clean sand but may have been rodent transported from above. Artifact density was slightly higher than in adjacent units (6 sherds, 2 chipped stone, 1 corncob, and 6 bones).

<u>Surface 8</u>. This was marked by a smooth, alluvial surface except in the west where it was intermittent and patchy and exhibited a rough, gravelly appearance. Like many others, it lacked artifact and feature associations.

Layer 12. Aeolian sand containing many thin laminae comprised the deposit filling the narrow depression that extended south from the steps. An indented corrugated sherd was found on lamina Surface 9A.

Layer 13. Adjoining Layer 12 to the west was an accumulation of 1-6 cm of gravelly sand that was marked by abundant caliche spots along the



Plate 6.10. Other Structure 5, South Steps. 50-cm north arrow rests at the base of Layer 8 and the top of Surface 6. Note stabilized riser of Step 6 at top of stairs. (NPS#18128)



Plate 6.11. Other Structure 5, South Steps. 30-cm north arrow rests on Surface 9. Note Wall X below arrow and juncture of walls in the background. (NPS#18161)

wall. It became thinner (1 cm), very hard, and clayey toward the south and center of the deposit.

Surface 9 (Plate 6.11). One of the best manifestations of cultural use was this prepared plaster surface, 2-2.5 cm thick, that coped up along Step 9, the main roomblock wall, and the wall extending southeast off the West Wing corner (the "West Wall" of OS 5). The latter wall does not extend below this surface.

Layer 14. The composition of chunks of sandstone, some charcoal, and several adobe impressions of logs in an overall sand matrix marked this deposit as an intentional one. In places it was up to 23 cm thick and could be separated into an upper and lower unit based on the increased density of adobe and stone in the lower half and the presence of Surface 10A. Some of the so-called adobe appeared to have been broken fragments of local, native clays. Cultural material in the unit yielded 3 sherds, 4 bones, and a corn kernel. Surface 10A, at 219 cm below Subdatum 14, articulated with the bases of Major Wall 2 and the "West Wall" of OS 5. At this depth, between the latter two wall bases, was the first appearance of another wall that may have been an earlier segment of Major Wall 2. This wall, designated as Wall X here (Plate 6.11), separates distinct deposits of fill; Layer 14 extended down almost to the possible wall foundation top on the east side, and the opposite side yielded Layer 15.

Layer 15. Extending along the western side of Wall X from the top nearly to its foundation stones was very fine, soft, nonlaminated sand that contained a few chunks of clay and large and small pieces of sandstone. The composition of this deposit was distinguished from all others in Plaza 2. Most important of the cultural material recovered from it were a mandible and tibiotarsus of a turkey less than a week old (Steven Emslie, personal communication 1979) and the largest amount of eggshell recovered from Plaza 2 (14 pieces, weighing 0.59 grams). This material is indicative of some turkey domestication at the site in the late A.D. 1000s, before the species' relatively common presence in the early A.D. 1100s. These were the only two turkey elements recovered in the area south of and within OS 5.

Surface 10. White-flecked, pink, compacted, sterile deposits with 1-2 cm of clay and small sandstone spalls stuck to the surface denote the initial record of cultural activity here, probably from wall construction. This material corresponds to that found on Surface 17 in Grids 181 and 201. A comparable surface was also found just east of 0S 5, whereas 1-2 cm above it was an ephemeral surface (10C) covered with a thin lens of ash, charcoal, and burnt sand underlain by a floor burn. Three to four centimeters above Surface 10C was a hard packed, alluvial surface (10B) that abutted the foot of Step 1.

Surface 10 Features. Paralleling Wall X along the eastern side was a 6-10-cm-wide trench cut through Surface 10 and filled with sand. In the room excavations, similar trenches were filled with construction debris. Surface 10 extended east and 10 cm under Major Wall 2.

Surface 11. On the other side of Wall X, but about 7 cm lower, Surface 10 continued as Surface 11. It, too, was covered with spalls and clay. The surface was 26-32 cm below the top of Major Wall 2A and extended west under the "West Wall" of OS 5, situated 26 cm above.

#### Test Trench 3 (inside OS 5)

A small test was sunk in the western end of OS 5 to examine the contents and stratigraphy (Figure 6.12, Plate 6.12) as well as to establish the sequence of construction.

Layer 3. Designation of a Layer 3 was reserved exclusively for TT 3, and for this reason was omitted in the stratigraphy descriptions of the area south of OS 5. The 35-cm-thick deposit was clayey sand containing numerous, small, gray chunks of adobe and fragmented, native, sterile clays that comprised 30-40 percent of the layer volume. A few spalls and fragments of charcoal were also encountered, along with a concentration of soft, organic material that may have been a coprolite. The deposit directly underlies the top of OS 5 (Surface 1), and the lack of internal lamination is taken as a sign of intentional deposition. The lower part of it revealed an increasing density of clay chunks, comprising 80-90 percent of the fill, which appeared to be remnants of wall and floor plaster and the fill from a wall core.

<u>Surface 2</u> (Plate 6.12). Sixty centimeters below the top of OS 5 was an alluvial, clayey, lens surface. Weathering revealed other clayey, sandy, use surfaces underneath separated by aeolian lenses of sand. This surface articulated with the main roomblock wall and the south riser for Step 5.

A smaller test pit was extended below Surface 2 in the southwestern corner. To avoid layer confusion with the adjacent tests around OS 5, the deposit immediately under Surface 2 was designated Layer 20.

Layer 20. This unit of sand, 4-7 cm thick, interfingered between several, natural, ephemeral surfaces (S3-S5). It contained a few flecks of charcoal and a sherd. Layer 20 and the remaining fill below yielded a scant seven sherds that can only be tentatively assigned to a period in the late A.D. 1000s, if not later.

Layer 21. A hard, packed, aeolian, sand deposit between Surface 5 and Surface 6 was similar to Layer 20, except harder. It contained no laminae.

<u>Surface 6.</u> There was no evidence of cultural use for this naturally formed surface.

Layer 22. This was a seemingly natural unit of clayey sand that separated Surface 6 and Surface 7.

<u>Surface 7.</u> This hardened surface of aeolian sand appeared to have been culturally compacted from traffic use.



Plate 6.12. Other Structure 5 interior. Test Trench 3 cleared to Surface 2. 30-cm north arrow. (NPS#18107)



Plate 6.13. Other Structure 5, East Steps. Note remodeling exposed by small test behind 30-cm north arrow and tread wear of the center stones of the lower steps. (NPS#18185)

Layer 23. Layer 23 was identical to Layer 22.

Surface 8. At this depth, 86 cm below the top of 0S 5, the wall plaster covering walls to the west, southwest, and south ended abruptly. The surface at which the plaster presumably started was hard, full of caliche specks, and formed from the natural effects of water and wind.

Layer 24. This occurred as a natural deposit of aeolian sand.

Layer 25. Layer 25 was another deposit of aeolian sand but mixed with small chunks of gray construction mortar.

Layer 26. These laminated sands, 30 cm thick, yielded a concentration of charcoal flecks in otherwise clean sand. Overall, it was analogous to intentional Layer 10 found in Grids 181 and 201. The Southeast (Mid) Wall was built on top of this unit. Four of the seven bones recovered from OS 5 came from Layer 26, while the rest were found in Layer 3.

Surface 9. This surface was naturally formed, although it was somewhat irregular and eroded and marked by caliche spots. An indented corrugated sherd was found in association.

Layer 27. Like several of the layers above, this consisted of natural, clayey sands. It contained the only piece of turquoise (unmodified) found in OS 5.

<u>Surface 10</u>. This was an unusual, hard, gray, clayey surface with spalls and adobe protruding through it from Layer 28 underneath. Although the surface appeared to have formed in part from alluvial action, there was a thin lens of ash covering it in the northeastern area, which attests to at least some short-term use of the surface.

Layer 28. A matrix of sand with inclusions of spalls and adobe comprised this unit. In some lower parts of it, spalls and adobe comprised 40-50 percent of the fill. This unit was thought to be intentionally placed and was about 30 cm thick.

Surface 11. A prepared surface of reddish clayey sand, 1.5 cm thick, apparently served during the construction of the southwestern wall of OS 5. Part of the surface had been removed down to Surface 12 to facilitate construction of the wall.

Surface 12. At the bottom of TT 3, 146 cm below the top of OS 5 and 232 cm below Subdatum 14, was the compacted top of the pink, sterile deposit that was designated as Surface 10 south of OS 5 and Surface 15 in Grids 181 and 201. The base of the 16-17-cm-high foundation for the southwest wall of OS 5 rested on this surface along with the gray mortar clumps from which the foundation was made.

Summary and Conclusions. The internal fill of OS 5 revealed an initial series of intentionally placed deposits (Layers 26 and 28) that probably were associated with the construction and support of the Southeast and Southwest Walls, among others. These were followed by seemingly natural accumulations of sand, which suggests a period when OS 5 was left as an enclosed, unroofed structure with steps. A final, intentional filling of the structure cavity with Layer 3, during renovation and remodeling of the upper steps, elevated OS 5 an additional 65-70 cm.

#### Walls in and around OS 5

A number of masonry walls comprise OS 5 and the structures associated with it. The sequence of their construction is illustrated in Figure 6.12, and short summaries of each wall are given below.

OS 5 Walls. Walls comprising the last major construction of OS 5 were constructed of large blocks and tabular spalls haphazardly set in abundant, sandy, pinkish mortar. Many of the blocks of pastel colors were soft and friable, especially in the top courses where they had substantially deteriorated. Exposed faces of some of the large blocks were ground smooth. The smaller blocks and spalls were often of hard gray sandstone, like that employed in the East Wing masonry. A single coat of plaster, 2-3 cm thick, covered the rough stonework. Liberal use of mortar anchored OS 5 to an alluvial surface that rises sharply 60 cm before encountering the East Wing exterior wall.

West Wall. The west wall of OS 5 was the exterior of the East Wing. It had been built during use of Surface 12 (TT 3) and Surfaces 10 and 11 (south of OS 5). Hard, tabular blocks and spalls in a band design were incorporated into its exterior face, with a minimal use of mortar (Plate 6.12). OS 5 butted against this wall.

Southwest Wall (Figure 6.12). The wall was exposed in TT 3 and abuts the main roomblock wall at an angle of about 60° with an azimuth of  $151^{\circ}/331^{\circ}$  from true north (Plate 6.12) for its greater than 55-cm length. At its junction with the East Wing room wall, it was 1.4 m high, the tallest of any walls in OS 5. The base of this wall nearly reached the foundation of the main wall to which it butted. The exposed northeastern core-and-veneer section was faced with small and large, hard, squarish blocks of masonry, similar to the main roomblock wall behind it, and it was covered on the interior by a thick coat of tan plaster. Given its azimuth, it is quite likely that it once connected to the wall (azimuth  $147^{\circ}/327^{\circ}$  true) found under Major Wall 2, about 13.5 m away, which terminated at the gate or door through MW 2. Because of its height, veneer style, and alignment, the wall surely predated the construction of OS 5, but was later incorporated into it.

Southeast Wall (Mid Wall) (Figure 6.12). This wall butted at right angles against the Southwest Wall and extended northeast under the eastern steps. The interior was lined with large, soft blocks with ground faces and interspersed with small chinks in a poorly aligned, band design. A small part of the thick plaster covering the Southwest Wall continued onto this wall, but most was gone. A finished exterior face was not apparent. It had been built on Layer 26 (Test 3) and formed the riser separating Steps 4 and 5. Compared to that of Major Wall 2, butted against its southern exterior, the veneer was better executed, with tighter fitting blocks, although both walls are thought to be approximately coeval.

<u>Walls 1 and 2</u> (Figure 6.12). Remnants of two crudely constructed walls were found in the Layer 3 fill above the Southeast Wall. Wall 1 was built of reused stone set in adobe mortar on Level 2 of Layer 3 and extended up to Layer 2. Wall 2 was similar but extended east. The purpose for these two walls was not discovered.

North Wall (Figure 6.9). The north wall of OS 5 consisted of large, soft blocks and small, tabular stone set without banding. There was great variability in the size of stone used. The lowest course, set on aeolian sands without a separate foundation, was even with the bottom of Step 1 and the base of the Southeast Wall, suggesting that both were built at the same time on Layer 26. The style of masonry suggested late A.D. 1000s or early A.D. 1100s construction. Parts of the lower courses revealed exterior plaster 2-3 cm thick. The wall was appoximately 84 cm high and 3 m long.

# Walls Adjacent to OS 5

"West Wall" of OS 5. Despite its field identification, this wall was not part of OS 5, but may have been related to it. Instead, it connected to the southeastern corner of the East Wing and extended south 163 cm along an azimuth of 151°/331° from true north. More of it might remain, although only the upper courses were cleared. It was about 37 cm wide and was lined with large and small blocks set in abundant mortar. Both this and Major Wall 2 share part of Layer 14 (south of OS 5) as the first deposit to accumulate after their construction. The "West Wall" visually approximates the alignment of Major Wall 2 but is actually offset by 4-10°.

## Major Wall 2 (see Major Walls below).

Wall X (under Surface 9 south of OS 5). Only a 30-cm segment of this wall was exposed (Plate 6.11), limiting our knowledge of it. Its apparent azimuth is approximately 4°/184° (true) and nearly parallel to the East Wing exterior wall (177°/357°). If it relates to the wall near the gate superimposed by Major Wall 2, then it must jog 30° east to fit the latter's alignment. For this reason, its association with other walls Excavation revealed that it did not extend and structures is unknown. north of OS 5. The top of this wall, 50 cm wide, lies 10 cm under Surface 9. Although the top was smooth, as if from lengthy exposure to the elements, it still exhibited the impressions of two, large, wall stones, which were not recovered in the fill. The wall veneer was composed of small, hard, tabular stones, mostly in the range of 5 cm long and 2 cm thick, along with a few larger blocks suggestive of banding. Clearly, it is one of the earliest walls in Plaza 2, although not predating construction of the East Wing.

Steps of OS 5 (Table 6.1)

Two sets of steps ascend OS 5, one from the east (Steps 1 through 5) and a better preserved series from the south (Steps 6 through 9). For the most part, all were composed of large, soft blocks of sandstone. The condition of the two staircases was markedly different, however. The south stairs (Figure 6.11) were very well preserved (Plate 6.10), but the east stairs were hardly recognizable as such (Plate 6.13). The south stairs were probably buried more quickly than were the east stairs, but the condition of the latter is mostly the result of exposure, less substantial construction, and some damage incurred by wall clearing and the initial excavation. Evident use of the staircases was confined to the worn centers of the leading edges of the stairs, where presumably traffic was the The gravelly texture of some deposits directly south of the heaviest. south steps is interpreted as resulting from step deterioration. Compared to the peripheries, greater compaction of the surfaces in front of the worn steps also is attributed to foot traffic.

<u>Step 1.</u> The lowermost eastern step had been substantially narrowed by remodeling of Step 2. The tread was worn along the top front edge.

<u>Step 2</u>. Step 2 was remodeled by widening the step 5-8 cm and elevating it, so that the new addition rested on 13 cm of sand that had accumulated over and buried Step 1. The remodeling incorporated a white clay mortar that was also used in other late construction of OS 5. Step rounding from foot use was evident along the center edge of the tread.

<u>Step 3</u>. Two parallel courses of stone were set for Step 3, but the one along the leading edge had mostly slumped away. At the southern end of the step was a small retaining wall of several stones, set in much mortar to buttress Step 4 or the fill of Layer 2.

<u>Step 4</u>. This was a nondescript, badly deteriorated surface that may not have been a functional step. The white clay mortar used in its construction suggests remodeling. The riser separating it from Step 5 was a crude wall, 45 cm wide, composed of copious amounts of mortar and some reused stone built on Layer 3 (Level 2).

<u>Step 5</u>. The top of OS 5, at the junction of the two staircases in their latest version, was capped by an uneven surface of clayey sand and a few stones. It had an elevation rise of 25 cm and was 125 cm across.

<u>Step 6</u>. Another poorly defined surface running from the deteriorated, uncertain, southern riser of Step 5 to the definite riser for Step 7 was designated a step. The uncertain riser that would have confirmed its function as a landing or step was stabilized before notes could be taken (Plate 6.10), which obscured its true nature. The suggested riser was between 10 and 19 cm high.

<u>Step 7</u>. One of the best defined steps in the series revealed clear bowing out in the center perhaps from compression by foot traffic.

Step Number	Length (cm)	Riser Height (cm)	Tread Width (cm)
1	210	22-27	21-24
2	218	26-33	42-48
3	180?	19-23	42
4	120?	10?	77?
5	120? east; 120? south	?	Top of OS5
6	176	10-19	?
7	160	15-18	23
8	164	16-21	23-25
9	174	23-30	22-25

Table 6.1. Other Structure 5 step dimensions.

<u>Step 8</u>. Like Step 7, this also bowed out in the center. At the western end, its riser still revealed a coating of plaster 9 cm up from Step 9 articulated with Surface 5. The worn edge of several large blocks was exposed along the plastered tread.

Step 9. The lowest step in the series revealed a plastered riser, with the plaster coping over Surface 9 and the main wall of the roomblock. Exposed blocks along the edge of the tread revealed edge-rounding. When the step was finally buried by accumulating sands, the remaining south steps were replastered and the lowest (Step 8) articulated with use Surface 5.

#### Structures Comparable to OS 5

An informal survey of other Chacoan greathouses by H. Toll revealed no other structures reminiscent of OS 5, except at Pueblo Bonito. At the southeastern corner of Pueblo Bonito was a complex of small, masonry boxes that resemble OS 5 in construction, size, and position. They are now heavily stabilized but early photographs reveal a remarkable likeness to OS 5 (Plate 6.14). The six compartments comprising the structure were filled with clean sand and built against the eastern roomblock on aeolian deposits (Judd 1964:176, Plate 81) sometime after A.D. 1075 (see Lekson 1984:137). The insides of the compartments were plastered, like OS 5, and at least one revealed a red band of paint below a covering of white A clear sequence of masonry steps is not evident for the gypsum. structures at Pueblo Bonito, but the stabilized, low, parallel east walls could have once been steps. Judd (1964:176) referred to these structures as shrines. Lekson (1984:143) refers to two other "stepped shrines" at Pueblo Bonito, one at the southwestern corner of the house and another at the southeastern corner of Kiva A. The former was noted on an early model of the site and its reality is suspect.

Another similarity with the complex at Pueblo Alto and Major Wall 2 is a probable wall joining the East (trash) Mound at Pueblo Bonito with the shrine structures nearby. Walls leading from the East Mound and the southeastern corner of the houseblock are separated by a gap of 12.8 m, although their alignments suggest that once they were connected. The wall leading from the East Mound was stabilized by Gordon Vivian in 1939.

## Summary and Conclusions

Most of the interpretative aspects of OS 5 have been gleaned from H. Toll (1985). Artifactual clues to the function of OS 5 are scant. Below the rubble layer, a total of 169 sherds was recovered from all OS 5 tests. Well over half of these are attributable to the last use surface, which correlates with the latest use of the areas cleared to the north in Grids 181 and 201 (where the large firepits were discovered) in terms of artifact abundance, ceramic types, and the presence of obsidian. The small numbers of sherds preclude saying much other than noting the dominance of Gallup Black-on-white and the presence of western and northern tradewares decorated in carbon paint that mark an early A.D. 1100s deposition.



В

Plate 6.14. Pueblo Bonito, "shrine" room at the outer southeastern corner. Note Type III masonry wall of room and the interior white plaster. Compare with Other Structure 5 at Pueblo Alto (Plate 6.8). A) Partly excavated. (NGS# 23340-A) B) Note possible lower step. (NGS#23329-A) Photos by Neil Judd, 1923. (©National Geographic Society)

The total lithic recovery from the OS 5 excavation was 52 pieces, 49 Obsidian was the second most abunof which were conchoidally fractured. dant material (n = 7, 14 percent), which is not unusual for an early A.D. Washington Pass chert, however, occurred in relatively 1100s deposit. low frequency whereas spotted, yellow brown chert (material type 1072) ex-The increase of obsidian and ceeded it in frequency (n = 4, 8 percent). spotted, yellow brown chert and the reduction of Washington Pass chert are characteristic of early A.D. 1100s deposits at Pueblo Alto (Cameron and Sappington 1984), although it was exaggerated here. As is also true in the grids to the north, silicified woods comprised around half of the lithic material, being by far the most abundant material type. One projectile point found in the fill of the south stairs is consistent with the unusually high occurrence of projectile points in the general Plaza 2 area Utilized lithics of all sorts occurred at a slightly lower excavated. percentage of conchoidal stone than in the grids to the north (18.4 versus 23.6 percent), although given the small size of the OS 5 collection there is no reason to suspect a meaningful difference between the two groups. Hammerstone/abraders were relatively common tools (n = 7) but most occurred in the Layer 1 rubble (n = 5) and probably came from the wall core where they were discarded during wall construction.

Other cultural material was quite sparse from OS 5, although there were some interesting occurrences. The overall volume removed from OS 5 was small, so the amounts of eggshell (21 pieces) and squash seeds (7) are notable. It is also curious that only squash remains were recovered from OS 5 whereas the seemingly ubiquitous corn was absent. Nevertheless, the latter was present in the surrounding deposits, and we may conclude that its absence is due to sampling error. Ornaments and semiprecious stones were recovered (three shell beads and one turquoise chip), but half occurred in the wall rubble and the rest in the Test 3 fill. The high charcoal count for OS 5 reflects the intersection of Test 3 with Layer 26, which is analogous with the trashy, intentionally placed Layer 10 north of OS 5. A relatively large number of suspected human coprolites was found in and around OS 5 that suggest periods of nonformal use of the area. Their frequency, however, may be due in large part to the sharp awareness of the excavators rather than to an abnormal occurrence of coprolites.

Bones were relatively infrequent (110 elements) and were not particularly informative except for the presence of immature, turkey elements signifying some bird domestication at the site. Oddly, the immature elements were the only two turkey bones associated with the A.D. 1000s use of OS 5. Forty of the 110 elements (36 percent) came from the fill above Surface 1, by far the largest number for any unit associated with OS 5. Just two elements of the overall total were burned, suggesting that the elements were derived from some initial processing activity and the remains of postoccupational creatures. Typically, the majority species represented were from rabbits and prairie dogs.

The complexity of architecture in the southeastern corner of the site (Figure 6.14) revealed continual activity there after construction of the East Wing. Apparently, at first an early version of Major Wall 2 connect-

ed Pueblo Alto to the Trash Mound, but a gate through the wall directed access between two plaza areas and perhaps the two major prehistoric road routes passing by Pueblo Alto. Sometime after construction of the East Wing, probably in the late A.D. 1000s, the initial OS 5 was built as a walled polygon, either as a stage of construction or as a walled empty enclosure. A part of the proposed initial Major Wall 2 (the Southwest Wall) was incorporated in the polygon after Major Wall 2 was rebuilt and attached to OS 5 instead of to the East Wing. The south steps were then added, and then the east steps. Remodeling of OS 5 apparently was in response to rising accumulations of sand that were burying the lower steps. At the time of last use of the area, when the large firepits just to the north were present, OS 5 had been nearly submerged by aeolian sands, although probably it was no longer used.

The OS 5 steps provide the best evidence for assessing the potential function of the structure. Clearly the steps provided the means for gaining elevation above the surrounding area, although the structure may have been used for other purposes before its use as a stairway. The position of OS 5 against the East Wing suggests a number of potential possibilities for its use:

(1) OS 5 served as an elevated platform. Its position and small area on top would have limited use to one or a small number of observers, with a view restricted to Plaza 2 and the outlying areas to the east and north. These areas, of course, are those traversed by a number of prehistoric roads that converge on Plaza 2. Several doors leading into the East Wing from Plaza 2 mark an area of potentially high traffic intensity and an ideal location for the exchange of goods. Presumably, such activities would have been structured and controlled by ranking personages from Pueblo Alto. Such control undoubtedly was intertwined with religion. Thus, one wonders if the presence of the bird beaks, points, malachite, turquoise, and the turquoise-painted object found nearby provide some evidence of ceremonial use of the area. Spectulatively, then, OS 5 may provide physical evidence for a locus of control and for overseeing activities in Plaza 2.

(2) OS 5 may have served as a formal entrance into Plaza 2 from Room 192 in the East Wing through a door not now visible or, conversely, from Plaza 2 into Pueblo Alto.

(3) OS 5 may have been the basal platform for access to the East Wing roof. We know that the room roofs at Pueblo Alto saw considerable use in the early A.D. 1100s, although access to them was probably available by variety of means. It may not be fortuitous, however, that this area of Pueblo Alto's roof provided the best visibility far up the canyon to Una Vida and Kin Nahasbas.

(4) For at least a time, OS 5 was an empty, masonry-enclosed polygon that was later intentionally filled with sand during remodeling. Judd (1964:176) referred to similar empty boxes built against the southeastern corner of Pueblo Bonito as shrines and, if OS 5 were left open for a period of time, it may well have served as a receptacle for the deposition of special items.

(5) Finally, OS 5 may have simply provided a route across Major Wall 2 between Plazas 2 and 3. Toll notes, however, that the major wall is easily crossed and contains a gate, so the formality of using OS 5 to transcend the barrier enhances the possibility that OS 5 held some symbolic importance, perhaps as a route for processions.

# The Interpretation of Plaza 2, Pueblo Altoa

This section has been assembled to complement the treatments in the Plaza 2 area; it relies heavily on the figures and descriptions above. The deposits in Plaza 2 are complex, yet often ephemeral. These attributes led to considerable puzzlement and weighing of possibilities during excavation. This section is a distillation of several years' worth of such reflections.

### Nature of the Plaza 2 Deposits

To the best of my knowledge the portions of Plaza 2 that were excavated had never been roofed. This one fact has a great effect on the deposition and preservation in the area. Extensive tests show that the fill in the areas beside walls of the main roomblock generally consists of a substantial layer of rubble from wall deterioration which rests on another substantial deposit, consisting primarly of wind-blown sand, and, at the bottom, the preoccupational surface. Because of the way walls disintegrate and the fact that the great majority of high winds come from the west and southwest, both of these layers decrease in thickness from west to east and form a slope away from the wall. The rubble layer seems to have a fairly consistent thickness of around 1 m, with the aeolian The rubble layer was considered to be deposits of similar thickness. strictly postoccupational here, as it was in the rest of the site--it was removed as quickly as possible from areas to be tested. The deposits underlying the rubble, however, differed from the room fill, because there is good evidence that they were not postoccupational. The nature of this aeolian "unit" had a great effect on the quantity of area that the project was able to clear.

The aeolian deposits near the wall are clearly laminated, and large firepits exist on the uppermost surface. Including this top surface, 18 surfaces were defined by excavation; although 18 is a lot of surfaces to clear, the number under-represents the depositional picture. A deposit next to a structure is obviously subject to many vagaries, but the most important ones are natural deposition and removal, precipitation, and artificial deposition, removal, and compaction. Natural deposition and precipitation appear to have created the majority of deposits below the

<sup>&</sup>lt;sup>a</sup>This section is a contribution by H. Wolcott Toll.

rubble; this "formation process" resulted in many small deposits and noncontinuous surfaces. Most of the 18 surfaces that were partially cleared presumably resulted from some combination of a large precipitation event and compaction, though an additional, perhaps counteractive, process likely to have occurred was the churning of dry, sandy deposits seen today in the topsoils of the area during dry spells.

We defined numerous surfaces during excavation. Profiles were used in anticipation of layers, but within-layer variability of these natural units--especially the small ones--made profile definition only partially reliable. The presence of many surfaces, probably exposed during the occupation of the site, creates a dilemma: on the one hand the surfaces are archeological data, potentially informative as to the topics of interest in the area; on the other, they contain relatively little material and few features, and they overlie surfaces seen in profile to have had longer exposure, more modificatons, and to associate with the early postconstruction part of the occupation. Given that the site should be protected in perpetuity, we decided to clear surfaces insofar as we were able to follow them. Although this was probably the right decision for the long term, in the short run it meant that much fewer of the lower surfaces were exposed than would have been desirable.

The presence of burned spots, apparently nonrandomly distributed artifacts, and architectural changes in the staircase (OS 5) that correspond to accumulations of sand all corroborate the use of the area as it was being buried. There is little to indicate the length of time it took for these deposits to accumulate. Ceramics are too scarce to be very useful for dating the deposits; it may be tentatively noted, however, that there are later, carbon-painted sherds in the upper levels but not in the lower, although material is especially scarce from the lower levels. Another material shift is indicated by the fact that the uppermost layer contains a number of pieces of obsidian, a consistent characteristic of later deposits (Cameron 1985). Thus, the deposits excavated represent enough time for some shifts to have occurred in the artifact assemblages, and the last use of the area, on top of a meter or so of natural deposits, seems to have been very late in the use of the site, or even after it had fallen into general disuse (Pueblo Alto is thought to have been abandoned by A.D. 1140 or 1150).

The latest surface is different from those underlying it in several wavs: not only are the ceramic and lithic assemblages distinctive, but cultural material is by far the most abundant. Further, there are more features (both cleared and suspected) at this level than on any other. These include at least three enormous firepits. They all appear to be filled with charcoal that is mostly ponderosa pine. Ponderosa pine is not usually used for fuel in Chaco, and the dated pieces from these features range up to about A.D. 1056, much earlier than the archeomagnetic date of  $1190 \pm 14$  obtained from the excavated example, and also earlier than the stratigraphic position would indicate. In all likelihood, this wood came from room timbers, presumably from the East Wing (see Chapter 4 and Volume I, Chapter 8). This interpretation is bolstered by the presence of rubble directly on top of the firepits, which suggests that the walls began to

deteriorate shortly after the pits were used, a likely consequence of removing roofs.

There are a number of intriguing things about the placement of these pits. The three that are known are placed on either side of two breaks in the east wall, both of which appear to have been entrances into the roomblock. All of these firepits sit directly west of the spot where a road enters Plaza 2 and could have tied into a visual network including the Poco Site (29SJ 1010). The Poco Site is a series of low, masonry circles located 3.4 km east of Pueblo Alto at a bend in a prehistoric road; the site shows little evidence of residential use, but does have extensive burned areas (Drager and Lyons 1983). Like the firepit date, the archeomagnetic date from the Poco Site is quite late (A.D. 1210  $\pm$  11) but Windes (Volume I, Chapter 8) feels that the more likely span of use is the late A.D. 1000s and early A.D. 1100s.

Below the latest surface in Plaza 2, the type and, perhaps, the intensity of use appear to have been different. The top surface and that immediately underneath it have some material similarities, some of which may relate to mixing. The large firepit was used a number of times, apparently with some gaps between uses, so the two upper surfaces probably both associate with the firepits. Lower surfaces definitely antedate the firepits as they were cut by the construction of the pits. Perhaps indicative of the greater use of the upper surfaces, or this use in combination with falling walls, fewer surfaces were definable in the upper portions of the natural deposits (Figure 6.3). Below the third "major" surface (surfaces that could be followed over most of the excavation area and were used for separation of collections), however, a plethora of surfaces were definable in plan and profile. Through seven major surfaces the deposits are fairly similar: there are sometimes extensive, hard, surfaces that quite likely resulted from heavy precipitation. Artifacts and features tend to be few, but always present, and some surfaces show decidedly more use than do others.

Burned spots are present on some surfaces, as are minor localizations of material--the use suggested by these deposits is a casual one (as perhaps attested by the presence of some coprolites on one surface) or a tidy one, as seen in the paucity of material. The change from the uppermost surfaces and levels and the underlying, more closely spaced surfaces is, then, from more homogeneous sandy units to greater differentiation of deposits, and from more features to fewer. The more differentiated layers correspond temporally to the use of OS 5 (see above) as a staircase (that is, in its last major modification), whereas the last few surfaces were exposed while OS 5 was largely covered with sand.

There seems to be another shift in the nature of deposits at about the level labelled Surface 9 (basal to Layer 5), around 50-60 cm below the top of the cultural deposits, which is near the base of the staircase modification of OS 5. This shift is more subtle than the shift from the uppermost level. At this point there is more evidence for disturbance of the ground surface, and some rock and clay are present in Layer 7, which may relate to the construction of OS 5. Some of these disturbances are

rather minor, such as possible rearrangements of fill; there is, however, one, apparently large, depositional event. At three places along 17 m of the East Wing wall, there is a soft homogeneous layer 30-40 cm thick and 0.6 to 1.6 m wide; the base of this unit is 15-20 cm above the base of the wall veneer. The softness and lack of lamination of this layer (Layer 10) make it quite likely to have been intentionally deposited. It contains more charcoal and rock than do the natural layers, as well as a few large sherds.

The purpose and source of this fill layer are somewhat unclear, but its placement had several effects. The surfaces below this unit dip slightly toward the wall, whereas all those following it slope away from the wall. The presence of this layer caused a crack in a number of the overlying surfaces; the fact that this crack ran consistently parallel to the wall about 60 cm away caused much consternation during excavation. The rapid deposition of the layer seems also to have preserved a strip of exterior plaster. The intentional deposit extends above the base of an apparent plug of the lower part of a door into Room 186 of the East Wing; this fact and the change in deposition suggest this intentional fill may have been placed because of a change in the use of the Plaza 2 area, apparently a shift to less intensive use. Such a shift is potentially very important to the understanding of phases of the system's operation, but a great deal more needs to be known about it for it to be more than a suggestion.

A smaller intentional deposit capped by a darkened surface underlies the large intentional fill layer. Of the five additional major surfaces exposed in the test trench, two seem likely to be constructional and preconstructional, one has a formal heating pit, one has unusual mudcracks, and only one seems to be an alluvial surface similar to the group of natural layers above the large intentional fill unit. Even the natural layer near the base of the wall shows some possible shaping (coping) next to the main wall. At this general level in the three cuts reaching this depth, there are very closely spaced, multiple laminae on an apparently level surface. It is suggested that these laminations resulted from a period of unknown length during which the wind-borne deposits that are plainly likely to accumulate in this location were kept cleared away.

The following more specific activities may be assigned to some floors.

(1) Signalling, as above--Surface 1 and possibly Surface 2.

(2) Ceremonial activity--Surface 4, on the basis of bird beaks, points, painted wood, all in the southeastern quarter of Grid 181.

(3) Defecation--Surface 6; it is perhaps interesting that this floor occurs at the end of the group 1 sequence proposed above, which also suggests that traffic through the area may have ceased at the time of the exposure of this surface.

(4) Constructional activity--Surface 5, Surface 9, and probably on the larger scale, Surface 10.

Having proposed some shift in use, the time period represented by the Plaza 2 stratigraphy is of interest. The elevational difference between Surface 1 and Surface 9 is 43-57 cm. According to Weide (Appendix MF-C), 7 cm per year accumulation is feasible; according to Love (Appendix MF-C), exposed, disturbed soil is necessary in the vicinity for such a buildup to occur, and this loose soil would be provided by the pueblo. According to observation of wind deposits (and there was indeed wind in 1978), a deposit of 7 cm per year does seem entirely possible. If, as also seems possible, major alluvial surfaces equate with major moisture events such as winter precipitation (as also suggested by Love) the 9 extensively excavated and analyzed surfaces could represent as little as 9-10 year (which fits arithmetically with 7 cm per year).

My feeling is that, in combination with the sketchy ceramic data, there are enough laminae and moisture events are infrequent enough that more than 10 years are represented by our 9 major surfaces. The implication of a very short accumulation time ending about A.D. 1100 is that before the accumulation something was done to keep the area clear; this suggestion is born out to some extent by the presence of many very closely spaced laminae contemporary with the base of the main wall's veneer as seen in the Grid 121 backhoe trench to sterile (Figure 5.5). The longer the accumulation time is shown to be, the less surface cleaning activity is indicated.

An aspect of the stratigraphy important to the eventual understanding of large, open spaces is that surfaces of all kinds were regularly far more evident quite near the shelter of the pueblo wall. Within 2 m of the wall the surfaces seem to be well preserved; by 4 m from the wall many lesser surfaces have usually dwindled; 6-10 m only major units remain discernible. The increased deposits by the wall extend about 2 m from the wall; away from walls in the central areas of both Plazas 1 and 2, there is likely to be fairly simple stratigraphy, consisting of loose sand at the surface, one or two surfaces at depths of around 20-30 cm, and a hard, clayey substrate to bedrock, the latter at 50 cm or more below the surface. In the absence of clearly defined, cultural features (as opposed to occasional anomalies in the "sterile," which are hard to explain), then, the use history of central plaza areas may well be compressed into a very short and cryptic stratigraphic section.

## Artifact Distribution

<u>Stratigraphic Trends</u>. The areas of the surfaces excavated during the testing program were highly variable, which complicates comparison of quantities of material among layers and surfaces. The most extensive, surface excavations were conducted in 1977 and 1978; through geometric calculation of excavated layer volumes and by including only the five, 2-m by 2-m grids excavated for nine major surfaces, it was possible to arrive at comparable, average, artifact densities for layers (Tables 6.2-6.3). Once again, Surface 1 and its fill stand apart, with twice the artifact density of any other level, as well as the largest number of items. Below this uppermost surface there is a decrease in raw quantities of artifacts. Excluding the uppermost level, there is a rather good correlation ( $r_{\rm S}$  =

Layer-Level and Floor	Mean West base, cm BD 14	Mean East base, cm BD 14	Basal Area (m)	Volume 4 1/4 grids m <sup>3</sup>	Volume SW 1/4,G.201 3	Volume m <sup>3</sup>	Artifacts (All)	Density Art./vol.
Layer l	122	ca 158						
L2L1F1. 1	128	160	4 x 4	•64	• 36	1.00	167.5	167.5
L2L2F1. 2	140	169	4 x 4	2.16/a	•18	2.34	108.5	46.4
L2L3F1. 3	162	178	4 x 4	2.00/a	• 56	1.44	99	68.8
L2L4F1. 4	168	190	4 x 4	1.44	• 32	1.76	90/b	51.1
L3L1F1. 5	176	202	4 x 3.35/c	1.35	•20/c	1.55	77/ъ	49.7
L3L2F1. 6	181	203	4 x 3.35/c	•40	•23/c	•63	52	82.5
L4L1F1. 7	185	195/d	4 x 2.0/c	•16	•14/c	•30	25	83.3
L4L2F1. 8	191	195/d	4 x 2.0/c	•24	•21/c	•45	30	66.7
L5L1+2F1.9	194	208	4 x 3.35/c	•53	•18/c	•71	28	39.4

Table 6.2. Depths, estimated volumes, and artifact densities by layer and level over an area of 5 quarter grids in Plaza 2.

- a The volumes from L2L3 and L2L2 have been calculated to include the lumping of these levels in the NE 1/4 of Grid 201.
- b Calculated not including the sandstone/petrified wood debris ("Concentration").
- c Calculated removing .65 m for Other Unnamed Feature 1.
- d Floors 7 and 8 pinch out, at 2.6 m east of the main wall, before reaching the east edge of the excavation.

Layer-Level	Artifact Count	Calculated Volume	Density
L2L1	1	5	1
L2L2	2	2	8
L2L3	3	1	4
L2L4	4	3	6
L3L1	5	4	7
L3L2	6	7	3
L4L1	9	9	2
L4L2	7	8	5
L5L1+2	8	6	9

Table 6.3.	Artifacts, volume, density, and ranking of layer-levels
	from the areas in Plaza 2 excavated in 1978.

# **Correlation Coefficients**

Artifacts - Volume	r = .44	r <sub>s</sub> = .78
Artifacts - Density	r = .58	r <sub>s</sub> = .10
Volume - Density	r =37	r <sub>s</sub> =35

0.90) between volume of stratigraphic unit and number of items recovered. There is, nonetheless, not a strong relationship between volume and density, nor is there a clear decrease in density with depth. The most conservative conclusion is that use of the area was variable through time; clearly the heaviest <u>apparent</u> use was of the uppermost surface, though there is little control over the length of time that surface was exposed relative to the others.

As illustrated by the closer spacing of levels below Layer 2 (the base of which is Surface 4), more variability was perceived in these lower levels in less vertical space than in Layer 2. We are presented, then, with something of a quandary: if, on the one hand, stratigraphic variability and closely spaced levels mean activity, these lower levels may represent more intensive use of the area. If, on the other hand, artifact <u>quantities</u> are indicative of activity, the trend shown is one of increasing use from earlier to later, and culminating in the heaviest use on the uppermost level. Artifact <u>densities</u> would tend to support the contention that generally the layers below Layer 2 do represent more activity. Feature distribution would tend to support the opposite contention, that is, that the latest levels show more activity.

Horizontal and Material Distributions. Across any given level the occurrence of artifacts is by no means uniform. The comparison of feature distribution merely suggests some correspondence between features and relatively higher artifact frequencies, which in turn suggests that cultural deposition in Plaza 2 was activity-related rather than merely the result of random loss or dumping. The artifact assemblage, however, is not the part that readily identifies the activities. The frequency of projectile points is abnormally high by site standards, especially in view of the small quantity of material present (Cathy Cameron, personal communication). The variety of lithic materials from Surface 1 impressed M. L. Truell (Newren) in her rough sorting of the 1977 Pueblo Alto lithics as also qualitatively different; contributing to this difference is a relatively large amount of obsidian from the upper levels. Neither of these observations specifically identifies activities, but stock interpretations run along the lines of: (a) hunting and/or warfare based on points, (b) exterior connections based on variegated lithic materials, and (c) perhaps male activity based on some apparent stone working. We can only say that activities tend in that direction rather than, for example, grain processing, as ground stone is virtually absent. Proximity to the pueblo and natural agencies (decay, transport) both lend a randomizing effect which, in the presence of so few artifacts, must obscure some possibly meaningful distributions.

Lithics. Surface 1 had the largest exposed area of any surface excavated in Plaza 2 (11 2-by-2-m-grid squares). Still, if the number of conchoidal items is divided by the number of grids excavated per floor (ignoring fill volume, which is different from layer to layer but not too radically so for Surfaces 1-5), the number of lithic items per grid for Surface 1 (5.4 items) is more than twice that of all other surfaces except Surface 6 (2.8) and Surface 11, only 1.5 m<sup>2</sup> of which was exposed (0.375 grid square), at 13.3 items per grid.

Material type is also distinctive on the latest use-surfaces. In the stratigraphic floor excavations, all the obsidian occurs on Surface 3 or above with by far the most on Surface 1 (because mixing is suspected, especially between Surfaces 1 and 2, the break in obsidian occurrence may be even more dramatic than the recovery suggests). This pattern is followed in the other units and for the OS 5 excavation, with the exception of Level 4 of Grid 221. Test 1. According to level-layer correlations, Level 4 is in the vicinity of Layer 5 (Surface 8), which makes this occurrence of obsidian anomalous. For some reason undetected in excavation, this particular level contained a relatively high, artifact frequency possibly because of association with the base of OS 5. Although the bulk of this level corresponds with Layer 5, it does cut through the upper parts of the deposit, including a small part of Floor 1, on the eastern end of the trench (field Profile 1A). In relative quantities of material and the presence of obsidian, the adjacent area of OS 5 (Grids 221 and 241) followed the same upper-surface pattern.

