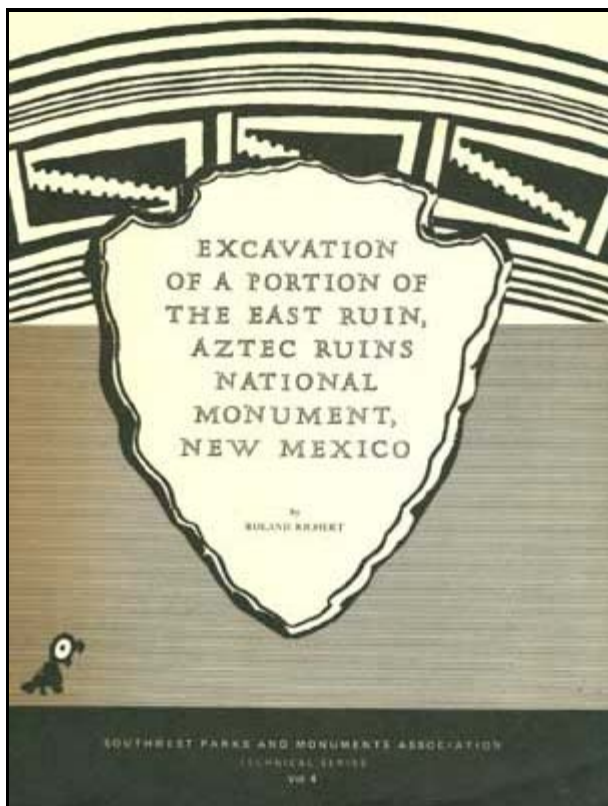


AZTEC RUINS

Excavation of a Portion of the East Ruins,
Aztec Ruins National Monument, New
Mexico



EXCAVATION OF A PORTION OF THE EAST RUINS, AZTEC RUINS NATIONAL MONUMENT, NEW MEXICO

By
Roland Richert

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PREFACE

This paper is concerned with data and materials recovered at the East Ruin, Aztec Ruins National Monument, between May and September 1957. They originate from excavations incidental to a stabilization project carried out within a small sector on the west side of that site.

Although the large and sprawling East Ruin, one of two major sites on the Monument, remains largely unexcavated, it does contain a series of open rooms with intact, prehistoric ceilings, and with these the stabilization project was concerned. Seven of these first-story ceilings were treated. Overburden was removed from six second-story rooms and a second-story kiva over them. Fill was removed from six of the ceilinged rooms (the seventh was empty) and from one adjacent, partly excavated room. The data, then, comes from 14 rooms and a partial kiva (*see* Richert 1957, for stabilization of the rooms and protective measures for the ceilings).

The combined excavation-stabilization project was under the direction of the writer operating with five Navajo laborers of the Ruins Stabilization Unit. To my immediate supervisor, R. G. Vivian, I owe sincere thanks for permitting me to undertake the excavation, and secondly, for his patience in allowing more than adequate time in which to prepare this report.

For their courtesy in taking time to examine and identify a small batch of atypical sherds, I wish to thank: Dr. Emil W. Haury, University of Arizona; Dr. Harold S. Colton, Museum of Northern Arizona; Dr. Erik K. Reed, Mr. Albert H. Schroeder, Mr. John F. Turney, all of the National Park Service; Mr. Stewart Peckham and Dr. A. E. Dittert of the Museum of New Mexico.

I am also grateful to Mr. Lyndon L. Hargrave, Collaborator, and again to Mr. John F. Turney, for their identification of birds and animal bones. I owe special thanks to Dr. Hugh C. Cutler, Director, Missouri Botanical Garden, who identified vegetal remains and made pertinent findings on maize.

A number of tree-ring samples were submitted in April 1962, to the Laboratory of Tree-ring Research for possible dating. Apparently all but one of our specimens are juniper. The single pine specimen was dated for us by Dr. Bryant Bannister while the other material is still under study at this writing.

Roland Richert
Globe, Arizona
July 1962

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INTRODUCTION

LOCATION

Aztec Ruins National Monument is located in the southeast quarter (SE1/4) of the southwest quarter (SW1/4) of Section 4, T. 30 N., R. 11 W., New Mexico principal meridian, San Juan County, New Mexico, at approximately longitude 108° W. and latitude 36° 50' N., about one mile north of the town of Aztec. The elevation is 5,642 feet above sea level.

ENVIRONMENT

Situated in extreme northwestern New Mexico, the Aztec vicinity (figure 1) lies along the Animas River approximately 45 miles below its source in Colorado. For 20 miles the river runs through a deep gorge, but from Cedar Hill to its junction with the San Juan, 15 miles below Aztec, it flows through a valley from 1 to 2 miles wide, bordered alternately by alluvial bottoms and boulder-strewn bluffs. In this section the bottom lands are ideal for farming. Stands of cottonwood, willow, and other deciduous trees are found almost exclusively on the bottoms and along the immediate streambanks. Rugged, hilly zones extend to the north, rising to the La Plata mountain range of southwestern Colorado. Rock-strewn hills, for the most part unsuitable for farming, separate the Animas from adjacent drainages. On the adjoining hills and on the bluffs overlooking the river the vegetation is Upper Sonoran, characterized by big sagebrush (*Artemisia tridentata*), black greasewood (*Sarcobatus vermiculatus*), fourwing saltbush or "chico brush" (*Atriplex canescens*), rabbitbrush (*Chrysothamnus* sp.), pricklypear (*Opuntia* sp.), bee-spider-flower or "Rocky Mountain bee plant" (*Cleome serrulata*), datil yucca (*Yucca baccata*), one-seed juniper (*Juniperus monosperma*), pinyon (*Pinus edulis*), and a few grass species such as blue grama (*Bouteloua gracilis*), prairie june-grass (*Koeleria cristata*) and alkali sacaton (*Sporobolus airoides*).



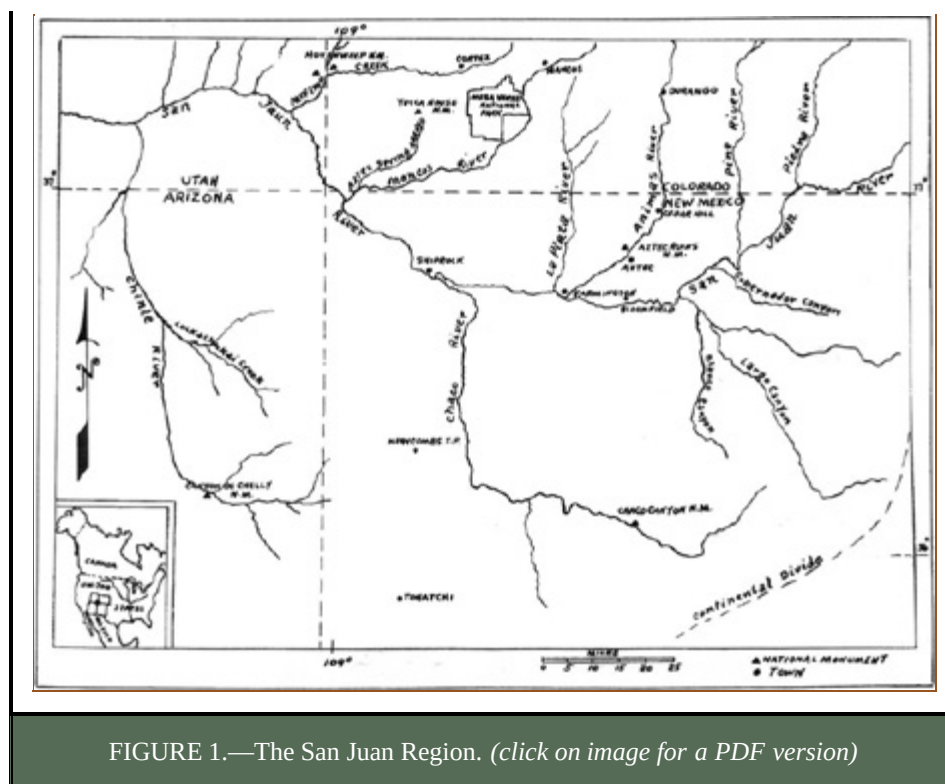


FIGURE 1.—The San Juan Region. ([click on image for a PDF version](#))

Deer still inhabit the surrounding foothills. Elk have retreated to the higher elevations in adjacent Colorado. Bighorn sheep are no longer found in the vicinity, but a protected herd of pronghorn has maintained itself just to the west, toward Farmington, for several years. Smaller mammals which still frequent the brush-covered 27 acres of the Monument include jackrabbit, cottontail, porcupine, rock squirrel, gopher, rat, several species of mice, and skunk.

A great many species of transient birds visit the area while in migratory flight: finches, warblers, sparrows, hawks, and ducks and other waterfowl. Local year-round residents are: blackbirds, crows, magpies, house or "English" sparrows, woodpeckers, jays, owls, and killdeer; while summer residents include robins, orioles, wrens, grosbeaks, phoebes and other flycatchers, and bluebirds.

Climatically, the Aztec area has pleasant summers, with high temperatures in the upper 90's and lows in the 40's. Late fall and winter bring snow and ice with temperatures dropping to sub-zero. Expected lows for short durations are -15°F to -20°F. Recorded maximum temperature is 101°F and a minimum of -26°F. Average summer day-night temperature difference is 35°F. Average annual precipitation is approximately 10 inches, of which about one-third falls from June to September. Droughts and relatively open winters sometimes occur.

As the above suggests, the locality is considered semi-arid and irrigation or flood plain farming, whether native or modern, was and is necessary for successful agriculture. It is evident that the Indians successfully met this challenge throughout a period extending at least from Pueblo I to Pueblo III times, for along the Animas there are dozens of permanent village sites whose inhabitants subsisted mainly on domestic crops.

According to early settlers, irrigation canals were present near the ruins prior to eradication by modern farming. The late Sherman Howe, who moved to Aztec in 1880, reported that a canal could be traced easily in the 1880's for nearly 2 miles. It ran about halfway between the West Ruin and the hill and emptied into the Estes arroyo. The intake of this canal was on the Animas River some 3 miles above Aztec (Howe 1947:9). Morris also implies that the Animas

was used for prehistoric irrigation (1919: 8).

HISTORY

The first actual description of the Aztec Ruins was by the geologist J. S. Newberry, who saw the site in August 1859. Lewis H. Morgan published the first ground plan and a further description from his visit of July 1879. From then on little of consequence appeared until the late Earl H. Morris began his systematic excavations in the West Ruin in 1916.

Within the Monument boundaries are two large Pueblo III structures, the East Ruin and the West Ruin, a smaller pueblo known as the Earl Morris Ruin, the Hubbard Mound, and eight additional mounds. Morris spent six field seasons in the excavation of the West Ruin (Morris 1919, 1921, 1924, 1928). In 1920 the American Museum of Natural History purchased the major ruins and 17 adjacent acres, deeding them to the United States. The area was proclaimed a National Monument in 1923. Later additions have enlarged the holdings to 27 acres.

Following Morris' work the National Park Service undertook the excavation of the Hubbard Mound, a tri-walled structure, in 1953 (Vivian 1959) and conducted tests in Mound F (ibid.). At an unspecified date, but undoubtedly sometime during 1916-1921, Morris also did some testing in the East Ruin. The only published reference to this work is in his La Plata studies (Morris 1939).

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THE EAST RUIN, EXCAVATIONS

The East Ruin (figures 2, 3; plate 1) has a maximum elevation of some 16 feet above present ground level. It is largely unexcavated and contains approximately 200 to 300 rooms. The entire site occupies an area some 400 feet long east to west and 180 feet north to south. The site is divided roughly into two groups, an East House group and a West House group; we are concerned with that on the west, measuring 186 feet by 147 feet (figure 3). This area has a straight north wall and opens toward the south with several wings jutting from the central mass. Between the wings are narrow recesses which appear to be plazas; circular depressions mark the locations of at least five kivas.

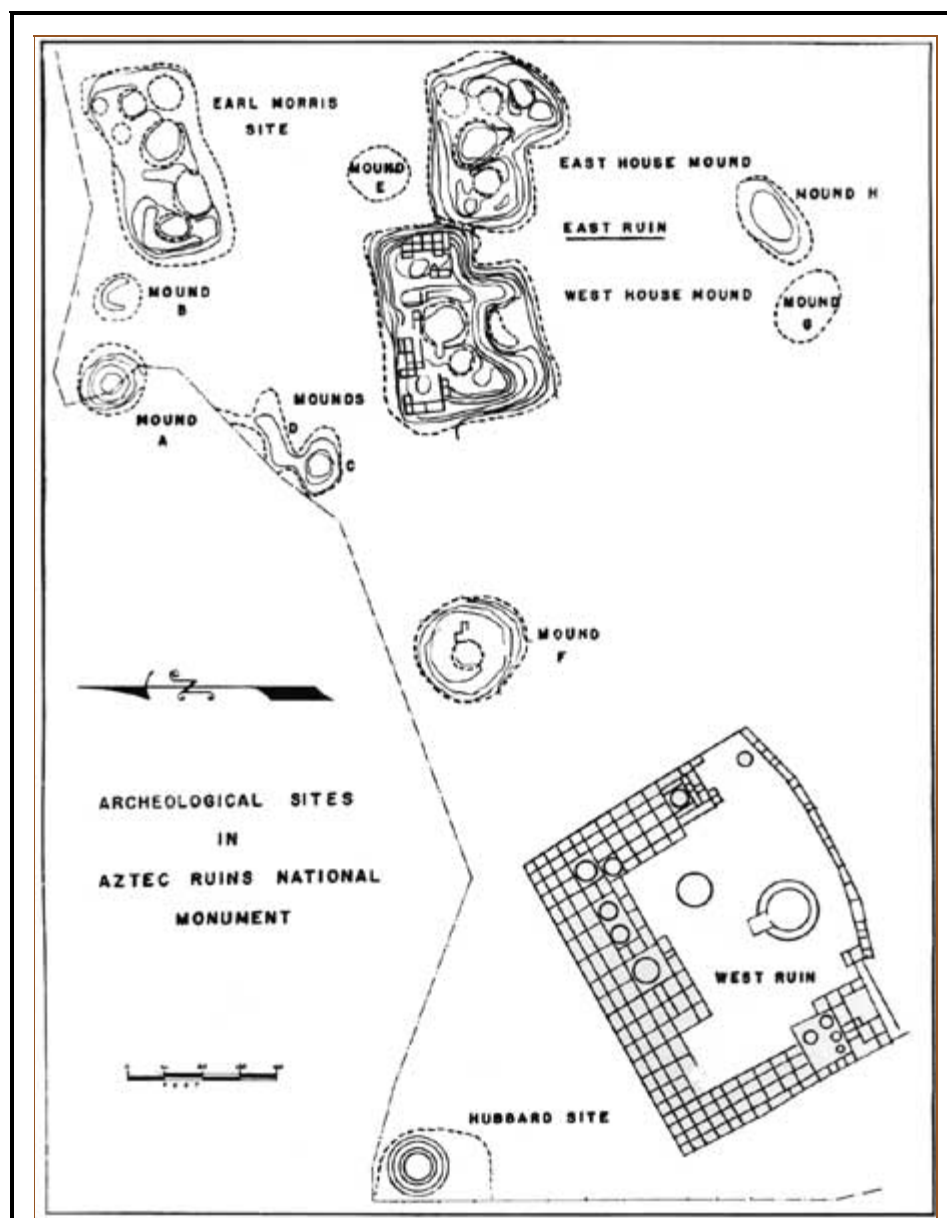


FIGURE 2.—Archeological sites in Aztec Ruins National Monument. *(click on image for a PDF version)*

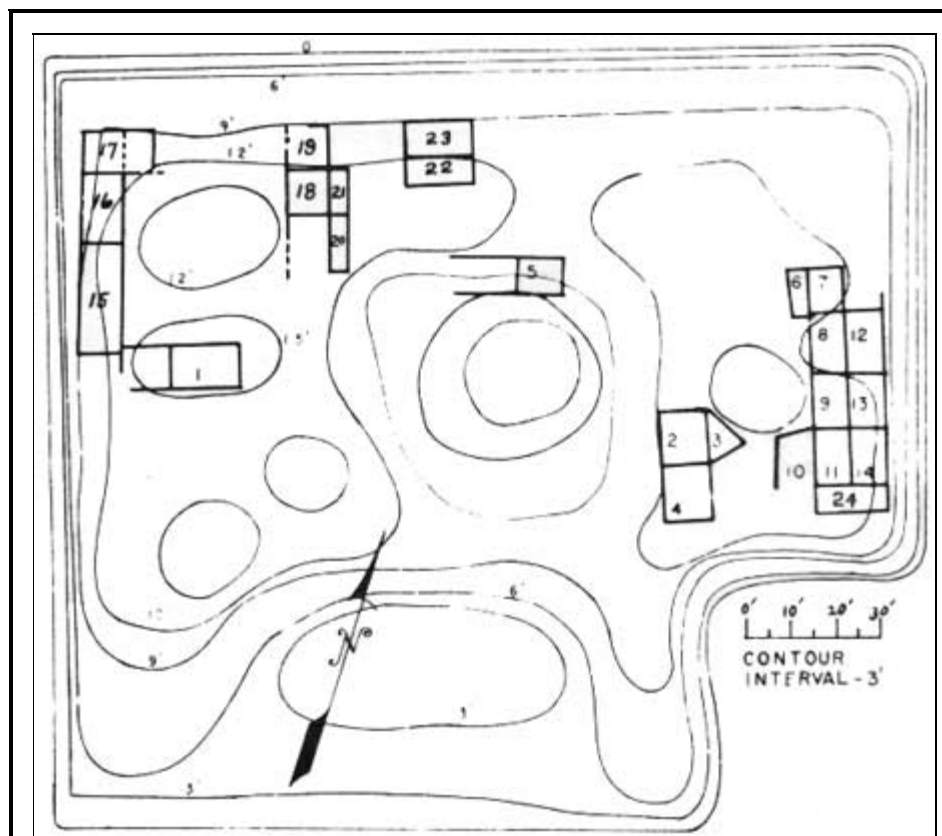


FIGURE 3—East Ruin, West House Mound. Rooms 1, 8, 9, 11, 12, 13, and 14 contain original ceilings from which the overburden was removed. Room 24 was cleared. Rooms 2 and 4 also contain original ceilings, their overburden having been removed in 1949. Rooms 3, 6, 7, and 10 are also open rooms with original ceilings, but remain unexcavated.



PLATE 1—General view of the West House Mound from the south. Exposed masonry at right (arrow) is the location of Rooms 8-14, inclusive, and Room 24.

Within this houseblock are at least 13 ground-floor rooms with intact ceilings. Overburden was removed from two rooms in 1949. Of the remaining 11 the overburden was removed from, and protective concrete coverings were put in place on 7 in 1957, the basis of this

report. The remainder contain fill, are unexcavated, and are covered by heavy second-story debris. Nine of the rooms are in a connected series; three can be entered through individual openings, and one was sealed off.

Kiva Over Room 1

This kiva was situated in part above Room 1 and in part above an adjacent room to the south, now collapsed. Only the north half of the kiva remained, and it was fragmentary. There were only two to three courses of masonry above the bench at the north and west sides and only the lower part of the bench at the east (figure 4).

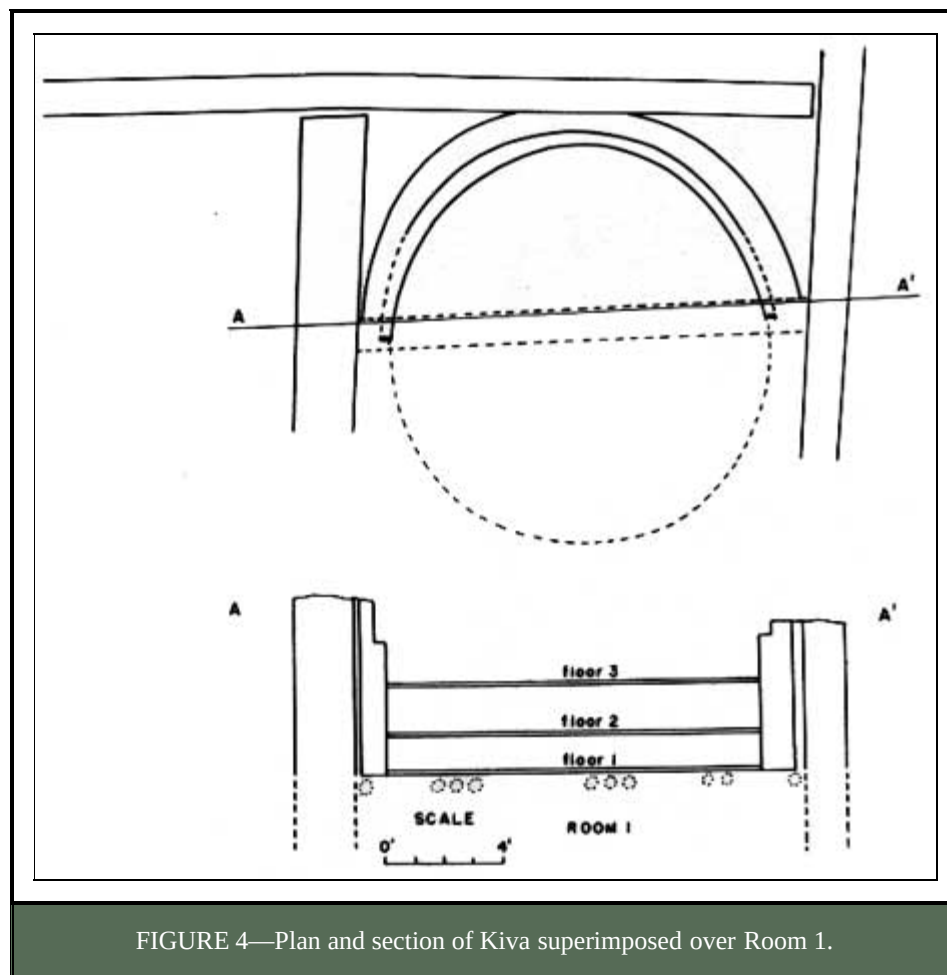


FIGURE 4—Plan and section of Kiva superimposed over Room 1.

The kiva was circular, 13 feet inside diameter. The bench averaged 7 inches wide and 4 feet 8 inches high. There were no pilasters rising from the bench. Any features such as firepit, deflector, ventilator, were lost with the south half. The bench at Floors 1 and 2, and the upper wall held several coats of plaster, while at the third-floor level the bench held additional alternate coats of both white and red plaster. The red plaster was the final coating and since it adhered only in patches, there was no way to determine whether it had originally formed a dado.

There were three distinct floors, each 2 to 3 inches thick, and separated by intentional fill 11 inches thick between first and second floors, with 17 inches separating second and third floors (plate 2). The fill consisted of compacted clay interspersed with layers of shredded juniper bark and occasional, random stone and small pieces of charcoal. Sherds throughout these fill layers between floors were sparse.

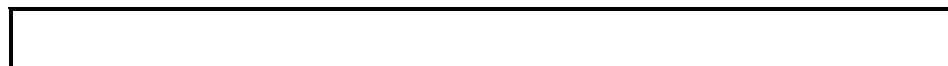




PLATE 2—The partial kiva remaining above Room 1. All three floor levels are shown. The inner edge of the south wall of Room 1 is indicated by a dashed line. Beyond this, at the left, the kiva sheared off into a collapsed room.

A faint seam along the circumference of the bench coinciding with the third-floor level suggests that the original height of the bench was unaltered throughout the life of Floors 1 and 2, but was increased in height when Floor 3 was constructed.

The first floor, circular base, and thick kiva corners rested immediately upon the four walls and ceiling of Room 1. Reinforcing of peeled juniper poles was found in both northeast and northwest kiva corners (plate 3). Four of these poles extended diagonally from the core of the northwest kiva corner onto the top of the south wall of Room 1. The amount and plan of reinforcing material strongly suggests that room and kiva were in use at the same time.



PLATE 3—Kiva over Room 1. Diagonal reinforcement in the northwest corner to support the kiva wall.

The typical Mesa Verde kiva is relatively small, normally has only six pilasters resting on a high and narrow bench, and has a deep recess at bench height, sometimes "keyhole" shaped, at the south. Most have a firepit, deflector, sipapu, and ventilator on a north-south axis. Here the locations for all such features except pilasters and a possible sipapu were lost with the south half. A sipapu was not present in any of the three floors. The pilasters have usually been thought of as bases for a cribbed roof, but such was not always the case since they have been found to support a light interior framework or to have been connected with interior wainscotings (Vivian 1959: 72, 73; 1960: 86). In any event, the roof here must have been supported by the top of the kiva wall.

Pottery

Sherds from the kiva over Room 1 were:

Fill from surface level to top floor (Floor 3), 0'-5'							
Type			Bowls	Jars	Dippers	Total	Percent
Utility Ware							
Indented Corrugated						93	41.9
Plain						8	3.6
Incised						3	1.4
Decorated Ware							
Mesa Verde Black-on-white	48	44				92	41.4
McElmo Black-on-white	9	1				10	4.5
Mancos Black-on-white	5	7		2	14		6.3
Cortez Black-on-white	1				1		.4
Wingate Black-on-red	1				1		.4
						99.9	222
Fill between top floor (Floor 3) and Floor 2, 5'-6'8"							
Utility Ware							
Indented Corrugated						67	47.5
Plain						8	5.7
Decorated Ware							
Mesa Verde Black-on-White	27	14				41	29.0
McElmo Black-on-white	8	2				10	7.0
Mancos Black-on-white	5	7		2	14		10.0
Chaco Black-on-white (?)	1				1		.7
						141	99.9
Fill between Floor 2 and Floor 1 (bottom or first floor), 6'8"-7'7"							
Utility Ware							
Indented Corrugated						10	41.7
Plain						3	12.5

Decorated Ware

Mesa Verde Black-on-white	6	3	9	37.5
Mancos Black-on-white	1	1	2	8.3
			24	100.0

Since the fill is intentional rather than occupational, the data give no clue to elapsed time for construction and use of three successive floors. A small amount of refuse in the 3 to 5 feet of fill above the final floor probably represents intentional deposition laid down between the time the kiva was abandoned and removal of the roof.

There is a larger percentage of Classic Mesa Verde sherds in the fill over Floor 1 than over that of Floor 2. Actually, what may be the earliest sherds (Plain and Incised), dating between Pueblo II and III, are in this fill above Floor 3, although small percentages of Mancos Black-on-white do occur in all three levels. If anything, the sherd counts merely point out that the fill material between floor levels was derived from either a refuse dump or random area surrounding the house block.

Artifacts recovered were: A mano, a scraper, one polishing stone, a fragment of a notched axe, and, one worked sherd. Bone was plentiful and from 30 pieces, 1 was identified as deer, 4 as bighorn sheep, 2 as cottontail rabbit, 6 as rabbit (sp.?), and 1 as rock squirrel. The remainder were charred fragments.

Fill

Upper Rooms (figure 5, plates 4, 5, 7)

Fill removed from upper, second-story rooms above the ceilings ranged in depth from 4 feet to 8-1/2 feet and from 5 feet to 9 feet in individual rooms. The entire upper level of this section of the East Ruin shows considerable modern disturbance. Morris noted that beginning about 1876 the exposed walls furnished an easily obtainable supply of building material for settlers in the valley (Morris 1919: 9). Lack of the main support beams in room debris containing small poles, juniper bark and shakes, and other organic remains, indicates that the pioneers also removed these larger members while salvaging the walls for stone.



PLATE 4—Upper Room 9. Portions of the broken second-story roof consisting of two main beams, transverse poles, shakes, bark, and adobe.



PLATE 5—Upper Room 11, northeast corner. The lower 18 to 36 inches of fill contained a considerable quantity of well preserved, organic refuse: corncobs, husks, leaves, yucca ties, cordage, etc.

Upper Room 8 had been excavated and backfilled 30 years ago. The fill in upper Room 11 was a maximum of 9 feet deep; the upper levels contained a layer of roofing material with the major beams missing. Upper Room 12 showed similar disturbance.

The most confusing situation prevailed in upper Room 14 (plate 6) where the fill sloped sharply upward from 4 feet to 8-1/2 feet. In the deepest portion, at a depth of 18 inches was a piece of newspaper, circa 1925, associated with a partial Tularosa Patterned Corrugated rectangular vessel. About a foot below this, or from 4 to 5 feet above the floor, and mixed with a heavy deposit of dry refuse, corncobs, shucks, bark, gourd rind, and bone, were upward of 5,000 large sherds, many of them representing partly restorable vessels, many of them virtually nested together. There were 1,082 indented corrugated utility ware, 3,282 Mesa Verde Black-on-white, and lesser amounts of Klagetoh Black-on-white, Wingate Black-on-red, Pinedale Black-on red, Klagetoh-Kintiel Polychrome, St. Johns Polychrome, Springerville Polychrome, and Querino Polychrome.





PLATE 6—Upper Room 14. Detail of loose, unstratified fill, 10 to 15 inches above floor, showing large sherds, sometimes nested, which together with other evidence, indicates possible redeposition in modern times.

The disturbed condition of the upper portions of the adjoining rooms and the newspaper here makes this find suspect. On the other hand the mixture of sherds with dry refuse a foot or so below the newspaper suggests a prehistoric refuse deposit. Considering their time range, the sherds could all have come from the East Ruin, but the remainder of the excavations in relatively undisturbed areas recovered only nine Wingate Black-on-red sherds, three each of Querino and St. Johns Polychromes, and none of Pinedale Black-on-red, Klagetoh Black-on-white, Klagetoh-Kintiel Polychrome, or Springerville Polychrome. In each of the rooms there was some indication of collapsed roofing though the major beams were missing. Besides the questionable deposit in Room 14, Room 11 held refuse also containing considerable dry organic material. Aside from these two deposits the fill consisted of earth and the debris of fallen walls. The sherd contents of these rooms are shown in Table I.



PLATE 7—Room 24, looking west. Broken floor and ceiling remnants being dismantled.

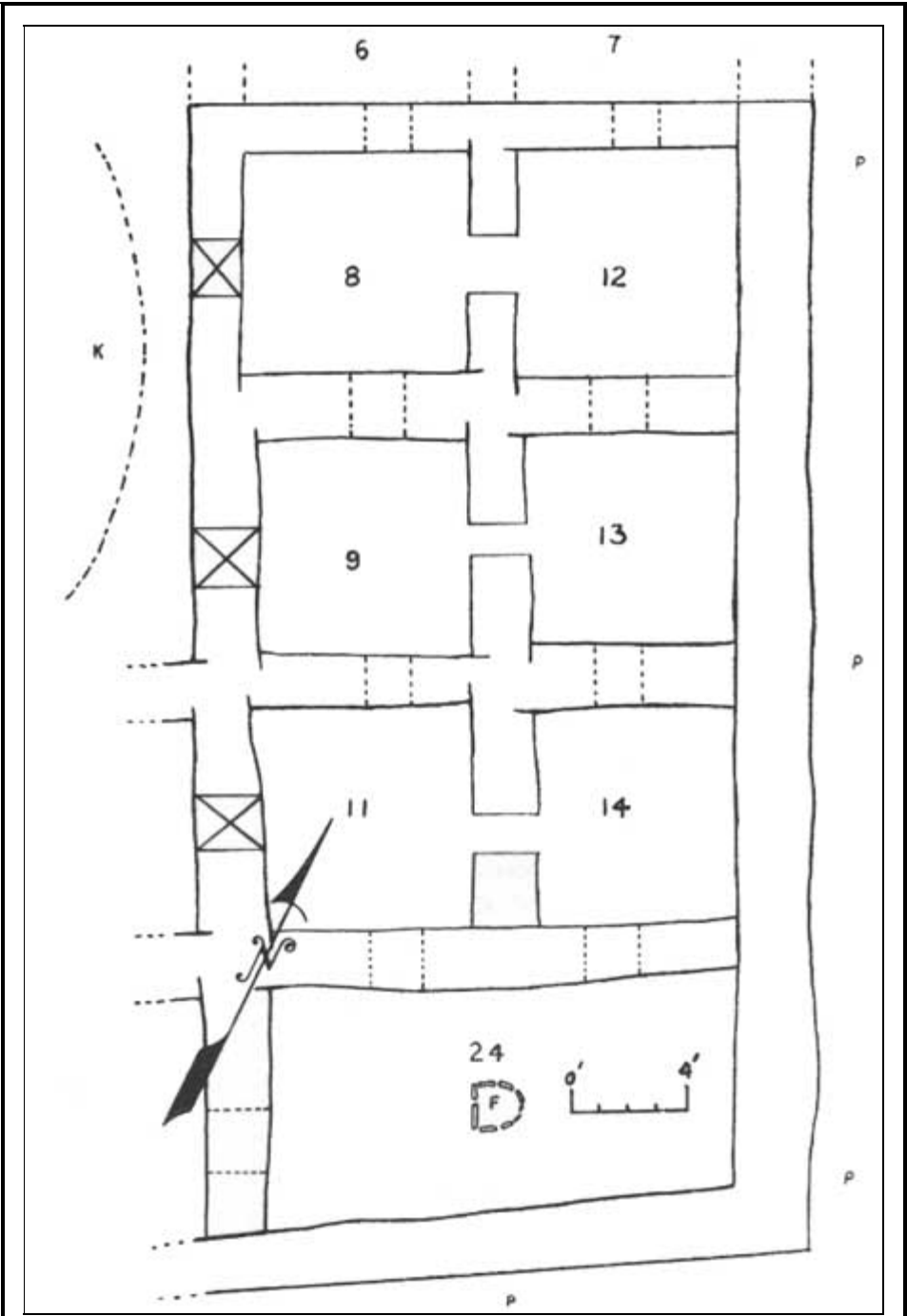


FIGURE 5—Excavated Rooms 8-14, and Room 24

- | | |
|-----------------------------------|---|
| Doors, first-floor rooms | |
| Blocked doors, second-story rooms | |
| Open doorways, second-story rooms | |
| Firepit | F |
| Unexcavated kiva | K |
| Plaza, or roomless area | P |

TABLE I — SHERD COUNTS — UPPER ROOMS

Pottery Type	Room No. 9		11		12		13		14		24		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Utility Ware														
Indented Corrugated	118	35.8	689	68.2	133	39.3	84	35.4	1,082	21.1	152	31.2	2,258	50.0
Reserve Indented Corrugated	1	.3							2	T			3	.1
Tularosa Patterned Corrugated										T				T
Mogollon Brown Ware										T				T
Decorated Ware														
Mesa Verde Black-on-white	195	59.0	306	30.2	200	59.2	144	60.8	3,282	64.2	292	60.0	4,419	58.7
McElmo Black-on-white	6	1.8	3	.3	1	.3	4	1.7	11	.2	8	1.6	33	.4
Mancos Black-on-white	5	1.5	5	.5	1	.3	4	1.6	2	T	32	6.6	49	.6
Chaco Black-on-white											1	.2	1	.1
Klagetoh or Kowitza Black-on-white									6	.1			6	.1
Unidentified Black-on-white	2	.6											2	.1
Morfield Black-on-gray					1	.3							1	.1
Wingate Black-on-red	1	.3	5	.5					338	6.6			344	4.5
Wingate Corrugated			1	.1									1	.1
Tusayan Black-on-red	1	.3	1	.1									2	.1
Finedale Black-on-red									31	.6			31	.4
Querino Polychrome	1	.3	1	.1					194	3.8			196	2.4
St. Johns Polychrome					1	.3	1	.4	70	1.4			72	.9
Klagetoh-Kintiel Polychrome									83	1.6			83	1.1
Springerville Polychrome									15	.3			15	.2
Tiegi Orangeware					1	.3					2	.4	3	.1
TOTALS	330	99.9	1,011	100.0	338	100.0	237	99.9	5,116	99.9	487	100.0	7,519	100.0

Lower Rooms (plates 8, 9, 10)

Fill in the lower rooms varied in depth from 18 inches to 5 feet. None of this fill consisted of primary refuse deposits; it was, instead, drift through cracks and holes in ceilings and holes in walls, and spill through doorways opening on collapsed, filled rooms. It was unstratified and contained building material, sherds, some of which were derived from their use as chinking in the masonry, scrap bone, and such artifacts as had been contained in the drift. The sherd contents of these rooms are shown in Table II.