In contrast to obsidian, Washington Pass chert, the other major import found in Plaza 2, is present in most units (but not Grid 221, Test 1, Level 4) and is about proportional to unit-by-unit occurrence throughout the stratigraphic sequence. Although they are too infrequent to signify much, most of the known exotics also occur in the upper deposits. Following the general pattern noted by Cameron (1982, 1985), most of the scant, spotted, yellow brown chert was in the upper levels. Silicified wood varieties, which comprise nearly half of the conchoidal stone from Plaza 2, are the only material found in nearly every unit, with perhaps a tendency to higher percentages in deeper contexts. The cherts also seem to increase somewhat with depth, though this is a small class.

Surface 1 is, however, disproportionately low in formal tools and detectably utilized lithics, especially considering its greater extent of Cameron (1985) notes that analytic technique for chipped excavation. stones was variable, with fewer utilized flakes recorded in 1977, the year in which Surface 1 was dug. Surface 4 is remarkable for its high frequency of points (3 of 11 pieces of conchoidal stone). Surface 3's lithic abundance was low but 6 of 8 conchoidal items from that unit are modified or utilized. The two units that show up with higher quantities of lithics relative to the others--Surfaces 6 and 11--are fairly nondescript in terms of both artifact and material types. Surface 6 (Layer 4, Level 2), a low-volume, high density layer does have a Washington Pass chert core, and 1 utilized flake is the only other Washington Pass chert Surface 11 has no utilized items and 4 of 5 pieces are present. silicified wood.

The distribution of the five cores recovered does not correspond well with the distribution of unutilized (or other) flakes, nor do the core material types correspond well with flake material types—there is only one silicified wood core and one of the five pieces of spotted, yellow brown chert is a core. There are two Washington Pass chert cores, but both come from units containing little additional Washington Pass chert. In view of the low frequency of debitage, the high relative frequency of used flakes, and these core—flake distributions, it is very unlikely that lithic reduction or working was an activity carried out in this part of Plaza 2, except perhaps during the last use of the area, though cores are absent in this layer.

The uses to which various materials seem to have been put in this collection are subjectively somewhat surprising. For example, quartzite (including "Morrison Sandstone" as a quartzite) is utilized or modified in frequencies equivalent to the usage of obsidian (36 percent) and Washington Pass chert (30 percent). Both occurrences of Morrison Sandstone/ quartzite are in the form of arrow points, whereas only 1 of the 43 pieces of Washington Pass chert is a point [though Washington Pass chert is remarkable for its low frequency of usage in general (Cameron 1985)]. Chert, comprising 7 percent of the Plaza 2 conchoidal stone, is the material of 4 of the 9 points. The only knife recovered is one of two pieces of Zuni Wood, but neither of the two pieces of Pedernal chert nor the two pieces of Brushy Basin chert shows any usage.

Briefly comparing Plaza 2 to the rest of Pueblo Alto, Cameron (1985) found it was characterized by small flakes and high relative frequencies of tools--she speculates that perhaps this area was the focus of some unusual lithic activity. In the entire collection from OS 5 and Plaza 2, the lithics comprise about 4.6 percent of the Pueblo Alto collection (n = 569, including an anomalous concentration of sandstone and splintery wood). The most distinctive aspect of the Plaza 2 lithics, at least superficially, is that 10.1 percent of the site's projectile points [9 of the 89 recorded by Lekson (1985)] are from Plaza 2. Especially when it is considered that around 20.2 percent of the points at Pueblo Alto came from Kiva 10 and 21.3 percent from the Trash Mound, Plaza 2 does seem to have a distinctive assemblage. A curious aspect of the points present in Plaza 2 is that six of nine are classified by Lekson as corner-notched, making them temporally anomalous with the ceramics (though several are on the borderline between corner-notched and side-notched). This suggests that the points deposited in Plaza 2 were either heirlooms or had some different use from the majority of their contemporaries. If the latter is the case, the shift to side-notched points has functional as well as stylistic implications.

Faunal Remains. Because of the distinctiveness of the lithics, it is interesting that Akins (1985a:193) found Plaza 2 to "have an unusual array of species" as well. This distinctiveness results from several occurrences: 13 bird beaks, 1 of the 2 fish parts from Pueblo Alto, some unusual rodent taxa, and the large numbers of small-mammal foot parts.

The upper surface once again yielded more faunal remains than did the other floors even when standardized by area excavated. Akins speculates that this surface, in particular, may have been associated with small-game processing in the area, because of disproportional numbers of cottontail as well as a few prairie dog and jack rabbit feet. The isolated fish vertebra in the fill to Floor 3 is intriguing, but its significance is a matter mostly for the imagination. The rodent taxa are single individuals from high in the deposits that may well have walked to where they were found, though Gillespie (in Akins 1985a) has suggested that they may be from raptor pellets; this is again intriguing--visions of eagle perches--but not really demonstrable.

The birds beaks (from orioles, passeriformes, and turkeys) are abundant and concentrated enough to make more of. This is especially so because 8 came from the layer associated with Surface 4, the floor that also had 3 associated points. Akins (1985a:191) suggests that ceremonial activity may be indicated. The area in which the beaks were found also produced flecks of what seems to have been turquoise-colored paint, suggesting that these birds--at least some of which were likely to have been colorful--may have been part of an ornamental object. The fact that beaks were found also in other levels may mean that this ill-defined but different activity took place several times in Plaza 2.

According to Akins' bone counts, the faunal occurrence is low in Surfaces 6 and 7, and 10 and 11, which may show some sort of cycling. Recoverable charcoal and wood specimens, however, do not show similar cycling---there is a heavy occurrence on Floor 1 that is primarily due to the large firepits on the upper surface. The occurrence then drops to nearly nothing for many of the intermediate layers (4-9 or 12) with an increase at Surface 13 and below. The high count on Surface 13 reflects the composition of intentionally placed Layer 10; a similar high count can be seen in Layer 26 of OS 5, an analogously placed, intentional-fill In view of the small areas of Surfaces 12 through 18 exposed, an layer. increase in wood product occurrence is suggested for these deeper floors. The occurrence of charcoal/wood, then, seems to go fairly well with those floors showing other activity. Somewhat suprising, corn and squash remains seem to occur more often in layers lacking wood charcoal--perhaps, then, there were not only chronological variations in amount of use but also type of use.

Ceramics. With the exception of a ladle handle, nothing approaching a whole vessel was recovered in any of the Plaza 2 excavations, and interpreting activity from sherd distributions is, of course, more difficult than interpreting lithic distributions. Ratios of gray to whiteware sherds and bowl to jar sherds show few differences among the most extensively excavated, upper nine, major layer units. Whitewares slightly outnumber graywares (53.6 percent), which is somewhat different from the total site percentage where graywares are 53.4 percent. The two intensively excavated surfaces thought to exhibit the most evidence of use (Surfaces 1 and 5) do contain significantly higher relative frequencies of bowls, but sample sizes make this trend tentative. On the whole, the ceramics do not suggest great changes in use of the area.

The stratigraphic distribution of ceramic types is more or less according to expectation except for the equivalent frequencies of carbonpainted sherds in the upper and intermediate units. This suggests that whereas Surface 1 shows a later lithic assemblage, the deposits dating after the construction of OS 5 are also fairly late. Counterposing the lateness suggested by the carbon-painted ceramics and type of masonry of

OS 5 is the fact that mineral-painted ceramics are by far the dominant decorated type and that only 1 PIII corrugated rim was found, as opposed to 17 PII and PII-III rims. The small group from the lowermost surfaces does have an earlier complexion in the high percentage of Gallup and Puerco Black-on-whites, the presence of Red Mesa Black-on-white, and the near absence of carbon-painted sherds.

The horizontal ceramic distribution seen in comparing the two Major Walls--both known only through wall clearing--with the surfaces suggests some temporal differences. Major Wall 1 appears to have either been considerably earlier or to have intersected an early deposit. Its occurrence of Gallup is quite similar to that of the lowermost surfaces in the plaza, but the substantial percentages of narrow neckbanded, plain gray, early Red Mesa, and Red Mesa indicate an earlier deposit. The placement of Major Wall 2 between the heavily Gallup-oriented Trash Mound and the later surfaces at the southern end of the main pueblo east wall is evident in the wall's high frequency of Gallup and the occurrence of a few later carbon-painted sherds. On the whole, then, Plaza 2 appears to be a Gallup ceramic provenience with a Red Mesa deposit somewhere on the northern edge (and perhaps scattered elsewhere), with use extending into the early A.D. 1100s ceramic period.

#### Extra-Mural Stratigraphy (Comments and Comparsions)

In an effort to place the deposits in Plaza 2 in a broader site context, an examination of stratigraphic sections made by the west and north walls outside the roomblock follows. The comparisons are made from a Plaza 2 viewpoint. Suffice it to say for the present that the main plaza (Plaza 1) shows much more in the way of prepared surfaces and cultural deposition than does Plaza 2.

The exploratory backhoe trenches cut to the west, north, and east walls of Pueblo Alto (see Chapter 5) show three very different things. The fill against the west wall, as seen in a trench slightly off the perpendicular to the northern end of the west wall of Room 229, has a rubble layer thicker by about 50 cm than the eastern side fill in Plaza 2, Grid In general, the east wall stands much higher than does the west 121. wall, the difference at these specific locations being about 200 cm versus 70 cm. On the western side the aeolian sand accumulation reaches a maximum of only 18 cm, as opposed to the 105 cm on the east. Especially in view of the severe outward cant of the west wall, it seems likely that the aeolian deposits on the east are at least partly responsible for the better preservation of that wall. Very little, if any, activity outside the pueblo is indicated in the west trench. I think the main difference in accumulation (and thus, perhaps, preservation of activity indications) is attributable to wind--if dominant winds were from the southwest, the west wall would be unlikely to form a sand drift, whereas the east wall clearly does.

Two stratigraphic cuts about 10 m apart were made against the north wall at Room 132 and at Room 138. The fill against the north wall shows the greatest human alteration of any of the three sides of the pueblo. It shows a rubble layer intermediate in thickness between the east and west
walls and corresponding to the intermediate, standing height of the north wall. The rubble layer in the cut at Room 138 is thicker than the other north cut because of the presence of what appears to be a prehistorically removed roof. Maximum thickness of aeolian deposits is 55 cm, again an intermediate figure; once again, this may have to do with wind direction or, as seems quite likely here, cultural modifications. Certainly the shape of the aeolian layer on the north (the North Trench outside of Room 138) indicates some form of modification. It also contains a small firepit (heating pit), which makes it quite similar to the aeolian deposits on the east side. The depressed area next to the wall is much more marked at Room 138 than it is at Room 132 and has no counterpart on the east.

Lekson has suggested a walkway along the back wall. It is possible that some of the cracking apparent in Other Unnamed Feature 1 (OUF 1) resulted from traffic passing east of the rise created by the long deposit next to the wall. Robert Webb suggested that compaction about 2-4 m away from the wall may indicate a foot route there (Appendix MF-D). The question is one of what happens to compacted soil when exposed to various versions of the elements. The variation in the basically aeolian/alluvial accumulation (Layers 4 and 6 in the North Trench) is also reminiscent of the Plaza 2 deposits.

The most distinctive and intriguing aspect of the north wall profiles is the presence of a 5-cm-thick (reaching 25 cm thick at Room 132) layer of gray clay. This layer appears to be at precisely the same elevation in both trenches, and in both the top of the layer is level. In both trenches this layer also seems to have had trash deposited beneath it to make it level, and in both there seems to have been an alternation of claytrash-clay in deposition. In both cuts there appeared to be some period of exposure (allowing minor, aeolian accumulation) between construction of the wall and creation of the flat clay surface. It seems possible (with the perspicacity of hindsight) that the large and rather rectilinear "rodent hole" shown for the Room 132 trench might be a wall trench. This prepared surface was over 8 m wide at Room 138; it is indicated as only 230 cm wide at Room 132, but this is also the edge of the profile. As a road (RS 11) is present from New Alto to somewhere west of the northwestern corner of Pueblo Alto, it seems very possible that this wide clay surface is that road's eastern continuation.

The suggestion of a covering supported by posts set 60 cm from the north wall is also interesting vis-a-vis Plaza 2 because of the presence of Other Unnamed Feature 1 with its consistent width of 60-65 cm, its two possible postholes, and peculiar deposition next to the east wall, which suggests to me the possibility that the east, as well, might have been covered.

Below the levelled clay surface along the north wall and below the trash fill used to level that surface are units indicating accumulation during occupation of the site; their relationship in time to the construction of the wall is not completely clear. In the Room 138 trench these trash-filled units overlie constructional debris and seem to postdate the wall, though they are cut by the wall trench (perhaps the tier of rooms

including Room 139, was built before the northernmost tier, that including Room 138?). If M. L. Truell (Newren) is correct about the construction of a foundation for Room 132 followed by raising the surface, then these layers postdate the wall's construction. If, on the other hand, the "rodent hole" is really a wall trench, then the layers at least partly antedate wall construction. In the case of the Room 138 cut, it is possible that the spall layer came from construction of rooms south of Room 138. The eastern cuts once again contrast markedly with this lower part of the northern profiles in that the east shows basically natural accumulation from the base of the rubble layer to the top of sterile.

As Ware and Gumerman (1977:162) point out, and as is borne out by our excavations around Pueblo Alto, below the blow sand there is a very compact natural surface, which they feel served as the roads' surface. The three profiles deep enough to show the base surface in Plaza 2 indicate that the plaza was probably cleared to that level at the time of construction--the aeolian deposits rest on level, hard, sterile soil. The overall flatness and slightly depressed nature of Plaza 2 also favor that interpretation, as do the non-natural mounds around the east side of the plaza.

The depth of bedrock in Plaza 2, seen at 75 cm below present surface in Grid 205, is somewhat less than Jeff West's reports of approximately 125-190 cm for exterior cores on the southern and western sides of the main mound (Volume I, Appendix MF-I). The 75-cm depth is comparable to depths of bedrock in Plaza 1. The auger test in Plaza 2, Grid 85, gave a bedrock depth of 185 cm from beneath a low area in the plaza surface. Taking into consideration the wall profile, it appears that bedrock may rise fairly quickly from north to south across the site. It may also be that the Soil Conservation Service's soil auger "defines" bedrock differently than do hand tools.

#### Speculation About Walkways Next to the Alto Walls

Using the evidence from the north and east walls as a springboard, we can embark on the most speculative and broadest level flight of whatever contained herein. A broad, prepared surface was created along the north wall shortly after the building of the big house, and this area saw considerable constructional activity, including, possibly, some post-supported structure(s). The extent and location of this surface suggest that it could be a road surface; its prepared nature could be the result of: (1) the availability of leftover (?) clay from construction of the house, and (2) the fact that the pueblo seems to sit on a small natural rise (viz. Room 139/142 excavations) that was probably accentuated by the presence of the earlier house containing Rooms 50 and 51, all of which necessitated levelling.

Actual preparation of surfaces on the east side is less clear but appears to have included at least a clearing of loose sand and perhaps the maintenance of this cleared area for some time. If any efforts were made to level the outside of the pueblo on the west, they are no longer visible; there was probably an effective rise of 1 m or more to the base of the west wall because of the lower elevation of the area west of the pueblo. The road indicated for this area is removed from the edge of the pueblo, which differs from the proposed continuation of the road from New Alto--the alignment of Major Wall 6, paralleling this road, suggests that the road should be underlying the rubble right next to the north wall.

As noted by Ware and Gumerman (1977:164) among many others, the 1-m widths of gates generally seem very much out of proportion with the 9-mwide roads they are purported to serve. I would suggest this explanation as one among many worth considering: roads were "constructed" and used on their full, presumably grand, scale during the Classic Bonito phase (ca. 1050-1100) when construction and population were also operating on that scale, most notably in the mid-A.D. 1000s to early 1100s (considering Pueblo Alto to have been built about A.D. 1045-1055). This period, then, is that during which we see levelling of Plaza 2 and construction of the clay surface on the north. Judging from masonry and largely speculative, stratigraphic relationships, which I propose that at this time few if any of the road walls were present, leaves the definition and function of Plaza 2 even more nebulous than it already was. If the road construction period is correctly postulated, the north roads would still have converged well away from the site, and the east road would enter through the space between the low, non-natural mounds outside our conception of Plaza 2. The walls would have been a later addition, when the road system (and all that it implies) was going into disrepair. At such a time, the roads were perhaps less well defined on the surface, and less wide, a result of both reduced use and reduced maintenance. This possibly provides an explanation for the narrowness of the gates.

This interpretation is perhaps strained, but it does have the following additional pros:

(1) it fits with the type of masonry on road walls;

(2) it fits with the fact that plazas seem to have been enclosed later at town sites, both phenomena implying a need for greater definition and/or security;

(3) it allows for wide roads--which fit better conceptually with the Classic Bonito phase than with the Late Bonito phase (post A.D. 1100)--to be created during the Classic Bonito phase and then continued in the Late Bonito phase when there was widespread influence from the San Juan area and collapse of the Chacoan system.

It also, of course, has cons as follows.

(1) If we see the Late Bonito phase as a generally less formalized period than the Classic Bonito phase, the addition of extensive walls to define "land route systems" does not fit as well. However "weird" constructions (such as tri-walls, OS 3, OS 5, and OS 6, Judd's "shrine" at the southeastern corner of Bonito, and the <u>associated wall that runs 155 m</u> toward Chetro Ketl) seem to be a hallmark of this late period, and the walls may fit with that concept.

(2) If the purpose of a gate is to restrict access, l m is easier to control than 9 m.

#### Summary and Wider Interpretations

That OS 5 and immediate environs show numerous remodeling and use episodes is evidence of Anasazi time investment. This is not to say that the structure represents any sort of massive effort--its total volume is less than one good, tall wall--just that it represents repeated effort. Clearing the Plaza 2 area of sand, a procedure suggested by its levelness and the presence of the mounds along its eastern margin, represents a far greater but less demonstrable investment in the area than does OS 5. The plaza clearing seems more likely to have been a large, one-time effort, followed by a period of maintenance along the wall, and then a lapse of The area may have been enclosed quite early in its use--the effort. constructional portion of the Trash Mound would have been present, as would the piles of plaza clearing and the southwest plaza wall. The use during this initial period seems to have been intensive relative to the subsequent phase.

There followed a period when natural deposits were allowed to accumulate, and activities may have decreased from the initial use. Within this span there is some evidence for variability of activities through time-some surfaces are more heavily used than others, and modifications were made on OS 5. Although some structure was present in the location of OS 5 for most of the occupation of Pueblo Alto, during this period of accumulation OS 5 consisted of dual staircases constructed of blocky, unbanded masonry.

The last apparent use left more material in place than any preceding one and involved the use of very large firepits. Somewhat speculatively, it seems that the site may have largely fallen into disuse. This use may represent a sort of reminiscent function--signal fires in a place that formerly had an important role in a large, now relocated, or only partially functional, system.

As to what actually went on in this "plaza," we remain sadly unclear (empty rooms and small tests in large, apparently empty plazas have that tendency). The initial proposal for examining Pueblo Alto's Plaza 2 argued that market plaza systems provide examples of many processes proposed for Chaco, and that their physical aspects could constitute appropriate models for testing (Toll 1978). The minimal literature extant then and since may be characterized by statements or examples of the difficulty of confidently identifying marketplaces archeologically, even at sites like Monte Alban (Blanton 1978:63), Tikal (Fry 1979:495), and Casas Grandes (DiPeso 1974:375, 399-401; 1974V:809), though there are suggestions that the archeological case may be better at Teotihuacan (Allen 1980:84; Millon 1973:18-23). Neither Pueblo Alto nor Chaco Canyon is the equivalent to any of these sites or their systems, except perhaps Casas Grandes. Perhaps, then, definitive identification of activities in an open space was not to be realistically expected. This is not to say that excavation in this area was fruitless. A summary of what the results do show includes the following.

(1) There was sustained use and maintenance of a very large space at the nexus of roads from many directions.

(2) Use of that space changed, which may very subtly reflect changes in the system.

(3) Some special function is probably symbolized by the presence of the "unnecessary" small double staircase (OS 5) and its predecessors.

(4) The area likely had a special connotation for the inhabitants and post-inhabitants. The presence of a similar feature, also in a large exterior enclosure, at Pueblo Bonito suggests that this function was not unique to Pueblo Alto.

In some ways, the absence of material from "plazas" may be an argument that the plazas were important; thus, a paucity in an unorthodox "plaza" such as Plaza 2 is indirect evidence that it indeed had the significance of a plaza. Modern pueblos stage communal cleanup projects before celebrations (see e.g., Lange 1959:181-182; Dozier 1966:173, 177), and devote special attention to the plazas. Both Lange and Dozier note that with some deterioration of control and tradition these cleanup projects were the source of some contention, and participation decreased. This is tantalizing food for unscientific speculation vis-a-vis the changing deposits in Plaza 2.

Although the results are not as clear as we wished, there is little question that such areas must continue to be examined. In this way comparative material will be increased and methods should improve. Moreover, the sorts of information potentially available are different--and not always less--than that derived from interior excavations.

# Plaza 3

The large open area just south of the site was designated Plaza 3. It is the least formal of the three designated plazas because of its lack of total enclosure. To the north is the southern enclosing arc at Pueblo Alto with at least two, road-related, door entries into Plaza 1. It is bounded on the east by the Trash Mound and Major Wall 2; the latter connecting the Trash Mound and the East Wing, and provides a minor but symbolic barrier between Plaza 2 and Plaza 3. Two entries between the plazas, however, were provided by a gate through Major Wall 2 and a staircase (OS 5) over its north end. A low masonry wall (Major Wall 5) running south from the Pueblo Alto southern arc provides at least a partial western barrier for Plaza 3. Besides aeolian sand hummocks and dunes, there is no obvious barrier enclosing the southern part of Plaza 3. A low, long dune stretches across part of the area, but trenching revealed only aeolian sands. A slight depression along the northern side of the dune, thought to be a possibility for a great kiva, was also trenched without tangible results. Thus, we are uncertain if this area was ever enclosed to the south.

A spur road splits off the main thoroughfare (RS 40) that connected Chetro Ketl and Pueblo Alto and enters Pueblo Alto through Plaza 3. Another spur from the western "Pueblo Bonito" thoroughfare (RS 33) may dodge around the southern end of Major Wall 5 to enter Plaza 3 and Pueblo Alto, although it is more likely that it parallels Major Wall 5 to the west and enters Pueblo Alto through the southwestern part of the Plaza 1 masonry arc.

Except for clearing of the various walls at the plaza peripheries, no work was conducted in Plaza 3. For two years it was used for backhoe access from the parking lot into Plaza 2, and we might expect some compression of fill across it and at the the southern end of Major Wall 5 that could impact future studies. If a line due east to the Trash Mound from the southern tip of Major Wall 5 is used as an approximate southern limit for Plaza 2, then Plaza 3's total area covered about 4.1 hectares, an area surprisingly and, perhaps, fortuitously similar in size to the other designated plazas at Pueblo Alto.

# Chapter Seven

# **Extramural Structures Associated with Roads**

Several unusual structures and two houseblocks were tested that were associated with the prehistoric road network around Pueblo Alto. Some of these could also have been discussed with Plaza 2 because of their proximity to the extramural plazas, but as a category of structures these were combined under this section. An overview of extramural houseblocks in the Pueblo Alto complex and their association with prehistoric roads is in Volume I, Chapters 4 and 5.

# East Ruin, Room 6 kiva (Figures 7.1-7.4)

At the end of the massive Major Wall 1 that runs east from the northeastern corner of Pueblo Alto is a houseblock termed the East Ruin, which is described in Volume I, Chapter 4. It is composed of six, paired, room sets (Figure 7.1) that are similar to other road-associated sets in and Armed with the latter knowaround Pueblo Alto (Volume 1, Chapter 5). ledge, we selected one of the rooms for excavation to clarify the spatial relationships between these room sets and roads. Because of their proximity to roads, we hypothesized that some control over traffic was exercised from these rooms or that the rooms served as storage facilities for roadtransported goods and for road-maintenance equipment. Discovery of a large court kiva, 8.3 m in diameter and with a masonry bench 2.5 m below the ground surface, in the East Ruin plaza suggested at least some ceremonial use of the houseblock, however. In addition, the layout of the room pairs was analogous to habitation- and storage-room pairings common in small habitation sites as well as in some habitation suites in the West Wing.

The East Ruin does not have its own site number; instead, it was treated as a feature of Pueblo Alto.

#### Strategy

Because Room 6 was part of a paired set, was adjacent to the plaza, and opened into another paired-room suite perpendicular to it at the junc-



Figure 7.1. East Ruin, located to the east of Pueblo Alto.





Figure 7.2. East Ruin, Room 6 kiva (i.e., "Room" 14), profiles.



Figure 7.3. East Ruin, Room 6 kiva (i.e., "Room" 14), Floors 1 and 2, plan view.



Figure 7.4. East Ruin, Room 6 kiva (i.e., "Room" 14), wall elevation.

tion of the two room wings, it was chosen for excavation. In addition to the above reasons for excavating Room 6, it was also shallow and promised a relatively quick and simple excavation, despite its size  $(20 \text{ m}^2)$ .

Horizontal control within the room was provided by dividing the room into six grids of equal size. Exploratory trenches across the grids and the narrow axis of the room yielded a small kiva built within the room. These trenches were then continued only within the kiva. Except for the uppermost fill of aeolian sand and wall debris, fill beyond the kiva walls was not removed except for a test in the southeastern corner of the room. The area of fill remaining within the kiva was divided into two equal parts, leaving four areas of unequal size that were eventually excavated. For coding purposes, the discovery of the kiva forced an additional room number to permit control of the kiva versus the room artifacts, but a number of terms persisted for its identity: Room 14, Kiva 14, and the Room 6 kiva. The reader should not confuse this kiva with Kiva 14 in Plaza 1, however. The interstitial spaces outside the kiva, but inside the room, remained as Room 6.

Depth was controlled by a subdatum set in the wall-juncture top at the northwestern corner. A second subdatum was set on top of the southwestern corner to permit triangulation or piece-plotting.

Because of limited time overhead camera recording to create the plan views was done without plane-table backups. The subdatums, however, were not precisely located and, therefore, some allowance for feature and artifact location error must be given. All deposits were 1/4 in. screened, but some pits received 1/8 in. screening. Upon completion of work in 1977, the kiva was lined with black plastic and buried with backdirt, with full expectations of a return in 1978 that never materialized.

The initial fill removal in the test trenches was accomplished in 20cm levels until the floor fill was reached after six levels were removed from each trench. The remainder was taken out in natural units.

# Fill (Figure 7.2)

The postoccupational fill consisted of two primary units of deposition: wall fall and aeolian sand.

#### Layer l

The uppermost deposit consisted of unconsolidated aeolian deposits that ranged between 5 and 10 cm deep and covered the entire room. The layer was extensively disturbed from wall clearing and vegetation but with little apparent loss of information. Cultural material was relatively sparse except for sherds (47), which constituted the highest frequency of cultural material for any unit dug in the kiva.

#### Layer 2

The bulk of the room fill consisted of loosely compacted wall rubble that averaged 50 cm thick. Like Layer 1, it was thickest against the west wall. The rubble consisted of both hard and soft varieties, with some preference for the latter, and generally of small to medium size. Although individual events were not discernible, presumably the majority of material derived from slow collapse of the west wall. The east wall probably fell into the plaza. Two areas in Layer 2 yielded lenses of burnt clay, ashes, and charcoal that marked informal hearths built after abandonment. These were not recorded except in passing, but their presence coincides with similar events in other postoccupational Pueblo Alto deposits.

#### Layer 3

Overlying the kiva floor was a compact unit, 20-30 cm thick, of sand interspersed with blocks of stone and elements of roofing (adobe impressions, plaster, and small fragments of unburned wood) mixed with some cultural material. Structural supports for the roof were absent and presumably salvaged.

# Floor 1 (Figure 7.3)

The upper kiva floor was a nicely compacted, smooth adobe covering (Plates 7.1-7.2) except for some rough spots caused by clearing a very damp surface. Much of the flooring was up to 8-10 cm thick, and it merged with the surrounding wall plaster. Isolated patches of floor plaster attest to efforts of repair in well-used areas. The area (1.8 m<sup>2</sup>) between the wing walls had been replastered and set with a few stones that elevated the area slightly above the main kiva floor. The overall area of the floor, including the bench, was 8.9 m<sup>2</sup>.

# Floor 1 Features

Six pits, all left open at abandonment, marked the floor. The most prominent was a large, 56-liter, adobe-and-slab-lined firepit located just south of the center point in the kiva. It still contained the gray ash, bits of juniper, and brush charcoal from its last use. In addition, burned pigweed and mustard seeds, corn cob fragments, and unburned prickly pear and a cucurbit seed came from the firepit fill (M. Toll, Volume III). The pit sides were well oxidized. No deflector was evident to shield the firepit from the ventilator drafts. A thick adobe coping formed a remodeled collar around the rim, which expanded into two rounded-ridge wing walls, about 5 cm high, that led across the floor to the southeast and southwest. The western wing wall had been shifted south from its original position with Floor 2. Wing walls, of course, are more typical in pithouses of the A.D. 600s than in late kivas.



Plate 7.1. East Ruin, Room 6 kiva (i.e., "Room" 14), Floor 1. Note faintly painted design on northern bench face. 30-cm north arrow. (NPS#15028)



Plate 7.2. East Ruin, Room 6 kiva (i.e., "Room" 14), Floor 1--an overhead view. 2-m stick and a 50-cm north arrow. (NPS#15795)

A few centimeters to the east of the firepit was a 95-liter, unlined, irregular, bell-shaped pit (OP 4) filled with layers of ash and burned sand, presumably from the firepit. At the bottom was a bone awl and, 1-2 cm above the bottom, a bone spatula in gravelly sand not mixed with firepit contents. A number of pieces of a Mancos Black-on-white bowl that matched two others in the floor fill also came from the pit. Both this pit and the firepit were built with Floor 2 and continued in use throughout the kiva's occupation. The materials in the bottom, however, suggest that it may originally may have held men's clothing repair and cooking equipment. The gravelly deposit in which they were found probably came from the gravelly pit walls, evidence of a potential abandonment of the pit, tools, and, perhaps, the kiva before the pit was reused as a dump for firepit cleanings.

Two of the remaining four other pits (OP 3 and 5) were of small volume and unsuitable for storage. No function can be suggested for these. The remaining two pits were so small as to be construed normally as tenuous features. However, they were positioned 25 cm apart, between the firepit and ventilator, the area of traditional historic ladder entry from the roof.

# Floor 1 Artifacts

A paucity of cultural material was left on the floor, most of it unrelated to use of the structure. Two indented corrugated jar sherds and one Escavada Black-on-white jar sherd were found on the floor. More pieces of the Escavada vessel matched numerous others in the floor fill and above the bench. The few bones are uninformative regarding cultural activity in the kiva. Bones were dominated by rabbit, prairie dog, kangaroo rat, and turkey elements and comprised a minimum of six individuals, none on the floor. Only 1 of the 31 elements from the fill was burned. Except for turkey, the same species were recovered in the firepit and OP 4. All six elements in the firepit were burned, but only 4 of the 28 recovered from OP 4 were burned. Except for the turkey and burned elements, the others may be postoccupational or remains from a limited foodprocessing activity.

A single piece of chipped stone came off the floor and five others came from OP 4. The firepit contained just two pieces, both Washington Pass chert. Twenty-one pieces came from the fill. Despite the late occupation of the kiva, there was a surprising absence of obsidian in the kiva and the East Ruin, although relatively high frequencies of spotted yellow brown chert (3 percent) and Washington Pass chert (18 percent) in the total sample (n = 67) are not unusual for the early A.D. 1100s occupation at Pueblo Alto. Pollen samples were not analysed, however, unburned seeds of economic annuals (pigweed and mustard) came from the two eastern quadrants analyzed, although few seeds were recovered (M. Toll, Volume III).

#### Floor 2 (Figure 7.3)

Immediately under the Floor 1 plaster was the initial kiva flooring, an ash-stained surface overlying a clean, light orange brown sand. Generally, it was a relatively thin application of plaster that in places thickened to 6-7 cm. It was badly fragmented when excavated. The deeply impressed grass marks covering Floor 2 indicate that the surface was then damp, perhaps from a very wet application of the Floor 1 plaster.

#### Floor 2 Features

Along with OP 4 and Firepit 1, discussed above, two other pits marked formal use of the lower floor. OP 1 was placed next to OP 4 and had been sealed with gray plaster. It was shaped like a heating pit but was unburned and filled with clean sand, which permitted only idle speculation about its function.

More interesting was OP 2, which closely resembled a series of pits in habitation Room 110 in the West Wing. It had been packed with fine sand marked by five (possibly six) vertical holes presumed to have been made by small sticks (Plate 7.3). The holes were 1-2 cm in diameter and between 2 and 30 cm deep. As with those in Room 110, prayer sticks are postulated to have been placed in them. Although the pit was associated with Floor 2, location to the side of the blocked west room door is as intriguing as those in Room 110.

#### Floor 2 Artifacts

Except for a single siliceous flake on the floor and three sherds in the floor fill, including a Mancos Black-on-white sherd that matched its companions in OP 4, and two indented corrugated sherds, artifacts were absent. Several desiccated squash seeds were observed in the southeastern area but were not collected.

# Walls (Figure 7.4)

#### Wall Masonry

What little could be seen of the kiva masonry revealed a preference for soft sandstone blocks, with few spalls, that contrasted with the thinner, tabular blocks interspersed with spalls used in the primary room walls at Pueblo Alto and in the East Ruin. The exterior kiva walls were left unfaced and were buried with fill dumped into the interstitial spaces left from constructing a round room in a rectangular space. The kiva builders, however, incorporated a part of the flat eastern and western sides of the room into the interior facing.



Plate 7.3. East Ruin, Room 6 kiva (i.e., "Room" 14), Floor 2, Other Pit 2. Part of pit is excavated to show pits in fill that may have held pahos or other types of slender rods. 30-cm north arrow. (NPS#15143)

#### Wall Features

A masonry-lined, floor-level ventilator was built to the south of the firepit. A slight bulge at the sides accentuated the 20-cm-wide, 36-cm-high tunnel opening. Stone lintels formed the roofing, and the floor sloped slightly down and away from the kiva floor. The shaft opening had been partly removed during wall clearing and was not investigated. The traditional firepit/ventilator axis was  $4^{\circ}/184^{\circ}$  from true north.

A 31-cm-wide bench, covering  $1.2 \text{ m}^2$ , stretched from wall to wall across the northern end of the kiva, 60 cm above Floor 1 and 65 cm above Floor 2. A continuous, thick coat of plaster covered the bench face and top and articulated with the adjacent floors and walls. The blocky remains of the north wall were found just behind the bench. No artifacts were left on the bench.

In the northeastern part of the bench wall was a nicely formed, cubical niche, 6 cm above Floor 1. Its volume was 10 liters and the inside smoothed with thick plaster that left no sharp corners. It had been only partly filled with postoccupational fill.

A sealed door in the west room/kiva wall was clearly the original passageway between Rooms 6 and 7. Undoubtedly, it was filled with masonry when the kiva was built. Another opening exists between the west and north walls. It was offset and perhaps was a later modification (early A.D. 1100s) modification. No evidence for a door from Room 6 into the plaza was noted, although one probably existed. A thorough investigation of doors was not conducted because of adverse effects to the kiva architecture and wall paintings.

# Wall Plaster and Paintings

Kiva walls were heavily plastered with a smooth brown mud. There were at least two and probably as many as four or five coats. The primary coat articulated with Floor 2, whereas the last coat lapped onto Floor 1. No attempt was made to strip the plaster to look for wall features because it was covered by a painted design that nearly encircled the lower walls (Figure 7.4). The design was geometric and painted with evenly spaced, large black squares separated by a faint cream-colored paint that was gone between most of the squares. A few of the squares were a lighter graywhite, although this may have resulted from deterioration of the paint. Remnants of black and white paint were also found on the north wall of Kiva 3 at Bc50 (Brand et al. 1937:79). Several other early A.D. 1100s kivas at Bc51 and Kin Kletso, in the canyon directly south of Pueblo Alto, also yielded painted murals (Kluckhohn 1939; Vivian and Mathews 1965:53). Kiva wall paintings occurred late in Chaco, and in the northern San Juan region they have been attributed to Mesa Verdean influence (Smith 1982:87).

Plaster was apparently absent as little could be observed on the Room 6 walls. If the room was abandoned for a period and the walls partially razed, then any wall plaster may have been mostly washed away by the ele-

ments. Without clearing out the kiva architecture, however, we cannot be sure of its absence.

# Test Trench 6 (Room 6)

Floor remains associated with Room 6 were not observed during the excavation of the kiva. We had hoped that the filled interstitial spaces created by the kiva had preserved vestiges of the Room 6 occupation, so the shallow, southeastern corner of the room was selected to test for it. Test Trench 6 removed four arbitrary levels of fill in 20-cm levels from the corner without positive results. We found only a thin, poorly prepared, undulating surface at the same general level as the kiva floors and probably related to the kiva. It did not attach to the room walls. The fill consisted of sand and wall rubble.

Ceramics (n = 36) from the test revealed a few White Mountain Redwares and a carbon-decorated Mesa Verde Whiteware that indicate contemporaneity with the kiva occupation, although these two wares were practically absent in the larger kiva sample (n = 279). More interesting was the presence of Red Mesa Black-on-white and plain gray sherds in the lowest two levels of TT 6, which were relatively more common than in the kiva. The latter types were expected in some quantities to be associated with the primary room occupation in the A.D. 1000s, but to be practically absent during the kiva's occupation in the A.D. 1100s. Chipped stones, likewise, fits expectations consistent with the two periods at Pueblo Alto (see Cameron 1984). Washington Pass chert was relatively more abundant in the TT 6 fill (n = 8 of 21, 38 percent) than in the kiva fill (n = 29 of 1)170, 17 percent). Bone (n = 36) was common for the volume removed, but represented mostly unburned jack rabbit elements (16) and two rare items: a mule deer antler and a screech owl tibia.

To summarize, TT 6 yielded nothing architectural that we could relate to the Room 6 occupation other than the unplastered corner walls. Despite small samples, both ceramics and lithics are suggestive of materials that relate to the primary occupation, though they were mixed with later materials.

## Summary and Conclusions

In terms of our original expectations for Room 6, the excavation was a disappointment and blunted further investigation and interest. Aside from a smattering of cultural material and the four room walls, nothing could be associated with the primary room occupation. Either the original room floor was left unprepared (and the lack of wall plaster might be additional proof of this) or it was removed or reused when the kiva was built. This problem was to have been investigated further, but this was not done because of other site priorities.

The kiva built in Room 6 was clearly occupied in the terminal years at Pueblo Alto in the early A.D. 1100s. Our initial prognosis that the East Ruin had been razed prehistorically, a speculation that was due to the lack of wall rubble encountered during wall clearing, remains unverified but plausible. Whether there was a hiatus between room and kiva occupation, therefore, is not known. Some continuity and shared cultural views with the inhabitants of Room 110 might be suggested by the presence of the possible paho-holder pit, if the latter is truly related to the kiva rather than to the room use. The contrasts between the two kiva floors, however, might indicate that the lower kiva floor was the reused room floor.

Major modifications of the East Ruin that betray additional early A.D. 1100s occupation were not evident, but wall clearing revealed a probable ventilator in the southeastern corner of Room 11, which must indicate another late kiva. With at least one, and probably two, early A.D. 1100s kivas built in the old East Ruin rooms, other modification and occupation of the compound probably took place despite the apparent absence of late refuse middens. The court kiva, the most logical receptacle for trash had it been abandoned then, was filled with clean sand, although we did not reach the floor. As to the initial relationship of paired-room units and prehistoric roads, we must wait for further work.

## Parking Lot Ruin (Figure 7.5 and Plates 7.4-7.5)

Brief coverage of the Parking Lot Ruin, located a few meters west of Pueblo Alto, is in Volume I, Chapter 4 (Associated Houses). The remnants of this small house were investigated before it suffered further depredations by motorized equipment. Backhoe trenches were sunk directly south of the structure to test for kivas, but no trace of cultural remains was found.

#### Strategy

The ruin was outlined by narrow trenches about 5-10 cm wide and deep that extended along both faces of the masonry walls. Selected deep-fill testing was conducted in the southwestern room (Room 4) because it was farthest from the exposed bedrock bordering the eastern side of the ruin. Here, test pits 75 cm<sup>2</sup> and 50 cm deep subdivided the room along its midlines, but this was largely unrewarding. Test pits (50 by 50 cm) were then placed against the center sections of all room walls in hopes of locating entry remains but, again, little was found. A burned and ash area in Room 1 prompted more extensive excavation there but, again, little was found.

All fill was 1/4 in. screened. Horizontal control was maintained by test pit and room. Vertical control was kept as depth-below-surface.



Figure 7.5. Parking Lot Ruin, located a few meters west of Pueblo Alto.



Plate 7.4. Parking Lot Ruin. Looking west toward New Alto and Cly's Cnayon. (NPS#14730)



Plate 7.5. Parking Lot Ruin. Looking northwest toward Cly's Canyon. Note mounds of Rabbit Ruin in upper right background. (NPS#15841)

Cultural material was stripped from the parking lot surface but was not point-located because of its displacement by road grating.

#### Post- and Preoccupational Fill

The occupational fill consisted of a thin (0-10-cm-thick) mantle of soft, loose, aeolian sand with inclusions of tiny pebbles, scattered spalls, mason's tools, and occasional flakes of chipped stone, sherds, cigarette butts, and pop can tabs. Most of the prehistoric cultural material was concentrated across the eastern part of the rooms, and beyond, and about 25-30 m north toward the present road.

Room testing revealed primarily sterile, preoccupational, aeolian sand that became progressively harder because of increased CaCO<sub>3</sub> content. In Room 4 at 75 cm depth, we encountered decomposed, sandstone bedrock and then tan and white, solid bedrock. This rose sharply toward the east where it emerged on the surface adjacent to Rooms 2 and 3.

The only cultural remains were observed in Room 1 where a light burn was found against the west wall 11 cm below the surface. In addition a small concentration of black ash 15 cm below the surface occurred near the the center of the north wall. The western half of the room was subsequently cleared because it was the least disturbed area of the site and was mostly outside the parking area.

#### Room 1 Fill

The upper 10 cm yielded loose, aeolian sand, a few sherds, and tiny chips of siliceous stone. The next 10 cm were harder sand with specks of caliche and spots of gray ash but otherwise identical to that above. At 20-30 cm below the surface were a few sandstone spalls, chipped stone, and a little ash in clean sand. This level probably marks some initial building activity at the house.