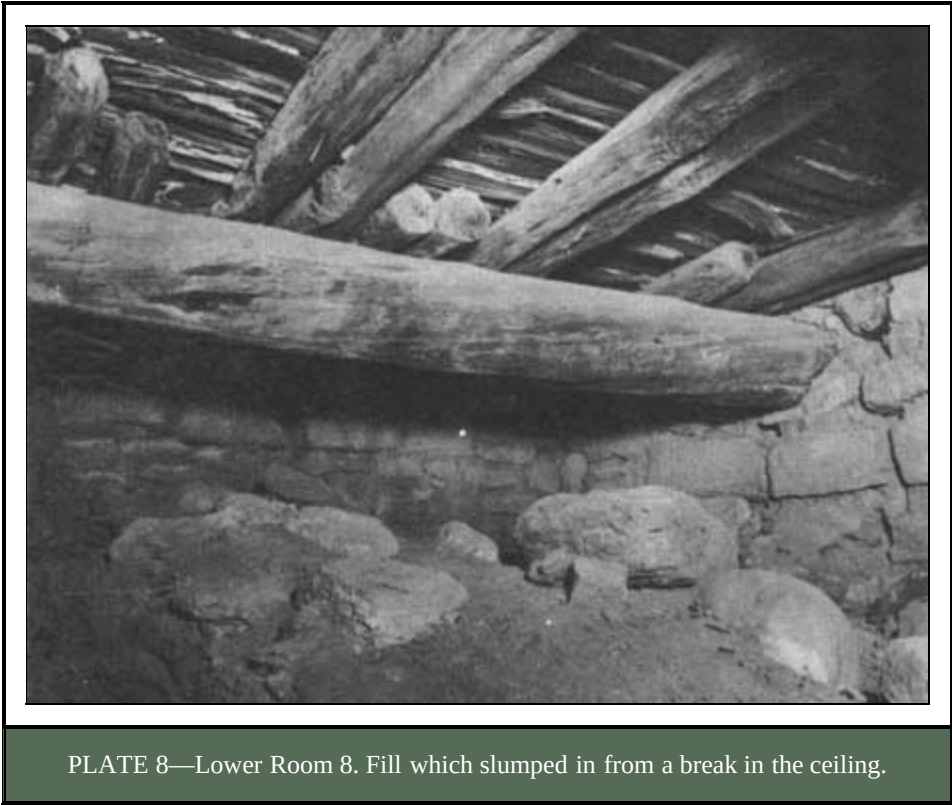


PLATE 8—Lower Room 8. Fill which slumped in from a break in the ceiling.



PLATE 9—Lower Room 9 Fill of extremely fine, powdery drifted dust. Thick mat of rodent-borne organic matter (arrow) lies above floor.



PLATE 10—Lower Room 11, recent break and fill line. Lower Room 11, showing hole made by vandals to gain entrance to unexcavated Room 10 and from which a considerable amount of fill drifted into Room 11. Dashed line indicates level of fill before excavation.

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ARCHITECTURE

Masonry (plate 11)

From the now exposed sections of the East Ruin, two and possibly three masonry types appear: (1) sandstone blocks, rather well selected, dressed, showing peck marks on one face, and sometimes ground to smooth finish, spalled with tabular stones and/or sherds, with a rubble core of mud and rough stone (these walls vary in width from 20 inches to 3 feet); (2) cobblestones or river boulders, set in large amounts of soil mortar, and (3) adobe wall, or predominantly adobe with a few random cobbles or some sandstone in the adobe. This may be a variation of (2) above, as the cobblestones are frequently plastered over with mud.

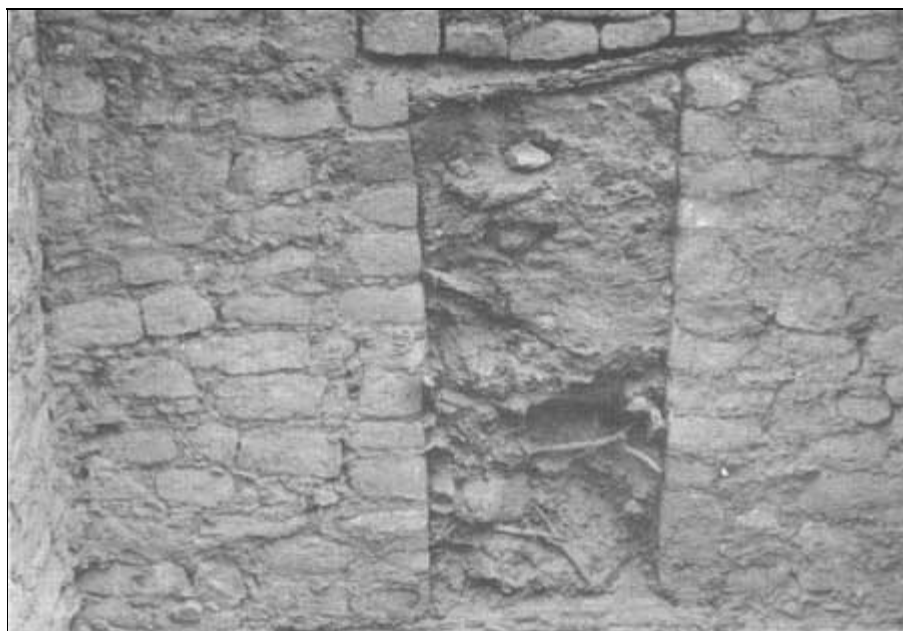
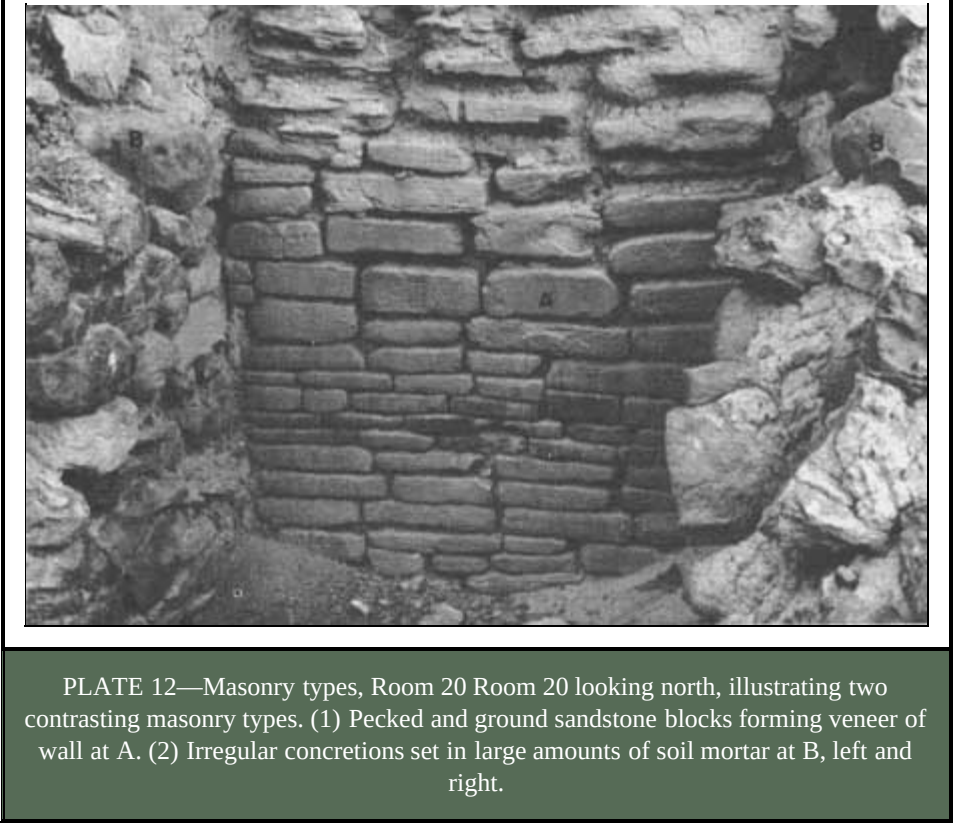


PLATE 11 —Masonry detail, Room 13. Upper Room 13, freshly exposed masonry detail. Note numerous small chinking stones and squared corners of the doorway.

An example of the extremes in masonry is seen in Room 20 (plate 12), which was a small bin or storage room previously excavated. The north wall displays a beautiful sandstone veneer with the stones having been pecked and ground as smooth as the grain would permit; yet the other three walls are composed of a double row of hard, rough and irregular concretions laid in abundant mortar.





While, of masonry now exposed in the East Ruin, the cobblestone variety is not as common as the double-coursed, pecked and spalled sandstone block with core type, it nevertheless may overlie, or be built between, the apparently dominant sandstone block type. Variation seems to have been a matter of choice and not of time.

TABLE II— SHERD COUNTS — LOWER ROOMS

Pottery Type	Room No. 8		9		11		12		14		Total	%
	No.	%	No.	%	No.	%	No.	%	No.	%		
Utility Ware												
Indented Corrugated	20	27.0	39	32.8	122	34.5	34	37.8	6	25.0	221	55.5
Reverse Indented Corrugated									1	4.2	1	.2
Decorated Ware												
Mesa Black-on-White	45	60.8	77	64.7	220	62.3	53	58.9	17	70.8	412	62.1
McElmo Black-on-White	3	4.0	2	1.7	4	1.3	2	2.2			11	1.7
Mancos Black-on-White	3	4.0	1	.8	1	.2	1	1.1			6	.9
Chaco Black-on-White					1	.2					1	.2
Puerco Black-on-red	1	1.3			1	.2					2	.3
Wingate Black-on-red					1	.2					1	.2
Quetico Polychrome	1	1.3									1	.2
Tusayan Polychrome					3	.8					3	.5
St. Johns Polychrome	1	1.3									1	.2
TOTALS	74	99.7	119	100.0	353	99.7	90	100.0	24	100.0	660	100.0

Considering shortage of building stone at Aztec, it is a wonder that all walls were not built simply of river boulders, since these can be obtained in unlimited quantity, whereas sandstone had to be quarried and hauled from several miles away.

Cobblestone masonry appears both early and late in Aztec. In the West Ruin Morris found deeply buried rooms and features composed of both adobe and cobblestone walls associated with the Chaco occupation. They are located beneath the present standing walls of Mesa Verde age in the East Wing (1918: 276-278). Beyond the western end of the West Ruin is a site known as the Annex where Morris conducted minor excavations. He regarded it as a late Mesa Verde structure, with a great many of the rooms built of "flimsy cobblestone walls" (1924: 231), erected after the West Ruin, and probably equating in time both with the East Ruin and reoccupied portions of the West Ruin. This is O'Bryan's Montezuma Phase, A.D. 1150-1300 (1950: 109.)

The South Wing of the West Ruin is a crescentic, single row of rooms of three types of masonry: (1) adobe reinforced with poles and sticks, (2) cobblestone, and (3) tabular stone. The first dates from the Chaco occupation, the second is found in both the Chaco-Mesa Verde periods, while the third is Mesa Verde (Morris 1928: 281). Cobblestones usually form a course or two of the foundations for the adobe walls.

In 1956 a pit was dug 8 feet deep along the north wall of the West Ruin. At a depth of 6 feet from the surface, the base of the massive masonry wall was found. Inset 3 to 4 inches, but precisely underneath and parallel with the sandstone masonry wall above it, was a cobblestone wall of unknown depth and extent. Whether this was a footing, as seems most probable, or part of an earlier structure, was not determined.

All walls of the large tri-walled structure at the Hubbard Site were of faced sandstone blocks, and all foundations under these walls were of large river cobbles (Vivian 1959: 16). Although foundation materials and construction were not verified in our brief work at the East Ruin, observations such as this, combined with sifting of occasional references by Morris for the West Ruin (1928 *passim*), suggest that use of cobble foundation material for both early and late walls may be more extensive than has been supposed.

From the above few examples, it will be seen that cobblestone masonry, *per se*, is not an accurate time indicator, as it occurs throughout the occupation of Aztec, about A.D. 1100-1300, with greatest incidence apparently near each end of the period. There is also some evidence that cobblestone masonry, or cobblestones interspersed with sandstone blocks, was used in lower, interior, and more protected sections such as partition walls, where it was less exposed to weathering, and the sandstone block masonry was used in upper, more exposed areas. This may be seen in Rooms 15, 16, and 17

In the latter half of the 13th century, toward the close of occupation, the inhabitants resorted increasingly to poorly constructed walls of adobe and/or mixed cobble and sandstone, and reused not only previously dressed stone but timbers as well for new construction. Rooms 8-14 are a case in point. While the walls here are of good ashlar masonry, stones in the facings show reuse. Certain portions of the large West Ruin were by this time abandoned; many rooms of the East Wing were nothing but trash dumps, so it is possible that this was a source of salvageable material. Whether the inhabitants were at the same time salvaging portions of the East Ruin to build up newer sections within the same site is difficult to say at this time.

Comparisons

O'Bryan (1950: 110-111) cites the pecking technique of stone working as a diagnostic of the Montezuma Phase (ca. 1150-1300) in the Mesa Verde district. The greatest building activity occurred there in the middle and latter years of the phase (1250-1260) (Lancaster *et al.* 1954: 5).

Masonry in this period at Mesa Verde "varied greatly with rough and superior types side by side. The finest examples of walls contain well shaped, evenly sized stones which have smoothed or pecked faces, the latter being more common. Many rooms were plastered and bore painted designs. Wide use of small chinking stones was characteristic. Few double-coursed walls were built and the single-coursed walls average somewhat thinner than in the earlier mesa-top pueblos. This may have been an effort to save space, or possibly the thick walls were not needed since the caves provided shelter against the destructive forces of the elements" (*ibid.*: 5).

On the basis of this description for Montezuma Phase masonry in the Mesa Verde, that displayed at the East Ruin is identical, except that it is double-faced and cored, a necessary adaptation since the pueblo was built in the open instead of in a cave.

It is significant also that both the inferior and better types of masonry, at both the East Ruin and in the Mesa Verde, occur side by side. Furthermore, the traits of pecking stone, use of spalls, plastering and painting walls (dados) are identical for the East Ruin and the Mesa Verde, and for refurbished portions of the West Ruin as well.

Roofs and Ceilings

Patterns and materials vary somewhat throughout the open and observable sections of the ruin. However, roof construction was remarkably uniform in both upper and lower Rooms 8-14 (plates 13, 14, 15, and 16). Across the short axis of the room were laid two juniper beams averaging 7 inches in diameter. An exception was upper Room 11 where a single juniper beam spanned the long axis. Beam ends in lower rooms extended through walls and were flush with wall faces of adjacent rooms. In upper rooms the beams were embedded about half the width of the wall, or to a depth of 8 inches.

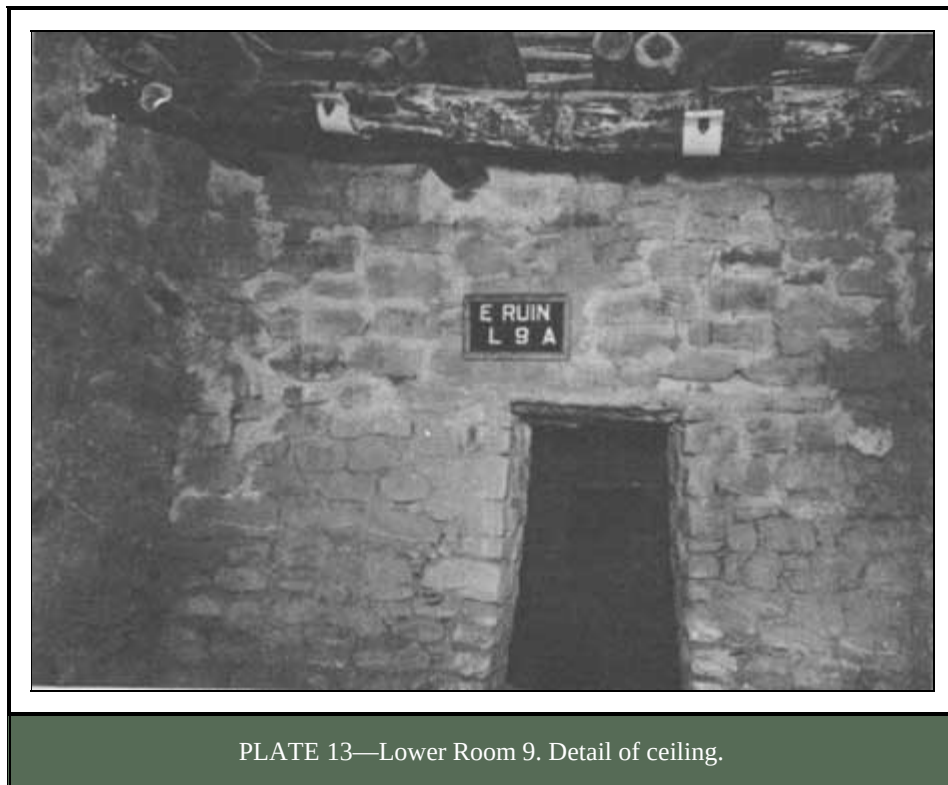




PLATE 14—Lower Room 11. Detail of ceiling Excellently preserved ceiling, rather heavily smoke-stained.



PLATE 15—Lower Room 12. Detail of ceiling Prehistoric ceiling. All of the wood is juniper.