#### Walls

#### Wall Foundations

Although the foundations were not fully explored (because little remained), test pits revealed that they closely resembled those underlying the main Pueblo Alto walls, in contrast to typical small-house wall foundations in Chaco Canyon that are narrow or even absent (Truell 1986:274, 287). The Pueblo Alto builders had cut a trench into sterile soil and filled it with gray clay and sandstone blocks. By 1976, just a single course of masonry, 50-60 cm wide, remained. The poor condition of the foundations precluded accurate abutment studies, although all appeared to be bonded and built contemporaneously.

#### Summary and Conclusions

Although we cannot rule out excessive contamination of the area by roadgrading and tourist discard of artifacts, the overall lithic and ceramic assemblages appear reliable. Both the ceramics and lithics appear relatively unmixed and indicative of time periods not readily accessible to surface collecting off Pueblo Alto or nearby New Alto. Only the Pueblo Alto Trash Mound offers material of similar age and composition, which, of course, is some distance away but the most profitable area for collecting. Nevertheless the Parking Lot assemblage is higher in types less likely to be collected (quartzite debitage and nonindented corrugated culinary) that are rare on the Trash Mound surface. The almost complete absence of types decorated in carbon paint (a trend common after A.D. 1100) and the 8 percent of Washington Pass chert (of 63 pieces) suggest deposition of the material in the mid- to late A.D. 1000s. The "deep" fill ceramics recovered in Room 1, which might date construction, also suggest this same period.

Of course, because of the absence of floors and features little can be said of specific room activities or function. The paucity of artifacts also lends little information except that most appear to be related to construction of the house. The hammerstone/abraders (Volume III, Plate 4.8), profusely scattered across the parking area, are much smaller than those found in the nearby Alto rooms and may indicate that softer stone was used in the building than during the initial construction at Pueblo Alto. It seems unlikely that the Parking Lot Ruin would have been an attractive source of stone in historic times, considering the proximity of New Alto and Pueblo Alto. Either the ruin was scraped away with road grading equipment or, more likely, it was dismantled in prehistoric times and replaced by New Alto.

#### Other Structure 13

A low mound of earth and stone extending west off the southwestern corner of Pueblo Alto (Figure 1.1) was first investigated in 1976 with poor results. Deep trenching was initiated in 1979 to resolve the issue of what might have been hidden there, and a long, masonry wall in deplorable condition was found. Most of the southern facing was gone, and the western end was badly disintegrated and could not be followed to termination. This wall extended west-southwest from Room 101 about 12.5 m to terminate at the edge of or slightly into the Pueblo Bonito-Pueblo Alto road (RS 33) that passes by the western side of Pueblo Alto. In places, the wall was up to ten courses high (about 50 cm) and about 70-80 cm wide. The style and materials of construction suggest the wall was built in the last half of the A.D. 1000s or later. It was of medium-soft blocks of sandstone with poorly set courses of blocks and spalls suggestive of some banding. The wall was built on aeolian sand without the benefit of a foundation.

Two potential wall stubs, 605 cm apart, extending north from the main wall, suggest the remains of a room similar to those in the road-associated, paired units at the site (see Volume I, Chapter 5). Unfortunately, the stubs were difficult to define and their reality was uncertain. The proximity of the wall at right angles to a prehistoric road invites comparison with the walls extending off the East Ruin into the RS 37 roadway on the eastern side of Pueblo Alto. It seems plausible to suggest that in both instances the wall was road related and, perhaps, affected road traffic in some undetermined way.

The little cultural material recovered from around the wall does not pinpoint the period of construction and use. Ceramics cover the A.D. 1000s and early A.D. 1100s, but two Shasta soda drink cans came from the western end (as a result of the 1976 wall clearing?) and a .22 cartridge from the early A.D. 1900s (see Volume I, Appendix MF-B) was recovered under the wall fall close to Room 101. Except for two sherds, ceramics from the OS 13 testing reveal types common to the A.D. 1000s.

# <u>Major Walls</u> (Figures 1.2 and 7.6)

A number of long, masonry walls lead out from Pueblo Alto. Vivian (1970b:73) once considered these related to water control, but it is now known (e.g., Vivian 1972, 1983) that some of the walls border five or more prehistoric roadways that radiate out from Pueblo Alto. Most of the roads do not enter the central plaza (Plaza 1) at Pueblo Alto or the main houseblock but were diverted past it. All the walls leading out from Pueblo Alto were cleared to various degrees and mapped, although Vivian (1983) tested many of these in 1970-1971. Cultural material was collected by the Chaco Center at specified intervals along the walls, but no screening was done except in select localities (e.g., near OS 5). Where walls physically connected to Pueblo Alto, abutments indicate that all were built after the main houseblock. Construction styles are not temporally diagnostic for the major walls, although the ceramics associated with the adjacent roads (see Volume I, Chapter 5) suggest that all the walls were built between about A.D. 1050 and 1100 or a little later. None of the walls were built on foundations.

#### Major Wall 1 (MW 1)

The massive wall connecting the northeastern corner of Pueblo Alto to the East Ruin 143 m to the east has experienced much investigation. A number of roads pass through it to the north, including the Great North Road and RS 43 to the Gambler's Spring (29SJ 1791) in Cly's Canyon (Figure 7.6) and Penasco Blanco. On aerial photos many of the roads north of Pueblo Alto converged on a single point that was discovered to be a meterwide door or gate in the wall 61 m east of the East Wing (Figure 6.1) when cleared by Prescott College in 1972 (Ware and Gumerman 1977). No prepared



Figure 7.6. The prehistoric road system in the vicinity of Pueblo Alto, Chetro Ketl, and Pueblo Bonito. Site numbers indicate stairways marked by circles, RS numbers indicate road segments, and T numbers mark ceramic transects. Heavy black lines outline road curbing or the masonry retaining walls of terraces.

surface was found leading through the door, however. Between the door and the East Ruin, the wall turned at a series of right angles to form what was later described as a "blockhouse" when it was excavated in 1974 by Richard Loose. The function of this particular feature is unknown. Later the wall was cleared in its entirety in 1976.

MW 1 is butted a few centimeters south of the northeastern corner of Pueblo Alto Room 169 except for at least one stone that is definitely tied. The exterior wall facing of Room 169 is intact above MW 1, and the two walls reveal different masonry styles that indicate that MW 1 was built after the construction of the East Wing. Room 169 exhibits faced, hard, tabular stones set in sparse amounts of hard, gray mortar, whereas the major wall was built primarily of large and small, unmodified blocks of soft sandstone set in copious amounts of brown, clay mortar. Trash was relatively abundant at this end of the wall and yielded, unexpectedly, a wire nail at some depth next to the wall about 1 m from Room 169.

At the opposite end, MW l is tied to Room 7 of the East Ruin, and it appeared that the room and wall were built at the same time. The cores of MW l and the wall of Room 7 are tied, while the stone veneer is alternately tied and butted. Because of deterioration, the major wall varies in height and width. Next to the door, it is 140 cm wide and 100 cm high, although the addition of the associated rubble would add 50 cm to its height.

# The Blockhouse (see Camilli and Cordell 1983:Figure 27)

About 27 m east of the door (or 89 m east of Pueblo Alto; Figure 6.1), the series of jogs in the wall create an open-ended rectangle (476 by 528 cm) before it heads back to its original course  $(90^{\circ}/180^{\circ})$ . This rectangle, or "blockhouse" wall was footed on the hard, caliche-impregnated, sterile sand that overlies bedrock. For the most part, the blockhouse wall followed the contour of the land. Masonry stone rested directly on the sterile sand without benefit of a foundation. Walls were about 67 cm high and 88-127 cm wide. Originally the wall was about 100 cm high, but where the ground dips downward to the east and west the wall grew correspondingly higher. Masonry pillars may have stood at the northeastern and northwestern corners, although advanced deterioration of the wall at these points makes it uncertain.

Fill surrounding the blockhouse contained little cultural material aside from a profusion of hammerstone/abraders (Volume III, Plate 4.7) found in the middle of the structure. These tools were evidently discarded during construction of the blockhouse and were common in other deposits of construction debris at Pueblo Alto. Charcoal and other artifacts were rare.

#### Major Wall 2 (MW 2)

At the southeastern corner of Pueblo Alto another wall extended from Other Structure 5 to the Trash Mound for a distance of about 43 m. This wall revealed a complicated history and some realignment where it ran north of a door opening and under OS 5 outside of Room 192 (see OS 5 notes). For the most part, the wall was a maximum of 35 cm high and 50-60 cm wide. There was no foundation, and the wall stones were footed on hard, sterile sands. Construction was of soft, crudely shaped, sandstone block and spall veneer with a rubble and clay core. Rubble fallen off to the sides could add another 40 cm to the present wall height.

Between OS 5 and an opening (gate) in the wall, the masonry was slightly superior to the remainder. It was also constructed of large, soft blocks surrounded by multitudes of hard, gray, tabular spalls that achieved a banded effect. There was a moderate use of mortar in smaller quantites than in OS 5 to which it butted. This segment was footed on an entrenched block and mortar foundation, unlike the longer southern segment.

The southeastern end of the wall terminated intentionally on the slope of the Trash Mound but the end was much deteriorated. There was no increase in trash where the wall extended partly up the Trash Mound. Instead, the deposits around the wall near the southeastern end were primarily sand and native sandstone gravels that perhaps reflect the first piles of debris cleared from around the site during construction. Although it has been suggested that the wall might have served as a walkway on which to carry trash from the pueblo to the Trash Mound, a gate in the wall 3 m from the southeastern corner of Pueblo Alto suggests otherwise.

# The Gate

Near one end of MW 2 was a finished square opening, 75 cm wide, allowing access between Plazas 2 and 3, that may have facilitated traffic crossover between the major roads running by the eastern and western sides of Pueblo Alto. The gate or door was oriented 58° or 59°/238° or 239° (all azimuths are from true north). It was bordered by large, soft blocks and smaller tabular, hard, gray stone. The uppermost use surface through the gate was natural and sandy.

An earlier segment of MW 2 may have connected the Southwest Wall of OS 5 with a wall under MW 2 at the gate. These two wall segments were of harder stone than that in the latest version of MW 2 and were set in bands that resemble construction of the main houseblock, which suggests construction in the middle A.D. 1000s. The azimuth of the primary wall leading south toward the Trash Mound was  $148^{\circ}/328^{\circ}$ , whereas at the gate the orientation north shifted toward OS 5 at  $161.5^{\circ}/341.5^{\circ}$  and away from the southeastern corner of the East Wing. The latter wall was of late construction and overlay an earlier wall, oriented  $147^{\circ}/327^{\circ}$ , that nearly matched the azimuth of the Southwest Wall  $(151^{\circ}/331^{\circ})$  of OS 5. From this we can spectulate that originally Major Wall 2 butted to the East Wing near the southeastern corner, but was later diverted to attach to OS 5 when OS 5 was constructed.

#### Major Wall 3 (MW 3)

On the other side of the Trash Mound near where MW 2 ascends, a third masonry wall (Plate 7.6) borders the prehistoric road that enters Plaza 2 at the northern end of the Trash Mound. This road, RS 40, comes up from the Talus Unit and Chetro Ketl in the canyon bottom and continues through Plaza 2 and the door in MW 1 as the Great North Road. There has been much commentary and investigation of this wall, probably because it is so easily seen and is the first approached when climbing to Pueblo Alto from Chetro Ketl.

Jackson (1878:448) first noted its presence and was followed by Holsinger (1901:58), who traced it for a considerable distance toward the canyon. Later, University of New Mexico students sought to connect its function to water control (Snyder 1947:6), as did the Vivians. Gordon Vivian and Al Lancaster cleared sections of the wall in the 1950s, as did Gwinn Vivian and Robert Buettner in 1967 (Vivian 1983b:A-13). Snyder also cleared parts of it, and so did the Chaco Center in 1976. There is little cultural debris associated with the wall until it passes close to the Trash Mound where the wall has trapped refuse washing off the midden. Certainly the wall prevented refuse from scattering onto the road; it may also have blocked drifting sands from the road, which it protects from the prevailing winds.

MW 3 runs north to south  $(7^{\circ}/187^{\circ})$  from the northern tip of the Trash Mound to the edge of the cliff 179 m south. The southern end is much disintegrated and disappears just before reaching the exposed bedrock of the cliffs. Overall, the wall averages about 80 cm wide and reaches a maximum of 60 cm in height. The wall was faced with large, poorly modified blocks of soft and hard sandstone with spalls and unshaped blocks filling the core. Only four or fewer courses of stone remained, and in many places no stone remained. There was little associated rubble to mark natural disintegration of the wall; instead, it appeared to have been purposely dismantled. If the wall had been dismantled, then it may be that the road, too, had fallen into disuse at the same time. Ceramic deposition along RS 40 ceased by A.D. 1100 and suggests abandonment of the road and MW 3, with the result that the stone from MW 3 was salvaged for use else-MW 4 and the East Ruin may also have suffered from salvaging where. during the same period.

There apparently is no masonry wall that borders the road along its eastern side until one descends the first ledges and stairs (29SJ 1980) below the Trash Mound toward Chetro Ketl and the Talus Unit. In reality, the wall continued intermittently all the way to the Talus Unit (along RS 40W).



Plate 7.6. Major Wall 3, bordering Road Segment 40, leading south toward Chaco Canyon, Chetro Ketl, and the Talus Unit. Note Tsin Kletzin (arrow) on the horizon left of center. According to Holsinger (1901), a stone idol sat near the end of this wall on the final approach to Pueblo Alto (see Volume I, Plates 5.7-5.8). (NPS#15261)

Plate 7.7. Major Wall 6, running east past New Alto toward Pueblo Alto. (NPS#15012)

#### Major Wall 4 (MW 4)

A few stones in linear arrangement between Plaza Feature 2 and the East Ruin and parallel to a prehistoric road (RS 37) may mark the paltry remains of another major wall. Only a short piece could be followed about midway between the plaza feature and the East Ruin, 55 m apart. No more than a single course of masonry remained except for two or three piles of stone along the proposed wall alignment of  $80.5^{\circ}/260.5^{\circ}$ . One of these, 140 by 90 cm and 25 cm high, may represent the remains of a masonry pillar. Otherwise, there was little cultural material or stone left to mark the former wall. Fill along the projected alignment is aeolian sand. If a major wall existed in this area, and it is not unlikely given the proximity of the road, then it had been dismantled and the stone carried away. Along the same alignment but on the opposite side of the East Ruin another masonry wall borders the northern side of RS 37 for 290 m east.

#### Major Wall 5 (MW 5)

This wall extends south from the outer wall of Kiva 7 and a small courtyard attached to the southern enclosing arc of Plaza 1. Snyder (1947) also cleared part of this wall and reported that it stretched for 52.7 m, a finding duplicated by our own clearing efforts, although the southern end could not be precisely determined. A mound of dune sand continues for another 50 m south along the wall alignment as if additional masonry was buried, although this area has not been tested. MW 5 averaged between 50 and 60 cm wide and was a maximum of 30 cm height (Snyder reported that it was between 51 and 61 cm high), although fallen stones along its sides would have made it much higher. Construction of the wall was similar to that of the others, consisting of an exterior facing of soft blocks of slightly modified sandstone, no foundation, and a core of clay and rubble. Footings rested on aeolian sands and sterile hardpan.

We were unsure if the wall bordered a prehistoric road. Its alignment  $(7^{\circ}/187^{\circ})$  is not parallel to any roads identified nearby, and its function may have been to enclose a plaza space (i.e., Plaza 3) rather than to funnel road traffic. The southern arc of Pueblo Alto rooms, MW 2 and the Trash Mound comprise the other major barriers or perimeters of Plaza 3. There are no discernible manmade barriers along the southern side of the area, however.

#### Major Wall 6 (MW 6)

To the west of Pueblo Alto stretches another wall  $(79.5^{\circ}/259.5^{\circ})$  that mirrors MW l stretching east (Plate 7.7). MW 6 lies within a few meters of New Alto but does not join to it. It extends east 62 m from New Alto, is about 271 m long and 106-110 cm wide, reached a maximum height of 50 cm, and was footed on hard, sterile sands. The amount of rubble scattered

along it may be the remains of a wall formerly twice as high. Soft blocks of stone (10-40 cm long and 4-8 cm thick) interspersed with harder varieties were used in the construction, along with a mortar and rubble core. It is unknown if the wall once connected to the northwestern corner of Pueblo Alto, although the lack of rubble suggests it did not. Both ends of the wall were so badly collapsed that the termination points could not be precisely determined, and numerous gaps occurred along its length. The eastern 10-15 m of the wall were littered with a mound of hard, gray appear sandstone spalls that to have derived from some initial construction activities at Pueblo Alto. About 35.5 m east from its eastern end, along the same alignment, are the foundations of a four-room complex designated as the Parking Lot Ruin, seemingly road related (see Volume I, Chapter 5). Between these four rooms and Pueblo Alto, about 32 m, RS 33 passes north from Pueblo Bonito. At the western end of the wall another road (RS 44), which runs between Pueblo Bonito and the Great Gambler's Spring, passes perpendicularly to the wall.

#### Major Wall 7 (MW 7)

A few meters east of the East Ruin is a masonry wall that borders the east side of a north to south road (RS 41). At the southern end, this road segment may terminate at RS 37, which ran by the southern side of East Ruin and into Plaza 2. Ireland and Obenauf, however, felt that aerial imagery suggested that it continued south to the edge of the uppermost benches, perhaps to link to 29SJ 1976, a series of stone circles built along the edge of the cliff (Windes 1978). Testing opposite where RS 41 enters RS 37 may demonstrate its continuance if an opening through the berm lining the southern side of the road were found. Approximately 149 m to the north along an alignment of 1.5°/181.5°, MW 7 merges with a prehistoric road that ran diagonally from the northeast to the north gate in MW 1 and Plaza 2. The wall is partly visible at its northern end but with only scattered stones marking its progress along its southern half. As it passes the East Ruin, the wall appeared to be offset 50 cm to the west and closer to the ruin. Overall, the wall is about 50-60 cm wide and 20-30 cm high. Generally, the wall consists of soft blocks of sandstone set on hard, sterile sand that may mark the original road surface. Little mortar was evident in the wall construction.

#### Major Wall 8 (MW 8)

Twenty-three meters east of the East Ruin rooms was a 287-m-long, masonry wall that bordered the northern side of RS 37. On the opposite side was a low berm that paralleled MW 8 and served to delineate the road depression. MW 8 varied between 60 and 70 cm wide at the western end to 80-95 cm wide at the eastern end. Its approximate height was 50 cm. Gwinn Vivian and Robert Buettner trenched parts of the wall in 1971 (Vivian 1983) and found a vertical, finished termination at its eastern end. The wall was formed by a double veneer of medium to large, rectangular, soft blocks with a narrow core of mortar and rubble, and it extended along an alignment of  $92^{\circ}/272^{\circ}$ .

## Major Wall 9 (MW 9)

About 128 m from the eastern end of MW 8 was another long, low masonry wall, over 465 m long and about 50 cm wide, that ran north and south  $(7^{\circ}/187^{\circ})$  presumably along a road (RS 36) between the Escavada small-house community and Chetro Ketl. Testing had been done along this long wall in 1967 by Gwinn Vivian. The southern end of the wall was found to terminate at about 50 m from the edge of the uppermost bench that descends into Chaco Canyon. Road traffic from RS 37 may have been diverted to RS 36, although there were shorter routes from Pueblo Alto more suitable for reaching either Chetro Ketl or the Escavada community. Therefore, RS 37 may have breached RS 36 to continue east toward the Poco Site and perhaps to communities along the upper Escavada Wash (i.e., Bis sa'ani), however, no visible wall lines an eastern route.

#### Terraces

Four areas along the first bench under the high cliffs running just south of Pueblo Alto were bordered by intermittent segments of masonry wall (Figure 7.6). Because of these borders, they were designated as road segments during the 1972 inventory survey (RS 28, 30, 31, and 34) but are more likely to have been agricultural features (see Volume I, Chapter 5; Vivian 1970a, 1970b). These are located along southeastern-facing areas of rincons and have had the low areas along the bench edges walled up (Plates 7.8 and 7.10; Volume I, Plates 5.15-5.16). Nowhere else were these kinds of features recorded in Chaco during the inventory survey. Some of the walls are impressive, but the overall acreage for growing crops between the retaining walls and the cliff talus is small; the sandy deposits trapped between the retaining walls and the cliff and talus rubble provided a linear strip for crops of only about 15-25 m wide, or about 6-12 hectares (15-30 acres) for all four areas. By any account, the area was too small for supporting more than small numbers of people: about 10-20 individuals according to the guidelines used by Cully et al. (1982:159, 165) for the the area around nearby Bis sa'ani. Presumably, the locales were favored because of the potentially higher moisture content availed by the location at the contact zone, where downward percolating ground waters are spread horizontally by nonpermeable shale deposits. This zone yields the best area for water discharge in the area, at Cly's Canyon, although the slight northwesternly dip of the geologic formations probably greatly reduced its potential along the terrace areas. Vivian (1970a, 1970b:192; personal communication 1987) believes that pour-off from the cliff tops bordering the terraces was also advantageous, but probably the small amount of run-off and the infrequent storms consistently reaching the north mesa would have negated this advantage.



Plate 7.8. Terrace walls (RS 31). Note similarity of masonry to Navajo construction. Todd Windes and Suzanne Hunt at base of bench. Looking west. (NPS#28732)



Plate 7.9. Stairway up to terrace (RS 28) level. Looking southwest. (NPS#30048)



Plate 7.10. Terrace (RS 31) built across an old gulley that cut through the bench. Note secondary masonry wall in lower left. Looking west. (NPS#28715)

For the most part, masonry stacked across the low places among the outer edges of the bench is crude and consists of large, unshaped, soft chunks of sandstone piled in abundant mortar with little regard for vertical facing. An abundant source of stone is available nearby (e.g., the talus). These walls were assumed to have been built initially by the Anasazi, because of their location, each bracketed by prehistoric staircases, and because of the associated ceramics. The style of workmanship, however, reflects greater similarity to Navajo rather than Anasazi construction.

#### Road Segment 28 Terrace

The easternmost terrace was built below a prehistoric road (RS 35) that heads for the stairs east of Chetro Ketl. Masonry is stacked intermittently for about 80 m and up to 50 cm high along the bench edge. Access up the 3-5-m-high bench was provided in two places along the stretch of retaining walls by a masonry ramp or staircase (Plate 7.10) and a series of stacked stone steps (Volume I, Plate 5.16). The potential crop area is limited to a strip about 11 m wide along the bench top. Cultural material for the terrace was relatively abundant (Volume I, Table 5.4). Staircases (29SJ 1527 and 1529) at the ends of the bench along the western side of the upper rincon provided access to the terrace from the cliff above. Ceramics along the walls suggest use of the terrace in the early A.D. 1000s through the early A.D. 1100s (Volume I, Figure 5.7), although a few Lino Gray sherds indicate an early site nearby.

#### Road Segment 30 Terrace

In the same topographic setting directly west of RS 28 are three stretches of masonry stacked along the bench edge for 280 m and up to 1.5 The longest strip extends for about 135 m, but breaks in the m high. overall feature were caused by topographic constraints. In places at the northern end, the masonry wall is faced on both sides and 1 m wide. At best, the sandy strip held back by the wall is a maximum of 15 m wide but often is much less where it is strewn with talus debris. Cultural material is rare. Staircases provide direct access from above at the ends of the bench. The most famous of these is Jackson's Staircase (29SJ 1526) at the northeastern end, while another easily traced prehistoric road (RS 36) runs along the cliff above toward Chetro Ketl. A staircase (29SJ 1551) that drops midway along the cliff to the terrace area below presumably was connected to RS 36 by a short spur route.

# Road Segment 31 Terrace

Directly west of RS 30 is yet another rincon with the bench along its western side lined with masonry. A nearly continuous stack of masonry, up
to 3 m high, runs for about 90 m along the bench edge. At the northern end, the sandy deposits were held by upper-level and lower-level retaining walls, each holding an expanse of sand about 12 m wide and 7 m and 23 m long, respectively. In places, sandy deposits widen to about 20 m, but, for the most part, the potential gardening area is now smaller because of In one place, a deep gully cutting across the bench had talus debris. been blocked with masonry up to 130 cm thick (Plate 7.9) apparently to utilize storm runoff from the cliffs above. Below the gully, where it had cut through the bench, were two other walls built of huge pieces of soft, rectangular, sandstone blocks that ran parallel to the bench. These may have served as secondary terraces to utilize the moisture trapped in the The latter two walls were faced and fitted much more bench gully. carefully than were the standard, bench-edge, retaining walls. Cultural material was relatively common (Volume I, Table 5.4), and ceramics suggest use in the late A.D. 1000s or early A.D. 1100s (Volume I, Figures 5.7-5.8). A piece of tchamahia blade found in the sands behind the retaining walls may attest to gardening activities at the terrace. Staircases along prehistoric roads (29SJ 1552 along RS 36 and 29SJ 1555 along RS 40E) at the ends of the terrace provided access from Pueblo Alto and Chetro Ketl.

#### Road Segment 34 Terrace

Southwest of New Alto is the westernmost terrace area. Much of it has been buried or altered by 1930's road construction that started from Cly's Canyon to an overlook area above Pueblo Bonito. Construction terminated at just about the northeastern end of the terrace, but much of the bench is buried under sandstone rubble created by the dynamiting of talus boulders. Bits of terrace walls are scattered along about 200 m or more of bench, which leaves a usable gardening strip of about 25 m wide. Because of the road disturbance and lack of cultural material, some question of the terrace identity remains. Wide-cut steps (29SJ 1575 and 1576) descending from the cliff above at the ends of the retaining wall segments, however, lend credence to its identity. These stairs apparently derive from spurs off the RS 11 route, running west from Pueblo Alto and New Alto, and terminate at the bench where the terrace is located. No roads or stairs are known for the area below the bench that might have suggested that the stairs only assisted traffic through the area.

## Chapter Eight

## The Pueblo Alto Trash Mound

## The Pueblo Alto Trash Mound (Figures 8.1-8.4)

To the southeast of Pueblo Alto is a large, oval mound first recorded by William Jackson in 1877 (1878:448, Plate 60). Jackson noted that the mound contents were approximately 25,000 cubic yards (19,125 m<sup>3</sup>), a grossly inflated figure. Later, remote sensing estimates before excavation placed the volume at 3,895 m<sup>3</sup> (Drager and Lyons 1983:36). In reality it is about 2,800 m<sup>3</sup>. Except for a slight possibility that a few burials were recovered from the mound near the end of the nineteenth century (Morris 1924:224; Wetherill 1904), the mound remained relatively untouched until Frank H. H. Roberts, Jr., trenched it in 1926 while working for the National Geographic Society. According to Roberts (1927:66-67):

The large refuse mound at Pueblo Alto furnished another likely place for the taking of stratigraphic sections and because of this trenches were cut in two portions of it and one test section was made in each. The material, ashes, sand, bones, charcoal, plaster, in the mound is of the usual type and there is nothing to warrent [sic] an extended description of it. The potsherds obtained showed a number of signi-Chief among the latter was the almost total absence ficant things. of the early forms, the Transitional and even its degenerate phase. The ceramic industry at Pueblo Alto seems to have had its inception at about the time the Solid [Escavada and Puerco Black-on-whites] and hachured designs [Gallup Black-on-white] with heavy framing lines were coming into prominence at Pueblo Bonito. The series then extends on down through the following styles of decoration and variations of vessel treatment until the final Bonito group which is Foreign wares are scarce, the Chaco-San Juan meagerly represented. forms are not plentiful and the late or final type of hachured design [Chaco Black-on-white] is rare.

The whole series in both sections was so similar and fitted into the sequence obtained at Pueblo Bonito so perfectly that it was not deemed worth the time and effort to tabulate the pieces. Consequently percentages for the sections can not be given. The material was used, and is used in this study, merely as a check on the sequence which has already been established. It substantiates in every way what has already been brought forward in preceding pages. It also



Figure 8.1. Trash Mound plan.



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Figure 8.2. Trash Mound, Test Trench 1, southwestern face before excavation of stratigraphic columns.



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Figure 8.3. Trash Mound, Test Trench 1, southwestern face.



Figure 8.4. Trash Mound, relative densities of cultural material through time.

gives the information necessary to a placing of this ruin in its proper relationship to the Chaco group.

Roberts (1927) trenched the Pueblo Alto midden into thirds but only described the stratigraphy for the single booth offset from each trench. He left no map locations of his work, but two flattish areas on top of both ends of the long axis seemed likely spots for Roberts' two test columns, given the general practice of exploratory trenching he utilized at Peñasco Blanco and Pueblo Bonito. Although we offset our two trenches (only one was completed), we were unsuccessful in avoiding Roberts' work. We encountered one booth near the middle of the cross section of the mound, and his other booth was probably similarly located at the opposite end (Figure 8.1). Roberts' work greatly aided our own in terms of comparative ceramic collections and inferences regarding the structuring and deposition of the mound, although he failed to describe the overall stratigraphy cut by his trenches.

Vickers et al. (1976:89) conducted ground radar tests across the midden in 1975 to locate buried structures but without success. In 1976 based on densities from our small-site excavations, Stephen Lekson estimated that a test trench 1 m wide, cut to the midsection along the short axis, would generate approximately 41,000 sherds and 6,600 pieces of chipped stone. The predicted inventory as well as the logistics of 4-mdeep tests were sobering as we tried to come to grips with studying the mound. Clearly, the mound could not be ignored, and we hoped that it would yield clues to the site function as well as the local and regional economy. Furthermore, the history of its growth might have provided clues to the size of the population that used it, as well as a comparative base for small-house middens.

Adequate sampling was clearly beyond our means, so conducting reasonably representative tests was of great concern. Roberts' (1927) work suggested considerable homogeneity for the Pueblo Alto Trash Mound, similar to his findings at Pueblo Bonito and Peñasco Blanco. These findings suggested that testing was likely to yield a more accurate impression of the mound deposits than if the deposits were heterogeneous.

#### Strategy

In 1977 the entire trash mound was gridded into 2-m squares, and then, two trenches, 75 cm wide, were extended across the northwestern half of the mound (Figure 8.1). The northern one (Test Trench 2) ran nearly parallel to and just southwest of Major Wall 2. The other (Test Trench 1) extended to the highest elevation. Both were offset from flattish areas on top of the mound thought to be scars from Roberts' 1926 work. Excavation units were kept in 2-m-long (grid), 20-cm-deep segments.

To minimize surface disturbance, dirt from Test Trench 1 was placed on parachutes spread on the ground. To prevent mixing of excavational units, capsules designating the provenience excavated were placed in each pile. This arrangement allowed flexibility in scheduling our screening.

After removal by trowel, shovel, and backhoe, all fill was screened through 1/4-in. mesh. Despite the deep-rooted faith by archeologists in securing unbiased samples from screening (that is, for specimens larger than the screen size), it was clear from our work in the midden that a wide assortment of biases exists that need further investigation. Based on secondary water screenings from stratigraphic column tests by Peter McKenna, an appalling amount of material was missed. McKenna noted that 30 percent of the bones, 28 percent of the chipped stones, and 19 percent of the sherds were missed. Both bone and ceramics were usually of the small, unidentifiable variety, of little consequence compared to the total, and do not represent serious skewing of the samples. The amount of large chipped stone debitage missed is more distressing, but probably our sample was still representative.

Two major factors can account for these errors: color similarity of the cultural material and the matrix, and the degree of familiarization with the specimen types being collected. It appeared that laborers were prone to miss all types of items evenly, while archeologists probably recovered proportionally more items of the class with which they were most familiar (e.g., ceramists will recover proportionally more ceramics than, say, a person interested in bone). This problem was not adequately monitored, however.

Specimen classes also exhibit different levels of recognition (shape and size are important factors), and it is difficult to spend an inordinate amount of time looking for both macro- and microspecimens. Finally, the specimen color adds greatly to the recovery rate. Items that blend well with the fill matrix, particularly black, white, or light yellow specimens, were missed more often than others, thus, the high rate of screen discard for bone, light and dark chipped stone, and culinary sherds. In addition, black and white stone beads (unlike those of turquoise) were probably poorly represented in almost all collections simply because their size and color make them difficult to see. They are also smaller than the 1/4 in. screen mesh.

#### Test Trench 2

Work on the northern trench (and around the end of Major Wall 2) revealed loamy fill, many sandstone spalls, and low artifact densities (e.g., Table 8.1). The surface at the northern end of the mound exhibited the same pattern. This trench was on the same side of the mound that revealed prodigious amounts of construction debris in Test Trench 1, and, in retrospect, Test Trench 2 probably contained more of the same. After reaching a maximum of 40 cm in depth and removing  $1.2 \text{ m}^3$  of fill, we discontinued work in favor of more intensive effort on Test Trench 1. We suspect that one of Roberts' (1927) trenches closely paralleled our own, although he describes primarily trash deposits in his booth. Thus, the

	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrugated	Unclass. indented corrug.	PII-III indented corrug. rim	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Unclass. Cibola mineral	Plain whiteware	Nonchacoan mineral	Chuska B/w	Unclass. Chuskan carbon	Sosi B/w	Forestdale smudged	Unclass.San Juan redware	Total	~
Grid 71 Level 6					5				1	4	6				1				17	3
Grid 99 Level 3					20				1	3	7	5	1						37	7
Level 4		1			32		4		1	12	8	9	2			1			70	13
Level 5	5		3		3					6	4						1		22	4
Level 6	5		1		9		6			6	6	2							35	7
Grid 127 Level 2					35					12	6	1					1	1	56	11
Level 3	ł		1	1	26		1	1		4	13	5						1	54	10
Level 4	1				29					18	13	3					2		66	13
Level 5	1		1		19					27	13	6					1		68	13
Level 6	3		1		17	1	2			6	10	3					1		44	8
Level 7	1		1		4					3	4	1							14	3
Level 8	1				3		4			1	1	1							11	2
Level 9	1				4		<sup>-</sup> 2			4	5	3		1					20	4
Level 10	1		_		3		2		_	1	1	1		_			_	_	9	2
Total %	20 4	1 T	8 2	1 T	209 40	l T	21 4	l T	3 1	107 20	97 19	40 8	3 1	l T	1 T	1 T	6 1	2 T	523	100 100
bowl jar other	20	1	8	1	20 <b>9</b>	1	14 7	1	1 2	43 64	43 50 4	5 35	2 1	1	1	1	6	2		
Ware %			4 culi	6% nary	,				44 Cib	% ola		8% unkn	iown	Ch	T uska	T Tusayan	1% smudged	T San Juan Redware		99

# Table 8.1. Ceramics recovered from the Trash Mound, Test Trench 2, in Grids 77, 99, and 127.<sup>a</sup>

 $a_T$  = trace (less than 0.5%).

mound in this area probably was similar to our second cut, with construction debris along the northwestern flank, overlain by refuse to the southeast.

#### Test Trench 1

Work in this trench started at the top of the mound and proceeded northwest in a stepped arrangement. Because of the slope of the mound, initial levels began at various heights in each grid, but levels on the same horizontal plane were assigned the same numbers. When Test Trench 2 was abandoned, Test Trench 1 was extended across the entire mound.

At the northwestern end of the trench, a mass of unconsolidated construction debris and masons' tools was encountered (in Layer 3) which fell out of the sides of the trench, dangerously undercutting it (Plate 8.1). This was finally removed in three large blocks (Backhoe Trenches 1-3) and placed on parachutes off to the sides for later artifact screening (see Table 8.2). After this experience, we decided to use the backhoe to help finish the trench at the southeastern end.

The southeastern four grids were thus removed by backhoe in 20-cm levels with final leveling of each unit and the removal of lower deposits done by hand. A total of 129 2-m by 75-cm by 20-cm units was removed from Test Trench 1. Overall, approximately 2.6 percent of the total mound volume was excavated (73.0 m<sup>3</sup>, including Test Trench 2 and the slumps), or about 6.3 percent (175.8 m<sup>3</sup>) of the total if Roberts' work is included.

After excavation of Test Trench 1, the southwestern trench face was profiled and described (Figure 8.2). The opposite face was not profiled because of its similarity to the profiled face and because of extensive damage from slumping (see below). Such a profile would have revealed a slight northeastern to southwestern dip in the deposits, especially past Layer 20, reflecting the general north to south accretion of the mound. With a fully exposed sequence of deposits before us, the numbering was such that the earliest layer numbers proceeded from the bottom of the mound on the northwestern side to the latest on top of the southeastern side. A few numbers are out of temporal sequence because of their recognition after much of the profiling had been done. Those layers numbered over 200 designate postdepositional units, such as potholes and Roberts' trench, that presented clear disconformities within the mound layering.

#### Stratigraphic Columns

After profiling it was clear that our excavation units had, as expected, cross-cut the natural stratigraphy of the mound. For more refined control, we tested the major natural units defined with a series of six booths placed off the profiled southwestern side (Figure 8.3). The test



Plate 8.1. Trash Mound, Strat Column 2, Layer 3. Construction debris from the initial greathouse construction at Alto. 30-cm scale. (NPS#15686)



Plate 8.2. (NPS#14863)

Trash Mound, Test Trench 1 shoring. Peter McKenna tries to profile stratigraphy under trying conditions. Note mass of construction debris from Layer 3.

Plate 8.3. Trash Mound, Test Trench 1 shoring. Brett Ratti attempts to excavate. (NPS#14860)

	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrugated	Unclass. indented corrug.	PII indented corrug. rim	PII-III indented corrug. rim	SMIII-PI mineral (polished/unpolished)	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Chaco-McElmo B/w	Unclass. Cibola mineral	Plain whiteware	Nonchacoan mineral	Newcomb and Burnham B/w	Chuska B/w	Toadlena B/w	Unclass. Chuskan carbon	Sosi/Black Mesa B/w Kana'a B/w	Unclass. Tusayan whiteware	Unclass. Mesa Verde whiteware McElmo B/w	Forestdale Red	Forestdale Smudged	Showlow Smudged	Wingate B/r	Tusayan/Middleton B/r	Deadmans B/r	Tusayan Polychrome	Unclass. San Juan redware	Total	8
Slump #1	9	5	65	2	1018	29	8	1	7	1	58	127		2	70	38	2		6	7	5	1 1		2 1	1	11	8		2	3		6	1,496	21
Slump #2	81	8	138	7	2377	48	5	2	114	17	93	518	6	1	744	433	15	3	32	24	27	14		5	5 (	64	2		2	14	1	25	4,825	68
Slump #3	8		19	1	395	9		2	14	4	26	110	1	1	80	79	1	1	2					3	:	11	5	1	1			5	779	11
Total % Form:	98 1	13 T	222 3	10 T	3790 53	86 1	13 T	5 T	135 2	22 T	177 2	755 11	7 T	5 T	894 13	550 8	18 T	4 T	40 1	31 T	32 T	1 15 T T		10 1 T T	6 8 T	36 1 1	4 T	1 T	5 T	17 T	1 T	36 T	7,100	100 96
bowl jar other	98	13	222	10	37 <b>9</b> 0	86	13	4 1	84 44 7	14 6 2	76 95 6	158 585 12	3 4	4 1	336 536 22	142 396 12	14 4	1 3	26 14	12 19	10 21 1	1 15		6 4 1	18 5	36 1	4	1	5	16 1	1	27 9		
Ware %		cı	60% ilina	ry		-					28 Cit	% ola				87 unki	″ nown		2 Chu	% ska		T Tusay	an	Т М.V.	ງ smu & ກ	l% udge aisc	d		re	1% dwar	e			100
Bkhoe Tr#1	119	28	45	10	243	4			117	7		34			163	108		7			5		1			3				4	L	.	902	46
Bkhoe Tr#2	29	8	14		67				33			11			56	43					i	1									5	5	267	14
Bkhoe Tr#3	164	16	57	9	86				132		2	9			149	150		5			13		_	1		4					6	5	803	41
Total % Form:	312 16	52 3	106 6	19 1	396 20	4 T			282 14	7 T	2 T	54 3			368 19	301 15		12 1			18 1	1 T	1 T	l T		7 T				4 T	15	5	1,972	101 100
bowl jar other	312	52	106	19	396	4			145 129 8	7	2	29 25			168 196 4	113 187 1		4 8			7 11	1	1	1		7				4	11			
Ware %		cu	46% 11ina:	ry							36 Cib	% ola				19 unkr	5% 10wn		l Chu	% ska		T Tusay	an	т м.v.	] SMI	f 1dgeo	d		l red	% ware				99

Table 8.2. Ceramics recovered from the Trash Mound slumps and backhoe tests in Test Trench 1.<sup>a</sup>,<sup>b</sup>,<sup>c</sup>

<sup>a</sup>T = trace (0.5%). <sup>b</sup>Slump #1 (Grids 267, 295, and 323), Slump #2 (Grids 155, 183, and 211), Slump #3 (Grids 267 and 295). <sup>C</sup>Backhoe Trench 1 (Grids 99 and 127: Level 7 to sterile), Backhoe Trench 2 (Grids 43 and 71: 0-100 cm), and Backhoe Trench 3 (Grids 43 and 71: 100-400 cm).

booths (strat columns) were 1 m square. Only two of the booths extended to sterile fill because the slope of deposition enabled the untested lower units in most booths to be sampled as higher units in another. All material was removed in natural units and screened (1/4 in.). Charcoal and the sandstone spalls were weighed and saved, and pollen, flotation, and soil samples were collected. The soil from each booth layer was also weighed (Tables 8.3 and 8.4). Photos and more profiles were made and, as in the main trench, Munsell color and grain size recorded along with the charcoal density for each natural unit.

As the 1977 field season ended, we had completed three booths and winterized the other three with plywood sides and covers. In 1978 the remaining booths (3-5) were finished and the trench shoring dismantled and removed by the backhoe. Steel pipes were set vertically in the corners of Test Trench 1 at both ends so that the pipe tops extended just above the surface. These should aid in future location of the trench, which was backfilled with the screened backdirt and some white sand from the Escavada Wash.

#### Slumps

Our first slump (Slump 1) occurred when the backhoe bucket dropped too hard alongside the trench and forced a chunk of midden  $(2 \text{ m}^3)$  from along the top into the trench. Near the middle at the deepest part of the mound we suffered our greatest grief. One day, a huge section of about 6 m<sup>3</sup> broke off the trench side (Slump 2) and buried a laborer to the waist. Later we discovered that the accident was caused primarily by our Test Trench 1 intersecting Roberts' booth off Section 1, which left a column of unconsolidated backdirt between our excavations (Figure 8.1). This weakened the trench side and it collapsed.

After the trench was closed, safety authorities from the N.P.S. and Occupational Safety and Health Administration (O.S.H.A.) intervened and decided that the solution involved placing about \$2000 worth of wood and steel bracing in the trench against 4-by-8-ft plywood sheets on one side and 2-by-12-in. planks on the opposite side to be profiled. The resultant maze of timbers, jacks, and shoring prevented deeper excavation and made profiling a bruising and foul-tempered business (Plates 8.2-8.3). An attempt to modify the problems with profiling resulted in the use of large sections of pipe and welded-wire-fence gates to retain the earth. Placement of the fences greatly disturbed the profile face and still made it difficult to trace out natural units.

Efforts to complete the trench were further hampered by the slump material in the trench bottom 3 m below the surface and the unexcavated bulk beneath it (another meter to sterile fill). Finally, in desperation, we removed all this by hand without protective bracing, completed the profiles, and described all the layers. During the latter work, a smaller deposit (Slump 3) of 2.4 m<sup>3</sup> fell in one night.

		Mean			Fre	quen	су о	f:			We	ight o	f:		
Layer	Length (cm)	Thick. (cm)	Sample Location	sherds <u>&gt;1/4"</u>	bones >1/4"	debitage >1/4"	hammers	corn cobs	flecks 5x5 cm	eggshell (gm)	charcoal (gm)	flot veg. (gm/liter)	rock (kg)	sand (kg)	Comments
1	363	15.5	SC 1	11	81	2	2	0	9	0.01	40.5	13.6	21.25	106.50	
2	220	15.5	SC 1	26	11	5	2	7	1		46.9	2.8	53.50	86.75	
3	960+	61.5	SC 1 SC 2	227 32	47 96	22 9	12 64	2 0	2		64.3 ?	1.3	292.25	482.25	
4	330	28.5	SC 1	67	34	8	8	0	4			2.3	163.00	292.25	
5	95	6.0	G 71	-	-	-	-	-	5		-	-	-	-	
6	50	7.5	G 43	-	-	-	-	-	3		-	-	-	-	
7	20	5.0	G 43	-	-	-	-	-	?		-	-	-	-	
8	456+	47.5	SC 1	46	36	6	4	1	4		5.0	2.8	92.25	410.50	
9	850	18.0	SC 2	37	87	11	4	0	2		216.0	4.1	27.50	139.00	
10 10a 10b	800 - -	51.5 33.0 24.0	SC 2 SC 1 SC 1	32 45 14	17 38 34	3 5 4	0 0 10	1 0 0	7 - -		11.6 17.2 0.7	1.2 8.6 1.5	297.00 68.50 183.00	507.00 298.75 281.00	
11	200	2.5	SC 1	0	162	3	0	0	23		6.5	4.8	1.00	4.00	Burned bone layer
12	75	6.0	SC 1	4	0	0	0	0	0		?	4.6	5.00	31.50	
13	875	22.5	SC 2	69	58	10	1	7	1		123.1	6.7	69.00	258.00	Mortar dump
14	100	3.0	SC 2	-	-	-	-	-	-		?	4.8	?	?	Charcoal lens
15 15Ъ	390 45	31.0 2.0	SC 2 G 99	20	5	1	2	3	?		93.1	0.9	180.00	285.00	Ash lens
16	645	24.0	SC 2	41	30	12	0	4	50+		316.8	3.5	80.00	206.50	Burned roof
17	775	46.0	SC 2	104	32	14	4	0	10		40.5	?	224.50	389.00	
18	80 <u>+</u>	6.0	SC 1	29	320	5	0	0	2		84.3	23.4	11.00	60.00	
19	155	22.0	SC 3	303	152	51	0	63	15		656.2	10.8	84.75	286.75	
20	923	21.0	SC 3	38	4	45	2	11	16		97.8	14.5	51.00	7 <b>9.</b> 00	
21	75	6.5	G 127	0	0	0	-	-	28		?	2.8	-	-	

Table 8.3. Material frequencies and weights from recorded layers in the Pueblo Alto Trash Mound.<sup>a</sup>

Table	8.3	(continued)	a
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		Mean			Fr	equen	cy o	f:			Wei	ght o	f:		
	Length	Thick.	Sample	sherd	bone	debitage		corn	flecks	eggshell	charcoal	flot veg.	rock	sand	<b>A</b>
Layer	(cm)	(cm)	Location	<u>&gt;1/4"</u>	<u>&gt;1/4"</u>	>1/4"	hammers	cobs	5x5 cm	<u>(gm)</u>	(gn)	(gm/liter)	(kg)	(kg)	Comments
22	470	21.0	SC 3	198	262	22	0	39	29	0.36	447.9	9.1	41.50	214.00	
23	115	14.0	SC 3	34	47	3	0	6	5		78.2	3.1	8.00	48.50	
24	690 36	10.0	G 155/183	-		-	-	-	16		-	-	-	-	Charcoal lens
24b		2.0		2	0	1	0	0	_		463.7	11.4	39.00	107.50	
24/31	690	20+0	50.5	101	05	11	Ū	55			40301				
25	60	4.0	G 155	~	-	-	-	-	8		-	-	-	-	
26	48	12.0	G 155	-	-	-	-	-	0-16		-	-			
27a	160	15.0	G 127	-	-	-	-	-	14		-	-	-	-	
27b		7.5	G 127	-	-	-	-	-	12						
28	125	10.5	G 127	-	-	-	-	-	27		-	-	-	-	
29	118	3.5	G 155	-	-	-	-	-	0		-	-	-	-	
30	330	12.5	SC 3	81	201	9	0	36	28	0.05	303.7	6.3	9.50	125.00	
31	270	21.0	SC 3	35	25	1	0	12	21		51.2	8.2	5.00	25.00	
32	355	18.0	SC 3	103	179	12	0	76	37		428.2	0.1	41.00	138.50	
33	27	3.0	G 155	-	-	-	-	-	?		-	-	-	-	
34	220	14.0	SC 4	11	0	0	0		26		?	-	-	-	
	700	<b>50</b> 0	<u>.</u>	(07	640	60	6	03	22	1.82	282.7	9.2	90.00	690.00	
35 35/41	780	27.0	SC 4 SC 3	217	144	25	o	43	?	1002	432.9	12.2	55.50	215.00	
36	193	5.5	G 211/239	-	-	-	-	-	12		-	-	-	-	
37	680	33.0	SC 5	27	87	3	1	7	22		171.6	4.7	23.50	75.00	
38	183	8.5	G 155/183	-	_	-	-	-	28		-	-	-	-	
39	105	7.5	G 155/183	-	-	-	-	-	18		-	-	-	-	
40	153	8.0	G 183	-		-	-	-	18		-	-	-	-	
41	51	3.0	G 155/183	_	-	-	-	-	18		-	-	-	-	
42	36	5.5	G 183	-	-	-	-	-	62		-	-	-	-	Ash lens

## Table 8.3 (continued)<sup>a</sup>

		Mean			Fr	eque	ncy	of:			We	ight o	f:		
1	Length	Thick.	Sample	sherd	bone	debitage		corn	flecks	eggshe	11 charcoal	flot veg.	rock	sand	
Layer	(Cm)	<u>(cm)</u>	Location	21/4	21/4	>1/4	nammers	CODS	<u>oxo cm</u>	<u>(gm)</u>	(gm)	(gm/liter)	<u>(kg)</u>	<u>(kg)</u>	Comments
43	313	25.0	SC 3	633	340	100	9	173	33	0.09	439.5	14.0	67.00	435.75	
44 44	415	17.0 8.0	SC 3 SC 4	114 248	? 107	2 17	0 0	1 50	20 ?	0.04	? 953.6	17.9 21.0	5.00 18.00	63.00 117.00	
45	176	25.0	SC 4	180	346	21	3	22	21		588.7	6.4	20.00	107.00	
46	175	9.0	SC 4	26	53	4	0	5	16		88.3	8.1	4.00	30.00	
47	455	9.0	SC 4	61	143	10	1	8	17		43.7	8.2	?	?	
48	250	15.0	SC 4	30	59	0	0	9	19		72.4	10.5	17.50	75.00	
49	125	4.0	G 267	-	-	-	-	-	100%		-	-	-	-	Lens
50	48	2.5	G 211	-	-	-	-	-	20		-	-	-	-	Lens
51	30	3.0	G 211	-	-	-	-	-	1		-	-	-	-	Lens
52	82	2.0	G 239	-	-	-		-	?		-	-	-	-	Lens
53	43	4.0	G 155	-	-	-	-	-	?		-	-	-	-	Lens
54	375	12.5	SC 5	22	58	6	1	11	16		108.9	14.2	7.50	56.00	
55	185	6.0	SC 4	66	310	15	0	17	21		443.5	13.6	12.00	93.00	
56	270	10.0	SC 4	137	260	22	1	9	26		247.6	9.1	15.00	120.00	
57	930	8.0	SC 4	-	-		-	-	?		~	-	-		
57	-	10.0	SC 5	2	53	2	3	14	47		104.2	16.7	3.00	14.00	
57/58	-	9.0	SC 4	69	84	17	1	16	?		179.2	8.3	?	?	
58	480	24.5	SC 5	299	191	16	3	81	26	0.17	348.9	6.1	38.50	124.50	
59	166	7.0	SC 5	18	14	2	0	9	20		30.3	17.4	1.50	8.00	Ash lens
60	135	6.0	SC 5	23	35	2	1	5	35		45.2	3.6	?	?	
61	205	4.0	SC 5	74	49	10	0	52	15		186.0	19.7	8.50	40.00	
62	490	17.5	SC 5	336	280	28	5	126	24		1,000.0?	12.5	58.00	469.00	Same as L 81?
63	47	4.0	G 267	-	-	-	-		10		-	-	-	-	Charcoal lens
64	200	7.0	G 267	-	-	-	-	-	18		-	-	-	-	

Table 8.3	(continued) <sup>a</sup>
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		Mean			Fτ	eque	ncy	of:			We	ight o	f:		
_	Length	Thick.	Sample	sherd	bone	debitage	2	corn	flecks	eggshell	charcoal	flot veg.	rock	sand	<b>a</b> .
Layer	<u>(cm)</u>	<u>(cm)</u>	Location	>1/4"	>1/4"	>1/4"	hammers	cobs	5x5 cm	(gm)	(gm)	(gm/liter)	(kg)	(kg)	Comments
65	55	5.0	G 267	-	-	-	-	-	11		-	-	-	-	Mortar dump
66	28	2.0	G 211	-	-	-	-	-	10		-	-	-	-	Charcoal lens
67	30	2.0	G 211	-	-	-	-	-	0		-	-	-	-	
68	85	4.0	G 211	-	-	-	-	-	13		-	-	-	-	
69	850	16.0	SC 4	55	39	17	0	14	5		67.5	4.9	7.00	76.00	
6 <b>9</b>	-	14.0	SC 5	37	39	15	4	11	-		158.0	5.8	?	?	
69Ъ	-	18.0	SC 4	155	83	41	0	47	?		262.0	6.1	21.50	202.00	Not in TT Profile
70	175	6.0	G 183	-	-	_	-	-	10			_		_	Ash lens
70	-	9.0	SC 4	166	33	2	2	0	6		24.1	3.1	38.00	72.00	
71	464	5.5	SC 5	80	55	19	3	25	7	13.16	263.7	7.9	28.50	69.00	Much eggshell
72	360	15.0	SC 4	241	104	36	0	0	1		135.3	8.3	46.00	178.00	
73	100	4.0	SC 4	2	0	0	0	0	0		-	-	0.00	12.00	Plaster fragments
74	256	6.0	G 239	-		_	-	_	1		_	_	-	_	
74	-	6.0	SC 5	14	14	6	0	4	-		27.4	5.7	3.00	35.00	
75	110	5.0	G 183/239	9 -	-	-	~	-	8		-	-	-	-	Ash lens
76	280	11.0	SC 5	43	30	15	0	8	-		47.1	4.4	9.00	48.00	
77	150	6.0	G 211/239	9 –	-	-	-	-	50		-	-	-	-	Ash lens
70	200	6.0	oo /	27	0	,	0	,	0	0.50	74 6	2.0	0.00	35.00	
/0 78a/h	390	6.0	80 4	55	25	14	2	0	,	7 30	66 5	6 1	15.00	87.00	
/oa/U	403	0.0	30 5	))	25	14	2	U		/ • 10	00.5	0+1	19.00	07.00	
79	55	3.0	G 211	-	-	-	-	-	3		-	-	-	-	Ash lens
80	40	3.0	G 295	-	-	-	-	-	0		-	-	-	-	Ash lens
81	<b>49</b> 0	41.0	SC 6	419	240	6	4	56	2	0.12	460.0	17.5	73.50	445.00	Same as L 62?
82	<b>49</b> 0	17.5	SC 6	189	29	8	2	10	13		354.5	13.9	47.50	161.00	
83	36	6.0	G 267	-	-	-	-	-	0		-	-	-	-	Ash lens
84	16	10.0	G 239	-	-	-	-	-	7		-	-	-	-	Ash lens
85	160	10.0	SC5	51	9	3	0	11	3	0.06	121.1	5.6	8.50	48.00	

## Table 8.3 (continued)<sup>a</sup>

		Mean			Fre	equen	су с	f:			We	ight o	f:		
Layer	Length (cm)	Thick. (cm)	Sample Location	sherds >1/4″	bones >1/4"	debitage >1/4"	hammers	corn cobs	flecks 5x5 cm	eggshell (gm)	charcoal (gm)	flot veg. (gm/liter)	rock (kg)	sand (kg)	Comments
86	55	4.0	G 239	-	-	-	-	-	0		-	-	-	-	Ash lens
87	38	3.0	G 211/239	-	-	-	-	-	0		-	-	-	-	Ash lens
88	85	9.0	SC 5	0	0	0	0	0	0		-	-	0.00	10.00	Ash lens
89	35	5.0	G 211/239		-	-	-	-	9		-	-	-	-	Ash lens
90	34	1.5	G 211/239	-	-	-	-	-	0		-	-	-	-	Ash lens
91	112	11.0	G 211	-	-	-	-	-	4		-	-	-	-	
92	310	8.0	SC 5	40	18	8	2	13	7		125.6	6.3	4.50	46.50	Same as L 95?
93	46	3.0	G 239	-	-	-	-	-	10		-	-	-	-	Ash lens
94	42	4.0	G 239	-	-	-	-	-	3		-	-	-	-	Ash lens
95	300	3.0	SC 5	20	12	6	l	13	7		102.4	12.7	9.50	40.00	Same as L 92?
96	240	8.0	SC 6	77	22	16	1	13	18		167.9	33.6	15.00	52.00	
97	380	23.0	SC 6	206	38	22	3	4	4		415.8	13.5	37.00	178.00	
98	230	22.5	SC 5	70	48	17	4	34	7		136.5	?	8.50	44.00	
9 <b>9</b>	115	3.0	G 239	<b>_</b> ´		-	-	-	9		-	-	-	-	
100	103	7.5	G 239/267	-	-	-	-	-	8		-	-	-	-	
101	85	4.0	G 239	-	-	-	-	-	40		-	-	-	-	Charcoal lens
102	168	27.0	G 323	-	-	-	-	-	3		-	-	-	-	
103	210	16.0	SC 6	259	92	35	2	11	9		282.1	17.6	38.00	146.50	
104 104	525	30.0 10.5	SC 4 SC 5	255 126	122 90	46 45	1 4	27 50	7	1.24 0.28	202 <b>.9</b> 39 <b>.</b> 3	1.6 7.4	52.00 23.50	204.00 254.00	Fetish found (Plate 8.181B)
105	380	45.0	SC 5	175	83	34	3	6	5	0.19	?	7.6	-	-	
106	43	14.0	G 267	-	-	-	-	-	3		-	-	-	-	
107	142+	15.0	G 323	-	-	-	-	-	2		-	-	-	-	
108	120	15.0	G 323	-	-	-	-	-	3		-	-	-	-	

## Table 8.3 (continued)<sup>a</sup>

		Mean			Fr	equen	icy c	f:			Wei	ght o	f:		_
Layer	Length (cm)	Thick. (cm)	Sample Location	sherds >1/4"	bones >1/4"	debitage >1/4"	hammers	corn cobs	flecks 5x5 cm	eggshell (gm)	charcoal (gm)	flot veg. (gm/liter)	rock (kg)	sand (kg)	Comments
109	280	17.0	SC 6	230	69	39	0	35	19		237.5	14.0	31.00	265.50	
110 110a	250+ 8+	39.0 4.0	SC 6 G 323	125	54 -	24 -	0 -	17 	8 -		105.6	11.2	14.00	191.50 -	Charcoal lens
111	100	22.0	SC 6	55	30	15	0	4	11		84.4	10.9	13.00	68.00	Trash dump?
112	105+	6.0	G 323	-	-	-	-	-	3		-	-	-	-	Charcoal/ash
113 113a	400+ 17	70.0 4.0	SC 6 G 323	666 _	224	158	4	14 -	8 -	0.11	320.6	7.3	116.50	937.00 _	Clay lens
114	55	4.0	G 211	-	-	-	-	-	-		-	-	-	-	Ash lens
115	126	15.0	G 267	-	-	-	-	-	-		-	-	-	-	
116	147	4.0	G 267	-	-	-	-	-	-		-	-	-	-	Part of L 71?
117 117a	225 35	14.0 4.0	G 183/211 G 183	-	-	Ξ		-	21		- -	- -	-	-	Charcoal lens
118	51	2.5	G 211	-	-		-	-	-		-	-	-	-	Ash/fire lens
119	36	1.8	G 183	-	-	-	-	-	1		-	-	-	-	Ash lens
120	60	7.5	G 183	-	-	-	-	-	-		-	-	-	-	Charcoal lens
121 <b>a/</b> b	131	5.0	G 155/183	-	-	-	-	-	1		-	-	-	-	Ash lenses
122	?	2.5	SC 5	71	69	19	0	34	?		249.5	?	-	-	Part of L 95
123	?	?	SC 5	24	1	4	0	10	?		30.1	8.7	-	-	Contact with
200	320	70.0	SC 5	34	16	2	0	3	?		6.2	?	-	-	
201	90	25.0	G 211								-		-	-	Pit in L 104
202	130	90.0	G 183								-	-	-	-	Pot hole
203	?	?	?												

## Table 8.3 (concluded)<sup>a</sup>

				Mean			Fr	equen	су	o f:		We	ight	of:	
		Length	Width	Thick.	Sample	sherd	bone	debitage		corn	flecks	charcoal	flot veg	sand	
Layer	Feature	(cm)	<u>(cm)</u>	<u>(cm)</u>	Location	>1/8"	>1/8"	>1/8"	hammers	cobs	<u>5x5 cm</u>	gm	_gm/liter	kg	Comments
1	Conc 1	?	?	?	SC 1	0	103 <sup>b</sup>	0	0	0	-	-	-	-	Burned bone lens
	Conc 2	?	?	?	SC 1	0	12 <sup>b</sup>	0	0	0	-		-	-	Burned bone lens.
															volume=ca 200 ml
	Conc 3	?	?	?	SC 1	0	53b	0	0	0	-	-	-	-	Burned bone lens
3	Lens 1	18	?	4.0	G 71	-	-	-	-	-	-	-	-	-	Charcoal lens
	Lens 2	18	?	2.0	G 43	-	-	-	-	-	-	-	-	-	Charcoal lens
	Lens 3	21	?	4.5	G 43	-	-	-	-	-	-	-	-	-	Charcoal lens
9	Lens l	85+	?	4.0	G 127	-	-	-	-	-		-	-	_	Charcoal lens
	Lens 2	105+	?	4.0	G 127		-	-	-		-	-	-	-	Charcoal lens
	Feat. 1	48+	19+	10.0	SC 2	1	256	0	0	0	-		10.1	-	Charcoal lens
	Feat. 2	100+	100+	10.0	SC 2	0	23	0	0	0	-	-	-	-	Ash lens
	Feat. 3	65+	45+	?	SC 2	5	612	8	2	0	-	-	14.2	-	Ash lens
13	Feat. 1	55	20+	10.0	SC 2	1	102	0	0	0	-	-	2.6	-	Ash lens
	Feat. 2	43+	14+	10.5	SC 2	2	3	0	0	0	-	-	2.7	-	Charcoal lens
19	Feat. 1	67+	40	2.0	SC 3	14	3	8	0	6	-	8.5	25.5	_	Ash lens
	Feat. 2	38	30	10.5	SC 3	0	0	0	Ó	0	-	508.5	_		Charcoal lens
	Feat. 3	51+	24+	• 5	SC 3	2	0	0	Ō	Õ	-	_	43.4	-	Ash lens
2				_				_		_			_		
4/31	Feat. 1	70+	55+	?	SC 3	10	1	0	0	9	-	33.3	11.7	7.0	Ash lens Rock = 1.0 kg
45	Feat. 1	50+	27+	?	SC 4	0	0	0	0	0	-	-	24.0	-	Trash lens
69	Feat. 1	39+	21+	•8	SC 4	0	0	0	0	0	-	-	-	-	Ash lens
69Ъ	Feat. 1	100+	55+	3.0	SC 4	2	0	0	0	0	-	-	8.6	-	Ash lens
	Feat. 2	47	30+	?	SC 4	2	0	0	0	0	-	-	12.5	-	Ash lens
70	Feat. 1	27	7+	•8	SC 4	0	0	0	0	0	-	-	-	-	Ash lens
72	Feat. 1	100+	27+	•8	SC 4	0	0	0	0	0	-	-	8.6	-	Ash lens
81	Feat. 1	40	40	3.0	SC 6	3	0	0	0	0	-	-	16.4	-	Ash lens
104	Feat. 1	70+	40+	?	SC 4	0	0	0	0	0	-	-	82.4	-	Ash lens
	Feat. 2	67+	31+	?	SC 4	2	0	0	0	0	-	-	12.0	-	Ash lens
10 <b>9</b>	Feat. 1	50	15	2.5	SC 6	5	2	1	0	0	-	-	-	-	Ash lens

<sup>a</sup>Key: SC = Strat Column (booth); G = Grid No.; veg. = vegetal remains. <sup>b</sup>Material screened through 1/16" mesh.

Layer	Sample Location <sup>b</sup>	Number Sherds to kg sand	Number Bones to kg sand	Number of Debitage to kg sand	No. Ham. Stones to kg sand	No. Corn Cob frags to kg sand	No. of Flecks 5x5 cm	gm egg- shell to kg sand	gm charcoal to kg sand	gm fiot per liter	kg rock to kg sand	% of Rock to total	Wgt. of Sand (kg)
ì	SC 1	0.10	0.76	0.02	0.02	0.00	9	0.00009	0.38	13.6	0.20	16.6	106.50
2	SC 1	0.30	0.13	0.06	0.02	0.08	1		0.54	2.8	0.62	38.1	86.75
3	SC 1 SC 2	0.47	0.10	0.05	0.14	0.004	2		0.13	1.3	0.61	37.7	482.25
4	SC 1	0.23	0.12	0.03	0.03	0.00	4		-	2.3	0.56	35.8	292.25
8	SC 1	0.11	0.09	0.01	0.01	0.002	4		0.01	2.8	0.22	18.3	410.50
9	SC 2	0.27	0.63	0.08	0.03	0.00	2		1.55	4.1	0.20	16.5	139.00
10 10а 10Ь	SC 2 SC 1 SC 1	0.06 0.15 0.05	0.03 0.13 0.12	0.01 0.02 0.01	0.00 0.00 0.04	0.002 0.00 0.00	7 - -		0.02 0.06 0.002	1.2 8.6 1.5	0.59 0.23 0.65	36.9 18.7 39.0	507.00 298.75 281.00
11	SC 1	0.00	40.50	0.75	0.00	0.00	23		1.62	4.8	0.25	22.2	4.00
13	SC 2	0.27	0.22	0.04	0.003	0.03	1		0.48	6.7	0.27	21.1	258.00
15	SC 2	0.07	0.02	40.00	0.01	0.01	?		0.33	0.9	0.63	38.7	285.00
16	SC 2	0.20	0.15	0.06	0.00	0.02	50+		1.53	3.5	0.39	27.9	206.50
117	G 183/211	-	-	-	-	-	21		-	-	-	-	-
17	SC 2	0.27	0.08	0.04	0.01	0.00	10		0.10	?	0.58	36.6	389.00
19	SC 3	1.06	0.53	0.18	0.00	0.22	15		2.29	10.8	0.30	22.8	286.75
20	SC 3	0.48	0.05	0.57	0.03	0.14	16		1.24	14.5	0.65	39.0	79.00
37	SC 5	0.36	1.16	0.04	0.01	0.09	22		2.29	4.7	0.31	23.9	75.00
22	SC 3	0.93	1.22	0.10	0.00	0.18	29	0.00170	2.09	9.1	0.19	16.2	214.00
32	SC 3	0.74	1.29	0.09	0.00	0.55	37		3.09	0.1	0.30	22.8	138.50

Table	8.4.	Material	densities	for	selected	layers	in	the	Pueblo	Alto	Trash	Mound.	a

<sup>a</sup>Layers arranged from earliest (Layer 1) to latest (Layer 113). <sup>b</sup>Sample location key: SC = Strat. Column (booth); G = Grid.

## Table 8.4 (continued)

Layer	Sample Location <sup>a</sup>	Number Sherds to kg sand	Number Bones to kg sand	Number of Debitage to kg sand	No. Ham. Stones to kg sand	No. Corn Cob frags to kg sand	No. of Flecks <u>5x5 cm</u>	gm egg- shell to kg sand	gm charcoal to kg sand	gm flot per liter	kg rock to kg sand	% of Rock <u>to total</u>	Wgt. of Sand (kg)
27а 27b	G 127 G 127	-	-	-	-	-	14 12		-	-	-	-	-
30 31	SC 3 SC 3	0.65 1.40	1.61 1.00	0.07 0.04	0.00 0.00	0.29 0.48	28 21	0.00040	2.43 2.05	6.3 8.2	0.08	7.1 16.7	125.00 25.00
24 24b	G 155/183	-	-	-	-	-	16		-	-	-	-	-
24/31	SC 3	1.50	0.60	0.10	0.00	0.49	-		4.31	11.4	0.36	26.6	107.50
34	SC 4	-	-	-	-	-	26		-	-	-	-	-
35 35/41	SC 4 SC 3	0.88 1.01	0.94 0.67	0.10 0.12	0.01 0.00	0.13 0.20	22 ?	0.00120	1.86	9.2 12.2	0.13 0.26	11.5 20.5	690.00 215.00
36	G 211/239	-	-	-	-	-	12		-	-	-	-	-
38	G 155/183	-	-	-	-	-	28		-	-	-	-	-
40	G 183	-	-	-	-	-	18		-	-	-	-	-
43	SC 3	1.43	0.78	0.23	0.02	2.52	33	0.00021	1.01	14.0	0.15	13.3	435.75
44W 44E	SC 3 SC 4	1.81 2.12	0.63 0.91	0.03 0.15	0.00 0.00	0.02 0.43	20 ?	0.00034	- 8.15	17.9 21.0	0.08 0.15	7.4 13.3	63.00 117.00
45	SC 4	1.68	3.23	0.20	0.03	0.21	21		5.50	6.4	0.19	15.7	107.00
46	SC 4	0.87	1.77	0.13	0.00	0.17	16		2.94	8.1	0.13	11.8	30.00
47 <sup>·</sup>	SC 4	-	-	-	-	-	17		-	8.2	-	?	?
48	SC 4	0.40	0.79	0.00	0.00	0.12	19		0.97	10.5	0.23	24.1	75.00
54	SC 5	0.39	1.04	0.11	0.02	0.20	16		1.94	14.2	0.13	11.8	56.00
55	SC 4	0.71	3.33	0.16	0.00	0.18	21		4.77	13.6	0.13	11.4	93.00
56	SC 4	0.88	2.17	0.18	0.01	0.08	26		2.06	9.1	0.13	11.1	120.00

<sup>a</sup>Sample location key: SC = Strat. Column (booth); G = Grid.

Layer	Sample Location <sup>a</sup>	Number Sherds to kg sand	Number Bones to kg sand	Number of Debitage to kg sand	No. Ham. Stones to kg sand	No. Corn Cob frags to kg sand	No. of Flecks 5x5 cm	gm egg- shell to kg sand	gm charcoal to kg sand	gm flot per liter	kg rock to kg sand	% of Rock to total	Wgt. of Sand (kg)
57 57 57/58	SC 4 SC 5 SC 4	0.14	3.79	0.14	0.21	1.00	? 47 ?		- 7.44 -	_ 16.7 8.3	0.21	17.6	14.00
58	SC 5	2.40	1.53	0.13	0.02	0.65	26	0.00140	2.80	6.1	0.31	23.6	124.50
59	SC 5	4.50	1.75	0.25	0.00	1.13	20		3.79	17.4	0.19	15.8	8.00
61	SC 5	1.85	1.23	0.25	0.00	1.30	15		4.65	19.7	0.21	17.5	40.00
62	SC 5	0.72	0.60	0.06	0.01	0.27	24		2.13	12.5	0.12	11.0	46 <b>9.</b> 00
81	SC 6	0 <b>.9</b> 4	0.54	0.01	0.01	0.13	2	0.00027	1.03	17.5	0.17	14.2	445.00
64	G 267	-	-	-	-	-	18		-	-	-	-	-
69 69 69 b	SC 4 SC 5 SC 4	0.72	0.51	0.22	0.00	0.18	5 - ?	0.00630	0.89 _ 1.30	4.9 5.8 6.1	0.09	8.4 _ 9.6	76.00 ? 202.00
70 70	G 183 SC 4	2.30	- 0.46	0.03	0.03	0.17	10 6		0.33	- 3.1	- 0.53	_ 34.5	 72.00
72	SC 4	1.35	0.58	0.20	0.00	0.00	1		0.76	8.3	0.26	20.5	178.00
71	SC 5	1.16	0.80	0.28	0.04	0.36	7	0.19100	3.82	7.9	0.41	28.9	69.00
74 74	G 239 SC 5	- 0.40	- 0.40	0.17	- 0.00	_ 0.11	1		- 0.78	_ 5.7	_ 0.09	7.9	35.00
76	SC 5	0.90	0.63	0.31	0.00	0.17	-		0.98	4.4	0.19	15.8	48.00
77	G 211/239	-	-	-	-	-	50		-	-	-		-

Table 8.4 (continued)

<sup>a</sup>Sample location key: SC = Strat. Column (booth); G = Grid.

## Table 8.4 (concluded)

Layer	Sample Location <sup>a</sup>	Number Sherds to kg sand	Number Bones to kg sand	Number of Debitage to kg sand	No. Ham. Stones to kg sand	No. Corn Cob frags to kg sand	No. of Flecks 5x5 cm	gm egg- shell to kg sand	gm charcoal to kg sand	gm flot per liter	kg rock to kg sand	% of Rock <u>to total</u>	Wgt. of Sand (kg)
78 78a/b	SC 4 SC 5	0.77 0.63	0.26 0.29	0.03 0.16	0.00 0.02	0.03 0.00	9	0.01690 0.08200	2.13 0.76	2.9 6.1	0.00 0.17	0.0 14.7	35.00 87.00
85	SC 5	1.06	0.19	0.06	0.00	0.23	3	0.00130	2.52	5.6	0.18	15.0	48.00
92	SC 5	0.86	0.39	0.17	0.04	0.28	7		2.70	6.3	0.10	8.8	46.50
95	SC 5	0.50	0.30	0.15	0.03	0.33	7		2.56	12.7	0.24	19.2	40.00
82	SC .6	0.74	0.18	0.05	0.01	0.06	13		2.20	13.9	0.30	22.8	161.00
96	SC 6	1.48	0.42	0.31	0.02	0.25	18		3.22	33.6	0.29	22.3	52.00
97	SC 6	1.16	0.21	0.12	0.02	0.02	4		2.33	13.5	0.21	17.2	178.00
98	SC 5	1.59	1.09	0.39	0.09	0.77	7		3.10	?	0.19	16.2	44.00
103	SC 6	1.77	0.63	0.24	0.01	0.08	9		1.92	17.6	0.26	20.6	146.50
104W 104E	SC 4 SC 5	1.25 0.50	0.60 0.35	0.23 0.18	0.005 0.02	0.13 0.20	7	0.00610 0.00110	0.99 0.15	1.6 7.4	0.25 0.09	20.3 8.5	204.00 254.00
105	SC 5	-	-	-	-	-	5		-	7.6	-	-	-
102	G 323	-	-	-	-	-	3		-	-	-	?	-
200	SC 5	-	-	-	-	-	?		-	-	-	-	-
109	SC 6	0.87	0.26	0.15	0.00	0.13	19		0.89	14.0	0.12	10.4	265.50
110	SC 6	0.65	0.28	0.13	0.00	0.09	8		0.55	11.2	0.07	6.8	191.50
113	SC 6	0.71	0•24	0.17	0.004	0.02	8	0.00012	0.34	7.3	0.12	11.1	937.00

<sup>a</sup>Sample location key: SC = Strat. Column (booth); G = Grid.

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All three slumps occurred on the same side in close proximity to one another. Probably Roberts' Section 1 trench paralleled ours by only a meter or so to the north, and it contributed to our slump problems. Based on Roberts' Pueblo Alto notes and the technique he practiced at Pueblo Bonito, it seems reasonable to assume that Roberts placed his two trenches across the short axis of the Pueblo Alto Trash Mound and that they were very close to ours. If so, we hit the southwestern end of his 1-m-wide, secondary, test column and, thus, his Section 1 must have paralleled our Test Trench 1 by only a meter or two to the northeast. It is a wonder that our entire trench did not collapse.

The great depth of this midden (4 m) is uncommon in Southwestern sites but not necessarily in rooms or kivas. Archeologists will continue to work with similar material and be faced with the practical and safe way to deal with them. Shoring standards for trenches have never been devised with the archeologist in mind, and federal regulations now insist that trenches over 5 ft deep be shored or have the sides stepped back (U.S. Office of the Federal Register 1987:200-206). When similar shoring was mandated for Kiva 10, we ceased excavation rather than subject ourselves to further torment.

### Stratigraphy

We identified 165 deposition units in Test Trench 1, from single episodes of dumping to massive homogeneous layers. Adjacent units (or layers) were often comprised of the same materials and were separated from each other primarily on the basis of subtle differences in the color, texture, and density of individual constituents. For instance, the charcoal or calcium carbonate density (which would also alter the color) might distinguish adjoining layers. Although it is true that not all were distinct enough to prevent argument during profiling, Roberts' work five decades earlier closely supports our own observations about the nature of the stratigraphy. Given the nature of the deposits being recorded, the records are surprisingly close for Roberts' booth in Section 1 and the major layers recorded directly across in our profile (Grid 211), less than 75 cm away:

	No. of Layers	Mean Thickness	sd
Roberts' Section 1	16	23.6 cm	9.6
N.P.S. Grid 211 (midpoint)	17	17.9 cm	7.8

Roberts' second booth (Section 2) in the trench across the northeastern end of the mound reveals similar strata (11 layers, averaging 30.3 cm thick, sd = 9.4). Both booths yielded a Gallup ceramic assemblage (Tables 8.5-8.6), which suggests considerable homogeneity for the mound. Furthermore, Roberts' (1927) deep tests in the Pueblo Bonito and Peñasco Blanco middens revealed similar results. Surface examinations of all the greathouse middens in the park (see below) also suggest analogous depositional histories.

Level	Depth (cm)	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrugated	Unclass, indented corrug,	PII indented corrug. rim	PII-III indented corrug. rim	PIII indented corrug. rim	BMIII-PI mineral (unpolished)	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Unclass. mineral	Plain whiteware	Unclass. carbon	Newcomb B/w	Chuska B/w	unclass. Chuskan carbon (solids)	Kana'a B/w	Black Mesa/Sosi B/w	Mancos B/w	Unclass. smudged	Wingate B/r	Unclass. Tsegi orangeware	Unclass. Tsegi/San Juan redware	Unclass. San Juan redware	Unclass. redware	Total	**	
A	(0-41)			2		141		1	ı			4		10	44	2	35	32			2	2					2	1				279	10	-
В	(41-66)	1				54	2	1		1	1			2	22			11			1											96	3	
с	(66-86)	6	1			82					1	5	1	3	32		6	11	4							3				1		156	6	
D	(86-107)	4		2		64	1					3		5	22	1	11	15	1	1	1					1			1			133	3	
E	(107-130)	8	1			67						4		5	20		27	22		2		4				5		1		1		167	6	
F	(130-137)	3	1	1		42					1	1		1	11		10	10							:	4			3			88	3	
G	(137-163)	2	ł			104	6	2				5	l	5	43		12	23	6		1	3	1	1		2		1		2	1	222	8	
н	(163-168)	3	1			25									3		8	1		1		3									1	46	2	
I	(168-193)	1				103	1	1						6	35			17								2		2			ĩ	169	6	
J	(193-208)	13		2	1	98		2			1	7			32		6	13	2		8	1				3						189	7	
к	(208-244)	6		3		133	2					5	1	7	43		25	22	1		2					4			6	٠.		260	9	
L	(244-274)			1		85	1	3			2	10			38	3	8	18		2		1				1		1	1			175	6	
М	(274-300)	6		12		256	2		1		1	15		10	64		24	41			2	9				4			4			451	16	
N	(300-318)	1		2		76						6		2	34	1	18	5		1												146	5	
0	(318-343)			1		104	2	1			4			1	13		8	8								1		1				144	5	
P	(343-378)	5		1		47				1		4		1	23		5	10							1	3			1			102	4	
Tota %b Form	1	59 2	5 T	27 1	1 T	1481 52	17 1	11 T	2 T	2 T	11 T	69 2	3 T	58 2	479 17	7 T	203 7	259 9	14 T	7 T	17 1	23 1	1 T	1 T	 1 T	33 1	2 T	7 T	16 1	4 T	3 T	2823	101 97	
bow jar oth	er	59	5	27	1	1481	17	11	2	2	9 2	48 18 3	3	27 30 1	178 294 7	7	81 109 13	71 187 1	11 3	6 1	11 5 1	8 15	1	1	1	33	2	4 3	16	3 1	3			
Ware	7				57 culi	% nary								29 C11	9% Dola			10: unkn	7 0 wm	C	2% huska	a	T Tusa	yan	т м.v.	1% smudg		l red	% Iware				100	

Table 8.5. Ceramic frequencies from Roberts' Section 1 in the Pueblo Alto Trash Mound sorted using the Chaco Center typology.

<sup>a</sup>Smithsonian Institution collections (NMNH), Lot 111, Catalog #334161. Levels are natural units, 3 feet square. <sup>b</sup>T = trace (less than 0.5%).

Level	Depth (cm)	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrugated	Unclass. indented corrug.	PII indented corrug. rim	PII-III indented corrug. rim	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Unclassified mineral	plain whiteware	line accified corbon	Newcomb B/w	Chuska B/w	Unclass. Chuskan carbon	Black Mesa/Sosi B/w	Mancos B/w	Unclassified smudged	Unclass. Tsegi orangeware	Unclass. Tsegi/San Juan redware	Unclass. San Juan redwre	Unclassified redware	Total	54
A	(0-46)		1	l		75	1	1		2		1	27	32	11					1		3		2		2	160	9
В	(46-84)	6		5		58	4			4			29	22	20			1	1		1	2		2			155	9
С	(84-107)	2		1		55				4	1		17	14	10							4		2			110	6
D	(107-132)	3		3	1	87	2			3		4	39	27	25			1		2		2					198	12
Е	(132-145)	10		4		10 <b>9</b>	1		1	6		1	59	23	17 3	2	3					6		6			248	14
F	(145-183)	6		5		94	4			1		2	47	25	27	1						1		4			217	13
G	(183-213)	2		2		27				3			9	6	4		1	1									55	3
н	(213-244)	2		2	2	119	1			7			86	17	10			2	2					2			252	15
I	(244-280)	10				28	1	1	1	5			25	17	6		1					1	1				97	6
J	(280-300)	5				46	1		1	6			17	9	5						1	1			3		95	6
к	(300-323)	8	1	3		52			1	11		6	18	24	4		1			2		2		1			134	8
Tota %b	1	54 3	2 T	26 2	2 T	750 44	15 1	2 T	4 T	52 3	1 T	14	373 22	206 13	139 8	3 T	6 T	5 T	3 T	5 T	2 T	22	l T	19 1	3 T	2 T	1721	101 99
Form bow jar oth	e: Mer	54	2	26	2	750	15	2	1 3	24 22 6	1	2 11 1	112 261	76 135 5	29 109 1	1	2 3 1	2 2 1	3	5	2	22	1	18 1	3	2		
Ware	. %			c	49% ulin	ary					3 C1	8% bola			8% unknown	n	Cì	1% uska		T Tusayan	Т М.V.	1% smudg		1% redwa	are			98%

Table 8.6.	Ceramic frequencies from Roberts	Section	2 in the	Pueblo	Alto Tra	sh Mound	resorted
	using the Chaco Center typology.	1					

 $^{a}$ Smithsonian Institution collections (NMNH), Lot 112, Catalog #334162. Levels are natural units, 3 feet square.  $^{b}T$  = trace (less than 0.5%).

#### Depositional History

Three major episodes in the formation of the mound were evident from field observation. The earliest was a mass of stone debris from construction followed by depositional units of trash. The final deposits appear to be derived from alluviation of the earlier deposits and from aeolian deposits that accumulated after use of the mound ceased (although the site continued to be occupied). Plotting various materials by density in their depositional order seems to confirm this basic sequence (Figure 8.4).

The Pueblo Alto Trash Mound consists of a multitude of widely broadcast layers. In addition, there are a great number of smaller layers or lenses that must have derived from single dumping events (e.g., from single containers of material). The recording of the latter was not consistent; some were designated layers while others became lenses within a layer. If all small units were considered minor events and arbitrarily defined as being spread less than 150 cm, then only 64 units of deposition exceeding 150 cm are left in the profile. Although some argument could ensue over whether this split is reasonable, it does seem probable that units in excess of the cut-off point and several centimeters thick could not have derived culturally from a single container load.

Full data are not recorded for 11 of the 64 major layers. Some layers, however, were examined more than once, which created 59 layers for analysis. From these, the density of major transported items (ceramics, chipped stones, bones, corncobs, and hammerstone/abrader frequencies, and charcoal, stone, and flotation residue weights) in each layer was calculated against the primary nontransported material (sand) to graph the depositional history of the mound (Figure 8.4, Table 8.4). Overall, our work and Roberts' suggest the following schematic for the composition of the Trash Mound.

## Construction Debris Deposition (43.0 Percent of the Total Profile)

The earliest, bottom-most unit (Layer 1) was of soft, fluffy, decayed organic matter, possibly from rotted juniper bark. After that, however, from Layer 2 through Layer 20 (data lacking from Layer 17), stone comprised the primary cultural material, nearly reaching a maximum of 40 percent of the total layer weight. The 12 layers with stone averaged 562.8 cm long (sd = 299.5) and 32.1 cm thick (sd = 15.6). The most massive deposition, predominantly of loose stone with little interstitial sand, occurred in Layer 3 (Plate 8.1). For safety reasons we did not extend our booth into the heart of this layer; if we had, an even greater stone density was probable.