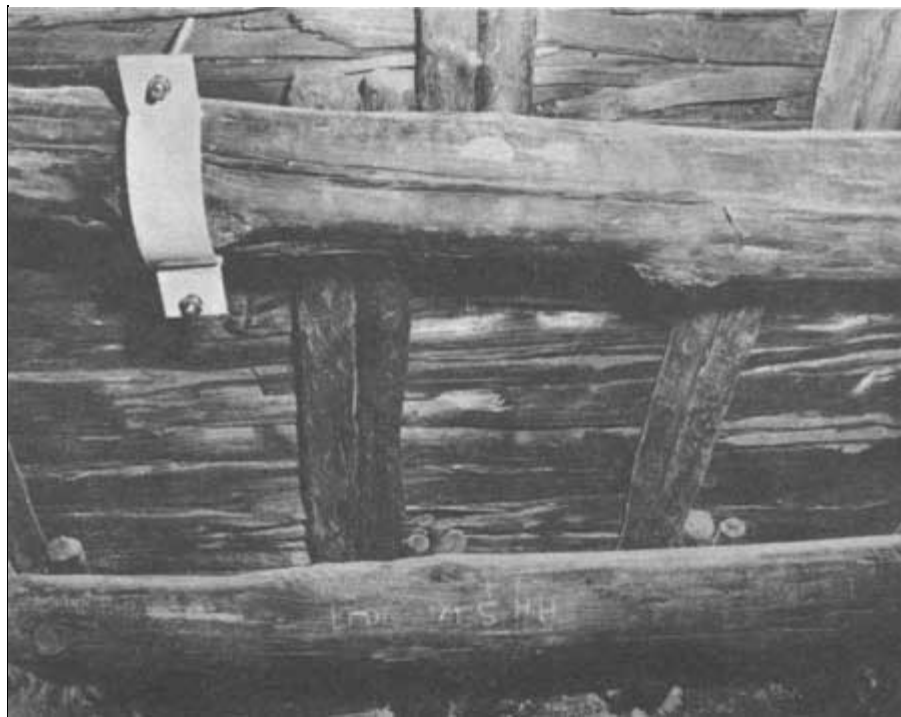
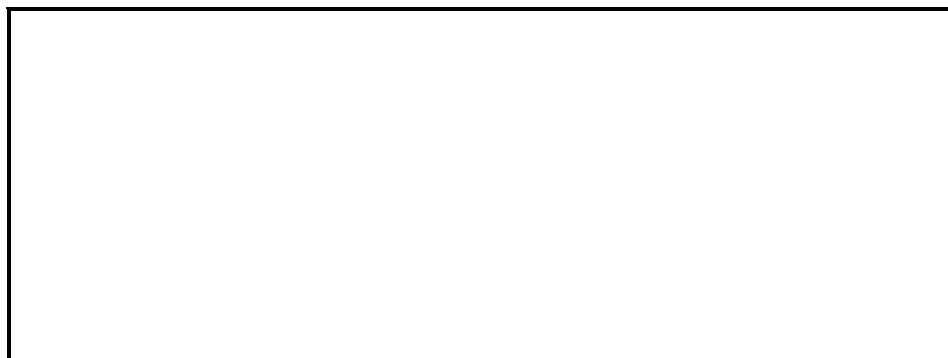


PLATE 16—Lower Room 14. Detail of ceiling well preserved, the two main beams, secondary poles, and shakes are of juniper.

Where two main beams were used, they were placed nearly equidistant from the walls which they paralleled, dividing the ceiling area roughly into thirds. At right angles to the large beams were next laid peeled juniper poles 2 to 3 inches in diameter and spaced in pairs, each pair placed from about 6 or 8 inches to 24 inches apart and spanning only a third of the ceiling area, i.e., sets of paired poles were about 3 feet long and extended from one wall to one main beam, while other pairs spanned the main beams only. Additional, alternating long and short poles, extending from one-third to the entire length of the ceiling, were placed next to the walls at the two sides. Ends of these poles were usually embedded in the walls only an inch or two. Above the poles, laid in the opposite direction, are a layer of juniper splints, and above these—the final step in the roofing—is a layer of puddled adobe 3 to 6 inches thick. Sometimes a layer of juniper bark was placed an inch or so above the shakes, embedded in the adobe.

The long and narrow ceiling of Room 1 (plate 17) varied slightly from this pattern. There, three pairs of beams and one set of three lay across the short axis. Above these were laid juniper poles side by side, no one of which extends more than one-third or one-fourth the length of the ceiling. The butts and thin ends are not alternated and the poles vary considerably in length. Hence, the ends sometimes terminate on beams, but just as often end at odd intervals between beams.



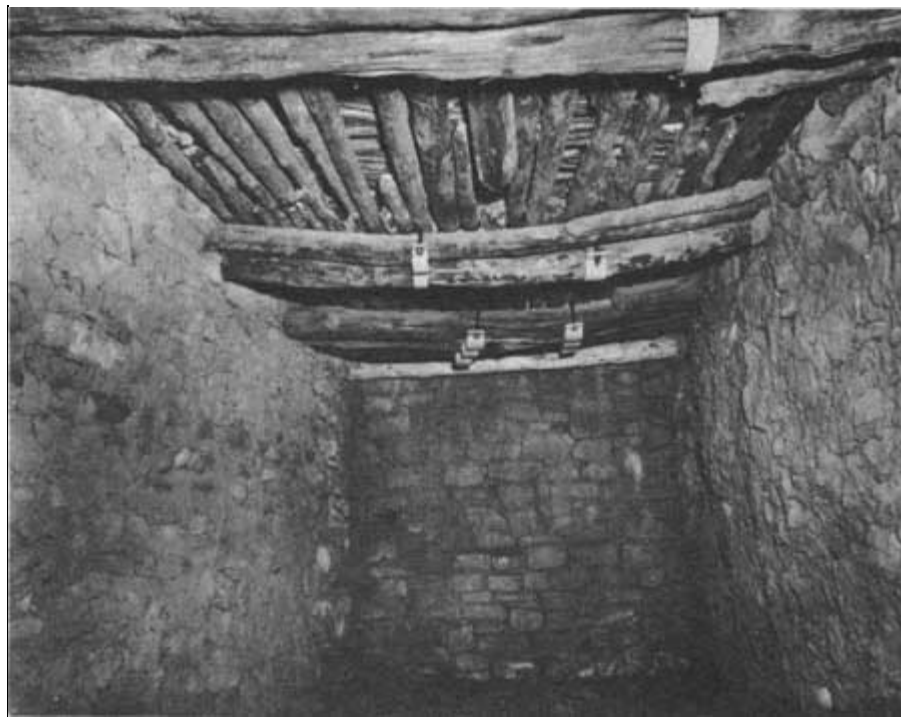


PLATE 17—Ceiling of Room 1. One-half of a kiva rested on the roof of this room while the other half overlay an adjacent room to the right which collapsed.

In Room 24, the largest room, were four main logs, while in Room 21, among the smallest of rooms, the major beams were omitted and the spans were made with closely spaced juniper poles. In Rooms 22 and 23, one or two long beams, which are probably reused pine, extended through three walls to provide partial support for two ceilings.

Most observable roofing wood is juniper for main beams as well as for secondary poles and shakes, while pine, fir, and pinyon are rare, and there is reason to believe that they were reused members. In Room 4, the secondary poles are probably cottonwood or sycamore.

Of rooms containing original ceilings which have been cleared of debris, the average height from the floor to shakes is 7 to 3 inches, which is a good 2 feet lower than the average ceiling in the West Ruin. Since this comparison is based on rooms of the West Ruin known to be of Chacoan origin, although reoccupied by the Mesa Verde Branch, there is a suggestion of a cultural difference.

Doorways

Doors were uniform in size. In first-floor rooms the jambs are inclined so that the door is slightly wider at the sill than at the lintel (plate 18). Both sills and lintels were made of six or seven peeled juniper poles, 2 to 3 inches in diameter, varying from 3 or 4 feet to over 6 feet long, the butts and thin ends alternated, flush with the wall face. The outer poles, both top and bottom, were tied in place with withes a short distance back from the jambs. The withes are usually single, but do range up to six or seven. They range from one-eighth to one-half inch in diameter and are in each case half round.



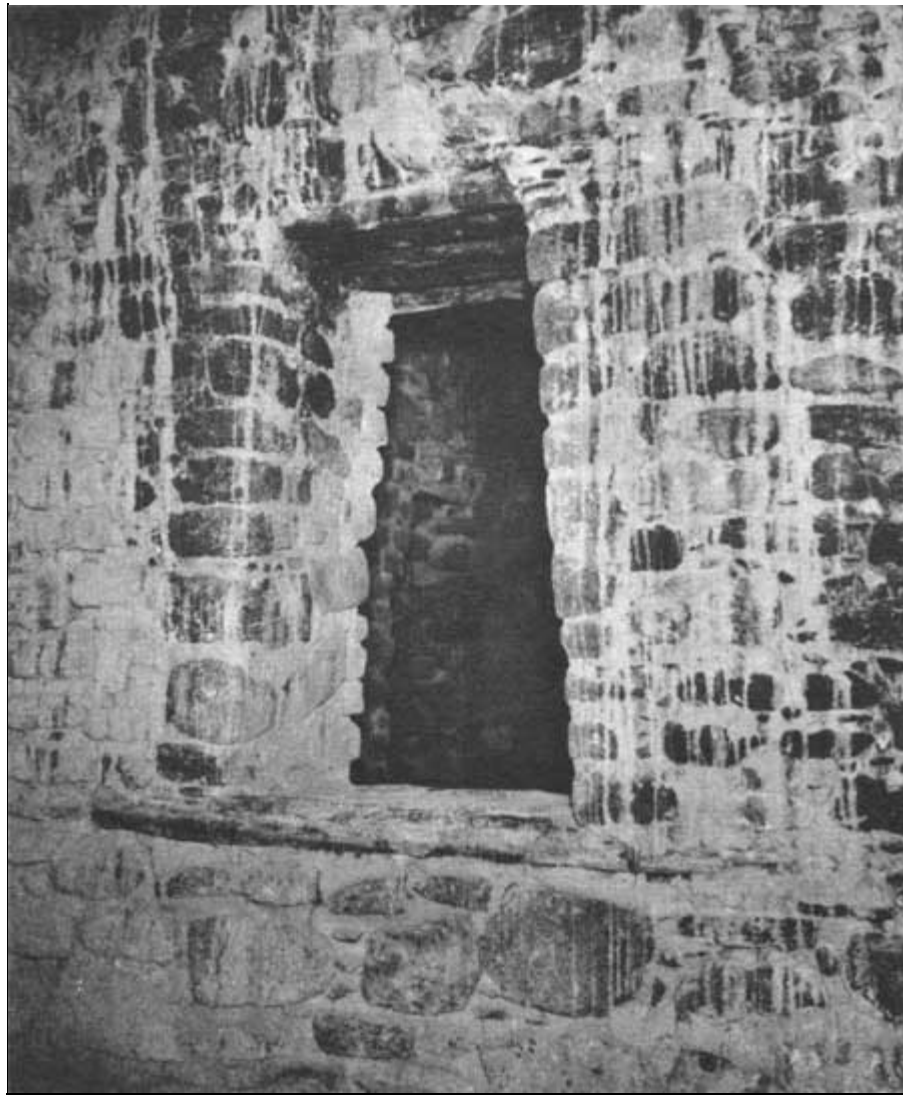


PLATE 18—Lower Room 14. Detail of doorway. Sill and lintel poles are sometimes 5 to 6 feet long and built deeply into wall core. Note that outer lintel pole is exposed for a space of 3 inches and concealed except where adobe and spalls covering them have eroded. Jambs are straight but slightly wider at the sills than at the lintels.

In the lower floor doors (plates 18 and 19) the average width at the sill is 22 inches, at the lintel, 19 inches, and the average height is 34 inches. Height of sills above floors varied considerably, the range being from 16-1/2 to 28-1/2 inches. Use of steps is inferred, but none were found. There was no evidence in ground-floor rooms of a method for closing the doorways.

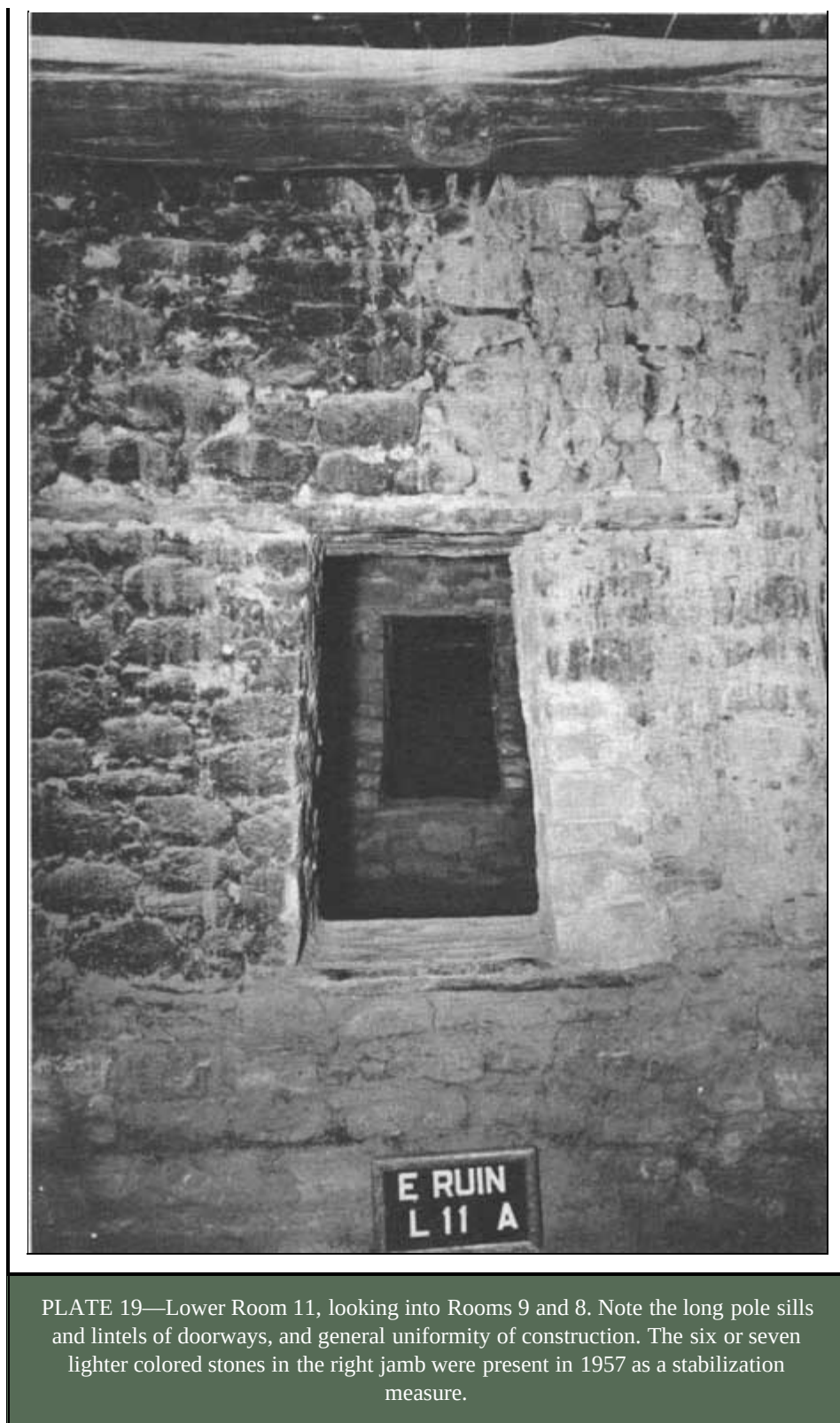
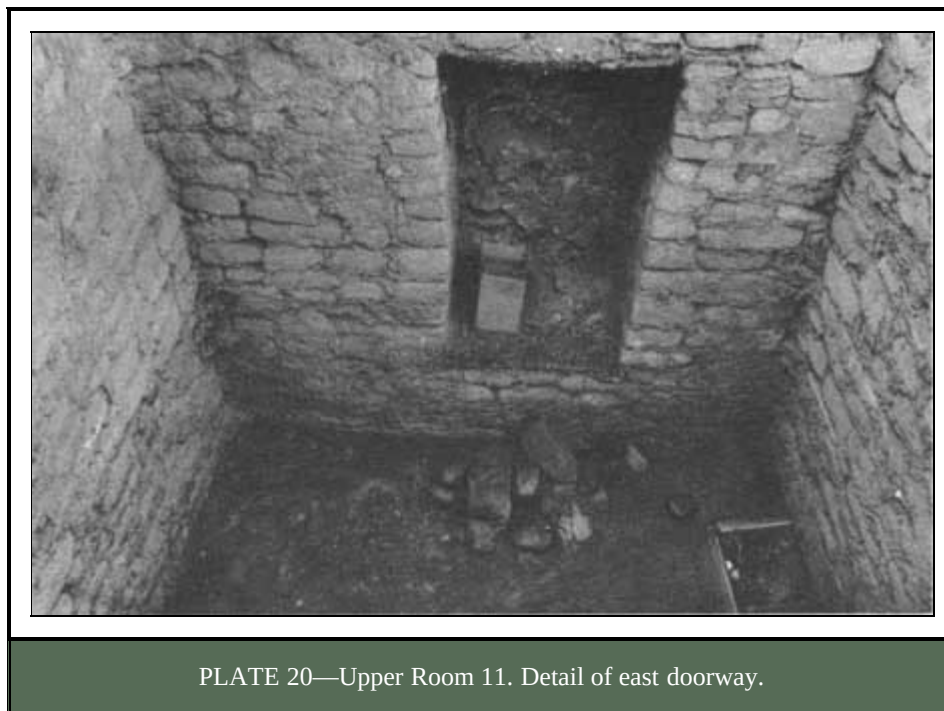


PLATE 19—Lower Room 11, looking into Rooms 9 and 8. Note the long pole sills and lintels of doorways, and general uniformity of construction. The six or seven lighter colored stones in the right jamb were present in 1957 as a stabilization measure.