Stone in these layers was a very hard, indurated, light grayish-green sandstone, often appearing freshly broken. The most common whole artifacts in association were hafted hammers, unhafted hammers, and hammerstone/abraders of the same hard material (Volume III, Plate 4.2). The latter were small discoidal pieces that easily fit the palm of the hand and were ground flat on two opposing faces with the edges battered. Overall, these layers marked the initial massive construction at Pueblo Alto.

Other cultural material was relatively sparse among the construction debris with two exceptions: in Layers 11 and 16. The peak density of bone material in the mound was found in Layer 11. This was composed entirely of unstratified, light gray ash and burned small (78 percent) and large (12 percent) mammal fragments (n = 744) that might have derived from a single large firepit, although the length of the deposit (2 m) technically made it a "major" layer. There were corresponding densities for charcoal and chipped stone in Layer 11 as well. Charcoal density also peaked in Layer 16, which was composed primarily of burned roofing.

The earliest layers of construction debris were associated with a Red Mesa ceramic assemblage, followed by a transition to a Gallup assemblage (Tables 8.7-8.8). This duplicates our findings for the construction debris and lower room floors excavated in the Central Roomblock and the West Wing.

## Trash Deposition (37.9 Percent of the Entire Profile)(Plates 8.4-8.6)

At about Layer 20 there was an overall increase in trash material-here represented by charcoal, bones, ceramics, chipped stones, and corncobs. Hereafter, this deposition marks a period of trash discard. Except in Layer 20, where there was an unexplained increase in chipped stone debris, siliceous stone remains at a relatively low and stable level throughout the mound. Sandstone density after Layer 20 dropped to fluctuate between about 10 and 25 percent of the total layer weight. Some of this might be from minor construction activities. Nevertheless, the density was far higher (by 2 to 5 times) than in our only village midden sample (29SJ 629), which employed primarily mud in construction. Stone in neither midden was attributable primarily to stone tool discard.

The 40 layers deposited during the period appear shorter (mean length of 355.5 cm; sd = 200.5) and thinner (mean thickness of 14.0 cm, sd = 11.0) than the preceding ones formed from construction debris but longer than those in the period following. The largest unit deposited during this period, Layer 35, was remarkable for its homogeneous mixture of adobe chunks, grayish sand, bits of charcoal (>10 mm), and occasional spalls and larger stones.

During this period, charcoal, bone, and sherd densities peaked. Immediately after Layer 20, bone densities increased markedly with few substantial drops. High levels were maintained for 19 layers until Layers 61 and 62, where densities decreased, with only minor peaks in Layers 82 and 98 disturbing the overall reduction. Bone density was greatest between Layers 44 and 61 and was primarily from small mammals (e.g., rabbits and prairie dogs). Artiodactyl remains (by raw frequencies and MNI) were generally in the clear minority but nearly equaled small mammal densities during a dramatic increase in Layers 56 through 58. This corresponded to a similar maximum density of stone tools (abraders and

Layer	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrugated	Unclass. indented corrug.	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Gallup B/w	Unclass. Cibola mineral	Plain whiteware	Burnham B/w	Chuska B/w		Unclass, Chuskan carbon	LaPlata B/r	Total %
surface	1	1	1		21			1	6	8	3		1				43 8
1	2		1				1		5	1	1						11 2
2	4		1	2	3		4			11	1						26 5
3	56	10	32	9	3	1	41	2		40	25	3		:	3	2	227 44
4	16	1	4		2		18			14	11				1		67 13
8	9	2	5	1	4		8		1	9	7						46 9
<b>1</b> 0 <b>a</b>	1	1	1		19		3		4	9	7						45 9
10ь	6	2			2		3			1							14 3
12									2	1	l						4 т
18	2	2	1		6		1		7	10							29 6
Total %a	97 19	19 4	 46 9	12 2	60 12	1 T	79 15	3 1	25 5	104 20	56 11		1 T		4	2 T	512 99 100
Form: bowl jar other	97	19	46	12	60	1	43 33 3	2 1	4 21	39 64 1	27 28 1	2 1	1		1 3	2	
Ware %		cul	46% inar	у					41% Cibola		11% unknown		2 Chu	% Iska		T San Juan Redware	100

Table 8.7. Ceramics recovered from the Trash Mound, Strat Column 1 (in the northeastern quarter of Grid 70).

 $a_T$  = trace (less than 0.5%).

Layer	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrugated	Unclass. indented corrug.	PII indented corrug. rim	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Unclass. Cibola mineral	Plain whiteware	Burnham B/w	Chuska B/w	Unclass. Chuskan carbon	Sosi/Black Mesa B/w	Unclass. Tusayan whiteware	McElmo B/w	Unclass. San Juan whiteware (carbon)	Forestdale Smudged	Wingate B/r	White Mountain redware	Deadmans B/r	Unclass. San Juan redware	Sanostee B/r	Total	54
Surface	9		16		268		2	1	1	2	27	94	64		1	3	2	2	1	2		1	2		1	ı	500	60
3	10	l	1	1	6			5			3	3	1	1													32	4
9 AL#1	1				17	1		2	1		6	1	1	1													31 1	4
AL#3	-		1					1			1	1	1														5	
10	4	2	3		8			2			3	5	5														32	4
13 AL#1 AL#2	11		5		15	2		1 1			11 1	8	8 1			1					3			1			66 1 2	8
14					1		2																				3	т
15	1	1			6						2	2	5		1						1				1		20	2
16	1	1			17			2			5	9	5								1				1		41	5
17	1	5	6	2	38	-	_	1			18	18	14	_	_			_	_		1					_	104	12
Total %b	38 5	10 1	32 4	3 T	376 45	3 T	2 T	18 2	2 T	2 T	77 9	141 7	105 13	2 T	2 T	4 T	2 T	2 T	l T	2 T	6 1	l T	2 T	l T	3 T	1 T	838	99 97
Form: bowl jar other	38	10	32	3	376	3	2	13 4 1	2	2	27 50	46 93 2	25 80	1 1	2	1 3	2	2	1	1 1	6	1	2	1	3	1		
Ware %			5 culi	5% nary	7				2 Cib	9% ola			13% unk.	с	1% husk	a	T Tus	ayan	Т М.	v.	1% smud		re	1% dwar	es			100

# Table 8.8. Ceramics recovered from the Trash Mound, Strat Column 2 (in the northwestern quarter of Grid 126).<sup>a</sup>

aAL = ash lens.

 $b_{\rm T}$  = trace (less than 0.5%).



Plate 8.4. Trash Mound, Strat Column 3, looking southwest. Tags and numbers mark natural units of deposition (i.e., layers). 15-cm scale. (NPS#16919, 16920)



Plate 8.5. Trash Mound, Strat Column 4, looking southwest. Tags and numbers mark natural units of deposition (i.e., layers). 15-cm scale. (NPS#16915, 16916)



Plate 8.6. Trash Mound, Strat Column 5, looking west. Tags mark natural units of deposition (i.e., layers). 15-cm scale. (NPS#16911, 16912)

hammerstones) and a minimal density of sherds. The volume of Layer 57, however, was small and sampling error was possible.

Charcoal densities, although more erratic, jumped in Layer 19 and continued sporadically at high levels for the next 22 layers until Layer 81. For the next seven of nine layers, the densities decreased to levels as low as those deposited during the period of construction. The last five layers revealed even lower densities of charcoal, probably because of aeolian accumulation.

Like charcoal, ceramic densities jumped in Layer 19 and sporadically increased for the next 11 layers, peaking in Layer 44. Thereafter, a decline set in for the next seven layers, and then a sharp upswing in Layer 58 preceded the maximum mound density in Layer 59. A period of above-average ceramic breakage appeared in contiguous Layers 58, 59, and 61. Again there follows a major ceramic decline for the next 14 layers, with a major exception in Layer 70, followed by another overall increase for 5 more layers starting with Layer 82. The latter increase may be due to deflation of the sand, resulting in higher artifact densities. The final layers revealed low ceramic densities because of aeolian deposits. Ceramics from this episode belong entirely to assemblages dominated by Gallup Black-on-white (Tables 8.9-8.12).

Overall, sherd densities were higher than bone or chipped stone densities. In the heart of the mound (between Layers 19 and 81), where charcoal, corncobs, sherds, and bones (if we exclude the Layer 11 bones) all reached their maximum density, bone density, however, dominated sherds and chipped stones in 11 of 23 layers. For seven consecutive layers (between Layers 45 and 57), bone exceeded ceramic and chipped stone densities and closely followed the trends in charcoal density.

After these peaks, overall densities of ceramics, bones, corncobs, and charcoal decreased for about nine layers without reaching their former densities again. It was during this period of lessened trash deposition that a sudden rise in construction debris appeared (Layers 70-72). Chipped stone waste also followed this increase in masonry debris, although it was uncertain if the two events were causally related.

Aggradation (4.7 Percent of the Entire Profile)

Starting at Layer 82, it appeared that the depositional pattern had changed again. The layers (82, 96-98, 102, 103, 108, 109, 111, and 115) became shorter and thicker than previously [averaging 234.4 cm long (sd = 123.3) and 18.3 cm thick (sd = 5.4)] as if redeposited from truncated higher units, although some construction debris is again evident (e.g., Layer 103). Major erosion of the mound was expected to have taken place immediately following disuse until the exposed material became stabilized. Lighter materials (sand) were likely to have washed downslope and off the mound whereas heavier artifact materials would have been left behind, resulting in an increase in artifact densities. Such a pattern is still evident today at the Chetro Ketl midden after it was churned over earlier this century. A plausible alternative explanation would be a new period
Layer	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrug. rim	Unclass. indented corrugated	PII indented corrug. rim	BMILI-PI mineral (unpolished)	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Unclass. Cibola mineral	Plain whiteware	Nonchacoan mineral	Burnham B/w	Chuska B/w	Toadlena B/w	Unclass. Chuskan carbon	Sosi/Black Mesa B/w	Unclass. Tusayan whiteware	Unclass. San Juan whiteware (carbon)	Forestdale Smudged	Deadmans B/r	Tusayan redware	Unclass. San Juan redware	Total	20
Surface	8		5		103	1	1		3	2	17		33	24	4	1	2	1	5						2		212	10
19 AL#1 AL#3	15 1		7		127 2	3 1		1 1	5 2	6 1	24 3		50 2	32 3	1	2	1		2				2	6		3	287 14 2	13 1 T
20	2		1		13				2		3		8	4					3							2	38	2
22	12	1	7		105	1		3	2	1	13		31	18		2							2				198	9
23	1		1		13						3		11	3												2	34	2
24b					1						1																2	Т
24/31 AL#1	5		3		77 4			2	1	2	12 3		36	10 1					1	1	1				1	l	151 10	7 T
30	4		3		27	1			1	2	13	1	11	12	ł	1	1						2	ı			81	4
31	4		1		8				1	1	8		6	6							1						35	2
32	2		4		50	1				4	19		15	7												1	103	5
35					1						1																2	т
35/41	3		6	3	92	4			2	1	24	3	44	24	1	2			2				4	2			217	10
43	9		19		308	5		1	3	10	57		111	69	2	2	6	3		1		1	23	3		1	633	30
44	3	1	1		71		_	1	1	1	7		16	9	_	_	_		1	_				1			114	, 
Total %b	69 3	2 T	58 3	3 T	1002 47	17 1	1 T	9 T	23 1	31 2	208 10	4 T	374 18	222 10	9 T	10 1	$10 \\ 1$	4 1 T	4	2 T	1 T	1 T	33 2	14 1	2 T	11 1	2,133	100 102
Form: bowl jar other	69	2	58	3	1002	17	1	5 3 1	14 9	19 12	67 141	2 2	133 228 13	59 156 7	7 2	7 2 1	8 1 1	3 1	5 9	2	1	1	33	12 2	2	u		
Ware % <sup>b</sup>	)		cul	54% inary	,				c	30; ibol	r La			11 unkn	l% 10wn		2% Chus	ka		T Tusa	yan	T MV	2% smudg	Tse	1% 3 <b>i</b>	S.J.		100

#### Table 8.9. Ceramics recovered from the Trash Mound, Strat Column 3 (in the northeastern quarter of Grid 154).<sup>a</sup>

<sup>a</sup>AL = ash lens. <sup>b</sup>T = trace (less than 0.5%).

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			qua	irt	tei	r c	of	Gr	id	2	10)	)• <sup>;</sup>	a	• 4 • 4		0	17 (C) 24	ł			ж. 1		in tr ist	7		(285) 	•				
2 - 2		с	Layer	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrugated	Unclass. indented corrug.	PII indented corrug. rim	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Unclass. Cibola mineral	Nonchacoan mineral ?. Plain whiteware	Newcomb and Burnham B/w	Chuska B/w	Toadlena B/w	Nava B/w	Unclass. Chuskan carbon	Kana'a B/w	Unclass. Tusayan whiteware	class. Mesa Verde whiteware	Forestdale Smudged	Deadmans B/r	Tsegi orangeware	Unclass. San Juan redware LaPlata B/r	Total	. %	
•			Surface	2		2		26		2		2	4		9	4	$\top$	•		1									52	2	
			34					6		1			3		1								•						11	Т	
			35	6		18	2	322	5	4	3	3	58	1	01	40 13	1	5	ı		9	3	1		6		1	5	607	26	
			44	2		6		175	ļ		2	2	11	1	23	20 3	3 2								1				248	11	
			45	1				106	3		3	5	14		27	14 1		1	1						2			2	180	8	
			46					20					2		2	1										l		1	26	1	
			47			1		36	4	1		2	4		8	5													61	3	
			55	ł				35			1	1	5		20			1								l		2	66	3	
			56	2		5		64				2	19		25	15 1					1					1		2	137	6	
		•	57/58	4		1		36	1		1	1	5		8	8		1			1					1		2	69	3	
			69	1		3		27			1		1		12	10							ĺ						55	2	
• •	•		69b AL#1 AL#2	8	· .		•	79 2	1		4	1	6		32 1	15	1	1		1 1					1 ·	•		1	151 2 2	7	
			72	9		13		95	2	3	4		25		54	31		2	1		ı					1			241	10	
			73								1																		2	Т	
			76	8		9		81	1		2	2	14		26	18 1		1					÷	1	••			2	166	7	
			78					18					1		3	5			. '										27	1	
			104 AL#2	6	1	3		133		1		5	14	1	47	25 5	5 . 	2		1			1		6			2	253 2	11	
			Total %b	50 2	1 T	61 3	2 I T	262 54	17 1	12 T	22 1	26 1	186 8	33 T	99 17	211 25	5 4 T	14 1	3 T	4 T	12	3 T	2 T	1 T	16 1	2 T	1 T	7 12 T 1	2,358	101 101	
			Form: bowl jar other	50	1	61	2 1	262	17	10 2	18 2 2	12 14	67 118 1	1 1 2 2	47 249 3	45 18 162 7 4	2 2	9 5	1 2	2 2	5 7	3	2	1	16	2	1	7 10 2			
			Ware % <sup>b</sup>		cul	9% inar	y.		; ~ j	11.4	4. <sup>1</sup>	2. Cib	7% ola			10% unknov	m		2% Chusk	a		T Tusa	yan	T MV	1% smudg	1 Tse	ζ ζί	S.J.		100	
<: Q :	. i	2	1,147			-	3 - 2	1.15	51	. <i>*</i>	5	Ś.	ę,	: .	; ;		le.		·, ·				., I	<u>ъ</u> ,			۰,	- 13	l gar	الت ال	

Table 8.10. Ceramics recovered from the Trash Mound, Strat Column 4 (in the northwestern

 $a_{AL}$  = Ash lens.  $b_T$  = trace (less than 0.5%).

Layer	Plain gray	Narrow neckbanded	Unclass. indented corrug.	PII indented corrugated rim	PII-III indented corrug. rim	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Unclass. Cibola mineral	Plain whiteware	Nonchacoan mineral	Chuska B/w	Toadlena B/w	Unclass. Chuskan carbon	Sos1/Black Mesa B/w	Unclass. Tusayan whiteware	Unclass. San Juan whiteware (carbon)	Forestdale Smudged	Showlow Smudged	Wingate Smudged	White Mountain redware	Deadmans B/r	Unclass. San Juan redware	Total	8	
37 48 54		1	13 19 14	2			1	2 1	3 4 4		4 3	1 1 1		2	1							1		ı		27 30 22	2 2 1	
57 58 59 60 61 62 69 71	4 1 1 2 1	15 1 2 8 1 4	2 88 9 9 42 141 23 41	3 1 1	1	6 1 3	7 1 6	2 1 7 1	42 3 6 46 3 5	1	33 3 2 11 62 7 17	19 1 2 45 2 6	1 2 1 1	1 5	2 1 1 1	2 1 1 3 1	2 2	1	1	56 1 1 6	11	1		1	4 1 1	2 299 18 23 74 336 37 80 14	T 18 1 4 20 2 5	
74 76 78 85 92 95 98	2 1 1 1 1	4 2 1	6 21 30 20 15 15 41	1	1	Ζ	3	2 3 1	2 8 10 8		3 8 9 13 1 6	5 2 1 5 1 3 6	1	1 1	3	1				2 1	1	1	1		1	43 55 51 40 20 70	3 3 2 1 4	
104 105 122 123 200	1 3 1	8	64 75 39 10 18	2 3		3	5 3 1	7 2 1	13 12 12 3 4		12 22 4 4 8	14 34 5 5 3	1	2	2 1	3 2 1	3 1	3		1 4					3	126 175 71 24 34	8 10 4 1 2	
Total %a	21 1	47 3	755 45	14 1	2 T	16 1	27 2	31 2	190 13	1 T	241 14	161 10	7 T	13 1	12	19 1	8 T	4 T	1 T	72 4	12	3 T	1 T	3 T	10 1	1671	98 101	
Form: bowl jar other	21	47	755	14	2	11 5	12 12 3	14 17	72 118	ı	95 137 9	49 107 5	5 2	9 4	8 4	11 8	8	4	1	72	12	3	1	3	9 1			
Ware % <sup>a</sup>	1	c	50% ulinar	у				3 Cib	0% ola			10% unkno	wn	C	3% Chusk	a	l) Tusaj	% yan	T MV	sm	5% udge	ed	r	1% edwa	re		100	

## Table 8.11. Ceramic frequency and distribution in the Trash Mound, Strat Column 5 (in the northeastern quarter of Grid 238).

 $a_{\rm T}$  = trace (less than 0.5%).

Layer	Plain gray.	Wide neckbanded	Narrow neckbanded	Unclass. indented corrug.	PII indented corrugated rim	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Unclass. Cibola mineral	Plain whiteware	Nonchacoan mineral	Burnham B/w	Chuska B/w	Toadlena B/w	Unclass. Chuskan carbon	Sos1/Black Mesa B/w	Unclass. Tusayan whiteware	Mancos B/w	McElmo B/w	Forestdale Red	Forestdale smudged	Showlow smudged	Puerco B/r	White Mountain redware	Tusayan B/r	Tsegi orangeware	Unclass. San Juan redware	Unclass. redware	Total	24
Surfac	e 6		22	148	1			9	21		52	39	1	2			4		1		3	1	3	1			1	2			317	12
81 AL#1	11		17	238 2	4	5	6	1	53		41 1	26	2		1		1		1				4	3					2		416 3	16
82	3		8	117	1	4	2	1	18		10	19	1		3	2															189	7
96			3	43	1	1			2		14	13																			77	3
97	2		2	109	2	2	4	4	17		32	19			1	3		2			2	1	2							1	206	8
103	8		12	130	3	5	10	8	14	1	40	23											3						2		259	10
109 AL#1	5		8	116 1	4	2	2	8	16		29 2	24			3	1	3						3						2	1	225 5	9
110	1		4	56	2	3	1	1	11		24	19			1		1													1	125	5
111	1		2	23		6	1		2		6	13									1										55	2
113	18	1	31	303	6	7	4	1	48		117	89 		_	6	_	2	1		4	1	1	18	3		1			3	_	666	26
Total % <sup>b</sup>	55 2	1 T	109 4	1286 51	24 1	35 1	30 1	33 1	202 8	l T	367 14	285 11	4 Т	2 T	14 1	7 Т	11 T	3 T	2 T	4 T	7 T	3 T	33 1	7 T	1 T	1 T	l T	2 T	9 T	3 T	2,542	98 96
Form: bowl jar other	55	1	109	1286	24	28 6 1	13 17	9 24	58 142 2	1	112 242 13	53 221 11	1 3	2	5 9	6 1	5 6	3	2	4	6 1	1 2	33	7	1	1	ı	1 1	7 2	1 2		
Ware %	Ъ	c	58 ulin	% ary				2 Cib	6% 0la			11 unkn	% Iown		) Chu	l% 1ska		1 Tusa	yan	Т М.	v.	sr	2% nudge	ed	Wt.	Mt.	1% Tse	gi	δJ ι	ınk		99

#### Table 8.12. Ceramics recovered from the Trash Mound, Strat Column 6 (in the northeastern quarter of Grid 294).<sup>a</sup>

<sup>a</sup>AL = ash lens. <sup>b</sup>T = trace (less than 0.5%).

of trash deposition in the mound, or more likely, a combination of both processes.

#### Aeolian Deposition (More Than 14.4 Percent of the Entire Profile)

Finally, there remain a few massive units (Layers 104, 105, 110, 113, and 200), that average about 422.3 cm long (sd = 102.8) and 42.4 cm thick (sd = 23.0) and cover the southeastern flanks of the mound and beyond. Those analyzed all show greatly reduced densities of cultural material, starting with Layer 104. This being the leeward side of the mound (the prevailing winds are from the southwest), it is logical to expect accumulations of windblown sand to be greatest after the mound had stabilized. This process is probably also responsible for the deposits of sand banked along the eastern exterior of the main houseblock.

Material Culture

and shirt space.

The mass of material recovered from the Trash Mound represents 40-50 percent of the total cultural material collected during our excavations at Pueblo Alto (Table 8.13).

Material	Number	Material Anterio Durate	Number
	• .		
sherds	38,813	bones (unworked)	23,531
chipped stones	5,153	worked bones	69
projectile points	12	human parts	9
hammerstones	297	charcoal fragments	18,174+
hammerstone/abraders	182	corn cob fragments	2,585
hafted hammers	49	eggshell fragments	1,083
abraders	100	dendrochronological frags.	138
other ground stones	177	adobe beam impressions	92
manos, inc. fragments	26	ornaments	86
metate fragments	6	cupric minerals	43

Table 8.13. Totals of materials recorded from the Trash Mound.

Ceramic fragments were the most common artifacts and were found in all units of excavation. Their densities in the mound (between 513 and 893 per  $m^3$  in the six booths) were consistent with other Chacoan middens for which we have information (Table 8.14). Unfortunately, this type of information is seldom recorded by archeologists, so comparative information is sparse. Haury (1976:191), in a rare example, records ceramic densities in trash between 2,000 and 8,000 per  $m^3$  at Snaketown that are much greater than any recorded from Chaco Canyon.

The Pueblo Alto mound is remarkable for the relative homogeneity of the ceramics. The proportion of various forms (bowls, jars, ladles), types, and trade wares remained relatively stable, although graywares occurred in greater proportions than at the small houses (Toll 1984:121). Despite site occupation that extended later than the mound, there were

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#### Table 8.14. S Summary of Bonito phase greathouse trash mound data. a . i a polana, kapan basa dalamen Artifact density Artifact densityMean layerMoundSurface/m2Excavation/m3ThicknessSizesherd chip.st.sherd chip.st.No. (cm) sd (m) Est. mound e sanda en subèrs Volume Greathouse midden<sup>b</sup> (m<sup>3</sup>) Pro Maria 6200-7800 63x37x6.1 all. Trans NE Trans 24.0 -NE Trans 23.7 化石油合同合金 化合体运输 and the second second SW Trans NW Trans 12.4 N Trans 12.9 PEÑASCO BLANCO E. Trash Md-TP 1<sup>C</sup> - 1357 - 5, 20.0 9.1 42x27x3.7 1430-1840 " " -TP 2<sup>C</sup> - 836 - 10 21.3 9.1 " " -TP 3<sup>C</sup> - 2.8 " " -N Trans - 2.8 " " -C Trans 17.8 7.0 " " -S Trans - 18.4 PENASCO BLANCO en l'en elle anno 1000 a l'entre l'entre de la construcció entre la sel d'entre por a no de gen PUEBLO ALTO Trash Mound PUEBLO ALTO Trash Mound $\pm$ TP 1° 893 16 23.6 9.6 58x30x3.7 2700-2900 " 637 11 30.3 9.4 " TT 1<sup>d</sup> 513 68.3 120 19.2 14.5 " N Trans 11.1 120 19.2 14.5 -</td 计中国代码 机合成 法公司法 法公司公司 PUEBLO BONITO East Mound-TP 8° - -East Mound-TP 8<sup>c</sup> 420 16 20.3 9.9 70x34x3.0 3100 358 358 23: 23: 25.7 19.1 75x43x4.9+ 7660-9100 3. East Mound-Trans 25.8 3.0 West Mound-Trans 24.7 1.5 and the second a second second East+East -Trans 24.1 Filler the Charles of the system is a set - x - k + j West+West -Trans 18.6 1. 1. 1. 1910. 化合金 化分离 化过度 化氟代基 医外外的 No. A Moridae and area so which PUEBLO PINTADO - 21x14x0.6 90 म् २१ म Midden 1-Trans 12.0 4.5 🕆 241 AV **-** . . ' 1.2 Midden 2-Trans Midden 3-Trans 11.3 3.1 ، <del>م</del>ی میں بروریہ میں برور میں میں ک the <u>T</u>age of 3 . J. J. - 40x14x1.6 \_ 440 Midden 4-Trans 0::013.5 03.6 - 25x17x1.2 300 sa se serie KIN BINEOLA Midden 1-Trans 11.5 0.2 - 23x12x1.0 180 Midden 1-Trans 11.5 0.2 \_ ( . --19x16x0.75 113 Midden 2-Trans 15-2 Midden 3-Trans 15.1 Midden 4-Trans 22.5 85 24x18x0.3 43 ..... \_\_\_\_ · 18x16x0.25 15x10x0.3 106 Midden 5-Trans 10.0 KINYAFA COLA HABES £ . . . . e station of the Midden 1-Trans 18.7 1.9 45x22x1.4 950 -1 i 🗕 🖓 🖓 Midden 2-Trans 18.8 Midden 4-Trans 23.1 -17x12x0.5180 Midden 4-Trans TSIN KLETZIN Trash Mound-Trans 12.5 1.6 20x10x0.4 30 PUEBLO DEL ARROYO Parking Lot-TPe - 228 16.4 unknown unk. Inder M. Marke

<sup>a</sup>See Windes (1982b:Table 1) for additional greathouse trash mound data. <sup>b</sup>Trans = sherd and chipped stone transects by the Chaco Center, N.P.S., 1980-1981. CTest pits excavated by B.H.H. Roberts, N.G.S., 1925-1926. Test trench excavated by the Chaco Center, N.P.S., 1977-1978.  $\{a_i\}_{i=1}^{n-1} \in [0,1]$ eTest pit excavated by James Trott, N.P.S., 1980.

Preserve Barton

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almost no later ceramics on or in it. Several restorable vessels (Plate 8.7) found during excavation had been meticulously smashed into small pieces and those from each vessel deposited as a batch in the mound. A11 were bowls (six Gallup Black-on-white and two Forestdale Smudged). One of the latter (Plate 8.7B) was found in the sterile sand at the bottom of Grid 239. The Gallup bowls were all from Grid 183, Level 10, and appear to constitute a set of ritually deposited vessels. Judged by their appearance, all could have been made by the same potter. Both deposits occurred just after cessation of major construction and during the initial disposal of trash. Several other restorable vessels were also recovered from the mound (Plate 8.8), but these were probably accidentally broken and then discarded. They were scattered throughout the excavated deposits.

Faunal remains were also common in the mound, with an average density of 650 bones per  $m^3$  for the six booths. Preservation was good, probably because of the sandy matrix and the elevation of the mound. The large number of bones recovered made it feasible to study only those from the strat column booths (Akins 1985a). Small mammals (rabbits and prairie dogs) made up the bulk of the deposits, followed by artiodactyl remains of mule deer, bighorn sheep, and pronghorn antelope in decreasing order. Over half of the remains, however, were not identifiable as to species. Although dog remains were common in middens of small, contemporary sites in the canyon (Akins 1985b:353), only a single dog part came from our work in the Pueblo Alto mound (Akins 1985a).

Bird remains, including turkey, were rare in the Trash Mound. One turkey burial was found in a pit about 40 cm below the surface near the end of the main period of trash deposition. Layer 35 yielded the vast majority of the turkey remains from the Trash Mound (36 of 42 elements, 86 percent), a minimum of three birds. This layer also yielded one of the highest concentrations of eggshell in the Trash Mound but only enough by weight to form a single egg. Eggshell (40.4 g), presumably all from turkey, was found in 27 percent of the layers formed during the primary period of trash deposition, but may represent very few eggs. With two exceptions, besides Layer 35, no layer produced enough eggshell by weight to equal a single egg (mean weight = 7-8 gm). In Layers 71 and 78, however, there was enough for two and one eggs, respectively.

Human remains from the mound (and all of Pueblo Alto) were scarce, with no burials being recovered. Only nine human parts were recovered from various areas of the mound and none were articulated (Akins 1985c).

Chipped stone densities were low  $(68/m^3)$  and were represented primarily by Washington Pass chert, quartzite, and petrified wood (types 1109-1110 and 1112-1113), followed by lesser quantities of 1140 petrified wood and pieces of the Morrison Formation. Overall, Washington Pass chert and splintery, petrified wood (1109-1110) were the most common materials in the mound and comprised about 50 percent of the total (Cameron 1985).

Ground stone artifacts were represented primarily by abraders. Fragments of manos and metates were rare. Probably little ground stone

Trash Mound 603



Α



В

С

Plate 8.7. Restorable and partially restorable vessels intentionally smashed and placed in the Trash Mound. A) Four Gallup Black-on-white bowls from TT 1, Grid 183, Level 10. (NPS# 23155) B) Forestdale Smudged bowl from TT 1, Grid 239, Level 18. (NPS#23156) C) Forestdale Smudged bowl from TT 1, SC 5 (Grid 238), Layer 58. (NPS#23157)



В

Plate 8.8. Restorable or partial vessels from the Trash Mound. A) Gallup (3) and Mesa Black-on-white bowls from Strat Column 5, Layer 58. 5-cm scale. (NPS#23158) B) A Gallup Black-on-white bowl (maximum rim diameter is 38 cm) from Strat Column 6, Layer 97. Note handle on one side. (NPS#23159) reached the trash mound because of its value for reuse. Percussion tools (hammerstones, hammerstone/abraders, and hafted tools) were more common than ground stone tools but were limited primarily to the construction debris layers where they were discarded from construction work.

Although charcoal and ash were common in the midden, the fill was relatively unstained from their presence. Individual hearth contents were evident throughout the mound but were not churned and mixed like most midden deposits. Burned corncobs, presumably from use in hearths, were common throughout the mound but not in the quantities seen of burned brush.

Ornaments in the Trash Mound were dominated by beads (Mathien 1985), although many probably escaped capture through the 1/4 in. screen mesh. Black shale beads were the most prevalent type (32), followed by calcite (16), shell (12), turquoise (5), gypsite (2), and bone (1) beads. Turquoise was also recovered as small chips (9), pendants and pendant blanks (6), and inlay (1), whereas other unmodified cupric minerals occurred as azurite (32) and malachite (2) fragments. Turquoise does not appear to be widespread at Pueblo Alto relative to other kinds of minerals, particularly in bead form. A few Glycymercis shell bracelet fragments (7) came from the midden along with three zoomorphic figures of jet (lignite). Of the latter, the most spectacular find was the side of a frog pendant (Plate 7.9A), from Slump 2, presumably similar to that magnificent find from Pueblo Bonito (Pepper 1920:Plate 1). A beautiful, dark reddish-brown, goethite, zoomorph pendant (Plate 8.9B) was recovered from Layer 104. A piece of a bone flesher or a bead(?) exhibited drill-mark ornamentation (Plate 8.9C) identical to a piece recovered at Pueblo Bonito (Pepper 1920: Figure 141), but otherwise bone ornaments and ornamented bone were rare.

### Rate of Deposition

Understanding the processes responsible for the creation of the Pueblo Alto Trash Mound may be important for assessing the site demography, the period of site occupancy and the activities contributing to the midden.

Chacoan, small-house, midden deposits generally lack internal layering. A steady, unbroken accumulation of trash seldom allows discontinuities to develop, and this can be attributed to year round deposition. Other factors contribute to the homogeneous nature of most middens. Rodents, dogs, turkeys, children, and natural events may act to mix the orderly disposition of refuse. Burial practices and construction activities that remove the refuse for fill elsewhere may also enhance the homogeneity of the midden and destroy stratigraphic processes. Assessment for seasonality then usually relies upon biological indicators (Monks 1981).

A hiatus or a rapid change in the deposits usually leads to noticeable differences in the fill. A sudden shift in the type or amount of cultural material being deposited can also lead to stratification. Like-



Plate 8.9. Unusual ornaments from the Trash Mound. A) Fragment of a jet frog found in the debris from Slump 2 in the Trash Mound. (NPS#24545) B) Goethite effigy from the Trash Mound, Layer 104. 5-cm scale. (NPS#31308) C) Decorated bone flesher or bead blank from the Trash Mound found in Grid 239, Level 7. 3-cm scale. (NPS#24541) wise, natural events, such as wind and rain storms, can change the type of deposition and leave discontinuities. Finally, the periodicity of the deposition can also affect the clarity of stratification.

The type of stratification in the Pueblo Alto mound may be nearly unique in Southwestern middens outside the Chacoan sphere. It is the regularity of the depositional units in the mound that makes the mound different from almost all others except for those at other greathouse sites in the canyon. Although the cultural content differed little among adjacent layers, there appears to have been little mixing of the material. It is noteworthy that possible major contributors to surficial impact (dogs, turkeys, and rodents) upon the mound were rare in the midden faunal record (Akins 1985a). Apparently the mound also did not serve as a primary locale for human burial, which preserved it from considerable disturbance.

Thus, it is not major shifts in cultural material that depict the depositional history of the mound but rather hiatuses. The stratigraphy of the Trash Mound must be from intermittent deposition. The regularity of the layers in both thickness and spread and their surprising coincidence in number with the span of the main period of trash deposition (approximately A.D. 1050 to 1100) suggest a yearly event. Deposition, of course, could have occurred more frequently, but it still must have been at regular intervals.

Seasonal behavior can depend on several factors (Monks 1981:218-222), although the availability of critical food resources, and the character of exchange (Judge et al. 1981) may be most important here. The work of Roberts (1927) indicates that the pattern exposed in the Pueblo Alto mound was common to many other greathouse, extramural middens. In fact, he found the layering so obvious in them that it was easier to excavate in natural units than by arbitrary standards. This was at a time when few excavators were concerned with natural units of deposition and seldom excavated with this problem in mind. A major exception, however, was Nels Nelson, the father of Southwestern stratigraphic studies, who, in 1916, practiced his novel methods in the nearby Pueblo Bonito trash mounds (Nelson 1920:381-390).

The bulk of all the mound layers was sand, mixed with cultural material. It was inferred that the sand itself was deposited culturally and not primarily during periods of abandonment. A yearly or periodic sweeping of the site (i.e., in the plaza or in the rooms) could generate like deposits. Clearly, the mound constitutes the major area for refuse during this period, although at least two possible plaza kivas (Kiva 13 and Loose's Plaza 1 kiva) were also used as dumps. Thus, it is uncertain The bulk of the material, if the entire site was seasonally occupied. however, must have come from a population that was only intermittently present. Akins (1985a) suggests that the faunal record does not indicate an annual deposition of bone because of variation among immature animals used as the seasonal indicators in her study. Nevertheless, the clear layering of the mound unquestionably marks intermittent deposition and,

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together with the estimated number of layers and span of use (see below), suggests a yearly cyclic deposition.

Period of Deposition Roberts (1927:235-236) believed that the site occupation could be dated by examining the midden contents: The material at Pueblo Alto showed none of the Transitional wares, indicating a later period of construction. This pueblo seems to have been erected at about the period of del Arroyo's development. The fine hachure, Hachure C, and the foreign wares of the final period of Bonito's occupancy are missing at Pueblo Alto showing that it too had passed its heyday while Bonito was still carrying on. [Roberts 1927: 242]

This premise has been followed by many archeologists who seek the temporal assignment of a site by testing only the visible trash heaps in front of the house mound. For Chaco, at least, this approach leads to misleading inferences regarding site occupations. At Pueblo Alto there was clear evidence of site occupation that continued later than the deposition of the Trash Mound.

Despite the impressive size of the Pueblo Alto Trash Mound, it probably grew to completion in far fewer than 100 years. The earliest treecutting date recovered during site excavations was A.D. 1021r (one), but most cutting dates cluster around the A.D. 1040s and A.D. 1060s. During the early growth of the mound, while Pueblo Alto was being built, a room or rooms burned and the material was dumped to form Layer 16. This lucky event seals most of the construction debris and dates all subsequent deposition as post-A.D. 1045 (Volume I, Table 8.2). Probably the room(s) did not burn at the time it was constructed, but its position in the mound during the ceramic transition from a Red Mesa to a Gallup dominated ceramic assemblage suggests deposition at about A.D. 1050 shortly after site construction.

The initial Red Mesa ceramic assemblage in the mound, together with some tree-ring dates from elsewhere on the site and in the mound, suggest site construction and mound deposition beginning between A.D. 1021 and 1045. If the layering represents singular episodes of construction, then one or more per year is reasonable. A span of construction of far less duration, say between five and ten years, is plausible, especially in light of the recent excavations at a similar but larger Chacoan ruin of Salmon (Adams 1980:248). If this is true, then the beginnings of the site and the mound probably are closer to A.D. 1040.

The work of Roberts (1927) at the Peñasco Blanco East Mound also suggests that the period around A.D. 1040 is a reasonable estimate for the start of the Pueblo Alto mound. He found debris of construction in the Peñasco Blanco mound during the transition between Red Mesa and Gallup

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assemblages as well (see below). The earliest eleventh-century, tree-cutting dates from the ruin cluster in the A.D. 1050s and 1060s (Robinson et al. 1974:29-30), which may correlate to the period of the debris deposition.

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Near the end of the Pueblo Alto mound deposition, a piece of charcoal that tree-ring dated at A.D. 1072+vv was deposited in Grid 239, Level 11. Again, the date does not establish the time of deposition, only that everything from that area on postdates A.D. 1072, perhaps by a considerable span. The ceramic assemblage for the entire mound, except for the very earliest rubble layers, was dominated by Gallup Black-on-white and overall indented corrugated ceramics with a paucity of early A.D. 1100s carbon-painted and redware sherds. Although later assemblages occur at the site, they were absent in (Tables 8.1-8.2, 8.5-8.12, 8.15) and on (Table 8.16) the mound. Presently the best estimate for the Pueblo Alto Trash Mound deposition lies between about A.D. 1050 and 1100.

The short period suggested for the Pueblo Alto Trash Mound is similar to Hawley's (1934) analysis of the large Chetro Ketl trash mound. She suggested a period of just 38 years for its accumulation, based on the recovery of firepit charcoal dating between A.D. 1084 and 1122 (Hawley 1934:63, 79). Despite the difficulties of accurate temporal control derived from firepit charcoal, ceramic types suggest that Hawley's estimate of the period of mound deposition was reasonable and only 20-30 years later than that predicted for the Pueblo Alto mound. Although her ceramic classification differs from our own, an examination of surface ceramics left on the greatly disturbed Chetro Ketl mound (Table 8.30) reveals an assemblage identical to Pueblo Alto's (see Other Greathouse Middens below).

# Summary and Conclusions

All cultural material in the Trash Mound undoubtedly represents secondary refuse (see Schiffer 1972). Its transportation from the loci of activity that produced it, presumably within Pueblo Alto, may diminish but does not negate its value for understanding those activities common at the site. If a steady rain of material were being deposited on the mound throughout the year, then individual episodes would be difficult to distinguish. The stratigraphy, however, indicates that deposition was not continuous. The relative rapidity of the layer formation increases the probability that materials derived from a few, perhaps specialized or seasonal, activities.

The thick, widely broadcast layers that characterize the primary period of trash deposition are unusual in Southwestern extramural middens. It is unlikely that the distinct layering would have remained intact if a steady, daily accumulation of trash was taking place. Disturbance from a myriad of creatures and from the natural elements should have blurred the boundaries of differing deposits. Instead, great sheets or blankets of homogeneous cultural material and sand appear to have been deposited quickly without subsequent disturbance.

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Table 8.15. Ceramics recovered from the Trash Mound, Test Trench 1, in Grids 155, 183, 211, 239, 267, 295, and 323.

10 01100 155, 105	, 211,		ZUI .	275,	Form	12.50
Ceramic types	Number	%	%	bowl	jar	other
Culinaryb	(9.162)		53			
plain gray	258	1	55		258	
wide neckbanded	27	T			27	
narrow neckbanded	639	4			639	
neck indented corrugated	25	Т			25	
unclass. indented corrugated	7,974	46			7,974	
PII indented corrugated rim	204	1			204	
PII-III indented corrugated r	im 24	Т			24	
Pill indented corrugated rim	11	т			11	
Cibola Whiteware	(5,963)		34			
LaPlata B/w	4	Т		4		
early Red Mesa B/w	(11	T		8	12/	27
Red Mesa B/W Feeswada B/W	411	2		250	100	27
Puerco B/W	199	2		127	208	4
Gallup B/w	2.812	16		936	1.853	23
Chaco B/w	2,012	T		7	19	23
Chaco-McElmo B/w	2	Т		2		
unclass. Cibola (mineral pain	t) 2,161	12		819	1,271	71
Chuska Whiteware	(360)		2			
Tunicha B/w	(309)	т	2	2	2	
Newcomb & Burnham B/w	44	Ť		22	16	6
Chuska B/w	113	ĩ		63	46	4
Toadlena B/w	55	Т		38	14	3
Nava B/w	6	Т		6		
unclass. Chuskan (carbon pain	t) 147	1		58	83	6
Tusayan Whiteware	(40)		т			
Black Mesa/Sosi B/w	28	Т		27	1	
Dogoszhi B/w	1	Т		1		
unclass. Tusayan	11	Т		8	3	
Mesa Verde Whiteware	(127)		1			
Mancos B/w <sup>C</sup>	84	r		56	27	1
McElmo B/w	26	Т		22	4	
unclass. Mesa Verde	17	Т		13	4	
Plain whiteware	1,288	8	8	334	922	32
Smudged/polished redware	(235)		1			
Forestdale Red	6	Т		6		
Forestdale Smudged	189	1		189		
Showlow Smudged	40	Т		40		
White Mountain Redware	(23)		Т			
Puerco B/r	7	Т		7		
Wingate B/r	1	Т		1		
unclass. White Mountain	15	Т		12	3	
Tsegi Orange Ware	(57)		т			
Deadmans B/r	46	Т		41	5	
Middleton B/r	3	Т		3		
Tusayan B/r	1	Т		1		
unclass. Tsegi	7	Т		7		
San Juan Redware	(67)		Т			
Bluff B/r	4	Т		4		
LaPlata B/r	14	Т		11	3	
unclass. San Juan	49	Т		31	17	1
Chuska Redware	(1)		Т			
Sanostee B/r	1	Т		1		
Unclass. redware	7	T	Т	7		
Totals	17,339	96%	99%	3,262	13,898	179

 $^{a}T$  = trace (less than 0.5%).

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<sup>c</sup>Primarily Mancos B/w but also includes trace amounts of southern Cibola whiteware.

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	Plain gray	Narrow neckbanded	Neck indented corrugated	Unclass. indented corrug.	PII indented corrug. rim	PIL-III indented corr. rim	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Chaco-McElmo B/w	Unclassified mineral	Plain whiteware	Chuska B/w	Toadlena B/w	Unclass. Chuskan carbon	Sosi/Black Mesa B/w	whiteware (carbon) McElmo B/w	Forestdale? Smudged		Puerco B/r	Wingate B/r	Unclass. White Mt. redware	Unclass. Tsegi orangeware	Total	24
PUEBLO ALTO TI	RASH N	IOUND	:																								
North trans. South trans.	3	4 <u>13</u>	1	200 107	9 3	3	2		7	36 44	1	1	33 20	55 42	1 _1	1 	4	1	1							366 253	
Total %a	7 1	17 3	l T	307 50	12 2	3 Т	5 1		15 2	80 13	1 T	2 T	53 9	97 16	2 T	l T	6 1	1 T	1 T							619	99
bowl jar ladle	7	17	1	307	12	3	2 3		6 9	21 59	1	1 1	19 33 1	17 78 2	1 1	1	3 2 1	1	1	1							
Chuskan culinary	2 29%	6 35%	0	123 40%	9 75%	2 67%																					
Ware % <sup>a</sup> Chuskan culina	ary		56 culi 4]	5% Inary I%					C	30% Cibola				16% unknown	¢	1% Chuska		T Tusayan	Т М.V.	1% smu	ıd						99
TSIN KLETZIN 1	FRASH	MOUN	D:																								
Total %a Form:	3 1	3 1		196 60	5 2	1 T		l T	13 4	18 6		3	28 9	42 13			l T	5		t r		I T	1 T	1 T	l T	324	99
jar ladle	3	3		196	5	1		1	6	11		2	23	36			1	ر .				1	T	1	I		
Chuskan culinary	0	0		14 7%	0	0																					
Ware % <sup>a</sup> Chuskan culina	ary		euli culi	54% Inary 7%					C	19% Cibola				13% unknown	(	T Chuska		2% Tusayan	м.v.	Smi	: ıdg		red	2% iware	•		100

Table 8.16. Ceramics tabulated from surface transects across the trash middens at Pueblo Alto and Tsin Kletzin. The transect locations are marked on Figures 8.1 and 8.8, respectively.

 $a_{T}$  = Trace (less than 0.5%).

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This appeared to be the case during the initial deposition in the mound. Aside from sand, the overwhelming material is sandstone construction debris and a high density of abraders and percussion tools of the same hard sandstone. That the association is not fortuitous is strengthened by the high correlation between the densities of the construction waste and the sandstone tools (r = .89, p < .001, n = 15 layers). Both logically derive from the work of the Pueblo Alto masons. Overall for the mound, however, this statistical association is not maintained (r = .17, p > .1, n = 58 layers).

The latter test suggests that the deposition of construction debris and sandstone tools after the initial period of building was a random event, with a single exception. Near the middle of the mound, in Layers 70-72, there was a marked increase in both spall and sandstone tool density. If the two layers immediately before and after the increase were retained for contrast, then, again, a high correlation ensues (r = .87, p < .01, n = 7 layers). This suggests that a brief flurry of construction took place at Pueblo Alto. Because this material seemed systematically collected and deposited in the mound, unlike the haphazard deposition in the surrounding layers, it might mark a major, organized renovation or new construction at Pueblo Alto in the middle of the period of trash deposition, or at about A.D. 1075.

The overwhelming impression of the initial mound deposition is of one from a single activity—the construction of Pueblo Alto. The presence of similar construction debris and sandstone tools along the bases of walls in rooms excavated at Pueblo Alto lends additional credibility to this supposition. Other deposits interspersed with those dominated by construction waste probably were derived from activities related to the construction. For instance, the deposit of burned bone and ash in Layer 11 might be construed to be from a cooking and eating episode by the Pueblo Alto labor force.

Akins (1985a) found that the faunal remains associated with these initial deposits appeared to be derived from a spring or fall hunt. Logically, the late winter and the late summer are the best periods for construction. Water requirements for mixing mortar and drinking can be best met at these times, periods also favored historically by the Hopi for mixing mortar (Parsons 1936:134). In at least one of the original rooms at Pueblo Alto (Room 142), impressions of a green corn stalk in a piece of roofing suggest that the room was roofed in the autumn after maturation of the corn (Ingbar 1979:18).

Following the mass of stone rubble, deposits appear normal in artifactual content and suggestive of domestic or household trash. There are some notable differences, however, that distinguish these and other Chacoan greathouse refuse deposits from the majority of Anasazi middens. Foremost of these is the absence of burials, a pattern affirmed by earlier investigations at the Pueblo Alto, Peñasco Blanco, Pueblo Bonito, Chetro Ketl, and Aztec Ruin mounds. Not all Anasazi middens contain burials, although the practice of placing burials in trash deposits was widespread, particularly in the deep deposits of large pueblos [e.g., at Pecos (Kidder 1962), Hawikuh (Smith et al. 1966), and Long House (Cattanach 1980)]. At the Chaco greathouses, at least, the tradition had been altered.

Another discrepancy that could not be quantified was the seemingly lower density of vegetal garbage. Earl Morris (1928:414) also noted this distinction when he commented on the "sharp contrast" between the Pueblo Bonito mounds and the trashy contents in the Chacoan southeastern mound at Aztec. The sandy, light-colored matrix of the Pueblo Alto mound likewise contrasts with the ash-stained, soft, "gummy" deposits found in other nongreathouse sites (see Kidder 1962:95-97). The latter deposits were evident elsewhere at Pueblo Alto in earlier (Plaza Grid 8) and later (Kiva 10) contexts as well as in the deep middens at the small-house sites we have excavated.

The great amount and variety of material types tossed during the period of trash deposition suggest discards from a number of unrelated activities. Nevertheless, if such activities produced refuse on a regular basis, then we might expect to find similar increases and decreases in density among the various material types. Sherds, chipped stones, and charcoal all correlated closely to one another during this period. Faunal remains, however, also correlated with the rise and fall of the charcoal densities but less closely with sherds and chipped stones. This inconsistency suggests that the pattern of bone discard may have operated independently of ceramic and chipped stone discard.

A breakdown of the faunal material revealed only a weak correlation between the densities of small and large mammal bones (r = .39, .02 > p >.01, n = 34 layers) that probably indicates nothing of the hunting strategies involved but that all sizes of animal parts were being discarded at approximately the same rate. The weak correlation did hold for the earlier and later deposits in the mound.

The faunal material was unusual in other ways. Bone densities are greater than ceramics for about half of the trash deposits in the middle of the mound. The preservation here certainly assists this finding because faunal remains from smaller sites in the canyon bottom apparently have suffered extensively from ground moisture. The overwhelming increase in faunal discard between Layers 45 and 57 may be explained by an event or events such as feasting. Is it a coincidence that the greatest density of ceramics (in Layer 57) immediately follows this event(s)? The sharp increase in sherd density suggests that more vessels than usual were suddenly broken and discarded.

The faunal remains from layers of the period of trash discard suggest great seasonal variability (Akins 1985a), dominated by fall and winter assemblages. They were not cyclical, as if from year-round deposition, nor do they occur in regular seasonal blocks, as if they were regularly deposited during the same season year after year. At best, seasonal shifts seem evident but not necessarily for the same seasons. 614 Pueblo Alto

Ceramics from the Trash Mound reveal fluctuating periods of intense discard. More important is the estimate of the number of vessels that were broken and tossed in the mound. Toll (1984:130, Table 8) calculated that approximately 150,590 vessels were represented in the mound, a staggering number for the short period of deposition (50 years) and for the number of families estimated to have occupied Pueblo Alto. Conspicuous consumption by the Pueblo Alto inhabitants may be relevant to the mass of pot discard or it may be attributed primarily to periodic gatherings of nonresidents (Toll 1984:130).

With chipped stones, only fine-grained, Washington Pass chert and splintery, petrified wood (material types 1109-1110) appeared to derive The latter is a poor, flaking material, found from a common activity. primarily as hammerstones at 29SJ 629 (Wills 1977), 29SJ 1360 (McKenna 1984: Table 4.10), and Pueblo Alto (see Volume III, Chapter 4). These are the only two siliceous materials in the mound that maintain similar proportional densities throughout the main period of trash deposition, as if they were used and discarded together. They were also the most common debitage, found in 83 and 74 percent, respectively, of the layers. Densities by weight (r = .80, p < .001, n = 30 layers) and frequency (r = .94, p < .001, n = 30 layers) were both significantly correlated. A11 other tests for correlation among various material types indicated random discard (p > .1). Chipped stone discard during construction was so rare that no patterning was evident. The paucity of splintery, petrified wood, however, suggests its impracticality for shaping masonry.

It is reasonable to assume that charcoal deposition was related to the use frequency and to the number of hearths in use. Therefore, major increases or decreases in charcoal densities might signal a change in hearth cleaning and use and, by inference, a fluctuation in the site population. If the estimated total amount of charcoal is calculated for the period of trash discard in the mound, then approximately 2,091 kg of charcoal were dumped (1.97 kg/m<sup>3</sup> x 2800 m<sup>3</sup> x 37.9 percent). And, if the average firepit volume during this period was 45 liters (Windes 1984a: 77), weighed 211.5 gm/liter, and was emptied once a week (9.52 kg), then we could expect from it a minimum of 494.9 kg of charcoal a year per family (a family per hearth). At these rates, a single family living at Pueblo Alto for just four years might produce such a volume. Clearly, the amount of charcoal in the Trash Mound seems far less than might be expected for a large, permanent population in residence at the site. Either the charcoal figures were grossly in error, the charcoal was deposited elsewhere, it was often burned to ashes, or its production was altered by some change in the size or character of the population. It might be expected that charcoal was rare because firepit fuel was generally allowed to burn to ash, but firepits and, particularly, heating pits at Pueblo Alto were commonly filled with charcoal.

Carbonized corncobs were expected to correlate with charcoal densities because both are common in hearths. With a few exceptions, corncobs occurred in relatively low quantities in the mound and did not correlate with densities of charcoal. Either cobs were rare at Pueblo Alto or, most likely, they were used selectively for fuel or other tasks. Nevertheless, they did not constitute a primary fuel source at the site.

Despite our limited testing of the midden, it was a major ordeal for those involved, both for the problems encountered and for the amount of material recovered. Nevertheless, the mound was most informative and contributed much to our work at Pueblo Alto. The material from it was probably representative on a gross level of the entire midden but would have remained largely unknown had we not tested it. Despite the volume of material contained in the mound, that was generated during the Classic Bonito period, little similar material was found during our work in the roomblocks. Just three ceramically contemporaneous proveniences have quantities that justify direct comparison: that associated with Room 110 (Floor 1), in Room 103 (between Floors 1-4), and in Kiva 13 (Test Trench fill). The remaining nine rooms, including all in the Central Roomblock and all other proveniences tested, were devoid of more than a smattering of material generated during this period, despite their presumed contemporary use.

The midden test also generated large amounts of materials suitable for detailed analysis, which were generally unmatched elsewhere in the site. Furthermore, it yielded one of the two large bodies of tree-ring material recovered from Pueblo Alto. This came from a burned roof built in A.D. 1045 and deposited in Layer 16.

The earliest deposition is clearly from construction activities followed by a more "normal" period of trash discard. Examination of the latter deposits, however, suggested refuse was generated by activities dissimiliar in density and variety from the small-house middens.

Preservation, the periodicity of the trash-generating activities, and the primary site role or function may all influence the differences between the greathouse and small-house midden contents.

Ceramics and tree-ring dates suggested that the period of trash deposition lasted approximately 50 years and, in our profile, this period was represented by just 40 layers. More layers undoubtedly existed than were observed, but it is possible that we have recorded the majority, given their great spread. Although the full extent of each layer can only be surmised, it is reasonable to assume the maximum layer spread would parallel the length of the mound in parabola form if the material was thrown from its crest. Thus, our measurements of layer length must represent just the shorter dimension of each layer. We know from Roberts' (1927) work here that layer sizes and the ceramic assemblage were little different at the northern end of the Pueblo Alto Trash Mound and might represent similar, if not the same, layers as those recorded by us in the central part. If so, then perhaps a layer or two were formed per year.

An annual, site-wide housecleaning might explain the structure and contents of the Pueblo Alto trash mound. An annual house cleaning would leave unexplained the absence of a far greater amount of material that would have been generated during the remaining part of each year by a

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large, permanent population. More logically, however, the mound can be seen as the focus for 50 years of periodic trash deposition (seasonal, intermittent, or a combination of both), primarily by nonpermanent residents rather than daily deposition by a large, permanent population. Ceremonial or system-intregative activities are suggested by the mound stratigraphy and content, as well as the mound's proximity to Plazas 2 and 3 and the prehistoric road network. Although the interpretation of the Trash Mound deposition was based on a very small sample of the total mound contents, it seemed to follow a depositional pattern common to many of the greathouse mounds studied (see below).

#### Comparisons with Other Greathouse Middens

Despite a wealth of information gleaned from the Pueblo Alto Trash Mound, there was little comparative information about other greathouse middens other than Roberts' work. To rectify this problem, all the greathouse middens within the park (including the outlying areas) were examined, ceramic collections taken from them re-examined and sorted when they could be located, and old notes consulted. Our work coincided with the survey of greathouses in the San Juan Basin conducted by Marshall et al. (1979) and Powers et al. (1983) and, in some instances, the same middens were examined independently more than once.

The discovery of cliff ruins and other Anasazi houses and artifacts in the Four Corners Region near the end of the nineteenth century probably prompted much of the later unrecorded looting of the Chaco Canyon trash mounds. Even the father of famed Southwestern archeologist Earl Morris was drawn to Chaco Canyon in 1893 to search the Pueblo Bonito trash mounds for burials and relics (Morris 1924:224). Small sites, in particular, suffered from the hunt for Chacoan burials with little documentation (Akins 1986). Work at the large greathouse middens in some cases was well documented and forms the basis for what little we know about them. By 1930, investigators had trenched every visible, greathouse trash mound in Chaco Canyon, including at least 12 trenches in the Pueblo Bonito mounds alone, as well as many of the small-house middens (Morris 1924:224).

Although considerable interest has focused on the greathouse sites in the San Juan Basin over the past century, most of it has been directed at the houses themselves and not at the mammoth, attendant, trash mounds. William Jackson (1878) gave us the first comprehensive notes and maps on the Chacoan greathouses he noted in the canyon in 1877. Specific middens mentioned or drawn by Jackson at Chetro Ketl and Hungo Pavi no longer exist, which casts some doubt on their legitimacy (Lekson 1983:48). Jackson's maps of the other sites and middens he examined are relatively accurate (e.g., compare Volume I, Figures 1.5 and 1.6), which was due, in large part, to his use of a measuring tape and compass (Jackson 1878, 1929). In addition, there is some possibility that the two large middens shown in front of Chetro Ketl were removed during Hewett's work (see Chetro Ketl below). If there was a large midden in front of Hungo Pavi, its disappearance is still a mystery, although Gwinn Vivian (personal communication 1987) attributes its disappearance to flooding by the Mockingbird Canyon wash.

Initial scientific concern over the greathouse mounds arose primarily from archeologists' interest in ceramics. At Pueblo Bonito, Nels Nelson (1920) and later Neil Judd (1954, 1964) were the first to seriously investigate the large mounds to try to understand their relationship to the site occupation. Many archeologists felt that these mounds offered a long history of Southwestern ceramic change that would make it possible to construct a ceramic typology with good stratigraphic and chronological control. This view is best summarized by Nelson who stated that "...it seemed a priori impossible that stylistic changes should not have taken place during the long interval of occupation suggested by the size of the refuse heaps" (Nelson 1920:383). Nevertheless, the middens generally frustrated attempts at ceramic seriation because of their homogeneity and short period of deposition.

Not all greathouses exhibit extramural middens (Table 8.14). None of the greathouses built in the early A.D. 1100s (Casa Chiquita, Kin Kletso, New Alto, Tsin Kletzin, and Wijiji) exhibit formal, extramural middens except for a light scatter of refuse south of Tsin Kletzin that was enclosed by a masonry wall (Gwinn Vivian, personal communication 1987). Earlier greathouses often have great piles of debris in locations that duplicate those of the small-house sites, that is, to the east, southeast, or south of the rooms, plazas, and pitstructures. The distinction between post-A.D. 1100 and pre-A.D. 1100 refuse patterns was apparently duplicated at both greathouse and small-house sites (Windes 1982a, 1982b; Windes and Doleman 1985). Hungo Pavi, Una Vida, and Pueblo del Arroyo lack the large, extramural middens, although all may have fallen to the ravages of nature (i.e., the Chaco Wash) or man.

The largest middens occur where there is the greatest concentration of small houses and greathouses in Chaco. In this area, Pueblo Bonito, Chetro Ketl, and Pueblo Alto (on the mesa above) exhibit the greatest volume of midden deposits (Table 8.14). For the most part, the large, extramural middens were created over a relatively short span of time between A.D. 1050 and 1100 and then abandoned in favor of disposing refuse within the roomblocks and plazas.

Although it is clear that occupation or use of the greathouses continued into the A.D. 1100s and sometimes into the A.D. 1200s, the lack of trash attributed to these later occupations on the extramural middens must be considered a conscious effort by the inhabitants to avoid the earlier deposits. Trash generated in the early A.D. 1100s was kept within the house to be thrown into abandoned rooms and kivas or dumped on the plazas or over the back walls. Some late trash was also scattered beyond the house but never on the large, extramural mounds. The pattern of trash disposal changed during occupation in the A.D. 1200s, when it was restricted primarily in the greathouses to kivas. I suspect that during this period ceremonial rooms (i.e., kivas) were reused, but that habitation was avoided in the greathouse ruins in favor of reoccupying smallhouse sites (see Truell 1979) or building new houses along the cliffs (Volume I, Chapter 11; Windes and Doleman 1985). Later inhabitants apparently treated the Chacoan ruins primarily as a source for pilfering construction materials, firewood, jewelry, and household and religious equipment.

#### Pueblo Bonito

At the onset of the Hyde Expedition explorations at Pueblo Bonito in 1896, Richard Wetherill trenched the two large mounds for burials (Pepper 1920:26) after Earl Morris' father had cut through them three years earlier (Plates 8.10-8.11). To the surprise of both, neither investigator found any burials. At the conclusion of the Hyde Expedition in 1900, Richard Dodge of Columbia University put three or four more test trenches in the same mounds in hopes of correlating the geomorphology with prehistoric events at Pueblo Bonito (Pepper 1920:24). According to Pepper, "extensive collections were taken for office study," but the results, if any, have never seen print.

Nelson, assisted by Earl Morris, secured permission to test several greathouse refuse mounds in 1916 but was later restricted to Pueblo Bonito (Nelson 1920:383). Nelson's interest in stratigraphic excavation was keen, and the mounds looked worthy of investigation. According to records of the American Museum of Natural History, under whose auspices he worked, Nelson deepened two existing trenches across the East and West Mounds (probably Dodge's) and then put in 2 by 4 ft (61 by 122 cm) test pits alongside near the center of each mound--a method practiced by almost every mound excavator since then (Figure 8.5). Nelson's pits reached sterile fill at depths of 3.5 m (East Mound) and 4.9 m (West Mound). His work was the first to employ a design- and form-oriented typology for Chacoan ceramics. Sadly, Nelson was thoroughly disgusted with the homogeneity of the ceramics (Tables 8.17-8.18) and considered the results not worth publishing until a larger section of the mounds could be investigated. According to Nelson (1920:383):

In other words, the mounds have accumulated at a more rapid rate than has ordinarily been the case. In my sections this rock and adobe material was especially excessive in the middle third and probably has intimate connection with changes or restorations that took place in the great communal house.

During the National Geographic Society's work in Chaco Canyon in the 1920s, Neil Judd entrusted the ceramic investigations to Monroe Amsden and Frank H. H. Roberts, Jr. Amsden later withdrew from the project because of illness, and Roberts carried it to completion for his dissertation. Their excellent work was thorough and forms the basis for much of what we know about Chacoan ceramics and the nature of the large refuse mounds.

Judd (1922:Figure 119; 1964:212) twice trenched the larger West Mound in 1921 but found a ceramic assemblage that suggested disturbed stratigraphy. A renewed attack in 1922 resulted in an additional trench in each



Α

Plate 8.10. Pueblo Bonito. One of the many cuts through the West Mound deposits conducted by George Pepper in the 1890s. (Courtesy of the American Museum of Natural History) A) Overview of cut, looking south. (AMNH#412162) B) Stratigraphy showing change in direction of strata. Note thick, horizontal deposit of clayey material under stake that Lekson (1984:74) would attribute to intentional construction. Looking west-southwest. (AMNH#412152)



Plate 8.11. Pueblo Bonito. Stratigraphy of the deposits in the East Mound. Note Type III masonry wall next to laborer. Looking north at Threatening Rock. Photo by O. C. Havens, 1925. (®National Geographic Society)



Figure 8.5. Pueblo Bonito. Locations of Roberts' nine test pits, Judd's and Nelson's midden trenches, and the 1981 midden surface transects.

Table 8.17. Ceramics recovered by N. C. Nelson in 1916 from the trench in Pueblo Bonito's East Mound.

Depth <sup>a</sup> (cm) Level	Plain gray	Neckbanded ("plain coiled")	Indented corrugated	Red Mesa style	Escavada/Puerco style ("broad line")	Gallup style ("hachure")	"Indeterminant slipped"	Unclassified smudged	Unclassified redware	Total	84
$\begin{array}{ccccc} 1 & (0-15) \\ 2 & (15-31) \\ 3 & (31-46) \\ 4 & (46-61) \\ 5 & (61-76) \\ 6 & (76-91) \\ 7 & (91-107) \\ 8 & (107-122) \\ 9 & (122-137) \\ 10 & (137-152) \\ 11 & (152-168) \\ 12 & (168-183) \\ 13 & (183-198) \\ 14 & (198-213) \\ 15 & (213-229) \\ 16 & (229-244) \\ 17 & (244-259) \\ 18 & (259-274) \\ 19 & (274-290) \\ 20 & (290-305) \\ 21 & (305-320) \\ 22 & (320-335) \\ 23 & (335-351) \\ \end{array}$	1 1 2 1 1 2 3	1 1 2 1	38 66 13 50 15 5 14 6 9 18 6 9 18 6 9 13 15 23 20 8 36 18 1	7 9 1 6 1 8 3 10 1 1 1 1 1 3 7 7 7 4 4 7 7 3 2 13 3 1 1	15 11 5 14 8 6 10 8 2 4 1 1 7 6 5 2 15 8 1 8 1	13 6 4 9 15 4 13 14 12 11 8 1 1 8 12 7 2 18 16 17 1	18 7 1 3 6 5 6 2 5 6 1 6 5 8 5 4 12 3 4 7 1	15 4 2 1 3 1 1 1 6 3	5 1 3 2 2 1 1 1 1 1 1 1 1 1	112 103 27 84 51 24 450 47 23 31 36 10 10 10 41 36 44 41 356 50 63 55	11 10 3 8 5 2 5 5 2 3 3 1 1 4 3 4 4 4 5 5 6 5 T
Total %b Ware %	12 1	 5 T 40%	403 39	100 10	139 13 43%	209 20	115 11 11%	37 4 4%	20 2 2%	1,040	99 100 100

<sup>a</sup>Converted to cm from 6 inch levels.

 $b_{T}$  = Trace (less than 0.5%)

Level	Depth <sup>a</sup> (cm)	Plain gray/neckbanded?	Indented corrugated	Red Mesa style	Escavada/Puerco style ("broadline")	Gallup style ("hachure")	Indeterminant slipped"	Unclassified smudged	Unclassified redware	Total	84
1	(0- 15)	4	14	2	4	11	8	4	,	47	4
2	(15-31)	3	6		6	4	6	6	4	50	5
3	(31 - 46)	1	13	, n	14	20		3	-	67	6
5	(40 - 01) (61 - 76)	2	13	2	9	13	6	1	2	46	4
6	(76 - 91)	2	7	ĩ	10	23	9	12	_	64	6
7	(91-107)	9	32	4	7	18	4	3	1	78	7
8	(107-122)	10	16	6	6	15	9		3	65	6
9	(122-137)	8	7	2	11	9	9			46	4
10	(137-152)	4	14	1	•	1/	3	1	2	42	4
11	(152-168)	4	10	2	14	4		1		34	3
12	(168 - 183) (183 - 198)	4	5		8	9	4	1		27	2
1.5	(103-133) (198-213)	1	4	1	ĩ	2	2		1	11	1
15	(213-229)	2	2	ī	2	4	2			13	1
16	(229-244)	3	1			2	2			8	1
17	(244-259)		9	2			2			13	1
18	(259-274)		12	2 ·	2	4	1			21	2
19	(274-290)		14	1		5	2	i		23	2
20	(290-305)	1	5	1	1	5	4			17	2
21	(305 - 320)	1	6		2	10		1		28	3
22	(320-337)	2	3	2	5	32	Å	1		51	5
23	(35) - 351)	1	8	10	6	30	6	4		65	6
25	(366 - 381)	•	8	1	Š	7	4	1		26	2
26	(381-396)	1	12	2	4	6	5			30	3
27	(396-412)	4	6	3		6	1			20	2
28	(412-427)	1	3	4	8	3	6	1		26	2
29	(427-442)	4	4	9	7	3	1			28	3
30	(442-457)	1	3	2	1	1	3			10	1
31	(457 - 472)	4	,			5	1			8	1
32	(4/2-488) (499-570)	5	1			5				17	2
33	(400-3/3)	<u> </u>		1 -				-		<u> </u>	
Tota	L	91	262	65	149	317	141	43	15	1083	100
%		8	24	6	14	29	13	4	1		99
Ware	%		33%		49%		13%	4%	1%		100
		cu	linary	ъ	lack-on-	white	unknown	smudged	redware		

Table 8.18. Ceramics recovered by N. C. Nelson in 1916 from the trench in Pueblo Bonito's West Mound.

<sup>a</sup>Converted to cm from 6" levels.

of the two mounds. Again in 1924, the two mounds were trenched. Finally, Judd concluded that the disturbed nature of the deposits, at least in the West Mound, was due to the redeposition of trash from an excavation of a great kiva in the West Court.

Two years later, Roberts made nine tests off the exploratory trenches that Judd ran across the East and West Mounds and in the East and West Courts (Figure 8.5). Only a few of the ceramic tabulations from the tests were reported by Roberts (1927), however, including those from Test 7 in the West Mound (Tables 8.19-8.20). No ceramics or tabulations exist for the 1922 test in the East Mound (Test 9), and these may have been discarded in the field, although the Test 8 ceramics from there did survive (Table 8.27). Most of this material from Roberts' tests represents the only sample left for study at the National Museum of Natural History (NMNH)/Smithsonian Institution in Washington, D.C., from over 2,000,000 sherds excavated at Pueblo Bonito by Judd. The remainder was apparently reburied at Pueblo Bonito, much of it in a trench in the West Mound (Judd 1954:ix; 1964:12). Part of this anguishing deficiency can be filled by Wetherill's and Pepper's collections at the American Museum of Natural History, New York, where some of the unscreened, excavational material was saved. In 1980, the author was able to re-examine the ceramics from all or part of seven of Roberts' nine tests (Tables 8.21-8.27) including those from the middens. These were typed according to the typology used by the Chaco Center. No bulk chipped stone or faunal material is left from this work except for a little faunal material found with the Test 8 (East Mound) sherds.

Gallup Black-on-white followed by lesser quantities of Puerco and Red Mesa Black-on-whites dominates the painted ceramics in the Pueblo Bonito trash mounds. In far fewer quantities, but dominant among the carbon paint traditions, are types of Chuska White Ware and, rarely, Tusayan White Ware. Culinary material is primarily of overall indented corrugated vessels. Associated redwares are from the San Juan and Tsegi traditions. There is a noteworthy absence or trace of White Mountain Redwares. It is this ceramic assemblage that characterizes the Pueblo Bonito refuse mounds and the Classic Bonito phase between A.D. 1050 and 1100 (see Volume I, Chapter 8).

Judd (1964:12) made much ado about his early tests in the West Mound; he found the ceramics "mixed and confusing." Later, he believed that the solution to the confused deposition was to be found in the West Court. Here, he believed, excavation for a mammoth 16-m- (or 19-m-) diameter great kiva resulted in a case of reversed stratigraphy when older deposits in the West Court were redeposited in the West Mound (Judd 1954:176; 1964: 133, 216).

But Judd was wrong. The ceramic assemblage from the undisturbed trash just outside this early great kiva (Test 2) was dominated by Red Mesa Black-on-white (Table 8.22). This trash extended into a probably Pueblo I pithouse (Judd 1964:129, 133). Only the upper 127 cm of fill had Gallup Black-on-white in them, and this was still overshadowed by twice as much Red Mesa. On the other hand, the ceramics from both refuse mounds

				~ ~			2	1	4	~ I	10	1
%		36	99	100	100			4	5	~	10	10
Total		101	192	293			7	154	16	124	376	
Early red (Unclass. redware)			۳	1 3	1% ware							1% Ware
Late red (Unclass, redware)					red			Т		- 7	1 3	red
Black interior (smudged)								1		1	1	1% smudged
Chaco-San Juan (Unclassified carbons)							e			l	13	1% carbon
Not determined (Unclass. decorated and plain whiteware)			8	Ϲ	3% unknown			17	13		30 8	8% unknown
Early Hachure - Hachure A (Red Mesa and Gallup B/w)		16		16 5				15	19	31	65 17	
Solid (Escavada/Puerco B/w)					e bola)			7	1	2	10 3	re Lbola)
Degenerate (Late Red Mesa B/w)		6	6	18 6	45% hitewar rily Ci		e	20	9	I	29 8	36% Mitewal Mrily C:
Transitional (Early Red Mesa B/w)		26	70	96 33	w (prima			16	12	I	28 7	, prime
Pre-Pueblo (BMIII-PI decorated)		-	-	1 2						en l	3	
Early corrugated (Indented corrugated)		15	12	27 9	y			46	31	36	114 30	<u>~</u>
Bands (Neckbanded)		5	21	26 9	51% culinar			12	e.	15	30 8	54% culinai
Plain gray		29	68	97 33				19	9	34	59 16	
(depth)	ST 3	A (12-60") (30-152 cm)	3 (60-66") (152-168 cm)	otal %	are %	EST 4	A (0-24") (0-61 cm)	B (24-36") (61-91 cm)	c (36-54") (91-137 cm)	D (54-86") (137-218 cm)	otal %	are %
Level		~		Ľ	We	Ξ.	~	_	-		ř	3

#### Table 8.19. Ceramics recovered by F. H. H. Roberts, Jr., from Test 3 and Test 4 between Room 136 and the South Refuse Mound(s) at Pueblo Bonito.<sup>a</sup> Compare with Table 8.23.

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		1921	•a	Con	pare	e w	íth '	Tabl	le 8	3•26•	Julia	at Pu	ebioj	sonit	0 1n
Level	"Plain banded" (Neckbanded)	"Corrugated coil" (Indented corrugated)	(Early Red Mesa B/w)	(Late Red Mesa B/w) "Transitional"	"Degenerate"	(Red Mesa and Gallup B/w) "Solid"	Hachure B" (Gallup B/w) "Hachure A"	"Hachure C" (Chaco B/w)	"Chaco-San Juan" (Chaco-McElmo or unclass. carbons)	"Not determined" (Unclass. decorated and plain whiteware)	"Mesa Verde B/w"	"Polished black interior" (Smudged)	"Red" (Unclass. redware)	Total	*
A	3	48	5	5	20	2	25	16		35		1	8	168	8
В		6			3	1	1	1		9				21	1
С	3	68	3	2	23	7	20	13		22		5	5	171	8
D	1	30			5		8	5		8		3		60	3
Е		17		1	7		20			3	1	6	1	56	3
F	1	50	1	5	9	1	7			9		4		87	4
G		17	1	1	3		8			14		3	3	50	2
Н		39		4	22		26		1	19		10	1	122	6
I	3	27	6	1	4		5			9	1	1		56	3
J	2	54	ļ		7		17			14		3	3	100	5
К	1	33	2	5	20	1	27			11		5	1	106	5
L	1	31		4	11	4	14			7		8	2	82	4
M		182	3	14	23	2	42			30		2	7	305	14
N	26	36	1	18	10	3	33	2	2	31		1	1	164	8
0	15	39	7	15	5	2	26	1		33		3	1	147	7
Р	7	22	ĺ	5	4	1	16			8	ļ	2		65	3
Q	5	14	2	8	8	1	52	10		21		4	1	126	6
R	3	10	3	5	1		10			5		1	3	41	2
S	5	6	1	6			7			10			2	37	2
T	8	43	3	13			29	1		12		4		113	5
U	5	6	1	2			5			4				23	1
V										1				1	Т
W	4		2	5											
Total %b	93 4	778 37	41 2	119 6	185 9	25 1	398 19	49 2	3 T	319 15	l T	66 3	40 2	2,117	101 100
Ware %	41 culi	% nary		(p	whi rimari	39% tewa 1y	re Cibola	)		15% unknown	Т М.V.	3% smudged	2% redware		100

Table 8.20. Ceramics recovered by F. H. H. Roberts, Jr., from Test 7 (Stations 244-252) in the West Mound at Pueblo Bonito in 1921.<sup>a</sup> Compare with Table 8.26.

<sup>A</sup>Smithsonian Institution National Anthropological Archives, F.H.H. Roberts, Jr., Parers, misc. collections #4851, Box 1, Folder 5 (tabulations). Sherds stored under Catalog #334180). Sherds taken from 3' square at one end of N-S trench in a test 19'5" or 20' deep (Judd 1964:9, 212-213). Levels are natural units (i.e., layers). <sup>b</sup>T = trace (less than 0.5%).

			T	22	2	anu					cu		.01			<u> </u>							/F		55	-			
Lino gray Level	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrugated	Unclass. indent. corrug.	Whitemound B/w	Kiatuthlanna B/w	Early Red Mesa B/w	Red Mesa B/w	Puerco B/w	Gallup B/w	Chaco B/w	Chaco-McElmo B/w	Unclassified mineral	plain whiteware	Naschitti B/w	Tunicha B/w	Newcomb B/w	Unclass. Chuskan carbon	Kana'a B/w	Unclass. Tusayan whiteware	Cortez B/w	Forestdale Smudged	Unclass. Tsegi orangeware	Bluff B/o	Unclass. San Juan redware	Sanostee B/r	% Total	!
A (F1. 1-24") (? - 61 cm)	42	3	19	2	16				22	1	5	1		30	21		3	1	2		1		5			3		177 9	
$B  (24 - 36") \\ (61 - 91 \text{ cm})$	100	9	63	8	9			4	38					76	45		2	4	8	2	1	1	5			6		381 19	
C (36- 44") 1	96	9	42	6	5		5	16	29				1	70	51		5	2	7	2		1		1	2	6		357 18	
D (44- 67")	94	8	42	5	6		1	11	25					55	23	1	2	1	5	2					4	2		287 14	
D (44- 67")	57	9	25	ı			3	5	17					39	17	1	1		2	3		1			3	2		185 9	
E (67- 84")	, 75	15	28	4		1	2	7	16					50	25		4		1	1					1	6	1	237 12	
E (67-84")	,							n o	t	s o	rt	e d																(100s) -	
F (84~102") (213-259 cm)								n o	t	s o	or t	еć																(100s) -	
G (102-116")	108	20	50				5	11	24					59	36		1	2	6	2			1		1	3	1	330 16	,
H (116-122")	7	5	2					2						7	4		1		1		1							30 1	
I (122-128") (310-325 cm)	10	2						1	1					ĺ	1				1									16 1	
J (128-138") (325-351 cm)	7	1						2	1					5	3													19 1	
K (138-169") (351-429 cm)	1																											1 T	r
Total l ga T	<b>598</b>	81	271 13	26 1	36 2		16 1	59 3	173 9	1 T	5 T		ı t		226 11	1 T	19 1	10 T	33 2	12 1	3 T	3 T	11 1	 1 T	11 1	28 1	2 T	2,020 100 100	- ) )
Form: bowl jar l ladle	597	81	271	26	36	1	9 7	31 28	80 86 7	1	1 4	1	1	184 200 7	88 138	1	3 16	5 5	11 22	8	3	3	11	1	9 2	26 2	2	-	
Temper: trachyte 0 culinary column %	) 189 32	2 14	41	16 62	31 86																								
Ware % Chuska culinary %	K	50 culi 36	% nary %							325 Cibo	ζ bla				lt% unk.		Cł	3% iuska		l Tusa	% iyan	т м.v.	1% smudg		2% redw	are		100	)

Table 8.21. Ceramics recovered by F. H. H. Roberts, Jr., from Test 1 (Stations 232-235) in the West Court at Pueblo Bonito in 1925 and resorted using the Chaco Center typology.<sup>a</sup>

 $^{a}$ Smithsonian Institution collections (NMNH), Lot 124, Catalog # 334174. Levels are natural units, 3 feet square.  $^{b}{\rm T}{\rm =}$  trace (less than 0.5%).

Table 8.22. Ceramics recovered by F. H. H. Roberts, Jr., from Test 2 (Stations 244-252) in the West Court Trench at Pueblo Bonito in 1925. Test was above Pithouse 1 and just south of the unexcavated great kiva. The ceramics were resorted using the Chaco Center typology.<sup>a</sup>

Level	Lino gray	Plaín gray	Wide neckbanded	Narrow neckbanded	Unclass. indent. corrug.	PII-III indent. corrug. rim	BILL-PI mineral (unpolished)	BIII-PI minecal (polished)	Kistuthlanns B/w	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Callup B/w	Chaco B/w	Chaco-McElmo B/w	Unclassified mineral	Plain whiteware	Brimhall B/w	Drolet B/w	Pena B/w	Tunicha B/w	Newcomb B/w	Chuska B/w	Unclass. Chuskan carbon		Black Mesa/Sosi B/w Kana'a B/w	Unclass. Tusayan whiteware	Unclass. Little Colorado whiteware	McElmo B/w	Unclass. Mesa Verde white (carbon)	Forestdale smudged	Unclass. Tsegi orangeware	Abajo R/o	Bluff B/r	LaPlata B/r	Sanostee B/r (Chuskan) Unclass. San Juan redware	Total	м
A (0-18")		25	I	9	28						15	1	1	4		7	23	26						1	1 2					9	3	1					1	153	16
(0-46 cm) B (18-24")		101	3	37	58					2	24		4	18	7	9	74	48				2		5	5 11		1 2		1	7	6	4	2				1 3	430	45
(4661 cm) C (24-50") (61-127 cm)		98		33	41	t	1		4	2	28			7			67	58	1	1	1	2	ı	15	58		4			2			3				33	375	39
Subtotal %		224 23	4 T	79 8	127 13	I T	1 T		4 T	4 T	67 7	1 T	5	29 3	7	16 2	164 17	132 14	1 T	l T	1 T	4 T	1 T	1 11 T 1	21		5 2 1 1	-	1 T		9 1	5 1	5 1			-	4 7 T 1	958	100 98
D (50-62")		91	5	23	3				1	1	14						59	33		1		4			9		4						1				4	253	15
(127-157 cm) E (62-69")		94	1	43	2				2	5	30						55	32			1	5	2		14		2	1									4	299	18
(157175 cm) F (6986")	2	192	13	65			1	1	5	5	32						124	57		5		6			12		3	6						2	5		34	543	33
(175-218 cm) G (86-100")		89	14	17			2	3	3	2	13		2				63	30									4						4		1	1	91	258	16
(218-254 cm) H (100-110")		38	2	2				2	2		11						31	16			1						1							1			1 2	110	7
(254-279 cm) I (110-124")		63	4	3					4	3	14						23	15		2							3	3					2			1	1 8	142	9
(279-315 cm) J (124-133")	2	15	2	2					1									3										1				1						27	2
(315-338 cm) K (133-144") (338-366cm)		8															4	1												!								13	1
Subtotal %	4 T	590 36	47	155	5 T		3 T	6 T	18 1	16 1	114 7		2 T				359 22	187 11		7 T	2 1 T	5	2 T		35	1	.7	 11 1				1 T	7 1	3 T	6 T	2 I T	8 12 1 1	1,545	101 97
Total Z <sup>b</sup>	4 T	814 31	51 2	234 9	132	1 T		6 T	22 1	20 1	181 7		7 T	29 1	 7 T	16 1	523 20	319 12	l T	9 T	3 I T	.9	3 T		56	2	2 2 1 T	11 T	ן ד	14 1	9 T	6 T	12 T	 3 т	6 T	2 2 T	2 19	2,603	 97
Form: bowl jar other	4	814	51	234	132	1	3	5 1	17 5	12 8	92 86 3	1	1 5 1	6 23	1 6	4 12	232 282 9	95 221 3	1	9	1 2 1	4.5	1 2	1 1 10	20 36	ı	4 2 8	8 3	1	12 2	4	6	8 4	3	5 1	2 1	4 16 8 2 1		
Tempet: trachyte culinary col.%	1 25	238 29	12 24	107 46	58 44	1 100																																	
Ware % Chuska culinary %		47 culi 34	z nary Ż									31% Cibo	la					12% unk.				Ch	4% uska			т	1% `usay	an (	T Lit. 2010.	1 M.	z v.	T smud			27 redu	X ware	I		98

 $^{8}$ Smithsonian institution collections (NMNH), Lot 125, Catalog #334175.Levels are natural units, 3 feet square.  $^{5}T$  = trace (less than 0.5%).