Doorways in upper floor rooms (plates 11, 20) were similar to those in the lower floor except that they were not narrowed at the top and they averaged more than 1 foot taller. Average door width was 25 inches; average height, 52 inches; average height of sill above floor, 18 inches. The other feature which sets them apart from doors in the lower rooms is the presence of a drape pole usually set from 8 to 15 inches beneath the lintels, with ends embedded in the center of the jambs. These were probably used for suspension of some sort of covering for the door—perhaps a willow mat or buckskin. They could also have served as hand rails to facilitate passage.



The use of poles in doorway sills may be unique or almost so. There may be rare instances of pole sills in domestic rooms of the West Ruin of which we are unaware, but it is believed that most of them are of stone. Source of origin or prior use elsewhere is not known.

Each doorway in the west walls of upper Rooms 8, 9, and 11 was sealed. The patchwork masonry employed in closing the doors was generally inferior to that of the surrounding walls. Upper Room 11 is adjacent to an unexcavated room on the west, while upper Rooms 8 and 9 are bounded immediately to the west by an unexcavated kiva, a possible later structure which might account for the sealed doors (*see plan, figure 5*). Prior entrance, then, to upper rooms 8, 9, and 11, would have been at second-story level through side doors by ladder and/or from the roof of some sort of structure later razed to make space for the kiva.

Hatchway (plate 21)

The only known example of a hatchway in an existing roof is between lower and upper Room 4 (Vivian 1949). The hatchway is rectangular, 18 by 30 inches, long axis at right angles to the closest wall.





PLATE 21—Hatchway between upper and lower Room 4—photo by Vivian, 1949.

The opening was framed by short straight poles, two high, surmounted by a single course of masonry, the stones set flush with the puddled adobe floor. Poles forming the sides of the hatchway were chinked with adobe. The room ceiling and sides of the hatchway are heavily smoke-stained. No evidence of a hatch cover or ladder was found, as the lower room remains unexcavated.

>Ventilators

Repair work in 1956 disclosed a pair of small adjoining ventilators in an exterior wall at the northwest corner of the site. They were each 8 by 10 inches, located just below ceiling level of a first-story room. Lintels extending over both openings were small juniper poles about 5 feet long. These are the only presently exposed ventilators in the East Ruin, though future excavation should expose additional examples in the north exterior wall.

Floors

In second-story rooms, floors were invariably of puddled clay, as shown by squeezed-out portions of the wet clay mortar in the ceilings below, similar to plaster between laths. While this 3- to 4-inch layer of clay usually rested directly on the juniper splints, a layer of juniper bark was occasionally embedded in the clay. Human footprints in the floor of upper Room 9 appear to have been made during its construction.

Floors in first-story rooms, with one or two exceptions, appear to be tramped and packed clay. The floor in lower Room 11, if not of puddled clay, had been laid wet and packed hard. The floor of the kiva over Room 1 was of puddled adobe.

Firepit (plate 22)

Only one hearth was found, this in first-floor Room 24. It was well made, of slabs set in soil mortar, top flush with the floor, D-shaped in plan and basin-shaped in profile. It was built in the center of the room. Most firepits in the West Ruin were either circular, oval, or rectangular in form, and generally, like this one, stone-lined (Morris 1928 *passim*).

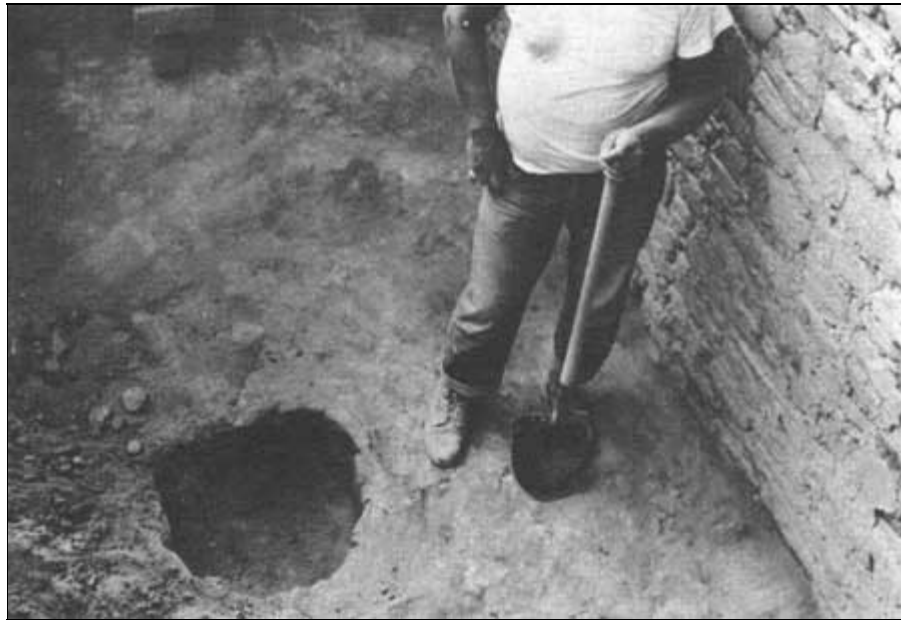


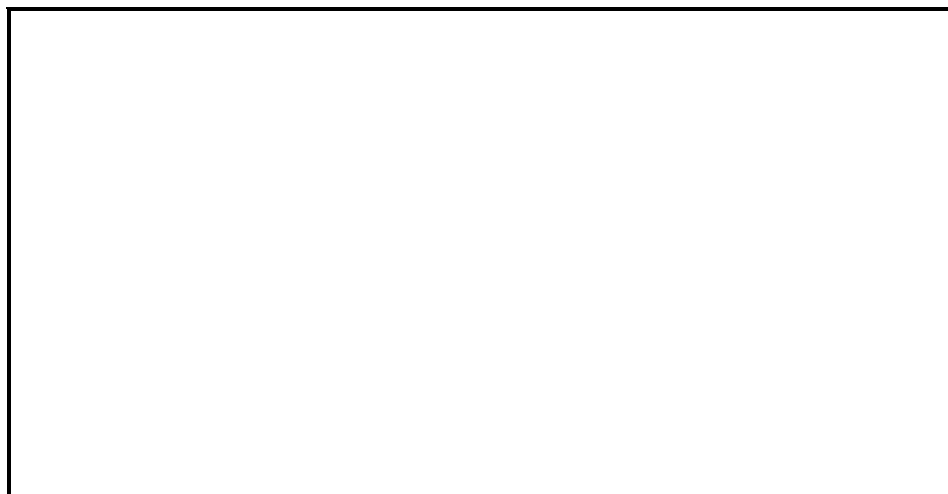
PLATE 22—Room 24, floor. Looking west "D"-shaped, stone-lined firepit near center of room.

Plaster

Mud plaster occurs on the walls of only two rooms: the kiva over Room 1 and Room 24. In the former, the fine clay coating was tinted, presumably with gypsum or kaolin for the separate white layer, and with hematite for the red layers. The final coat of plaster is red. This seems to have been a favorite color of the Mesa Verdeans at Aztec, and was found frequently as a final layer in reoccupied rooms of the West Ruin (Morris 1928 *passim*).

Balcony

Along the north wall between first and second story are a series of large beams, the ends of which were cut with a saw (plate 23). One story above them a juniper beam projects 3 to 4 feet. Before 1928 these lower beams protruded "more than a yard" beyond the face of the wall (Morris 1928: 413). They were cut sometime after 1928, probably by Morris and/or Douglass for tree-ring dates. These are very large beams, 10 inches or more in diameter; some of them extended through and formerly supported portions of ceilings for two rooms. Some of them are pine and may be reused timbers.



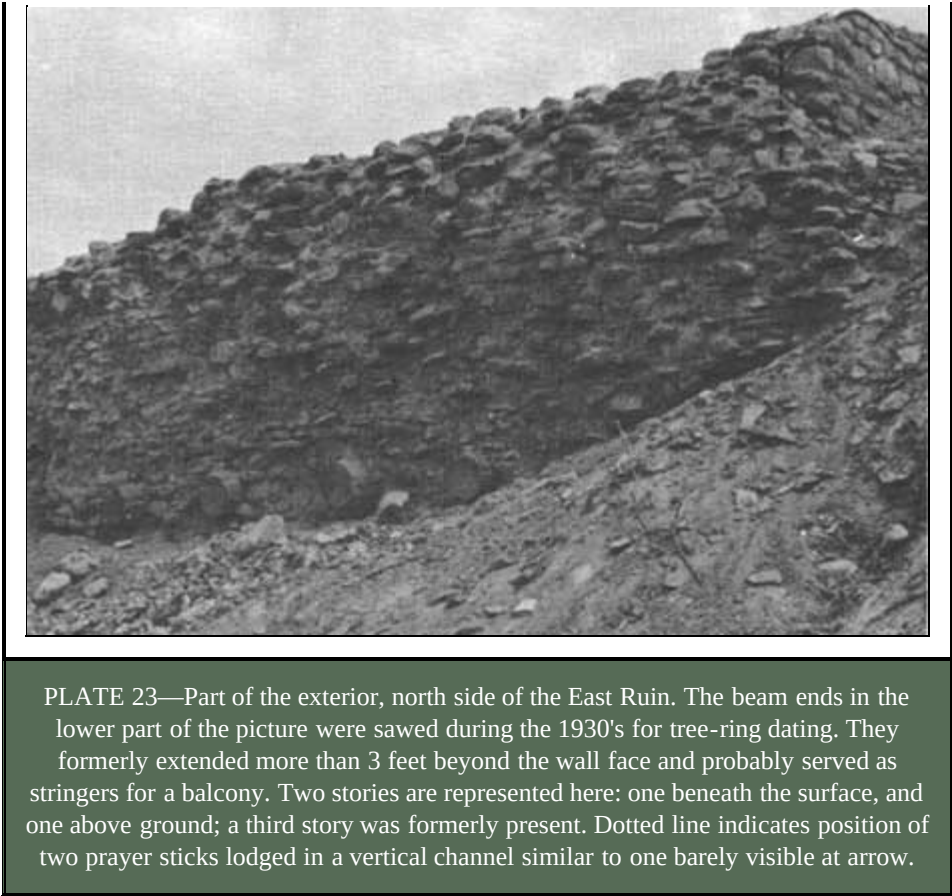


PLATE 23—Part of the exterior, north side of the East Ruin. The beam ends in the lower part of the picture were sawed during the 1930's for tree-ring dating. They formerly extended more than 3 feet beyond the wall face and probably served as stringers for a balcony. Two stories are represented here: one beneath the surface, and one above ground; a third story was formerly present. Dotted line indicates position of two prayer sticks lodged in a vertical channel similar to one barely visible at arrow.

Having found charcoal and burned clay against the outer wall of the West Ruin under circumstances suggesting an exterior balcony, Morris points out that the existence of a balcony there is heightened by the presence of the protruding beams in the exterior wall of the East Ruin (1928: 413). If these were indeed balconies, they could have been used not only as a means of defense; but in the case of multistoried, large-walled structures, they would also have served as stringers for scaffolding, perhaps used not only in repairing and maintaining walls, but during initial construction.

Balconies attached to walls below rows of doors occur at Spruce Tree House (Fewkes 1909: 15), Balcony House (Nordenskiöld 1893: 127), and perhaps other ruins in Mesa Verde National Park. Projecting beams, most of them gone now or sheared off, and exterior wall insets which likely served as a foundation and point of attachment for a balcony, are also noted for ruins of the classic period in Chaco Canyon National Monument: Chetro Kettle, Pueblo Bonito, Kin Bineola, and Kin Ya-a. Where this trait originated is unknown. Logically, it would derive as a byproduct of massive-walled, multistoried construction.

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AZTEC RUINS

Excavation of a Portion of the East Ruins, Aztec Ruins National Monument, New Mexico



DATING

Save for one pine specimen, a beam from upper Room 12, all other wood found in Rooms 8-14, 24, and the kiva over Room 1 was juniper. Numerous sections were submitted to the Laboratory of Tree-Ring Research at the University of Arizona. Thus far the only date obtained came from the pine beam. Dr. Bryant Bannister reported that "the date is definitely a cutting date and the tree was felled very late in the summer of A.D. 1240" (personal communication, June 4, 1962).

In 1940 Deric O'Bryan took tree-ring samples from both the West and East ruins at Aztec. This material was dated at Gila Pueblo by means of measured rings, and later the same year, Harold Gladwin submitted the results from both pueblos in a letter to then Custodian Carroll Miller of Aztec. The dates for the East Ruin are in Table III.

TABLE III — TREE-RING DATES FOR EAST RUIN, AZTEC
(Gladwin)

No.	Inside Date	Outside Date	Cutting Season	Diameter (cm)	Cell Count	
					Incomplete Right	Last Complete Ring
2579 ⁽¹⁾	1070	1120	Winter	20	0	48
2581 ⁽²⁾	997	1117	Spring	24	7	20
2582 ⁽³⁾	1020	1120	Winter	22	0	15
2583 ⁽⁴⁾	954	1116	Winter	28	0	15
2584 ⁽⁵⁾	1042	1115-(?)		15		
2585 ⁽⁶⁾	1210	1236	Autumn	14	35	50
2587 ⁽⁷⁾	1160	1238	Spring	17	5	30
2588 ⁽⁸⁾	1177	1239	Spring	16	8	31

- (1) Wall north of central kiva (probably Room 5).
- (2) Outside room, north of central kiva (Room 22).
- (3) North room of tier E of central kiva (Room 2?).
- (4) Central room of tier E of central kiva (Room 3?).
- (5) South room of tier E of central kiva (Room 4?).
- (6) 2nd room from east, outside (vicinity of Room 8).
- (7) 2nd room from east, outside (vicinity of Room 8).

(8) 2nd room from east, outside (vicinity of Room 8).

With the same letter, Gladwin submitted dates for the West Ruin. These for the West Ruin showed a concentration of 74 dates between A.D. 1106 and 1121, and three dates at 1225-1252. The East Ruin, Table III, shows five dates at 1116-1120 and three dates at 1236-1239. Gladwin believed that the dates between 1116 and 1120 from the East Ruin came from reused timbers taken from the West Ruin. His letter says in part,

"I am delighted that we can give dates of 1236 to 1239 for the East Pueblo. You will see that 5 pieces of wood show that they were taken from the main ruin and reused when the East Pueblo was built. It is also noteworthy that the only 7 pieces of juniper in our entire Aztec collection came from the East Pueblo."

In 1934 Harry T. Getty took borings from several rooms from which he derived dates for Rooms 22 and/or 23 identical with those derived 16 years later by Gila Pueblo. (Both Gladwin's and Getty's letters are in the files of the Aztec Ruins National Monument.)

Data presently available from the East Ruin reinforces Gladwin's opinion that construction took place in the 13th century and that dates in the 1100's came from reused timbers from the earlier West Ruin. The earlier dates are not in accord with the recently derived date of A.D. 1240, and they are not in agreement with the ceramics nor the architecture as they are now known. Compared with the ceramics, the earlier dates would seem to say that a portion, at least, of the East Ruin was built some 80 years before Classic Mesa Verde pottery reached its flower, and at a time when Chaco Black-on-white was in vogue. Ninety-two percent plus of all black-on-white sherds derived from work in the East Ruin are Classic Mesa Verde Black-on-white. The remainder, of Chaco or Morris' Chacoese and Mancos and McElmo, show up in the East Ruin either as intentional fill derived from refuse or as spall material from wall construction.

Since the Classic stage in Mesa Verde pottery was reached in the 13th century, it is more reasonable to believe that the East Ruin was built after 1200 than before. Hence, the dates 1236-1239 seem more in line; but there is no assurance that even these are not also from beams which represent salvaged material. By 1250 the majority of the large pine beams had been in place in the West Ruin well over 100 years. And it is probably more than coincidence that all except one of the main beams and secondary roofing material in Rooms 1, 8-14, and 24 of the East Ruin are of juniper. When these rooms were built, it is quite possible that many of the sound beams in the West Ruin, other than those which were still in use, had either been salvaged, burned, or were, by their position in refuse-filled rooms, so difficult of access that the people were resorting to the readily available wood then growing in the immediate vicinity. Furthermore, there are some grounds for believing that the population had been depleted or weakened to the extent that timber expeditions for large pine logs involving a sizable, perhaps specialized, labor force, and considerable time, were either out of the question or no longer deemed worth the effort.

Initial source of wood is problematical. Conceivably, large beams could have been floated down the Animas, if the Aztec vicinity did not then support stands of pine, pinyon or fir. We have implied that some large conifer beams in the East Ruin are reused timbers, salvaged from the West Ruin, and that the predominant juniper found in Rooms 8-14 was obtained from the immediate vicinity of Aztec.

On the evidence to date, the East Ruin is a pure Mesa Verde site, not preceded by Chacoan occupation, built and occupied in the 13th century. If anyone was living in the West Ruin at this time, they too, were Mesa Verdeans rehabilitating parts of what was initially a Chacoan structure. In a short span of 50 years, from 1250-1300, they became a disintegrating,

disorganized, and diminishing lot. There is some evidence that they were moving out of the San Juan at this time, probably in small groups, to the south. One migratory Mesa Verde group can be spotted in Canyon de Chelly at A.D. 1284 (Morris 1941: 227-230). Another may be noted in the Chacra Mesa east of Chaco Canyon (Vivian 1959: 74-77). Perhaps they were enroute to their assumed final homeland in the Rio Grande district. It is worth noting also that recent excavations by Hawley (1961: 3) in connection with Pueblo land claims and her correlative studies of Keresan oral traditions are strengthening Mera's hypothesis (1935: 39) that the Keres language, particularly Acoma and Laguna, and Mesa Verde pottery might be parts of the same culture.

Frankly, I do not know in what year the East Ruin was deserted. A reasonable guess would be near the close of the 13th century. But I would place complete reliance on dates from the fresh-appearing juniper beams in Rooms 8-14 if they could be obtained; barring this, a great amount of carefully recorded excavation in undisturbed portions of both mounds of the East Ruin will be necessary before further refinement of dates is possible. While there may have been short intervals of construction and rehabilitation at the East Ruin, I would place the initial construction date after 1200, at least for those rooms covered in this paper, and the cultural florescence at about 1240.

Stratigraphy

Stratigraphic data for the kiva over Room 1, and upper Rooms 9 and 11, appear valid and reliable. While material in the fill of upper Rooms 12 and 13 may have been redeposited, partly in the modern period, it nevertheless appears representative of the site thus far uncovered. Contents of upper Room 14 should probably be discounted.

According to Morris, who had tested down to sterile soil, the East Ruin is a Mesa Verde great house (Montezuma Phase) which has a Chacoan base (Mancos-McElmo Phases) only in the sense that there are no Chaco sherds beneath the East Ruin except in what was surface soil before the building was erected (1939: 40).

At the West Ruin Morris proved conclusively, not once but many times, the existence of a sterile layer representing a gap or period of abandonment between the initial Chaco occupation and the subsequent reoccupation by the Mesa Verde Branch (1928 passim). This was corroborated by Vivian at the Hubbard Mound, where he too found a sterile sandy layer signifying hiatus or abandonment of unknown duration between the first two construction levels (Mancos ? McElmo Phases) and ??? the third and final erection of the triwall building (Montezuma Phase) (Vivian 1959: 53).

The implication of Morris' work at the East Ruin, therefore, is that while people of the Chaco Branch were undoubtedly using the area now occupied by the East Ruin for either agricultural or other pursuits, they were not responsible for erection of the East Ruin itself. That Chaco buildings may somewhere underlie the vast East Ruin is not denied. From present evidence, however, these possibly existent buildings of Chaco origin are neither linked structurally nor culturally with the East Ruin as they are in the West Ruin.

According to the best available evidence, fully developed Mesa Verde Black-on-white was present in the La Plata by A.D. 1176, and was brought to the Aztec vicinity no earlier than 1171 (Morris 1939: 214). Initial construction of the West Ruin occurred between 1110-1121 and Mesa Verde pottery does not appear in this first occupation.

While both Morris and Kidder (Morris 1939: 203; Kidder 1924: 6) agree that the West Ruin was a Chaco-inspired structure, Morris modified his view somewhat in regard to ceramics, feeling there was a definite lag north of the San Juan compared with the Chaco area, and that this lag was more pronounced in ceramics than in architecture: "Not ?? withstanding,

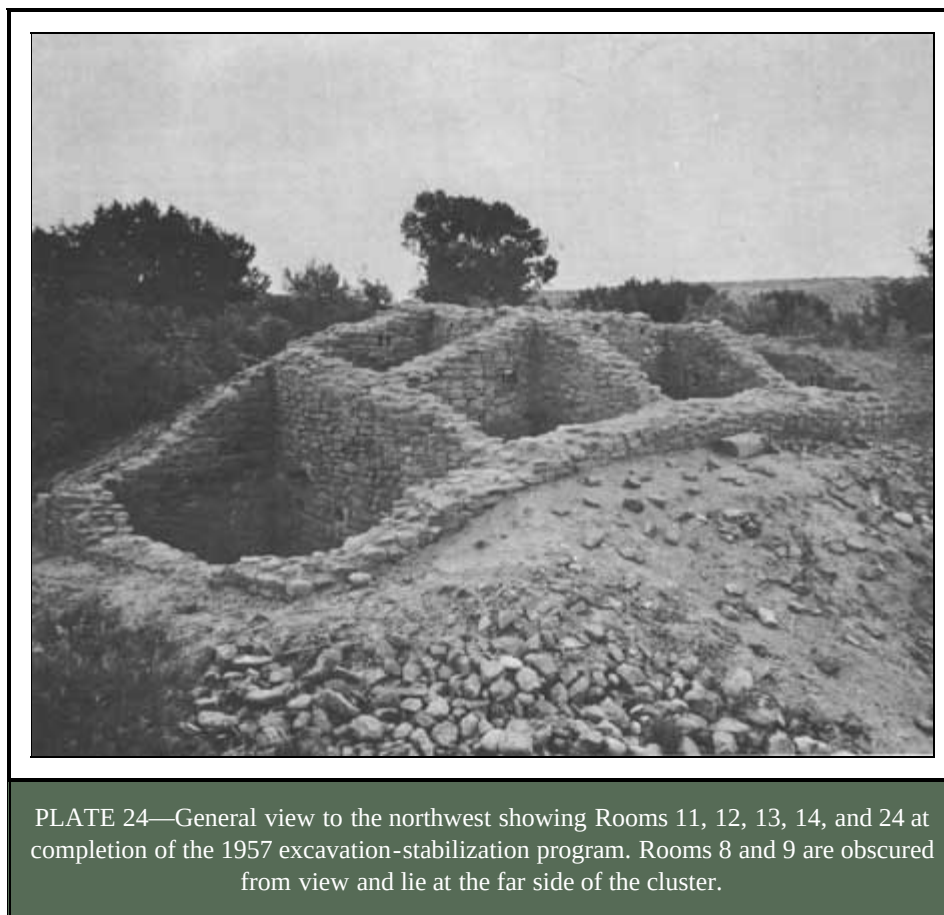
pottery made and used by the builders of Aztec ruin [West Ruin] is more Chacoese than Chaco. It is more Chaco, certainly, than anything else, but there is little of the clear white slip and the beautifully executed, narrow-line hachured patterns that are conspicuous features of the highest Chaco wares. It is representative of the black-on-white ensemble that was in general use north of the river at the time when the best wares of the Chaco center were being made, and I believe is the result of local expression of the generalized Chaco urge far more than of direct influence from the Chaco itself" (Morris 1939: 205).

If some of this Chacoese pottery may be equated with Mancos Black-on-white, and McElmo Black-on-white considered as the nascent stage of Mesa Verde Black-on-white, few students could quarrel with the thesis that two successive cultural forces, Chaco and Mesa Verde, are discernible at Aztec.

Use and Abandonment

The kiva over Room 1 lacks the pilasters normally associated with the Mesa Verde kiva, but must nevertheless be considered a ceremonial chamber. Room 1 below the kiva was not excavated. Its walls are not smoke-stained, and we can only assume that it was a sleeping or storage room.

Lower Rooms 8, 9, 12, and 13 (plate 24) show such little wear or usage, that their purpose is uncertain. Floors were clean, there were no firepits or fired areas, and the walls and ceilings are not smoke-stained.



Lower Rooms 11 and 14 are moderately smoke-stained, yet contain no firepits. They were, however, close to the firepit in the floor of Room 24 to the south, and this is the only visible source from which the blackening of walls may have occurred. Juniper pole sills of doorways, though shiny in some cases, are not worn from usage. From the evidence, or lack

of it, one can only guess that lower Rooms 8 through 14 were either storage or sleeping chambers.

Room 24 is the only one showing considerable use. The floor was dirty and stained by fire, and the central firepit nearly full of ashes. Very probably subfloor tests in Room 24 would disclose additional floors. A fragmentary second-story floor also showed a fired area but without firepit.

Upper Room 8 was excavated by others and we have no data on it.

Upper Room 9 was apparently emptied of contents when abandoned, if indeed it was ever used, and remained undisturbed thereafter. A used, fired floor area was on the roof but any evidence of a permanent or temporary structure, if formerly present, had been destroyed.

Upon abandonment, upper Room 11 was used as a trash area, since it contained 3 feet of mostly dry vegetal matter, byproducts of agriculture.

Upper Rooms 12, 13, and 14 were intentionally filled, the last containing upwards of 5,000 sherds. The pottery was from A.D. 1200-1300, mixed with only a few broken and discarded artifacts, while the former two rooms contained little other than earth mixed with Mesa Verde Black-on-white sherds.

The impression is strong that upper and lower Rooms 8-14 and 24 were little used, that abandonment was premeditated and without haste, and when this occurred little of value was left behind. Whatever may have been the reasons, they do not appear to have been of catastrophic proportions, such as a sudden attack by enemies. Neither is there evidence of burned sections in the site such as may be seen in the extensive, fire-gutted areas of the West Ruin. The most acceptable cause for abandonment is the disastrous and far-reaching drought of A.D. 1276-1299.

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AZTEC RUINS

Excavation of a Portion of the East Ruins, Aztec Ruins National Monument, New Mexico



ARTIFACTS

Stone

Projectile Points (Plate 25)

Only four complete and fragmentary projectile points were recovered. All are made from flakes with fine chipping and pressure retouching. They are small, triangular, side notched, stem slightly wider than shoulder, and the stems have straight sides and bases. All four points are of a type common to Pueblo III. Lengths range from three-fourths inch to one inch, width, one-half inch. Materials are red jasper, brownish yellow ??? sand, and chalcedony. Two were from the excavations and two were surface finds.

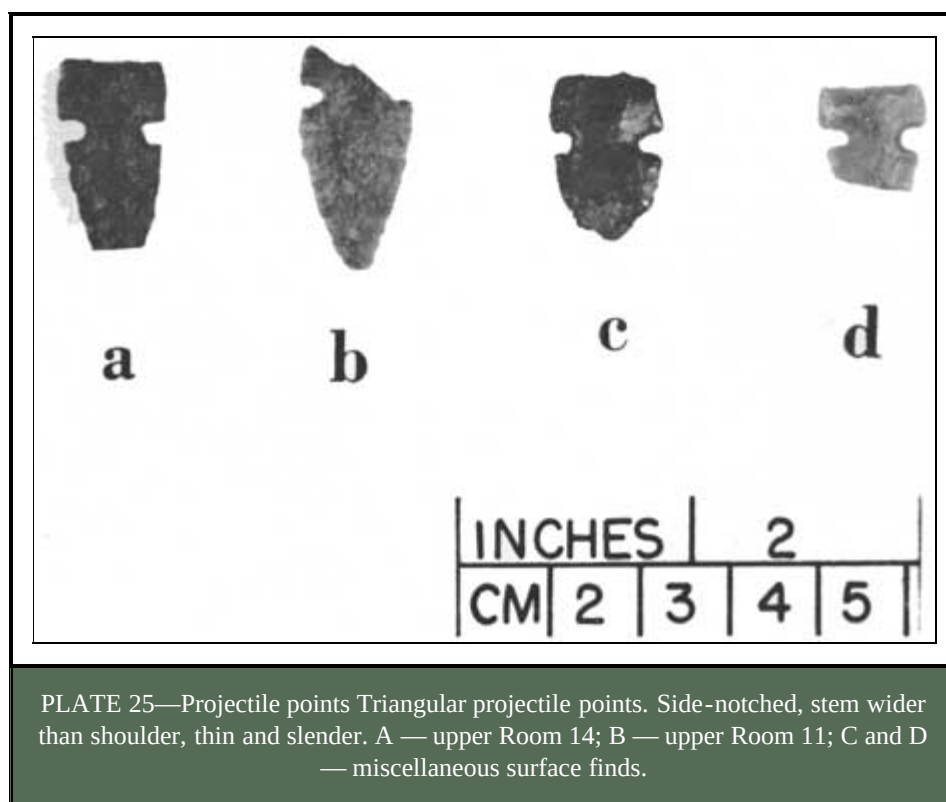
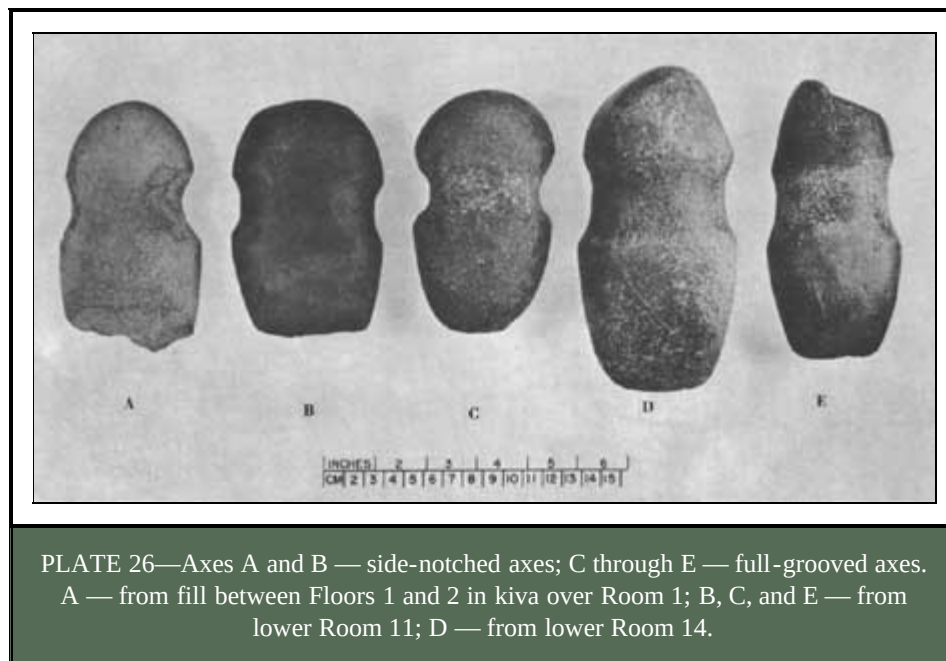


PLATE 25—Projectile points Triangular projectile points. Side-notched, stem wider than shoulder, thin and slender. A — upper Room 14; B — upper Room 11; C and D — miscellaneous surface finds.

Grooved Axes (plate 26)

River boulders of igneous or metamorphosed rock, selected for size and shape, furnished material for the six specimens recovered during the excavation. With one or two exceptions, workmanship is rather poor and there was a tendency to use the stone unmodified except for the hafting groove (plate 26A). Two principal types may be distinguished on basis of the groove: (1) full groove extending around both sides and faces, and (2) partial grooves or notches, on both the inner and outer sides only. Three of the axes are full-grooved (plate 26C, D, and E), and three are side-notched (plates 26A and B, and plate 27D). Two are made of

quartzite, three of olive gray basaltic porphyry, and one of black basaltic porphyry. The latter is double-bitted, or was originally intended for such until the bit for one edge broke and it became a poll hammer. All of the other five specimens are single-bitted axes, the grooves or notches always fashioned closer to the poll than to the bit. In the case of the double-bitted ax, the groove was central with respect to the bits. In all cases, the polls show use as hammers. All of the axes except the side-notched example, whose cutting edge is broken, show grinding facets along the faces near the bits made during manufacture. One ax (plate 26D) is outstanding for its workmanship and careful shaping.



Manos

Metates were not found in any of the rooms, and there were only two manos—one complete and the other broken. The specimen from lower Room 14 (plate 27A) came from the floor. It is flat, subrectangular, made of green, medium grained, hard sandstone. Upper face shows peck marks and was not used for grinding. The nether side has two smooth adjoining grinding surfaces on one face, slightly concave producing a slightly lozenge-shaped transverse cross-section. There is a suggestion of finger grips on the leading edge. Length: 9-3/8 inches; greatest width: 4-3/4 inches; greatest thickness: five-eighths inch. It was obviously much used, which reduced it to a very thin slab.

The example in plate 27B, came from the fill in lower Room 9. Broken transversely, it was once a large two-handed mano, made of brownish conglomerate quartzite. Rectangular, with rounded corners, in longitudinal cross-section as well as in shape, it has two opposite grinding surfaces, and there are finger grips on both leading and trailing edges. Edges are parallel. Length: 5-1/2 inches; width: 5 inches; thickness: 1 inch.





Pot Lid

A single specimen came from the floor of lower Room 14 (plate 27C). It is a fairly thin disc of graywacke, a dark green indurated sandstone, which, incidentally, is the same material forming the decorative (?) band of masonry along the midsection of the west wall of the West Ruin. The edge as well as both surfaces has been shaped by chipping and grinding. It is 4-1/2 inches in diameter and varies from one-fourth to one-half inch in thickness. A segment of it has broken.

Niche Covers

Four fragments of thin slabs of fine-grained sandstone were found in the trash of upper Room 11 and one fragment came from upper Room 9 (plate 27E through H). Judging from the edges which are present in three of them, they were subrectangular in shape. Edges have been shaped by chipping and grinding, and both faces were ground very smoothly. They are too small for door covers, but would have been the size of a ventilator opening or a wall niche. According to O'Bryan, similar objects have been found in place, closing wall niches in kivas, in several Mesa Verde cliff dwellings (1950: 84).

Polishing Stones

Two types were found at the East Ruin. Flat river boulders, varying in diameter from 6 to 9 inches are considered as floor polishers. Two of these came from upper Room 11. They are subspherical in form, considerably worn and abraded through use.

A second type is much smaller, ovoid in plan, 2 to 3 inches in greatest dimension, with high polish on both sides, probably used chiefly in smoothing the surface of pottery vessels. One specimen came from above Floor 3 of the kiva over Room 1; they correspond closely to examples found by Morris at the West Ruin (1919: 20) and O'Bryan at Mesa Verde (1950: plates XXXIIIe and XXXIVa).