Level	Plain gray	Wide neckbanded	Narrow neckbanded	Unclass. indented corrug.	PII indent. corr. rim	BMIII-PI mineral (unpolished)	BMIII-PI mineral (polished)	Early Red Mesa B/w	Red Mesa B/w	Puerco B/w	Gallup B/w	Chaco B/w	Chaco-McElmo B/w	Unclassified mineral	Plain whiteware	Tunicha B/w	Newcomb B/w	Unclass. Chuskan carbon	Kana'a B/w	Unclass. Tusayan whiteware	Unclass. Mesa Verde white (carbon)	Forestdale smudged	nirrass. 1965t Arališekate	Harles True Lariada D/i	Unclass. San Juan redware	Total	54	
A (0-24") (0-61 cm)				2					2	1	ι			2	2											10	2	
B (24 -36") (61-91 cm)	23	l	9	29	2		1	3	9	1	25			51	30	1	1	2	1					2	1	192	45	
C (36-54") (91-137 cm)	16	3	7	43	3	1		1	6	1	9		1	30	11			2	1	1	2	1			1	140	32	
D (54-86") (137-218 cm)	1		3	30	1				3	2	16	3		18	12											89	21	
Total %	40	4	19	104	6	1	1	4	20	5	51	3	1	101	55	1	1	4	2	1	2	1	2		1 1	431	100	
Form:	9	1	4	24	1	T	т	1	5	1	12	1	Т	23	13	Т	T	1	Т	т	Т	T	Т		ΤT		96	
bowl jar other	40	4	19	104	6	1	1	1 3	12 8	2 3	17 33 1	1 2	1	47 54	20 34 1	1	1	1 3	1	1	2	1	2		1 1			
Temper: trachyte culinary column %	8 20	2 50	5 26	58 56	5 83																							
Ware %		с	40% ulina	ary					(	43% Cibol	a				13% unknown		1% Chuska		1% Tusa	yan	Т М.V.	T smudg	r	1% edwa	re		99	
Chuska culinary %			45%	-																								

Table 8.23. Ceramics recovered by F. H. H. Roberts, Jr., from Test 4 between Room 136 and the South Refuse Mound(s) (Stations 175-180) at Pueblo Bonito and resorted using the Chaco Center typology.<sup>a</sup> Compare with Table 8.19.

<sup>a</sup>Smithsonian Institution collections (NMNH), Lot 127, Catalog #334177. Levels are natural units, 3 feet square.

#### 630 Pueblo Alto

Ceramics recovered by F. H. H. Roberts, Jr., in 1926 from Test 5 in the East Court, southeast of Kiva 2 at Pueblo Table 8.24. Bonito, resorted using the Chaco Center typology.<sup>a</sup>

(depth) Level		rugitive red Lino gray	Plain gray with	Plain Gray	Wide neckbanded	Narrow neckbanded	Neck indent. corrug.	Unclass. indent. corrug.	BMIII-PI mineral (unpolished)	BMIII-PI mineral (polished)	Early Red Mesa B/w	Red Mesa B/w	Puerco B/w	Gallup B/w	Unclassified mineral	Plain whiteware	Drolet B/w (mineral)	Theodore B/w	Tunicha B/w	Unclass. Chuskan carbon	Lino B/g	Kana'a B/w	Unclass. Tusayan whiteware	Lino smudged	Unclassified smudged	Abajo R/o	Bluff B/r	Unclass. San Juan redware	Sanostee B/r (Chuskan)	Total	м
A (0-15"	')			1		1		1				2	ł		11	7				1		1							1	33	4
B (15-19	") ~			10	ı	1			1			2			ι	4	:												1	21	3
C (19-21	") (m)			ı										1	2															4	1
D (21-26	") (")			13	2					1		1			3	2	:													22	3
E (26-30	(") (m)			8																										8	1
F (30-37 (76-94	") cm)		1	11	ι	1			1	1					1															17	2
G (37-39 (94-99	") сп)		ı	5												1	2						1							10	1
н (39-42 (99-107	") cm)			1																										1	т
I (42-48 (107-12	") 2 cm)			8		1						2			1	1	- -					2								15	2
J (48-54 (122-13	") 7 cm)			7				1				2		2	3	3												1		19	2
K (54-56 (137-14	") -2 cm)			7	4							2			1	3			2	3					1					23	3
L (56-60 (142-15	") 2 cm)			12	2	2			2	1	6				12	7				2		1	1							48	6
M (60-62 (152-15	") 7 cm)			9	l	3									3	3	1			1		2								23	3
N (62-66 (157-16	") 18 cm)			18		4	1			2		7			11	6				3			:						1	53	7
0 (66-77 (168-19	") 16 cm)		2	26	ı	1			4	1					2		1					2						1		41	5
P (77-86 (196-21	") 8 cm)	2	1	66	3	1			3						3	1													3	93	12
Q (86-10 (218-27	)8") '4 cm.)	9	9	186	22	2			13	8					7		1	2			3	4	3	3		3	1		8	294	38
R (108-1 (274-29	.16") 15 cm)			12					1	1						l					1									16	2
S (116-1 (295-30	.20") 5 cm)			27	1											2				2	l									33	4
T (120-1 (305-32	27") 3 cm)			3						2																				5	1
Total			34	437	38	17	1	2	25	17	6	18	1	3	61	41	5	2	2	12	5	12	5	3	4	3	1	 2 T	14	779	100
Form: bowl jar other		1 9 : 1	4 34	437	38	17	1	2	15 10	10 7	4	2 7 10 1	1	3	8 32 29	11 30	2 2 1	2	2	2 6 6	2	3 9	23	3	1	2	1	1	13 1		,,
Temper: trachyte culinary column 2		0	0	75 17	20 53	7 41	1 100	2 100																							
Ware %					69%	rv						17%	9			5%		(° <b>Þ</b>	3%		Ŧ	3% 5ave	n	Smur	l% iged		3 red	% ware			101
Chuska cu	ılinar	у %		cu	19%	- 7						100L	a			uuk.		CU	uəra	·	ιu	Jaya	•	a and	Aca		• ¢4				

asmithsonian Institution collections (NMNH), Lot 128, Catalog #334178. Levels are natural units, 3 feet square.  $b_T$  = trace (less than 0.5%).

Level (depth)	Plain gray	Narrow neckbanded	Neck indent. corrug.	Unclass. indent. corr.	PII indent. corr. rim	Red Mesa B/w	Gallup B/w	Unclassified mineral	Plain whiteware	Unclass. Chuskan carbon	Black Mesa/Sosi B/w Kana'a B/w	Forestdale smudged	Unclass. Tsegi orangeware	Unclass. San Juan redware	Total	%
A (0-17") (0-43 cm)	22	8	1	5		7	2	15	8		1 1		1	-	71	35
B (17-23") (43-58 cm)				n	o t	S O	rted									
C (23-31") (58-79 cm)	31	8	1	7	2	24		28	26	2		1		4	134	65
D-O (31-135") (79-343 cm)				n	ot	so	rted				-					
Total	53	16	2	12	2	31	2	43	34	2	1 1	1	1	4	205	100
%p	26	8	1	6	1	15	1	21	17	1	тт	Т	Т	2		99
Form: bowl jar other	53	16	2	12	2	15 16	2	15 28	16 18	2	1 1	1	1	4		
Temper: trachyte culinary column %	9 17	8 50	1 50	7 58	1 50											
Ware %		cu	41% lina	ry			37% Cibola		17% unknown	1% Chuska	1% Tusayan	1% smudged	2% Tsegi S	an Juan		100
Chuska culina	ry		31%										redwa	re		

Table 8.25.	Ceramics recovered by F. H. H. Roberts, Jr., from Test 6 below the Type 4 masonry
	under Room 156 in Pueblo Bonito and resorted using the Chaco Center typology. <sup>a</sup>

<sup>a</sup>Smithsonian Institution collections (NMNH), Lot 129, Catalog #334179. Levels are natural units, 3 feet square. <sup>b</sup>T = trace (less than 0.5%).
Table 8.26. Ceramics recovered by F. H. H. Roberts, Jr., from Test 7 (Stations 122-125) in the West Mound at Pueblo Bonito in 1921 and resorted using the Chaco Center typology.<sup>a</sup> Compare with Table 8.20

(depth) Level	Lino gray	Plain gray	Narrow neckbanded	Unclass. indent. corr.	PII indent. corr. rim	PII-III indent. corr. rim	P[II indent. corr. rim	Red Mesa B/w	Ëscavada B/w	Puerco Bw	Gallup B/w	Chaco B/w	Chaco-McElmo B/w	Unclassified mineral	Plain whiteware	Chuska B/w	Toadlena B/w	Unclass. Chuskan carbon	Kana'a B/w	Black Mesa/Sosi B/w	Unclass. Tusayan whiteware	Unclass. Mesa Verde white (carbon)	Forestdale smudged corrug.	Forestdale smudged	Unclass. Tsegi orangeware	Bluff B/r	Unclass. San Juan redware	Sanostee B/r (Chuskan)	Total	24
A (0-12") (0-30cm)		4	2	40		1				2	29	3	1	26	15	1		4		2	2			3	8	1			144	12
B (12-17") (30-43cm)				5	1					1	2	ı		6	4														20	2
C (17-31") (43-79cm)	1	4		63	2			2	1	3	25	2		33	15					3			1	10					165	14
D (31-38") (79-97cm)		1		29			1			4	12	1		ı	8									3					60	5
E (38-43") (97-109cm)										not	sor	ted																		
F (43-48") (109-122cm)										not	sor	ted																		
G (48-53") (122-135cm)			2	12			3				6			5	12			1					1	2	3				47	4
H (53-60") (135-152cm)			4	32	3					6	13	4		24	18		ı	1						11	1				118	10
I (60-64") (]52-163cm)		3		22	2	2				1	8	1	1	5	7							1		1					54	4
J (64-70") (163-178cm)		2	1	54	1					4	11	ı		10	8		1							3	4				100	8
K (70~75") (178-191cm)										not	sor	teđ																		
L (75-80") (191-203cm)										not	sor	ted																		
M (80-91") (203-231cm)										not	sor	ted																		
N (91-114") (231-290cm)		21	14	32	3			2		7	19	2		31	18					1				1				ı	152	13
0 (114-144") (290-366 cm)	,	9	10	35				5			18	1		32	20			2						3			1		136	11
P (144-149") (366-378 cm)	,	1	ı	20	2					2	13	2		10	2	1	ı			1				2					64	5
Q (149-173") (378-439 cm)	,									not	905	ted																		
R (173-177") (439-450 cm)	,									not	sor	ted																		
S (177-189") (450-480 cm)	ł									not	sor	ted																		
T (189-207") (480-526 cm)	,	7	4	36	2	1				2	21	2		20	10				1					4					110	9
U (207-212") (526-538 cm)	)	2	3	6							4			4	3														22	2
V (212-216") (538-549 cm)	,													1															1	т
₩ (216-233°) (549-592 cm)	,	1	3					3						4	3												1		15	ı
Total	1	61	44	386	16	4	4	12	1	32	181	20	2	212	143	2	3		1	7	2	1		45	16	 1 T	2 T	1	1208	100
Form: bowl jar other Temper: trachyte	1	61	44	386	16	4	4	6 6	1	11 20 1	42 138 1	6 14	2	65 142 5	42 100 1	1	1 2	2 5 1	1	7	2	1		45	13 3	1	2	l		
culinary column %	0 0	9 15	16 36	137 35	6 38		3 -   8 -																,			24				101
Ware %				43% culin	ary					3 Ci	8% bola				12% unk.	CI	1% nuska		Tu	1% sayan		т м.v.	4% saud	ged	re	24 dwa)	re			101
Chuska culinary	1 %			33%			[								[									- 1					I	

aSmithsonian Institution collections (NMNH), Lot 130, Catalog #334180. Levels are natural units, 3 feet square. bT = trace (less than 0.5%).

(depth) Level	Plain gray	Narrow neckbanded	Unclass. indented corrug.	PII indent. corrug. tim	<pre>PII-tII indent. corrug. rim</pre>	PIII indent. corrug. rim	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Chaco-McElmo B/w	Unclass. mineral	Plain whiteware	Chuska B/w	Toadlena B/w	Unclass. Chuskan carbon	Black Mesa/Sosi B/r	Unclass. Tusayan whiteware	McElmo B/w	forestdale Smudged Corrug.	Forestdale Red	Puerco B/r	Wingate B/r	Unclass. White Mt. redware	Unclass. Tsegi orangeware	Unclass. San Juan redware	Total	×
A (0-17") (0-43 cm)	5	7	112	3			1	2	4	18	4	6	47	33		2	3		1	2	56		2	2	ı	1		312	23
B (17-31") (43-79 cm)	1	1	24		4		2		3	26	5		13	21	1	1		3			8	1					2	116	9
C (31-34") (79-86 cm)		1	20		3				1	9	2	1	ı	8							3							49	4
D (34-39") (86-99 cm)	1		33	1	2				3	18			7	17				6										88	6
E (39-47") (99-119 cm)	2		97		3				1	12	3		6	6				3		1		1					1	136	10
F (47-60") (119-152 cm)	1		27	1	5				7	21	3	I	13	15	1					3								98	7
G (60-68") (152-173 cm)	2		11							15	1		11	4													1	45	3
H (68-77") (173-196 cm)	3		58		1			1	3	14	2		29	17	1	1		4			5	2		1				142	10
I (77-85") (196-216 cm)									not	sorte	đ																		
J (85-94") (216-239 cm)	3	10	31	1					1	17	4		11	8	1	1		2	1		3							94	7
K (94-98") (239-249 cm)		1	8						7	6			10	7		2					6							47	3
L (98-106") (249-269 cm)									not	sorte	d																		
M (106-110") (269-279 cm)		1	19	4		1			9	20	1	1	29	15		3					23					2		128	9
N (110-116") (279-295 cm)									not	sorte	d																		
0 (116-121") (295-307 cm)	1	2	4	1				1	3	6			19	9					1		5							52	4
P (121-128")) (307-325 cm)	1	1	34	1						3			3	4			1					9						57	4
Total Z <sup>b</sup>	20 1	24 2	478 35	12 1	18 1	1 T	3 T	4 T	42 3	185 14	25 2	9 1	199 15	164 12	4 T	10 1	4 T	18 1	3 T	6 T	110 8	1 12 T 1	2 T	3 T	1 T	3 T	4 T	1,364	99 98
Form: bowl jar other	20	24	480	12	18	1	2	3 2	12 18 3	56 129	10 15	1 5 2	78 119 2	52 112	3 1	6 4	2 2	17 1	1 2	2 4	109	1 12	2	3	ì	3	2 2		
Temper: trachyte culinary column %	7 35	9 38	144 30	6 50	5 28	1 100																							
Ware %			4J culir	l% nary						34% Cibol	a			12% unknown	Ch	1% uska		2 Tus	% ayan	т м.v.	92 smud	lgeđ		re	1% edwa	re			100
Chuska culinary	72		31	1%			1																						

Table 8.27. Ceramics recovered by F. H. H. Roberts, Jr., from Test 8 (Stations 80-83) in the East Mound at Pueblo Bonito in 1924 and resorted using the Chaco Center typology.<sup>a</sup>

aSmithsonian Institution collections (NMNH), Lot 131, Catalog #334181. Levels are natural units, 3 feet square.  $b_T$  = trace (less than 0.5%).

(Tests 7 and 8) revealed a different picture--not "illogical and confusing," as Judd would have us believe. Both deposits were clearly dominated by nearly identical Gallup assemblages, both in the excavated deposits (Tables 8.26-8.27) and on the surface (Table 8.28). Red Mesa Black-onwhite was a mere trace in the overall group. There was no indication of mixed or redeposited trash. It was strange that Judd found both mounds confusing but suggested the solution lay with redeposited fill dumped only in the West Mound. He had no answers for the nearly identical East Mound (Plate 8.11).

In summary, and of direct interest to our study here, the Pueblo Bonito mounds apparently were deposited between about A.D. 1050 and 1100 in well-stratified layers. Roberts (1927:30) found that the "strata were so clearly marked that it was more practical to follow them than to choose some set measurement." Furthermore, "some of the layers were very thick and gave indication of having been deposited all at one time" (Roberts 1927:59). The composition of the mounds, however, was not readily identified as household refuse (Judd 1964:212, 214) and seemed to be primarily of sand and lesser quantities of construction debris. The sherd density for the two mounds (East =  $420 \text{ m}^3$ , West =  $358 \text{ m}^3$ ) was low, and the surface was not noticeably stained by ash and charcoal. It is notable that walls enclosed the two mounds after considerable accumulation had Lekson (1984:143) believes that these walls comprised plattaken place. forms rather than for retaining trash. A thick horizontal layer of clay in the West Mound (Plate 8.10A) supports his contention. Despite some trenching, there was no evidence for enclosure walls in other greathouse mounds except at Tsin Keltsin, however, and no horizontal surfaces were noted, which suggest that the Pueblo Bonito mounds were special. Nevertheless, given the great size and location of greathouse mounds it is probable that all were part of the overall site design and planning [e.g., ritual landscaping (Stein 1987)].

#### Pueblo del Arroyo

Although it is not known with certainty if there was an extramural refuse mound at Pueblo del Arroyo, there may be some remains of one (Figure 8.6). Other greathouse dumps both in and outside of Chaco Canyon are always to the southeast or south of the pueblo. At Pueblo del Arroyo this location is now deeply cut by the Chaco Wash, but Judd (1959:122) noted that debris could be seen in old photographs where an area was cut by the wash. Jackson (1878:Plate 59) showed a masonry wall 30-90 m long and about 15 m southwest and parallel to the ruin that is still evident today. Judd (1959:120) believed that the wall was placed to divert flood waters from the Chaco Wash. Jackson (1878:443) found, however, that

below the remains of these walls, and extending out into the main arroyo to a depth of 14 feet below the surface, is an undulating stratum of broken pottery, flint-chippings, and small bones firmly embedded in a coarse gravelly deposit. I traced this stratum for several rods along the smooth perpendicular face of the wash, where

	Plain gray	Plain gray (fugitive red)	Narrow neckbanded	Unclass. indented corrug.	PII indented corrug.	PII-III indented corrug.	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Chaco-McElmo B/w	Unclassified mineral	Plain whiteware	Tunicha B/w	Toadlena B/w	Unclass. Chuskan carbon	Kana'a B/w	Black Mesa/Sosi B/w	Unclass. Tusayan whiteware	Mancos B/w	McElmo B/w	Forestdale Smudged	Puerco B/r	Unclass. White Mt. redware	Unclass. Tsegi orangeware	Unclass. San Juan redware	Total	2
East Md. (W) East Md. (E)	8 6		10 7	134 77	3 1	2	1		5	17 2	2 3	3 3	22 14	37 21		1	3 2	1	1	4	·	2	4 7	ı —	3	1 1		258 153	63 37
Total % <sup>a</sup>	14 3		17 4	211 51	4 1	2 T	1 T		6 1	19 5	5 1	6 1	36 9	58 14		1 T	5 1	1 T	l T	4		2 T	11 3	1 T	4 1	2 T		411	100 96
Form: bowl jar ladle	14		17	211	4	2	1		4 2	7 12	2 3	3 2 1	14 22	14 44		1	5	1	1	4		2	11	1	3 1	2			
Chuskan culinary	2 14%		6 35%	97 46%	3 75%	1 50%																							
Ware % Chuskan culina	ary		6 culi 4	0% nary 4%					C	18% Cibol	a			14% unknown	C	1% Chusk	a	Tu	1% isaya	n	м	r .v.	3% smudg		2: red	% ware			99
West Md. (E) West Md. (W)	11 22	2	11 16	143	1	3	6 3	3	4	23 27	1 2	2 3	55 58	92 73	3	1	3		1 3	3	2	2	5	ι	1	2	1	371 390	49 51
Total %ª	33 4	2 T	27 4	295 39	l T	3 T	9 1	3 T	5 1	50 7	3 T	5 1	113 15	165 22	3 T	2 T	6 1		4 T	6 1	2 T	2 T	17 2	1 T	l T	2 T	l T	761	100 98
Form: bowl jar ladle	33	2	27	295	1	3	5 4	3	3 2	15 35	1 2	5	43 70	55 110	1 2	2	4 2		4	4 2	2	2	17	1	1	2	1		
Chuskan culinary	4 12%	0	11 41%	132 45%	0	3 100%									-														
Ware % Chuskan culina	ary		culi Z	47% Lnary 42%					¢	25% Cibol	a			22% unknown	0	1% Chusk	a	 	l% isaya	m	м	T •V•	2% smud		re	1% dware	9		99

Table 8.28. Ceramics tabulated from surface transects across the East and West Mounds at Pueblo Bonito. Compare with Tables 8.23 and 8.24. The transect locations are marked on Figure 8.5.

 $a_{\rm T}$  = trace (less than 0.5%).



Figure 8.6. Pueblo del Arroyo. Location of the possible former midden noted by Jackson and Judd, and the location of two early A.D. 1100s ("Chaco-McElmo") dumps.

it was clearly defined, and picked out many pieces of excellently painted shreds [sic] of pottery.

This wall was exposed in the eastern end of an old channel that now cuts next to Pueblo del Arroyo along the southern side. Thus, the trash that caught Jackson's eye was located southeast of the ruin where refuse might be expected to have been dumped, and Judd (1959:Plate 53b) confirmed that refuse or debris was located there. Thus, it is reasonable to postulate that a midden once existed in the area in question. On the basis of the structure and content of the refuse mounds at Pueblo Alto, Pueblo Bonito, Peñasco Blanco, and Chetro Ketl, we could expect that a mound for Pueblo del Arroyo would be little different.

In 1980 excavations for a drainage pipe in the Pueblo del Arroyo parking lot revealed dense trash between 70 cm and 240 cm below the surface. This yielded a late ceramic assemblage that Roberts might well have classified as Chaco-San Juan (Table 8.29), now known as Chaco-McElmo Black-on-white (see Windes 1985). The frequency of Chaco-McElmo is higher than any assemblage recovered from Pueblo Alto and indicates deposition in the early A.D. 1100s. The charcoal and the large size of the sherds suggest primary deposition. Dense trash of this time period is unusual in its deposition well outside the houseblock. Given the location of the trash, the eastern edge of a midden was probably destroyed by the trenching. Of special note was the recovery of fragments of a Chuskan, cylindrical vessel of Toadlena Black-on-white, one of the few non-Cibolan cylindrical jars known (see Toll 1986). Judd (1959:156, Plate 55) recovered three redware cylinder jars from Room 15 in Pueblo del Arroyo incorporating sherd and sand temper (White Mountain Redware?), and Pepper (1920:120) found another redware one at Pueblo Bonito.

Another refuse dump dominated by "Chaco-San Juan" also occurred alongside the main back wall (Roberts 1927:239). The prominence of "Chaco-San Juan" ceramics at Pueblo del Arroyo (Windes 1985) led Roberts (1927:240) to speculate that the pueblo was a manufacturing center for this type.

Despite the absence of a well-defined trash mound at Pueblo del Arroyo, the ceramic assemblages from the rooms and kivas fit well with the tree-ring dates (See Robinson et al. 1974:36). Large amounts of Gallup and lesser amounts of Red Mesa and Chaco-McElmo black-on-whites were frequent in the room and kiva tabulations. The almost total absence of plain gray and banded culinary ware suggest that there is an absence of a Red Mesa assemblage at the site and that construction postdated A.D. 1050.

#### Chetro Ketl

Although extensive trenching of the refuse dump southeast of the pueblo has taken place (Figure 8.7), we know little of the content or stratigraphy of that great mound. According to Hawley (1934:31) it was trenched north-south and east-west by Hewett in 1922 (with trenches 11-ft

	Plain gray	Narrow neckbanded	Unclass. Indented corrug.	PII indented corrug. rim	PII+III indented corrug. rim	PIII indented corrug. rim	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Chaco-McElmo B/w	Unclassified mineral	Plain whiteware	Unclass, nonChacoan mineral	Chuska B/w	Toadlena B/w	Nava B/w	Unclass. Chuskan carbon	Black Mesa/Sosi B/w	Sosi B/w	Unclass. Tusayan whiteware	Holbrook B/w	Mancos B/w	McElmo B/w	Unclass. Mesa Verde whiteware (carbon)	Forestdale smudged corrugated	Forestdale smudged	Wingate B/r	Puerco 8/r	Unclass. White Mt. redware	Tusayan B/r	Unclass. Tsegi orangeware	Total	*
TRENCH BACKDIRT (not screened) % <sup>D</sup>	2 T	9 1	382 37	11	43 4	10 1	3 T	25 2	42 4	89 9	25 2	62 6	76 7	120 12	1 T	5 T	22ª 2	2 T	16 2	2 T	9 1	l T	2 T	5 T	34 3	7 l	1 T	14 1	3 T	12	3 T	l T	2 T	1041 97	
TEST PIT 1           Levels (in cm)           1 (70- 80)           2 (80- 90)           3 (90-100)           6 (120-130)           7 (130-140)           9 (150-160)           10 (160-170)           11 (170-180)           12 (180-190)           13 (190-200)           14 (200-210)           15 (210-220)           16 (220-230)           17 (230-240)	1	1 2 2	11 11 8 5 32° 13 18 15 7 9 6 10 9 4 1 14 12		1 1 1	2		1 1 2 2	2 1 3 1	1 2 3 1 3 5 5 1 2 3 4 2	ı	2 1 2 1 1 1 1 2 2	3 2 4 3 1 1 1 2 6 1 2 1 5 2	5 3 1 3 1 2 4 3 2 1 2 3 9 8		1 2 2	23		2 1 1 1 1				1	1	1 1	1 1 2 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 2 1 1 1 1	1	1 ]	12		1	25 23 16 44 30 31 13 21 13 22 13 12 13 12 11 38 31	6 6 4 11 8 8 8 3 5 3 6 3 3 3 10 8
Subtotal %b	l T	5 1	185 48		3 1	2 1		7 2	8 2	32 8	l T	14 4	34 9	47 12		5 1	5 1		5 1				1 T	1 T	3 1	7 2	5 1	7 2	l T	5 1	3		1 T	388	99 99
Total X <sup>b</sup>	3 T	14 1	567 40		46 3	12 1	3 T	32 2	50 3	121 8	26 2	 76 5	110 8	167 12	1 T		27 2	 2 T	 21 1	2 T	 9 1			6 T	37 3		6 : T	 21 1		 17 1		1 T	 3 T	1429	97
Form: bowl jar other	3	14	567	11	46	12	1 2	14 16 2	21 29	21 99 1	6 20	33 37 6	36 71 3	38 127 2	1	7 3	17 9 1	2	10 11	2	7 2	1	2 1	3 2 1	27 9 1	13 1	6 3	21	4	17	6	1	3		
Chuskan culinary	3 100%	8 57%	313 55%	4 36%	25 54%	6 50%																													
Ware %		cu	46% Linar	y					с	29% 1bol	a			12% unk.		Ch	4% iuska	n		Tu	1% saya	пá		Mesa	4% Ve:	rde	27 smud	ig l	Whi	2% te M	lt.	T Tse	gi		100
Chuskan culina	гy		55%																	Litt	le C	olor	ado										-		

Table 8.29. Ceramics recovered from construction of a drainage trench across the Pueblo del Arroyo parking lot in 1980.

<sup>a</sup>Includes fragments of a cylindrical jar. <sup>b</sup>T = trace (less than 0.5%). <sup>C</sup>Includes fragments of a Patayan Corrugated jar.



Figure 8.7. Chetro Ketl and the associated midden with the location of the many tests noted. Jackson (1878:Plate 57) noted two other middens directly south of the greathouse that are not evident now.

wide cut by horse-drawn scrapers) without deep excavations on the northern and western sides. This is partly wrong. In fact, it was bisected northsouth and east-west in 1920 by Hewett, who also removed a large section along the western side (Hewett 1921:47, 53-55). An additional pit was sunk at the center by Anna Shepard (F. Hawley Ellis, personal communication 1980) in 1929. Hawley's work in 1930 and 1931 involved yet another east-west trench at the northern end. Material collected from it was screened (1/4 in.) and saved (F. Hawley Ellis, personal communication 1980) and should have been curated at the Museum of New Mexico. There is a suspicion, however, that the bulk material was thrown out during the tenure of Paul Reiter who often had the chief groundskeeper at the museum, Sam Huddleson, remove the older materials to the city dump (Marjorie Lambert, personal communication 1980).

Tree-ring dates, instead of stratigraphy, suggested to Hawley (1934: 79-80) that it took just 38 years for the entire deposition of the Chetro Ketl mound, a mammoth deposit 62.5 by 36.5 m and 6.1 m deep, with a volume between approximately 6,200 and 7,800 m<sup>3</sup> (Table 8.14).

Hawley's (1934:34) observation that the change in ceramic design was trifling suggests that considerable homogeneity must have existed for the ceramics in the refuse mound. She, like Judd, believed that much secondary deposition took place (Hawley 1934:35, 60-61). Although Hawley did not employ a typology familiar to us today, she later named and redescribed her primary painted types from the mound as Escavada, Gallup, and Chaco black-on-whites based primarily on the presence and absence of polish (Hawley 1936:32, 42-44). Her Escavada included types we have called Escavada and Gallup black-on-white, incorporating both solid and hatched designs, and Red Mesa Black-on-white. Gallup, the name she applied to the polished examples, was the same as our Gallup and Puerco black-on-whites. She (personal communication 1980) remembers very little Red Mesa or Chaco Black-on-white being present. An examination of the mound surface revealed a clear Gallup ceramic assemblage (Table 8.30).

The descriptions and figures of the Chetro Ketl mound stratigraphy are such that it is unclear if the internal structure of the mound was similar to others in the canyon. Hawley (1934:33, Plate 14) described just four major strata, although at least one profile (possibly that shown in Hewett 1936:59) reveals eight layers of which three were described as "packed debris". She (personal communication 1980) affirmed the descriptions of the stratigraphy that generally revealed dismantled house rubble (not building-construction debris) and household refuse including charcoal. Roberts (1927:243) stated that the mound had very clear stratification. This suggests that it differed little from the others he investigated. Certainly, he would have mentioned it if it were not, although he must have examined Hewett's earlier sections and not Hawley's.

But Roberts (1927:242-243) confuses the issue by saying that "the great bulk of the wares are of the Chaco-San Juan group." There is no present evidence for this. He goes on to say that Hachure C (Chaco Black-on-white) was quite rare and that "the pueblo was of the period of Pueblo

	Plain gray	Narrow neckbanded	Neck indented corrugated	Unclass. indented corrug.	PII indented corrug. rim	PII-III indented corrug. rim	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Chaco-McElmo B/w	Unclassified mineral	Plain whiteware	Newcomb B/w	Chuska B/w	Toadlena B/w	Unclass. Chuskan carbon	Black Mesa/Sosi B/w	Unclass. Tusayan whiteware	Mancos B/w	McElmo B/w	Forestdale Smudged	Puerco B/r	Unclass. White Mountain redware	Unclass. Tsegi orangeware	Total	84
Dike N strip NE Quad NW Quad SE Quad SW Quad	3 1 1 2 2 1	12 3 5 7 3 12	2	157 113 110 131 126 150	10 3 1 3 4 2	3 1 2 2	3 3 1 2 8	1 1 1	6 4 11 7 15 8	35 26 23 29 30 55	1 2 3 6 9	2 1 1	41 16 20 35 43 34	78 27 47 37 54 48	1 1	1 1 1 1 2	1	3 2 3 3 3 5	1 2 1 3 5 2	1	1 1 2	1	7 4 5 1 2 5	2	1	3 1 3 2 4	368 208 240 270 304 355	21 12 14 15 17 20
Total %ª	10 1	42 2	3 T	787 45	23 1	8 T	20 1	3 T	51 3	198 11	22 1	4 T	189 11	291 17	2 T	6 T	3 T	19 1	14 1	3 T	4 T	2 T	24 1	3 T	1 T	13 1	1,745	99 97
Form: bowl jar other	10	42	3	787	23	8	10 10	3	24 26 1	65 131 2	5 17	2 2	86 102 1	72 218 1	1 1	4 2	2 1	10 9	13 1	3	4	1 1	24	3	1	9 4		
Chuskan culinary	2 20%	15 36%	1 33%	295 37%	9 39%	5 63%																						
Ware % Chuskan	culina	ry	50% culi 37%	% nary %		i			с	28% ibola				17% unk	CI	2% nuska	1		1% Tusaya	n	T M•V	<i>.</i>	1% smud	Wh.M	1% it • 7 redwar	ſsegi res		100

Table 8.30. Ceramics tabulated from surface transects across the remaining hummocks of the Chetro Ketl East Trash Mound. The transect locations are marked on Figure 8.7.

 $a_T = trace (less than 0.5%).$ 

del Arroyo and Pueblo Alto, the Classic period in the Chaco," in other words, the period dominated by Hachures A and B (i.e., a Gallup assemblage).

Although less is known of the excavations at Chetro Ketl than for the others in the canyon, it is still apparent that Chetro Ketl shared a similar history of ceramic deposition with Pueblo Alto and Pueblo Bonito. Ceramics found in the room and kiva excavations were well represented by late carbon assemblages (including Chaco-McElmo and McElmo Black-on-whites and Chuska wares) as well as White Mountain Redwares that mark an early A.D. 1100s deposition.

Essentially, the Chetro Ketl mound appears to be primarily a Gallup assemblage deposited between A.D. 1050 and 1100. This is suggested by dated charcoal collected by Hawley (Hawley 1934:Protocol 2; Robinson et al. 1974:22) and the mound's close ceramic similarity to the Pueblo Alto Trash Mound. Although we are less certain about the stratigraphy of the mound, it appears to contain little ash or charcoal, at least on the present surface of these thoroughly churned deposits. Hawley's figures suggest a period of "dumpings" that may be similar to the deposition at the Pueblo Alto Trash Mound.

Other large mounds or trash areas might once have existed directly south of Chetro Ketl in a position analogous to those at Pueblo Bonito. These were noted by Jackson (1878:440, Plate 58) but have since disappeared. F. Hawley Ellis (personal communication 1980) did not recall their presence when she worked there in 1930; however, Marjorie Lambert (personal communication 1980) suspects that they did exist. Lambert remembers that Hewett deposited his backdirt in the same location as the suspected trash areas, and periodically removed the accumulations with scrapers. Lambert's recollection was later confirmed by an old photo taken in 1929 showing Sam Huddleson guiding his horse-drawn scraper around the front, southeastern corner of Chetro Ketl. Perhaps the refuse shown by Jackson in front of Chetro Ketl was only a light scatter of trash, although all those shown by Jackson and still extant today are large mounds. If Chetro Ketl had multiple, extramural mounds, they probably would have surpassed the total volume of those at Pueblo Bonito. Lekson (personal communication 1981) counters this argument by saying that it would be unlike Reiter or Hewett not to boast about the great volumes had the middens existed.

#### Tsin Kletzin

Directly south of Pueblo Alto, on top of South Mesa, is a small greathouse known as Tsin Kletzin. Vivian and Mathews (1965:109) considered it a McElmo phase ruin, primarily on the basis of the large, rectangular, dimpled blocks used in the construction. The ground plan, which includes a plaza enclosed by a southern arc of rooms, is similar to earlier (i.e, A.D. 1000s) canyon greathouses. To the south of the ruin is a small midden (Figure 8.8), sprinkled with a few spalls. This midden apparently was enclosed by a masonry wall that was exposed during testing



Figure 8.8. Tsin Kletzin and the associated trash and spall mound. A second concentration of spalls is indicated by the dashed ovoid. along the northern and eastern sides (Gwinn Vivian, personal communication 1987).

A transect across the surface of the low midden revealed primarily a Gallup ceramic assemblage (Table 8.16). There were also relatively high numbers of Puerco Black-on-white sherds but part had the solid design elements also found on Gallup jars. Red Mesa Black-on-white was not observed, and there was little evidence for neckbanded culinary jars. The presence of Chaco-McElmo and Black Mesa/Sosi black-on-whites and White Mountain Redware indicates deposition in the very early A.D. 1100s. The scant tree-ring evidence from the site, three cutting dates between A.D. 1111 and A.D. 1113 (Robinson et al. 1974:42) is in temporal agreement with the ceramic assemblage.

Nevertheless, the ceramic assemblage from Tsin Kletzin differs from other greathouse middens. Given the site's proximity to the cluster of greathouses in the canyon bottom, it might be expected to share a similar ceramic assemblage. Instead, the sample is clearly dominated by culinary ware, 64 percent of the total assemblage, by far the highest frequency encountered at any of the park middens. Nevertheless, Chuskan ceramics, which comprise almost half of the culinary wares on other canyon middens, are surprising rare (7 percent of the culinary). This scarcity is paralleled by a paucity of painted Chuskan types and of Washington Pass chert from the Chuska Mountains (Cathy Cameron, personal communication 1981). The contrast in midden materials with other contemporary greathouses may be related to the role of Tsin Kletzin as part of a widespread communications system (Hewett 1936:37; Hayes and Windes 1975:152-154).

## Peñasco Blanco

Peñasco Blanco's importance lies in its western canyon mesa-top position astride several prehistoric roads. In the latter regard, it is similar to Pueblo Alto and might have served to control the western accesses to and from the canyon as Pueblo Alto probably did on the northern side. Peñasco Blanco's relationship to the Chuska Valley is important because of the large quantities of Chuskan pottery (Toll 1984; Toll and McKenna 1983) and Washington Pass chert (Cameron 1984) that entered Chaco Canyon during its occupancy.

There has been little known work at Penasco Blanco. Jackson (1878: Plate 61) first mapped the site and noted either one or two refuse mounds to the east. A very large, extramural midden, known as the East Mound, lies to the east of the site, and more midden deposits stretch to the north of the East Mound (Figure 8.9) to the small attendant ruin outside the northeastern corner of Peñasco Blanco. These two areas of trash may have been what Jackson mapped. The northern scatter is a later deposition (early A.D. 1100s) than the East Mound (Table 8.31).

Roberts' 1926 work in the East Mound represented the only controlled excavations at Peñasco Blanco until Richard Loose tested the southern pre-



Figure 8.9. Penasco Blanco. Note the approximate locations of F. H. H. Roberts, Jr.'s test sections, and the 1981 surface transects. Dashed area marks a second refuse area that may be partly associated with a small house ruin just to the north (not shown).

	Lino gray	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrug.	Unclass. indented corrug.	PII indented corrug. rim	PII-III indent. corrug. rim	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Chaco-McElmo B/w	Unclassified mineral	Plain whiteware	Tunicha B/w	Newcomb B/w	Toadlena B/w	Unclass. Chuskan carbon	Kana'a B/w	Black Mesa B/w	Black Mesa/Sosi B/w	Unclass. Tusayan whiteware	Holbrook B/w	Mancos B/w	McElmo B/w	Forestdale Smudged	Unclass. Tsegi orangeware	Bluff B/o	Unclass. San Juan redware	Total	8
PENASCO BLA	NCO	EAST	MOU	IND:																													
S.Trans %		55 24	11 5	25 11	9 4	24 10	1 T		13 6	l T	3 1	8 3	1 T		20 9	43 19	2 1	1 T	1 T	7 3	2 1	l T				1 T		1 T		2 1		232	98
N.Trans <sup>b</sup> %	,	55 18	9 3	13 4	4 1	77 25	3 1	1 T	11 4	1 T	4 1	24 8	2 1		40 13	38 13	l T		1 T	8 3	2 1			2 1				3			3 1	302	99
Form: bowl jar ladle		110	20	38	13	94	4	1	11 12 1	1 1	2 5	9 22 1	3		20 40	26 55	1 2	1	2	8 7	4		1	1 1		1		4		1	2 1		
Chuskan culinary		36 33%	4 20%	20 53%	9 69%	46 49%	3 75%	0																									
Ware %					52%						-	24%				15%		4%					3%				r	1%		1%			100
Chuskan cul	ina	; y		c	42%	iry					C	1001	a			unknown		Chus	ka			Tu	saya	n		м	•••	smud	re	edwa	re		
PENASCO BLA	NCO	NE M	IDDE	:N :																													
Total %	1 T	32 13	4 2	6 2		108 43	1 T	4 2	7 3		3 1	4 2		4 2	19 7	43 17			3 1	7 3			l T	l T	l T	1 T	2 1	1 T	l T			254	99
Form: bowl jar ladle	1	32	4	6		108	1	4	2 5		1 2	4		2 2	8 11	10 33			2 1	3 4			1	1	1	1	1 1	1	1				99
Chuskan culinary	, 0	9 27%	1 25%	4 67%		68 65%	1 100%	2 50%																									
Ware % Chuskan cul	ina	y		cu	61% lina: 54%	ry.					С	15% ibol	a			17% unknown		4% Chus	ka			Tus Litt	1% ayan le C	& olo		м	1% •V•	T smud	re	T edwa	re		

Table 8.31. Ceramics tabulated from surface transects across the Peñasco Blanco East Refuse Mound and the refuse scatter to the north of the mound. The transect locations are marked on Figure 8.9.<sup>a</sup>

 $a_{\rm T}$  = trace (less than 0.5%).

bAbout 2/3s of Gallup and indented corrugated sherds at E end & 2/3s of Red Mesa & plain gray sherds at W end of N transect.

historic road next to the ruin in 1974 for the Chaco Center. Roberts left no maps of his work at Penasco Blanco other than the test profiles. Three obvious cuts are still evident across the East Mound (Figure 8.9), but it is uncertain which of Roberts' sections they represent. Probably the shallowest cut (Section 1) was on the northern end, the deepest cut in the center (Section 2), and the last on the southern end (Section 3). Profiles and notes of his work indicate that the East Mound has much stratigraphic similarity to the extramural mounds at Pueblo Alto and Pueblo Bonito. We can have considerable faith in Roberts' work, as well as his ceramic tabulations (Tables 8.32-8.34), because of his practice of excavating natural units of deposition rather than by some arbitrary His excellent commentary provides valuable insights into the standard. characteristics of the East Mound:

Three test sections were made in the dump heap at Penasco Blanco as a means of telling where that pueblo fitted into the Chaco series and also for the purpose of checking on the sequence as it had been developed at Pueblo Bonito. The results were even better than hoped for as there was an almost perfect correlation between the sherds from this site and the sequence already determined. The dump heap at Peñasco Blanco had accumulated on the slope of the hill to the east of the pueblo and the strata were in such a position as to enable one to secure material from every one by making three cuts. In addition to this it was possible to make these cuts so that the bottom stratum of the second coincided with the top layer of the first and the bottom layer of the third was the one which immediately followed the top This combination of stratigraphy and one of the second section. horizontal deposition gives a complete picture, without a break, of the ceramic features of the pueblo. The material comprising the various layers of this refuse mound is in general like that which has already been discussed and it will not be necessary to go into any detail concerning it. Section Number 2 contained the record of great building and alteration activities and Strata C and D were composed Otherwise there is nothing of almost entirely of masons' debris. note to be observed in the stratification. The rubbish heap had a normal growth, so to speak, with no signs of disturbance, no penetrations.