Turquoise

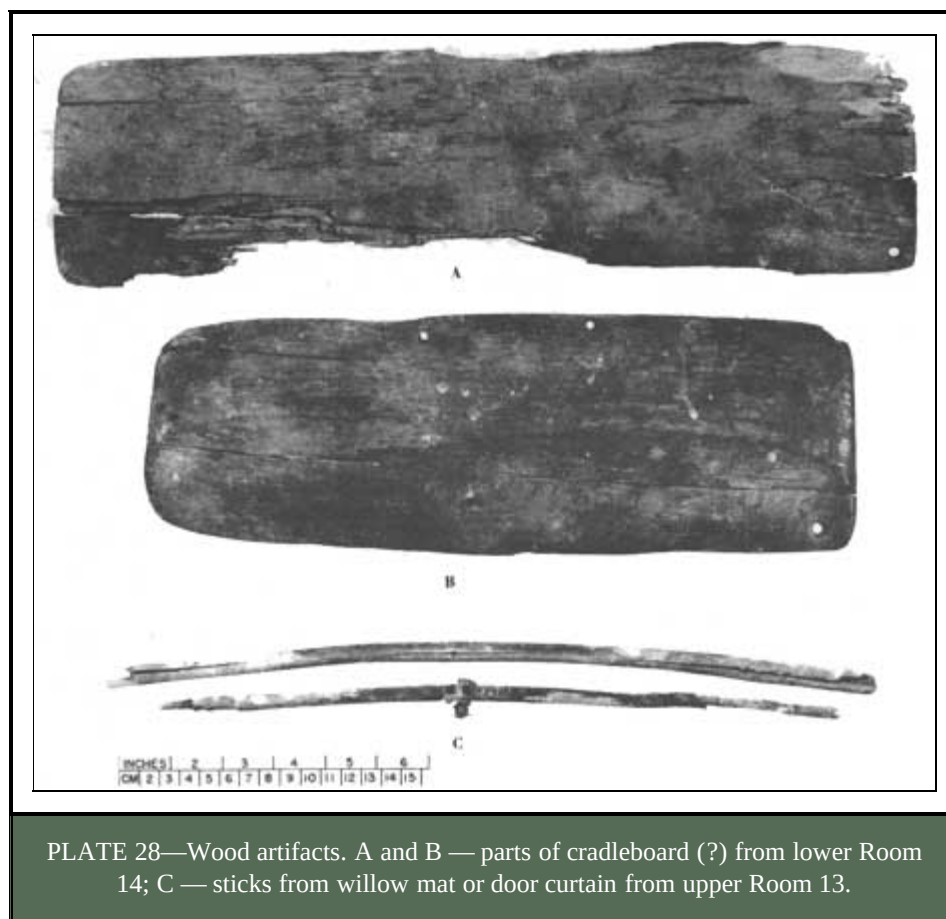
One fragment of a disc-shaped bead one-sixteenth inch in diameter came from upper Room 11. Turquoise may be rather scarce at the East Ruin, since the stone is not native to the Aztec

vicinity and was probably traded from the Rio Grande Valley.

Wood

Boards

Two boards were taken from lower Room 14 just above floor level. The larger (plate 28A), badly riddled with termite or other insect borings, is 16-1/2 inches long, 4-1/2 inches wide, and one-half inch thick, rectangular in shape with rounded corners and well finished, and having a biconical hole drilled at the corner of one end, the perforation being three-eighths inch from both the end and edge of the board. The smaller specimen (plate 28B) is 13-1/2 inches long, 4-3/8 inches wide, and one-half inch thick. It has a perforation at the corner of one end and two perforations 3 inches apart near one edge. The edge is slightly inset about one-fourth inch, beginning at one perforation and extending to the end of the board. Both boards, though flat and smooth as though sanded and polished, and free of splinters, are slightly convex on one side, and more concave on the opposite side. The convexity may well have been a natural curvature. Both specimens are probably ponderosa pine. Their use is problematical, but they are usually called cradleboards (Kidder and Guernsey 1919: 119; Morris 1928).



Corncob Mounted on a Stick

A corncob with a stick inserted through the center was found in the dry refuse of upper Room 11 (plate 29F). The stick is not altered in contrast to more elaborate gaming darts (Morris 1919: 60) or ceremonial objects (Martin *et al.*, 1952: 356) involving carefully smoothed sticks or arrow foreshafts on which the cobs were impaled. Hence, rather than being of implied ceremonial significance, this unelaborate item was more probably utilitarian in use, the stick serving as a holder for roasting, eating, or drying the corn.

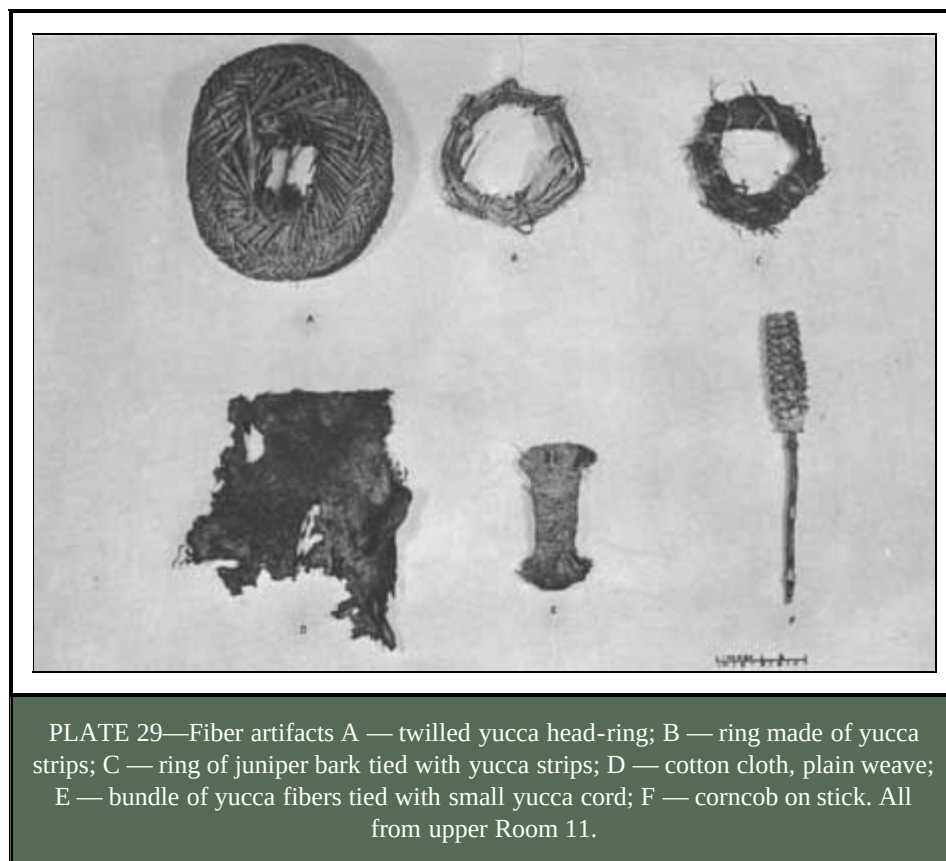
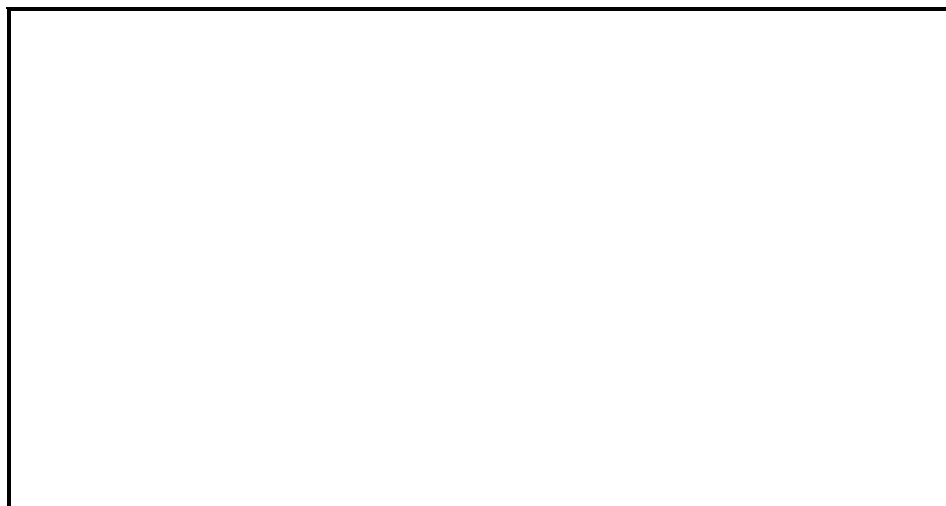


PLATE 29—Fiber artifacts A — twilled yucca head-ring; B — ring made of yucca strips; C — ring of juniper bark tied with yucca strips; D — cotton cloth, plain weave; E — bundle of yucca fibers tied with small yucca cord; F — corn cob on stick. All from upper Room 11.

Carved Pahos

During stabilization work on Room 23, which had been excavated many years ago, we found in the north wall two unusual vertical channels 2 inches square and 3 feet high; one of these was empty and the other contained the two carved pahos shown in plate 30A, B. These are straight sticks, probably cottonwood, whittled to shape and smoothed. The tops are carved into two lobes separated by a convex, barrel-shaped portion three-fourths inch long. The upper lobe is bevelled above and below, and the sides are flattened, terminating in a dull point. Below the barrel is a raised collar one-fourth inch wide. Although the distal ends of the pahos are broken enough remains to show that they were pointed. Moreover, they appear to be painted all over in black, although this could be a heavy encrustation produced by age. The specimen in plate 30A is 14 inches long, and one-half inch in diameter at greatest dimension at carved portion of the head or tip, 30B is 13-1/4 inches long and one-half inch at greatest diameter.



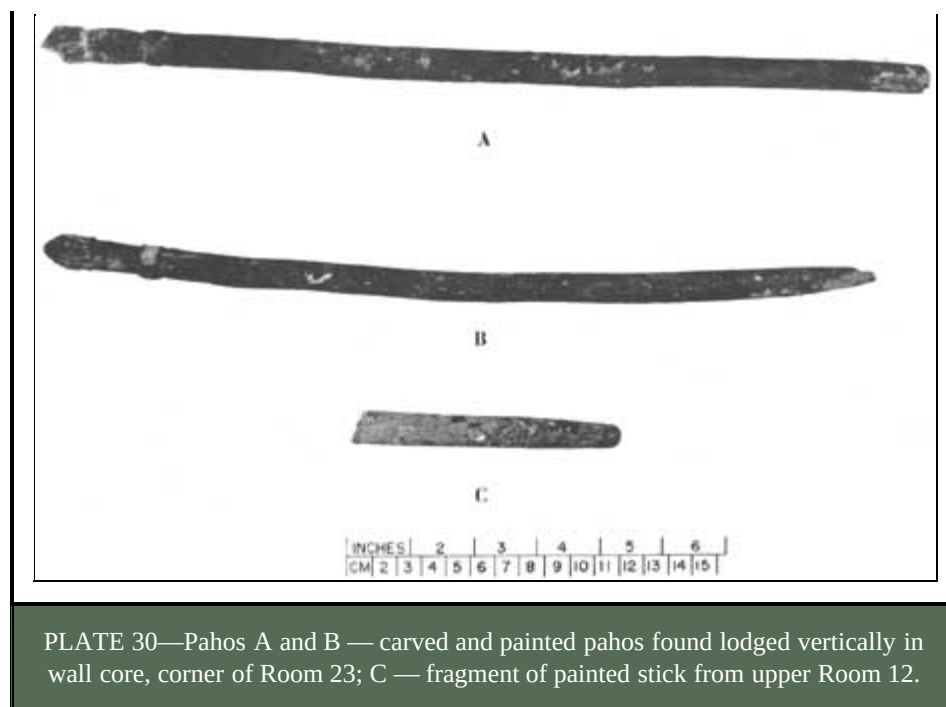


PLATE 30—Pahos A and B — carved and painted pahos found lodged vertically in wall core, corner of Room 23; C — fragment of painted stick from upper Room 12.

In the general fill of upper Room 12 was found one end of a stick with a blunt point (plate 30C). This fragment is 14-1/4 inches long and one-half inch in diameter at greatest width and resembles the lower portion of a paho. It bears a layer of red paint.

In the tower at Mummy Cave in Canyon de Chelly in 1932, Morris found an alinement of carved sticks, crook sticks, and little bows set vertically in the core between the face courses. Later examination showed that the southwest corner of the tower had a similar alinement, clearly evident for several feet down from the top (1941: 227). Although small bows and crook sticks did not accompany the two carved sticks in the core of the East Ruin wall, the latter are "dead ringers" for those found by Morris at Mummy Cave. There are an additional two in the Preservation Laboratory collections which came from room fill in the West Ruin.

Morris reported two similar finds at Mesa Verde in Cliff Palace and another in Balcony House. He viewed these similar, if not identical, finds as one more point to indicate that the tower in Mummy Cave was built by immigrants from Mesa Verde. The latest timbers in the tower were cut in 1284, which fact dovetails nicely into an assumption that the north country was abandoned during the great drought which began in 1276 (1941: 227-230).

By the same token, I think it can be safely said that the finding of identical prayer sticks in the walls of the East Ruin is another indication that it was a pueblo of the Mesa Verde Branch, the only difference being the location: the East Ruin was built in the open rather than in a cliff.

Mummy Cave Tower and the East Ruin are further linked culturally in that both are constructed of Montezuma Phase masonry and contain identically made pole sill doorways.

Judging from their widely reported distribution in Pueblo III sites, prayer sticks are probably a trait of the Anasazi culture which spread to the Hohokam and Mogollon.

Willow Mat

Two willow sticks came from high in the fill of upper Room 13 (plate 28C). Both are pierced in the centers, with one having a yucca cord strung through the perforation. One end of the strand has two overhand knots to prevent it slipping through the hole. In size, makeup and

intended function they appear comparable to the component parts of a strung willow mat curtain or doorway ("venetian blind") that can be seen in one of the West Ruin doorways today.

Haft for Ax or Maul (plate 31A)

A complete handle for either a maul or an ax was found in the fill above floor of upper Room 14. It is a tough, close-grained, small branch pulled and not cut from the tree. At a point equidistant from both ends it was bent and looped back on itself with some twisting motion so that both arms of the handle were parallel. The handle end is tied with two separate strands of yucca leaf, whereas the tie across the base of the loop, also with strips of yucca leaf, was wrapped around each side of the doubled-back branch as well as across the pair to make a secure haft for the stone implement it once held. Present length of the specimen is 18-1/2 inches.

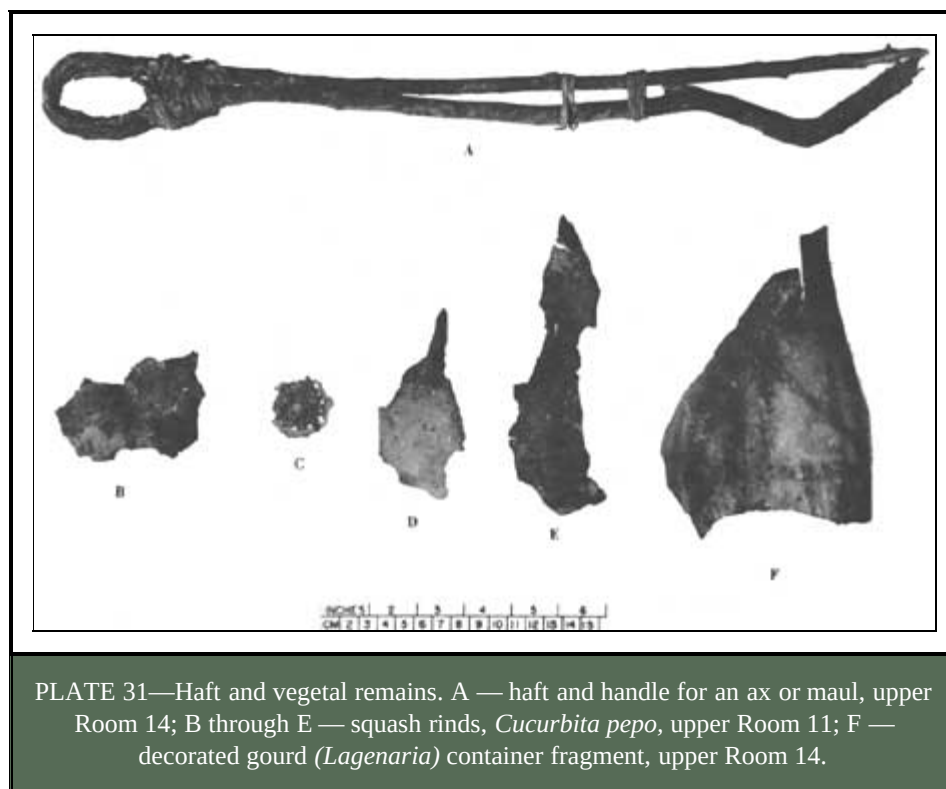


PLATE 31—Haft and vegetal remains. A — haft and handle for an ax or maul, upper Room 14; B through E — squash rinds, *Cucurbita pepo*, upper Room 11; F — decorated gourd (*Lagenaria*) container fragment, upper Room 14.

Bone

Bracelet or Pendant

A fragmentary bracelet or pendant of thinly worked bone came from near the east wall top of Room 15. The object (plate 32) is 1-1/2 inches wide, 2-1/8 inches long, and varies from less than one thirty-second to one-eighth inch in thickness. It has two drilled holes at the end, each near the edges. An incised decoration consists of three longitudinal grooves dividing the face or upper side of the ornament into two bands. The bands contain incised V's lying on their sides; in one band the V's lie with the open ends toward the end of the ornament, and in the other the V's are reversed in direction and face the opposite, missing end. The incising has a maximum depth of one-eighth inch. The undecorated side is longitudinally concave; the decorated side, convex.