The factor of the debris of construction in the second section is of considerable interest for a number of reasons. Peñasco Blanco is the only ruin which shows a type of masonry in certain sections that is identical with that in the old portions of Pueblo Bonito, that indicates in general an antiquity comparable to that of the latter. It also shows considerable additions to and changes in its older parts. The material in Strat C and D of Section Number 2 is unquestionably that which resulted from major activities in the building line. The importance to be attached to this lies in the fact that beneath these two layers all of the pottery was of the Transitional and its degenerate form. All of the potsherds in the later layers contained specimens of the various forms already noted as having had a later development at Pueblo Bonito. In other words the new forms did not appear until extensive changes were being made in the pueblo. Α

Leve1	"plain gray"	"bands" (neck banded)	"corrugated" (indented corrugated)	"pre-pueblo" (BMIII-PI decorated)	"transitional" (early Red Mesa B/w)	"degenerate" (late Red Mesa B/w)	"Hachure B" (Gallup B/w)	"Hachure C" (Chaco B/w)	"not determined" (Unclass. dec. and plain whiteware)	"Chaco-San Juan" (Unclass. carbons)	"polished black interior" (smudged)	"transitional red" (San Juan redware).	Total	82
A (0-13")	295	124	22	1	166	57	4	3	40	4		12	728	54
B (13-18")	67	33	3	2	64	4							173	13
C (18-22")	39	20		1	39						1	1	101	7
D (22-32")	96	55	3	4	123						1	7	289	21
E (32-39")	35	6			19							3	63	5
Total %	532 39	238 18	28 2	8 1	411 31	61 5	4 T	3 T	40 3	4 T	2 T	23 2	1343	100 101
Ware %		59% culinary			w (prima	36% hiteware rily Cibo	1a)		3% unk.	T unk.	T unk.	2% redware		100

Table 8.32. Ceramics recovered by F. H. H. Roberts, Jr., from the East Refuse Mound (Section 1) at Peñasco Blanco.<sup>a</sup> Compare with Table 8.35.

<sup>a</sup>Smithsonian Institution National Anthropological Archives, F.H.H. Roberts, Jr., Papers, misc. collections #4851, Box 1, Folder 12. Sherds are now in the Smithsonian Institution collections (NMNH), Lot 116, Catalog #334166. Levels are natural units, 3 feet square.

Level	"plain gray"	"bands" (neck banded)	"early corrugated" (neck indented corrug?)		"pre-pueblo" (BMIII-PI decorated)	"transitional" (early Red Mesa B/w)	"early transitional" (early Red Mesa B/w?)	"degenerate" (Red Mesa B/w)	"solid" (Escavada/Puerco B/w)	"Hachure A" (Red Mesa and Gallup B/w)	"Hachure B" (Gallup B/w)	"not determined" (Unclass. decorated and plain whiteware)	"polished black interior" (smudged)	Indian red" Tusayan and San Juan red)	"transitional red" (San Juan redware)	Total	%
A (0-18")	27	2		34			15	20	2	3	3	18	1			125	4
B (18-24")	10	1		5			4	10			5	7	l			42	1
C (24-50")	58	28		7	3		29	43			1	28		1	1	199	7
D (50-62")	245	82		21	10	4	101	89		1	4	71	1		8	637	21
E (62-69")	126	59		17	1		87	45				51			3	389	13
F (69-86")	74	29					46	25				20			5	199	7
G (86-90")	99	58			3		86	33							6	285	9
н (90-110")	74	46	8		4		59	10					2		1	204	7
1 (110-124")	69	21			7		89	10					4			200	7
J (124-129")	142	50	7		1		117	17					5		14	353	12
к (129-144")	148	82			8		165	17					3	_	3	426	14
Total % <sup>b</sup>	1072 35	458 15	15 T	84 3	37 1	4 T	798 26	319 10	2 T	4 T	13 T	195 6	16 1	l T	41 1	3,059	102 98
Ware %		53 culir	3% hary				u (prima	38% whiteware wrily Ci	e lbola)			6% unk.	l% unk.	re	1% dware		99

Table 8.33. Ceramics recovered by F. H. H. Roberts, Jr., from the East Refuse Mound (Section 2) at Peñasco Blanco.<sup>a</sup> Compare with Table 8.35.

<sup>a</sup>Smithsonian Insitution collections (NMNH), Lot 117, Catalog #334167. Levels are natural units, 3 feet square.

 $b_T = trace (less than 0.5%).$ 

Trash Mound 649

Level	"plain gray"	"bands" (neckbanded)	"corrugated" (indented corrugated)	"transitional" (early Red Mesa B/w)	"degenerate" (late Red Mesa B/w)	"solid" (Escavada/Puerco B/w)	"Hachure A" (Red Mesa and Gallup B/w)	"Hachure B" (Gallup B/w)	"Hachure C" (Chaco B/w)	"not determined" (unclass. decorated and plain whiteware)	"Chaco-San Juan" (unclass. carbons)	"polished black interior" (smudged)	"Indian red" (Tusayan and San Juan red)	"cherry red" (White Mountain redware)	Total	84
A (0-13")	44	10	83	13	19	7	6	19	3	32	5	1	3		245	13
B (13-24")	37	7	66	6	19	8	8	17		18	2	2	3	2	195	10
C (24-30")	14		32		16	4	3	7	1	5	7	1	7		97	5
D (30-41")	32	3	69	6	22	8	4	22	4		12	1	1		184	9
E (41-49")	24	6	54	7	13	3	10	23	1	20 ·	1				162	8
F (49-63")	22	14	68	10	30		4	27		41	1	5	1		223	11
G (63-69")	24	14	71	9	28		2	25		14		1	1		189	10
н (69-73")	81	23	46	20	41	6	4	8	1	62		2		3	297	15
I (73-84")	57	21	33	19	22	1	4	19		29		1	1		207	11
J (84-88")	41	12	23	8	21	2	1	8		23		1	2		142	7
Total %b	376 19	110 6	545 28	98 5	231 12	39 2	46 2	175 9	10 1	244 13	28 1	15 1	19 1	5 T	1941	99 100
Ware %		53% culinar	у		(pr	31% whitew imarily	% ware Cibola	)		13% unk.	1% unk.	1% unk.	l ređ	% ware		100

# Table 8.34. Ceramics recovered by F. H. H. Roberts, Jr., from the East Refuse Mound (Section 3) at Peñasco Blanco.<sup>a</sup> Compare with Table 8.37.

<sup>&</sup>lt;sup>a</sup>Smithsonian Institution collections (NMNH), Lot 118, Catalog #334168. Levels are natural units, 3 feet square. <sup>b</sup>T = trace (less than 0.5%).

[sic] feature also apparent in the material at Pueblo Bonito. This feature gives good evidence to support the contention that the Transitional pottery was the type which belonged to the old and original sections of both Pueblo Bonito and Peñasco Blanco.

The appearance and development and increase in the later forms of pottery is well shown in the graphs and extensive discussion of them is not necessary. In making these graphs Stratum A of Section 1 was omitted as the same material, the same stratum, is [sic] in K of Section 2. This avoids the duplication of data and also removes the possibility of intrusive features through A having been the top layer of the mound at a point where late materials could easily have been deposited. With this omission the strata of Sections 1, 2, and 3 occur in an unbroken sequence.

One of the chief points of interest in the pottery from the refuse mound at Penasco Blanco is the absence of all foreign wares. Closely associated with this is the small number of Chaco-San Juan and late hachured decorations. It would seem that the pueblo ceased its activity, probably was abandoned at about the time the final period was getting under way at Pueblo Bonito. Of course no excavations have been made at Penasco Blanco and there is no material from the rooms to study and it may well be that when such is secured there will be a larger showing of later wares.

Perhaps the most interesting feature to be observed is the steady increase of corrugated culinary vessels and the accompanying decrease of the smooth bodied type. [Roberts 1927:63-65]

Roberts notes with interest the mass of construction debris in Section 2, Layers C and D, which he feels marks a period of major construction at the pueblo. This also marks a period of ceramic change, when Gallup Black-on-white (Hachure A and B) and, apparently, overall indented corrugated vessels first appear. Based on our work at Pueblo Alto and elsewhere in the canyon, we believe this shift occurred at approximately A.D. 1040-1050. It is perhaps relevant that there are no tree-ring cutting dates between A.D. 916 and A.D. 1045 from Peñasco Blanco, and that this might correspond to the absence of construction debris in the East Mound. Thus, the mass of cutting dates (40) that followed A.D. 1045 and extended to A.D. 1088 (Robinson et al. 1974:29-30; Lekson 1984:Table 4.2) would appear to postdate the deposition of construction debris in Layers C and D.

Two periods of intense construction seem apparent: A.D. 1061 (8 dates) and A.D. 1087/1088 (22 dates). We might expect a major trash deposit, dominated by a Gallup Black-on-white ceramic assemblage, to correlate with these late building episodes, although the East Mound apparently at best contains only a small volume of this A.D. 1000s material. Undoubtedly, some occupation continued at the site after deposition of refuse in the East Mound had ceased. Later ceramic assemblages (e.g., those dominated by carbon-painted types) probably are buried within the plaza and the main house block.

Ceramics from Roberts' tests (Tables 8.32-8.34) were re-examined and sorted by the author (Tables 8.35-8.37). These analyses revealed that the East Mound was dominated by a Red Mesa Black-on-white ceramic assemblage dating in the A.D. 900s and early A.D. 1000s. Surface tabulations (Table 8.31) suggested that there is also a smaller Gallup ceramic component (e.g., in the mid to late A.D. 1000s) in the midden, not revealed by Roberts' tests, that was similar to other greathouse mounds. The small quantities of Basketmaker III and Pueblo I ceramics associated with the Red Mesa assemblage may date the initial deposition slightly later than the early tree-ring dates of between A.D. 898 and 916 (Robinson et al. 1974:29-30) that were recovered from the site. The location of the early midden ceramics outside the arc of rooms enclosing the central plaza suggests that there was an earlier wall or arc of rooms at Peñasco Blanco, which determined the positioning of the East Mound.

In summary, the Peñasco Blanco East Mound shares many attributes with others in the canyon, although it differs on at least two counts: (1) the surface is noticeably darkened by ash and charcoal, which suggests that a major component of the refuse was from firepit cleanings, and (2) the ceramic assemblage predates those comprising the bulk of the other greathouse middens in the park. Roberts' observations of the stratigraphy, however, reveal a steady accumulation of units of deposition, easily distinguished from one another, that seem to mirror similar patterns of deposition at Pueblo Bonito and Pueblo Alto.

#### Hungo Pavi

Little can be said regarding a trash mound at Hungo Pavi except to reference Jackson (1878:438) who stated that "just outside of it [the southern plaza arc], near the centre, is the usual mound of rubbish." It has since mysteriously disappeared.

#### Una Vida

There appeared to be no large refuse mound at Una Vida despite one of the longest occupations at a greathouse in the canyon. Jackson (1878) made no mention of a mound, nor have others. Surely, large amounts of trash and construction debris were deposited somewhere nearby, and perhaps only future excavation will reveal their locations.

#### Wijiji

The very short occupation thought to characterize Wijiji would perhaps not result in a massive trash mound, although it is due in part to the absence of such a mound that occupation is considered brief. Extensive piping in recent years to the southwest of the ruin has revealed no refuse, and probably there is little to be found within or outside the

Level	Lino gray	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrug.	Unclass. indented corrug.	Kiatuthlanna B/w	Early Red Mesa B/w	Red Mesa B/w	Unclassified mineral	Plain whiteware	Pena B/w	Tunicha B/w	Newcomb B/w	Unclass. Chuskan carbon	Kana'a B/w	Cortez B/w	Forestdale Smudged	Bluff B/o	Unclass. San Juan redware	Sanostee B/r	Total	24
A								not	sorted													(700 <u>+</u> )	) -
В		41	9	13		3		5	10	21	17		2	2	5	2						130	26
С		26	5	5	2	1		1	12	8	10		3	3	4	1		1			1	65	13
D	1	69	13	23	4		3	14	22	34	17		8		5	5	2		1	2	1	223	45
Е		33	3	1			1	3	2	6	7	1	1		1	2	1			2		83	17
Total % <sup>b</sup>	1 T	169 34	30 6	42 8	6 1	4 1	4 1	23 5	46 9	69 14	51 10		14 3	5 1	15 3	10 2	3 1	1 T	1 T	4 1	2 T	501	101 100
Form: bowl jar ladle	1	169	30	42	6	4	2 2	10 12 1	21 24 1	28 41	8 42 1	1	5 9	1 4	2 13	5 5	1 2	1	1	3 1	1 1		
Temper: trachyte column %	0	56 33	9 30	22 52	5 83	4 100																	
Ware % <sup>b</sup> Chuska cul	lina	ry	5 cul 3	i0% ina: 88%	î y				28% Cibola		10% unknown		Ch	7% uska		2% Tusayan	1% M•V•	T smudged		l% redwan	re		99

Table 8.35. Ceramics recovered by F. H. H. Roberts, Jr., from Section 1 in the Peñasco Blanco East Refuse Mound that were resorted using current typology (compare with Table 8.32).

<sup>&</sup>lt;sup>a</sup>Smithsonian Institution collections (NMNH), Lot 116, Catalog #334166. Levels are natural units 3 feet square. Totals do not match Roberts' primarily because Windes did not tabulate tiny pieces (<1 cm). Larger total by Windes for Level E is unexplained. <sup>b</sup>T = trace (less than 0.5%).

Level	Plain gray (fugitive red)	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrugated	Unclass. indented corrug.	PII indented corrug. rim	LaPlata B/w	Whitemound B/w	Early Red Mesa B/w	Red Mesa B/w	Puerco B/w	Gallup B/w	Unclassified mineral	Plain whiteware	Theodore B/w	Pena B/w	Tunicha B/w	Burnham B/w	Newcomb B/w	Chuska B/w	Toadlena B/w?	Unclass. Chuskan carbon	Kana'a B/w	Black Mesa B/w	Unclass. Tusayan whiteware	Unclassified smudged ware	Bluff B/o	Unclass. San Juan redware	Unclassified redware	Total	24
A		16		4		30	1	1	1		10	3	8	21	12																107	4
В		8			1	5	l				2		5	13	6																40	2
С		40	6	19	1	3	1			9	16		1	26	25				1	1			4	3					5		161	6
D		188		82	3	11	1			4	58		5	78	74			18	:	2		1		19			1		7		552	21
Е		80	6	37	7	2				4	21			46	45		1	3					7	1				1	3		261	10
F		84		22	2			1	3	4	21		1	23	18			6		7				4	1				5		202	8
G		104	7	45	1					11	40			12	31			6						11					4	2	274	10
H		54	14	18	7				1	11	13			12	19			1	:	2			3	4		1	3		1		164	6
I		64	3	18			l		4	7	17			14	29			20	1	2				6	1		4		1		190	7
J	1	125	5	46	5				5	6	47			19	23	1		8		7				6			5		13		322	12
К		138	9	62	2				2	7	37			34	48			26			1	1		1			3				371	14
Total %b	1 T	901 34	50 2	353 13	29 1	51 2	3 T	2 T	16 1	63 2	282 11	3 T	20 1	298 11	330 12	1 T	1 T	88 3	1 2 T	1	1 T	2 T	14 T	55 2	2 T	1 T	16 1	1 T	39 1	2 T	2647	100 98
bowl jar other Temper: <sup>C</sup>	1	703	24	275	13	11	1	1	6 8	17 22	95 123 2		2 4	83 94 3	59 164	1		20 64	1	4 4	1	1 1		20 26 1	2	1	13		28 2	2		
column	e 0 %	10%	13%	15%	100%	ſ	1 100%																									
Ware Chuska c	% ulir	nary	52% culin 14%	ary							26% Cibol	a			12% unknown				25 Chus	% ka				Tu	2% sayar	1	1% unk.	San	2% Juar u	n ink.		100

Table 8.36. Ceramics recovered by F. H. H. Roberts, Jr., from Section 2 in the Peñasco Blanco East Refuse Mound that were resorted using current typology (compare with Table 8.33).

<sup>a</sup>Smithsonian Institution collections (NMNH), Lot 117, Catalog #334167. Levels are natural units 3 feet square.

Totals do not duplicate Roberts' probably because Windes did not tabulate tiny fragments (< lcm).

 $b_T$  = trace (less than 0.5%).

<sup>c</sup>Levels A-C, E, and H are not included in form and temper totals.

Level	Lino gray	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrugated	Unclass. indented corrug.	PII indented corrug. rim	Whitemound B/w	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Unclassified mineral	Plain whiteware	Tunicha B/w	Newcomb B/w	Chuska B/w	Toadlena B/w?	Unclass. Chuskan carbon	Kana'a B/w	Black Mesa B/w.	Inclass. Tusayan whiteware	Unclass. smudged ware	Jnclass∙ Tsegi orangeware	Unclass. San Juan redware	unclassified redware.	Total	*
A	1	23	1	7		84	3		2	11		6	26	3	14	12			1		1		2	1	1	2			201	17
В		17	1	8		52	2		1	7		1	23		19	16		1	1		2				2		4		157	14
С										τ	iot s	sorte	d																	
D	1	20		7	1	73	1			12		6	33	1	19	24				6		-		1	1		1		207	18
E										r	not s	sorte	d																	
F		12		16	2	57			10	14	1		31		20	30	2					1			3		1		200	17
G										r	not :	sorte	d																	
н		81		18	2	36	1		3	22		1	14		29	45	4	4		4		3			2		2	1	272	24
I										r	not :	sorte	d																	
J		24	1	14	1	20		1		11			7		12	21	2	1			_	1			1		2		119	10
Total %b	2 T	177 15	3 T	70 6	6 1	322 28	 7 T	   1   T	16 1	77 7	1 T	14 1	134 12	4 T	13 10	148 13	8	6 T	2 T	10 1	3 T	5 T	2 T	2 T	10 1	2 T	10 1	1 T	1156	100 98
bowl jar other	1	137	1	55	6	186	2	1	8 4 1	31 28	1	5 1 1	35 50	1	26 50 4	43 77	3 5	1 3 1		4 5 1		23		1	7		5 1	1		
Temper: <sup>c</sup> trachyt column	е0 %	9 23%	0	7 47%	-	72 53%	2 40%																						-	
Ware % Chuska	culi	lnary	c	51% ulin 45%	ary						3 Ci	l% bola				13% unknown		C	2% Chusk	a		T	1% usay	an	1% unk.	re	1% edwar	e		100

Table 8.37. Ceramics recovered by F. H. H. Roberts, Jr., from Section 3 in the Peñasco Blanco East Refuse Mound that were resorted using current typology (compare with Table 8.34).

<sup>a</sup>Smithsonian Institution collections (NMNH), Lot 118, Catalog #334168. Levels are natural units 3 feet square.

Totals do not match Roberts' because Windes did not tabulate tiny pieces (<1 cm).

 $b_T$  = trace (less than 0.5%).

CForm and temper totals not recorded for Levels A and B.

Trash Mound 655

site. The lack of an extramural midden is consistent with other contemporary greathouses. Tree-ring dates and the architectural plan suggest construction and occupation at Wijiji in the early A.D. 1100s (Lekson 1984:224, 231).

#### Pueblo Pintado

Four trash middens partially encircle the greathouse (Figure 8.10). To the southeast of the site is a large mound (Midden 4) seemingly typical of others in the canyon. There is no reason to suspect that it is a trash-filled houseblock as suggested by Marshall et al. (1979:85). Although it has never been tested, surface collections indicate a Gallup sherd assemblage (Table 8.38) that dates deposition between A.D. 1050 to 1100. Tree-ring dates from the house reveal the earliest construction (so far) at A.D. 1060 (Bannister et al. 1970:54).

Three smaller middens (not trash-filled houseblocks) extend west in an arc from Midden 4, but these have yielded mixed Red Mesa and Gallup ceramic assemblages (Table 8.38; Marshall et al. 1979:85). These ceramics probably predate the earliest tree-ring dates and suggest an earlier occupation at about A.D. 1040-1050. If there are Red Mesa assemblages below the surfaces of these mounds, as I suspect, then we might expect initial occupation at Pueblo Pintado to date at least in the early A.D. 1000s. Later ceramics recovered from the rooms also revealed occupations in the A.D. 1100s and 1200s (Windes 1982b).

Marshall et al. (1979) identify a great kiva squeezed between Middens 3 and 4 that stratigraphically would place the kiva earlier than the Gallup assemblages on its flanks. This "kiva," however, is only a large, shallow depression with no evidence of rubble or associated cultural material.

The series of large mounds around the south and southeast of Pueblo Pintado appear no different from those examined in Chaco Canyon. On the surface they are not discolored by ash and charcoal, and the largest two exhibit ceramics from the A.D. 1050 to 1100 period. The interior stratigraphy of the middens, of course, is unknown but suspected to be similar to contemporary ones tested at other greathouses.

#### Kin Bineola

This site is located 17.5 km southwest of Pueblo Bonito and has its earliest building dates in the mid-tenth century. A second and presumably last period of construction took place between A.D. 1111 and 1120 (Bannister et al. 1970:20). A number of "refuse" mounds occur to the south of the site (Figure 8.11), but only one appeared to have substantial volume (Table 8.14). The most prominent and easterly of the group, Midden 1, was examined along a transect placed down its long axis. Besides the relative scarcity of sherds and chipped stone on its surface, Midden 1 was



Figure 8.10. Pueblo Pintado and the associated mounds of trash and construction debris. Note locations of the 1981 ceramic transects.

	Lino gray	Plain gray	Wide neckbanded	Narrow neckbanded	Unclass. indented corrug.	PII indented corrug. rim	PII-III indented corr. rim	Kiatuthlanna B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Chaco-McElmo B/w	Unclassified mineral	Plain whiteware	Unclass. Chuskan mineral	Brimhall B/w	Chuska R/w	Toadlena B/w	Unclass. Chuskan carbon	Kana'a B/w	Black Mesa/Sosi B/w	McElmo/Mesa Verde B/w Mancos B/w	Unclass. Mesa Verde whiteware (mineral)	Forestdale Smudged	Puerco B/r	Total	8
MIDDEN 1 <sup>7</sup> MIDDEN 2 <sup>7</sup> MIDDEN 3 <sup>7</sup>	1	60 30 43 25 69 21	8 4 6 3 5 2	16 8 12 7 29 9	20 10 15 9 65 20	1 2 1 1 T			14 7 17 10 16 5	2 1 1	7 2	10 5 6 3 7 2			21 10 29 17 31 9	46 23 37 22 86 26	1 1			1 T	1 T 2 1 1 T	1 T		1 T 1 1 T	4	1 T	1 T	201 172 327	98 101 97
Total %a	1 T	172 25	19 3	57 8	100 14	4 1			47 7	3 T	7 1	23 3	l T		81 12	169 24	l T			1 T	4 1	l T		2 1 T T	4	l T	1 T	700 1	100
Form: bowl jar ladle	1	173	19	57	100	4			26 20 1	1 2	2 5	5 17 1	1		21 59 1	36 132 1	1			1	4	1		1 1 1	1 3	1	1		
Chuskan culinary	0	2 1%	0	1 2%	5 5%	0																							
Ware % 50% culinary Chuskan culinary 2%										23 Cib	% ola				24% unknown		13 Chus	ç ska			T Tusay	an	12 M.V	•	T smud.	T White Mt.		99	
MIDDEN 4 %ª		23 5	2 T	14 3	221 51	7 2	3 1	l T	7 2	l T	4 1	24 6	4 1	2 T	48 11	57 13		1 T	l T		5 1		2 T	l T		3	l T	433	98
Form: bowl jar ladle		23	2	14	221	7	3	1	2 4 1	1	4	6 18	4	2	22 25 1	12 44 1		1	1		2 3		2	1		3	1		
Chuskan culinary	,	0	0	1 7%	44 20%	2 29%	0																						
Ware % cu Chuskan culinary				62% 1 inai 17%	ry.						21 Cib	% ola				13% unknown		22 Chus	ka ka			T Tusay	an	т м.v		1% smud.	T White Mt.		99

# Table 8.38Ceramics tabulated from surface transects across the trash and spall middens at<br/>Pueblo Pintado. The transect locations are marked on Figure 8.10.

 $a_{\rm T}$  = trace (less than 0.5%).



Figure 8.11. Kin Bineola and the associated mounds of trash and construction debris. Note locations of the 1981 ceramic transects.

notable for the abundance of small, tabular pieces of sandstone that were generated from construction activities. The sandy mound surface was not discolored by ash and charcoal.

Painted ceramics were rare on Midden 1 (Table 8.39), but there was a high relative percentage of Chaco-McElmo and Gallup black-on-whites that corresponds to the early A.D. 1100s tree-ring dates. The sherd grab sample from Midden 1 by Marshall and Stein (Marshall et al. 1979:61) was nearly identical in type frequency to ours except for their absence of Gallup. The presence of Red Mesa on Midden 1 and its prominence on the other mounds (Table 8.39; Marshall et al. 1979:61) suggest assemblages that correspond to the tenth-century, tree-ring dates. Construction spalls comprise most of the latter middens.

The Kin Bineola mounds superficially resemble those in Chaco Canyon but lack their great size and artifact density. All appear to have been derived from building activity debris rather than from habitation. A mound dating in the late A.D. 1000s is not evident from the surface samples. Instead, the ceramics indicate earlier and later assemblages that probably correspond to periods of construction, but there is little in the way of habitation refuse. This may indicate a lack of extensive, continual occupation at Kin Bineola (Windes 1982b). The odd incorporation of remnants of A.D. 900 masonry in the later wall construction at the site may also suggest a period of abandonment and deterioration of the house before remodeling.

## Kin Ya'a

This greathouse just east of Crownpoint, New Mexico, also has a number of refuse mounds in association (Figure 8.12). Three were sampled (Table 8.40), but the two to the southeast (Middens 1 and 4) probably relate directly to site activities. The large midden to the northeast (Midden 2) is southeast of a small house and separated from it by a prehistoric road that leads to Chaco Canyon (Marshall et al. 1979; Obenauf 1980). Midden 2 is dominated by trash deposited in the early A.D. 1000s, although the house across from it is much later. The location of Midden 2, nevertheless, seems to preclude its association with Kin Ya'a. A small concentration of refuse and spalls in Midden 3 may relate to construction activities at one of the two sites but is relatively unimportant.

Middens 1 and 4 are covered with a Gallup ceramic assemblage dating between A.D. 1050 and 1100. Marshall et al. (1979:205) report a similar finding of ceramics from their grab sample off Midden 1. The sandy matrix seems relatively unstained by ash and charcoal. The few tree-ring dates from the site indicate at least two periods of construction, A.D. 1088 (Windes 1982b:Table 4) and A.D. 1106 (Bannister et al. 1970:25), which does not conflict with the ceramic evidence. The high percentage of plain gray culinary ware (presumably from neckbanded and neck-indented corrugated vessels) suggests that a Red Mesa assemblage was masked by the

	Lino gray	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrugated	Unclass. indented corr.	PII indented corr. rim	PII-III indented corr. rim	LaPlata B/w	BMIII-PI mineral	Whitemound B/w	Early Red Mesa B/w	Red Mesa B/w	Puerco B/w	Gallup B/w	Chaco B/w	Chaco≁McElmo B/w	Unclassified mineral	Plain whiteware	Theodore B/w	Pena B/w	Tunicha B/w	Burnham B/w	Newcomb B/w	Unclass. Chuskan carbon	Kana'a B/w	Black Mesa/Sosi B/w	Unclass. Tusayan whiteware	Holbrook B/w	Forestdale Smudged	Bluff B/o	Unclass. San Juan redware	Sanostee B/r	Total	22
MIDDEN 1 %		10 4		9 3	2 1	147 53	3 1	1 T					4 1	6 2	6 2	1 T	9 3	31 11	39 14				l T		3 1		l T			2 1		1 T		276	97
Form: bowl jar ladle		10		9	2	147	3	1					2 2	3 3	2 4	1	4 4 1	10 21	10 29				1		3		1			2		1			
Chuskan culinar	у	2 20%		5 56%	1 50%	47 32%	0	1 100%																											
Ware % 62% culinary Chuskan culinary 33%							21% Cibola									14% unk								T Fusa	yan		1% smud	1	T :edwa	re		99			
MIDDEN 5 % MIDDEN 2 % MIDDEN 3 % MIDDEN 4 %	2 1 4 1 8 3	85 27 113 29 116 43 205 65	11 3 14 4 14 5 10 3	32 10 37 9 19 7 19 6	6 2 6 2 1 T 1 T	47 15 44 11 15 6 1 T	1 T	1 T	1 T	2 1 7 2	2 1 3 1 3 1	7 2 3 1 1 T 1 T	13 4 32 8 10 4 7 2	2 1 1 T 2 1	2 1 3 1 1 T		1 T I T	38 12 53 13 24 9 15 5	56 18 61 15 48 18 24 8	1 T 2 1 I T	l T	2 1 5 1 1 T 2 1		l T	3 1 3 1 3 1 1 1 T	2 1 6 2 1 T 1 T	2 1 1 T	6 2 1 T 2 1	1 T	1 T 1 T	l T	1 7 2 4 1 1 1 T 5 2	2 1	320 395 272 315	100 101 98 100
Total %	14 1	519 40	49 4	107	14 1	10 <b>7</b> 8	1 T	1 T	1 T	9 1	8 1	12 1	65 5	5 T	6 T		2 T	130 10	189 15	4 T	1 T	10 1		l T	10 1	10 1	3 T	9 1	1 T	2 T	1 T	3 10 T 1	2 T	1302	100
Form: bowl jar ladle	2 12	519	49	107	14	107	1	1	1	7 2	5 3	5 7	26 36	l 4	1 5		1	47 82 1	59 129 1	1 3	1	3 7		1	4 6	4	3	4 5	1	2	1	2 10 1	2		
Chuskan culinary	2 17	87 % 17%	18 37%	28 26%	6 43%	13 12%	0	0																							1				
Ware % Chuskan cu	lin	ary		6 cul 1	2% inar 9%	У							18% Cibo	la					15% unk			2 Chu	% ska			T Li	2% usay ttle	an ð Col	§ 10.	T smud		12 redwa	ire	100%	

Table 8.39. Ceramics tabulated from surface transects across the trash and spall middens at Kin Bineola. The transect locations are marked on Figure 8.11.

 $a_{T}$  = trace (less than 0.5%).

Table 8.40. Ceramics tabulated from surface transects across the trash middens at Kin Ya'a. The transect locations are marked on Figure 8.12.

	Plain gray	Wide neckbanded	Narrow neckbanded	Neck indented corrugated	Unclass. indented corrug.	PII indented corrug. rim	PII-III indented corr. rim	PIII indented corrug. rim	Kiatuthlanna B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Chaco-McElmo B/w	Unclassified mineral	Plain whiteware	Kana'a B/w	Mesa Verde B/w McElmo B.w	Forestdale Smudged	Unclass. White Mountain redware	Total	~
MIDDEN 1 % MIDDEN 4 %	50 14 9 5	2 1 5 3	15 4 6 3	2 1	157 44 97 52	2 1 2 1	2	l T		4 1 3 2	1	6 2 6 3	18 5 6 3	1 T	1	26 7 13 7	67 19 35 19		l T		1 T 1 T	355 185	100 100
Total %	59 10	7 1	21 4	2 T	254 47	4 1	2 T	1 T		7 1	l T	12 2	24 4	1 T	l T	39 7	102 19		1 T		2 T	540	96
Form: bowl jar ladle	59	7	21	2	254	4	2	1		1 6	1	6 6	3 21	L	1	15 22 2	26 76		1	1	2		
Chuskan culinary	, 0	0	0	0	2 1%	0	0	0															
Ware % Chuskan cul	inar	у		6 cul	5% inary T							16 Cib	% ola				19% unknown		т м.v.		T White Mt		100
MIDDEN 2 E transect % W transect %	65 15 123 29	9 2 14 3	25 6 47 11	2 T 3 1	132 31 41 10	8 2 2 T			3	15 4 33 8	2 T 1 T	5 1 2 T	20 5 22 5	l T	·	47 11 58 14	90 21 70 17	1 T	1 T 1 T	3 1 1 T		424 423	99 99
Total %	188 22	23 3	72 9	5	173 20	10			3 T	48 6	3 T	7	42	1 T	-	105	160 19	1 T	1 1 T T	4 T		847	99
Form: bowl jar ladle	188	23	72	5	173	10			1 2	21 25 2	3 l	7	11 31	ı		38 65 2	30 127 3	1	1 1	4			
Chuskan culinary	2 1%	0	0	0	4 2%	0																	
Ware % 56% culinary Chuskan culinary 1%												25) Cib	% ola				19% unknown	T Tusayan	т М.V.	T smud.			100

 $a_{\rm T}$  = trace (less than 0.5%).



Figure 8.12. Kin Ya'a and the associated mounds of trash and construction debris. Note the locations of the 1981 ceramic transects. Site 29Mc 11 is a small early Pueblo III house while Midden 2 across from it is composed of early A.D. 1000s (Pueblo II) trash. These two components may be unrelated to Kin Ya'a. The prehistoric road connects to Road Segment 50 on the mesa just to the south and to a road in the north leaving Chaco Canyon through Fajada Butte gap.

Gallup material. If this is true, it is possible that there was an earlier occupation and construction at Kin Ya'a that dates before A.D. 1050, although surface indications reveal no evidence of occupations before A.D. 1000. Later ceramics are associated with the house rubble. Again, the lack of excavation does not enable us to deduce the nature of the stratigraphy in the middens, although surface indications of Middens 1 and 4 reveal a close similarity to other greathouse middens.

#### Conclusions

It is evident that extramural middens associated with greathouses in the park reveal great similarity. Three kinds of deposition appear to form the kinds of middens examined. The smallest middens are characterized by dense accumulations of spalls, the highest density of any artifact These apparently derive from construction at the associated greattype. house. At several middens, including Pueblo Alto's, this debris is masked by later accumulations of trash and sand. Spall middens, evident at all the outlying greathouses examined (Pueblo Pintado, Kin Bineola, and Kin Ya'a), mark a shift in the placement of deposits, perhaps because of a hiatus between constructional and occupational deposition. Ceramics from these spall accumulations seem to correlate with tree-ring dates when the latter are available (e.g., Trash Mound 3 at Kin Bineola; see Figure The spall middens observed dated in the A.D. 900s or the A.D. 8.13). 1100s.

A second type of deposition might be broadly described as habitation refuse. The primary material that appears to distinguish this depositional type from others is the inclusion of charcoal and ash, evidently from firepit dumpings that stain the surrounding matrix gray. This, of course, is often a very intuitive assessment. Studies are needed to quantify the amount of ash and charcoal in deposits for future comparative work. Massive ash and charcoal dumping may imply lengthy duration and intensity of occupation at a site, a pattern common to many small-house middens but seemingly less common in the greathouse, extramural middens. Ash and charcoal staining was evident in the East Mound at Peñasco Blanco as well as in the deposits from the early A.D. 1000s and early A.D. 1100s at Pueblo Alto that seem to contrast with the third type of deposition that dominates the period in-between.

Roberts' studies of the trash mounds at Pueblo Alto, Pueblo Bonito, and Peñasco Blanco reveal the fallacy of relying on midden deposits to determine the occupational period at the greathouses. For Pueblo Alto he believed that occupation had ceased while Pueblo Bonito was still occupied (Roberts 1927:242), but this is only true if the Mesa Verdean occupation is considered. For the same reasons and because of the lack of huge trash mounds, Roberts believed that Hungo Pavi, Una Vida, Pueblo Pintado, and Wijiji were of the same late period. Subsequent work has shown this to be false. It must be remembered that refuse disposal was a continuing process during the occupations at the greathouses, but that the earliest and latest refuse is often found in areas other than the prominent, extramural middens.



Figure 8.13. Multidimensional scaling plot showing the temporal associations of the greathouse ceramic samples (n = 42) from middens with dated ceramic samples, using the KYST-2A program in 5-dimensional space. The 2 by 1 dimension is shown. The stress factor (.11) is moderate.



Figure 8.14. Multidimensional scaling plot showing the temporal associations of the greathouse ceramic samples (n = 42) from middens with dated ceramic samples, using the KYST-2A program in 5-dimensional space. The 2 by 1 dimension is shown. The stress factor (.11) is moderate. Plot slightly different from Figure 8.13 with the addition and deletion of four samples.

For the most part, the largest middens at the park greathouses (e.g. at Pueblo Bonito, Pueblo Alto, Chetro Ketl, and Pueblo Pintado) seem to have been deposited between A.D. 1050 and 1100, according to ceramic seriation and a few tree-ring dates obtained from the Pueblo Alto and Chetro Ketl mound deposits (Figures 8.13-8.14; see Volume I, Chapter 8 for an explanation). Note in the seriation plot figures the close correspondence between the temporal positioning of various midden ceramic samples and the construction tree-ring dates (in brackets) from the associated greathouses. Also note the poorer ordering of the surface samples compared to the excavated samples, presumably because the surface samples yielded some temporal mixing of ceramics.

The A.D. 1050-1100 period is dominated by the Gallup Black-on-white ceramic assemblages associated with these middens. From our work and Roberts' work at Pueblo Alto, Pueblo Bonito, and Peñasco Blanco, the stratigraphy in the large, extramural mounds was found to be very different from ordinary trash deposits commonly unearthed at Anasazi sites. In particular, the mixing and churning of the deposits and the amount of such decomposed vegetal matter as ash and charcoal that seems to characterize small-house middens and large sites occupied in other periods, such as Pecos (Kidder 1962) and Hawikuh (Smith et al. 1966), do not characterize the large, Chacoan, extramural middens in the late A.D. 1000s.

The homogeneity and regularity of layer thicknesses in the Chacoan middens suggest massive, periodic deposition, perhaps indicative of ceremonial behavior. The greathouses where this occurred may reflect only a few locales where this behavior was practiced. The largest middens occur at greathouses found in a relatively small area of Chaco Canyon and may mark a periodic event that was relatively restricted in the Chacoan world. Similar but less formidable middens at some outliers (e.g., Kin Ya'a and Pueblo Pintado), however, suggest parallel, periodic events that may have taken place throughout much of the Chacoan interaction sphere. Finally. these great mounds may also be part of the planned landscape around Chacoan greathouses that creates an aspect of impressive mounds and elevated structures for those approaching the site on the prehistoric roads (Stein 1987). The ritual aspects of the mounds and the greathouses may be one of the most important elements of the Chacoan Phenomenon (see Stein 1987 for a discussion of ritual landscaping and public architecture that may extend in time and space beyond Chaco Canyon).
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## Appendix A

# Summary of Statistics and Symbols Used in Various Chapters

H. Wolcott Toll

Statistic	Symbol	Derivation and Use	Reference
NOMINAL DATA			
Chi-square	x <sup>2</sup>	Test for difference in occurrence of attributes among groups.	Siegel 1956:175
Contingency coefficient	C	Measures the strength of association based on the X <sup>2</sup> distribution and controls for sample size; directly comparable only for contingency tables of the same size.	Siegel 1956:196
Fisher's Exact Test	р	Calculates the probability (p) that two samples are the same for two variables; used for small samples.	Siegel 1956:96
Diversity	н'	Measures the distribution of items in various categories (types, species) in a given sample; based on the logs of the percents in the categories.	Pielou 1969:229
Evenness	J	Compares the maximum possible value of H' with the actual value to give an index of the evenness of distribution (0 = all in 1 category, l = same percent in each category).	Pielou 1969:229
Richness	8	Used in conjunction with H' and J; the number of categories present.	Pielou 1969:229
Coefficient of Jaccard	sj	Gives an index of similarity between two groups based on the co-occurrence of attributes.	Sneath and Sokal 1973:131
ORDINAL DATA			
Spearman's Rank Order Coefficier	r <sub>S</sub> it	Gives a coefficient of correlation between two groups that can be ordered on the occurrence of some attribute, or one group ranked by two variables.	Siegel 1956:202
INTERVAL DATA			
Mean	x	The average of a series of values.	
Coefficient of variation	CV	The standard deviation divided by the mean; gives a standardized value for variability expressed as a percent.	Thomas 1976:82
Standard deviation	sd	Measures the dispersion of cases around the mean and the variability of the sample; the percentage of cases falling within given numbers of standard deviations from the mean is known.	Kushner and DeMaio 1980
Student's t-test	t	Compares the means of two groups to determine whether the two are likely to be from the same or different populations.	Kushner and DeMaio 1980:156
F test	F	Compares the variance estimates for two samples as a ratio in order to determine whether or not the variances are the same; the result is compared to a known distribution.	Kushner and DeMaio 1980:175
ABBREVIATIONS			
degrees of freedom	df	Calculated variously for different statistics; concerns "the number of parameters that are allowed to vary" after "certain restrictions are placed on the data."	Kushner and DeMaio 1980:260 Siegel 1956:44
probability	р	Gives the likelihood that a larger value will be obtained for a certain statistic, given the df of the sample (see also Fisher exact above).	's

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## Appendix B

# Symbols Used in Figures

Gigi Bayliss

B BT	H H	Burn Backhoe Trench	WF WT	=	Wall Wall	Foundation Trench	·····	Burn
CS	=	Circular Structure					<b>A</b>	1 i ani to
F	-	Feature					<b>^^^</b>	Lignite
F1	-	Floor						
FP	=	Firepit					~~~	Adobe or clay
H	-	Hearth						
HP	=	Heating Pit					* *	Charcoal or ash
L	=	Layer					≻ X	
Lv	=	Level						01
MB	=	Mealing Bin						Sand
N	=	Niche						
OP	=	Other Pit					<b>~</b>	200 cm below site datum
OUF	=	Other Unnamed Feature						
0S	犨	Other Structure					-2	Artifact location and artifact number
PG	111	Plaza Grid					•-	
PF	=	Plaza Feature					M	Rock
PGS	=	Present Ground Surface						
PH	**	Posthole						
Р	=	Wall Peg					<b>**</b>	Artifact
PR	=	Pot Rest						
RS	#	Road Segment						Projected boundary
RH	=	Rodent Hole						5
RP	=	Roasting Pit						Cross-section line
S	=	Surface						
SB	=	Storage Bin					Ţ	
SC	=	Storage Cist					1	Profile dividing line
SC	(on	a TT) = Strat Column in	ı Tra	sh	Mound		<u>ن</u>	
SF	=	Subfloor					<u> </u>	N (on features where not up)
SP	=	Storage Pit						
ΤM	Ξ	Trash Mound					000	Gravel
ΤP	=	Test Pit					-00	
TS	=	Top Surface						Coning botwoon plaster and suffere
ΤT	=	Test Trench						coping between plaster and surface
V	=	Vent						

VH = Viga Hole

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