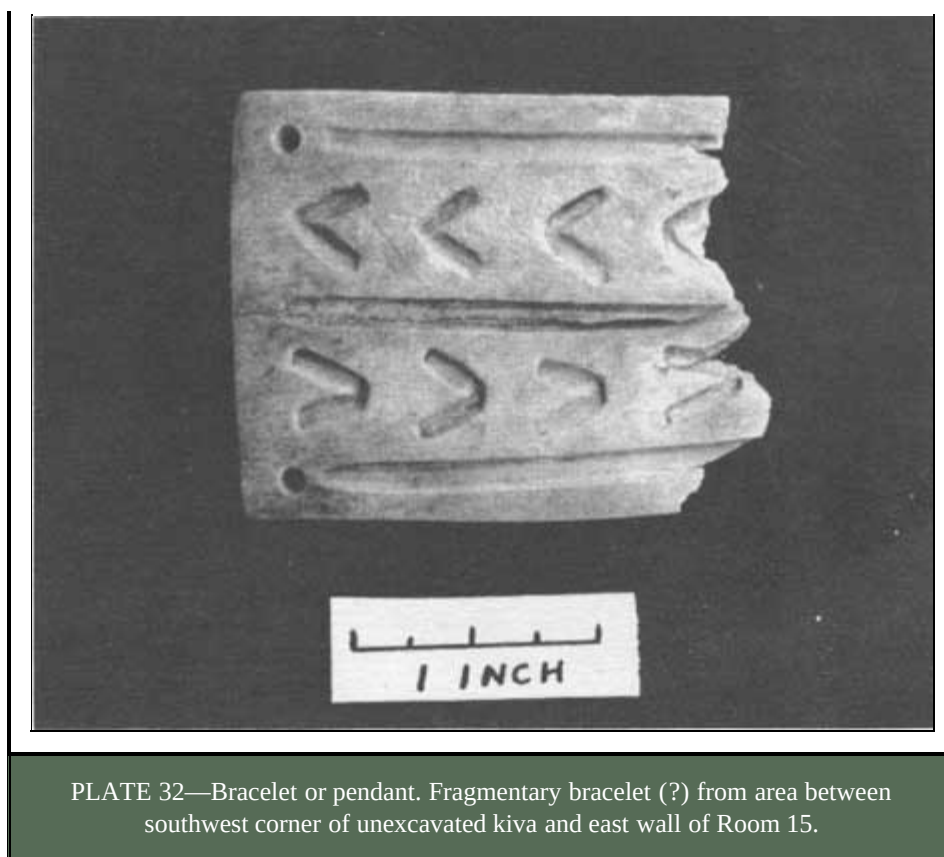


PLATE 32—Bracelet or pendant. Fragmentary bracelet (?) from area between southwest corner of unexcavated kiva and east wall of Room 15.

Size and shape suggest possible use as a bracelet. Grinding and polishing marks are evident throughout. The perforations, apparently designed either for suspension or fastening rather than inlay, were largely drilled from the upper side. The bracelet is broken transversely at or near the former center, and it is probable that the opposite, missing end had two corresponding perforations.

At least two similar bracelet fragments of thinly worked bone have been found in Pueblo Bonito (Pepper 1920: plate 12, figures 2 and 3). Another example is noted from the West Ruin near Kiva R by Morris (Cat. AR-2553). None of these comparative specimens are as well made nor as ornate as the one from the East Ruin, but they show unmistakable resemblances in size, and form.

Bone Awls

Three bone awls were found, and a fourth specimen probably represents an awl in process of manufacture. One was made of the ulna of a bighorn sheep (*Ovis canadensis*). The head is unworked; the specimen is 7-1/8 inches long, 1-3/8 inches wide at the base, and was from general fill of Room 24. A second specimen, also from Room 24, is the proximal end of a split radial bone of either deer or bighorn. Although the head of the bone is intact, it has been altered considerably by wear and use. The shank has a high polish and a shallow depression with transverse friction marks, exceptionally polished, which may indicate its use as a weaving tool. It is 30-3/4 inches long, seven-eighths inch wide at the base.

A third awl from fill in upper Room 12 is made from the proximal end of a split tibiotarsus of a turkey (*Meleagris gallopavo merriami*). The head is broken and deteriorated. The shank was broken and split just below the head, and the tip ground to a long, sharp point. It is 3 inches long, three-fourths inch wide.

Another example is a tarsometatarsus of a turkey, split longitudinally at a point 1-3/4 inches below the proximal end. The head is unaltered. The distal end was removed, and near the end

of the longitudinally split portion the two edges were ground to a rounded point. Evidently this is a bone awl in the early stages of manufacture. Measuring 4-1/2 inches in length and seven-eighths inch in width at the base, it came from the area west of Room 1.

Other Worked Bone

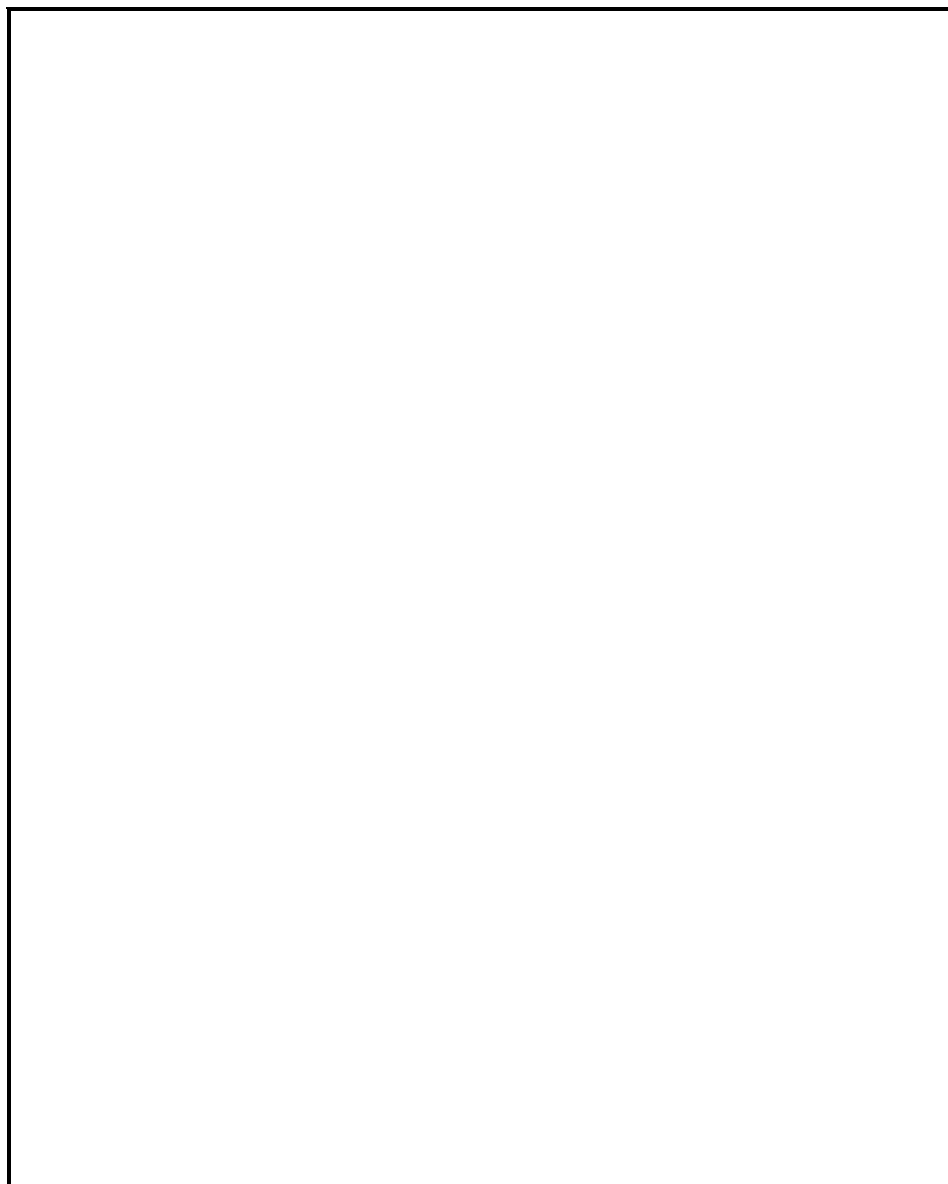
Three additional bones, two of which are distal portions of the tibiotarsi of turkeys, were found, apparently from which either tubular beads or whistles were made.

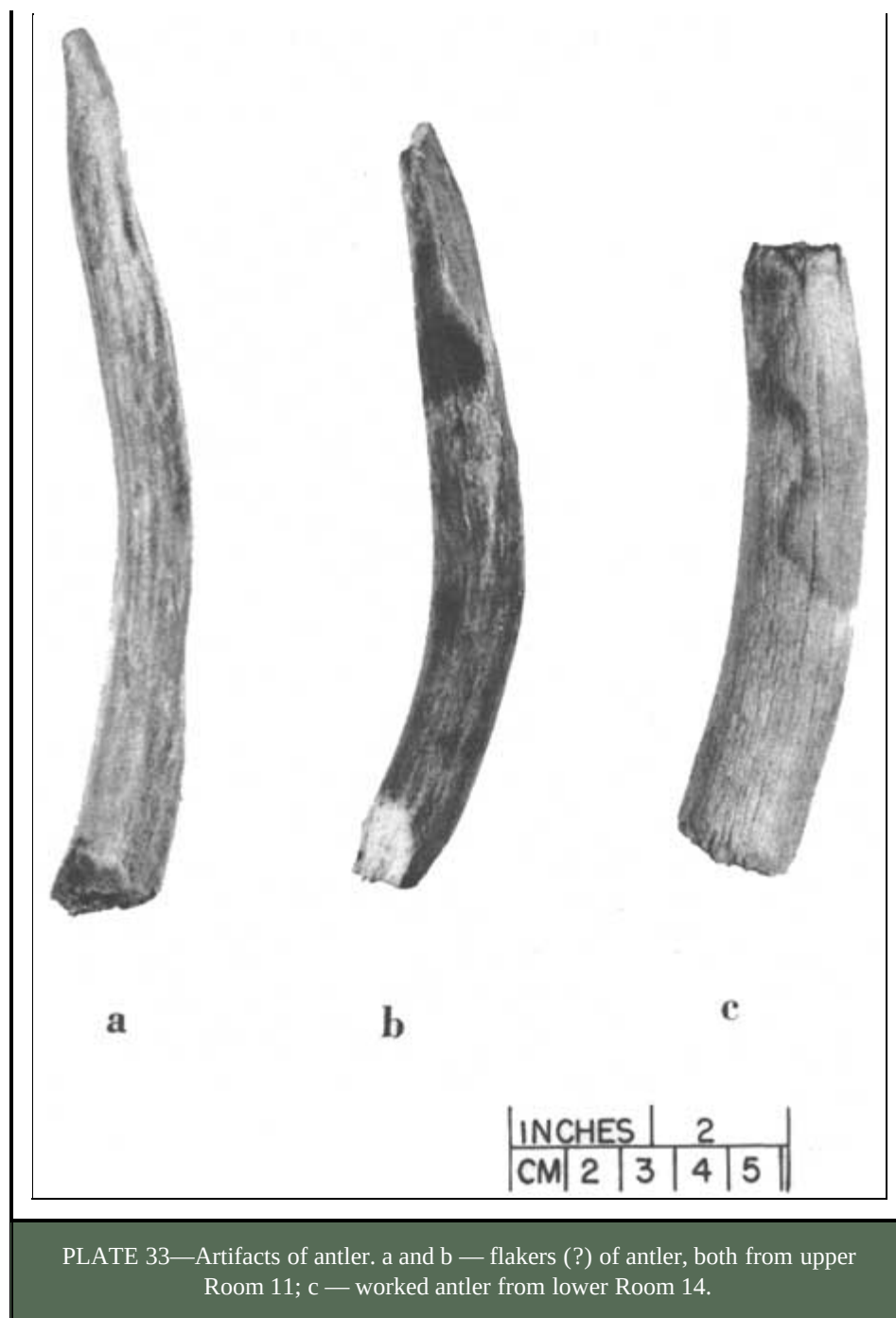
In the third, the proximal end of the left humerus of a turkey, the severed end was cut transversely and ground smooth. Upward three-eighths inch from this smoothed end is an incision completely encircling the shank, as in the process of making another bead.

Antler, Horn, and Hoof

Flakers

Two tines came from the dry refuse of upper Room 11. The tip of one illustrated in plate 33a is worked, showing two grinding facets. It is 6-1/4 inches long and seven-eighths inch wide at base. The butt is rough and shows hacking or sawing marks where it was detached from the shaft of the horn.





The other tine (plate 33b) is broken both at the tip and butt, although it shows some wear and is fire-scarred. It measures 5-3/8 inches in length and five-eighths inch in width at the butt.

Other Worked Antler

A third piece of antler came from the floor of lower Room 14. It is a midsection of the tine cut square on both ends (plate 33c). Use is unknown but it appears to have been prepared as a handle, because one end shows what seems to be the beginning of a socket to receive the base of a tool such as a knife or chisel. It is 4-3/8 inches long and seven-eighths inch at greatest diameter, fitting very conveniently in the palm of the hand.

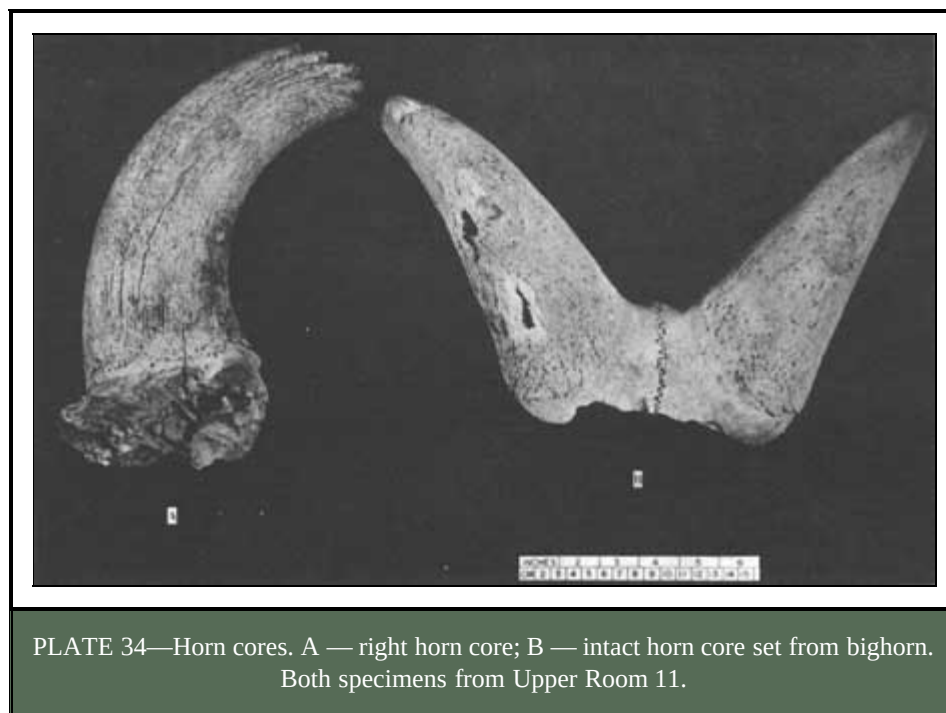
Hoof

One fragment of a deer (?) hoof was found in the dry refuse of upper Room 11. It was not perforated nor did it show any kind of wear or use to give a clue as to its intended purpose.

Morris found several deer or antelope hoofs in the West Ruin, each pierced near the upper edge and strung on yucca cords which he believed were portions of a rattle (1919: 63).

Horn

A right horn core (plate 34A) and an intact horn core set (plate 34B) of bighorn sheep (*Ovis canadensis*) came from the dry rubbish in the lower 3 feet of fill in upper Room 11. The single horn core is 13-3/4 inches from base to tip. The intact pair of horns measure 10-1/4 inches from former point of attachment at the cranium to the tip ends.



In general both the horn or sheath and core of bighorn sheep, as well as bones of this animal, played an important part in the economy of the people at Aztec. While artifacts of horn and core are not plentiful, those made from sheep bone are nearly as frequent as those from deer. No artifacts of sheep bone or horn are reported from Mesa Verde (Lancaster, Watson *et al.* 1954; O'Bryan 1950) although it is listed in the bulk bone material (O'Bryan 1950: 133). Whether this is due to the vagaries of collecting, unfavorable preservation, or relative scarcity of sheep on the Mesa Verde, is an open question. Particularly in early stages following their detachment from the animal, horn and antler are quite susceptible to both rapid weathering and consumption by rodents which may largely account for their general scarcity.

In the West Ruin collection of the Preservation Laboratory is a large slanting blade (11 inches long) with a round handle made of horn core, which could have been used for scraping, fleshing, or possibly as a baton (Cat. AR-2154). Two other objects, one of horn, the other of core, are listed for the West Ruin, but they, like the single horn from the East Ruin, cannot be positively identified as artifacts, owing to their weathered condition. Morris mentions finding sheep horns, and sometimes hoofs, throughout the West Ruin (1928 *passim*). And it is interesting to note that he found the core of a left horn of a large bighorn sheep in a wall pocket of a kiva in the Aztec Ruin Annex (1924: 247), which might raise question as to whether horn sets were possibly used by participants in ceremonial fashion, or whether they may have been a part of either fixed or movable paraphernalia in the kiva proper. At present there is no direct evidence in support of such use. However, a suggestive analogy may be found in a modern pueblo. In a kiva at Isleta (1935) there are sets of deer

antlers suspended along the circular wall a few inches beneath the roof (personal communication, R. G. Vivian).

Bighorns are perhaps the most common subject of pictographs in cliff sites of northeastern Arizona (Kidder and Guernsey 1919: 193), indicative of the importance ascribed to this game animal by the Anasazi. At least three types of bighorn sheep horn implements were found in that locality: scrapers, wrenches, and a spindle whorl (see Kidder and Guernsey 1919: plate 46A, c, d, and e; and plate 51, c, respectively).

Basketry

Basketry is represented by one fragment of either a plaque or tray, from upper Room 12. The direction of work is from right to left, close coiling; simple stitch, uninterlocked; two-rod-and-bundle foundation, bunched. It has a normal center. There are 6 coils and 12 stitches to the inch and the rods average one-sixteenth of an inch in diameter. No color decoration could be detected. The material is unidentified but appears to be willow.

From his earlier work Morris (1919: 56) describes both coiled and plated basketry from the West Ruin, although none of the 24 presumably complete baskets from it were included in the study series by Morris and Burgh (1941: 13) due to limitations of time. It was felt justifiable to omit them since most belonged to the Mesa Verde period (Montezuma Phase) already well represented in the series. The better specimens are on display in the Visitor Center at Aztec Ruins National Monument.

Matting

Fragments of two twilled rush mats were recovered, one from upper Room 12 and the other from upper Room 14. Mats were one of the usual ceremonies in burials at Aztec (Morris 1924 passim).

The weaving is over-two-under-two. The material may be either a rush (*Juncus* sp.) or the leaf or flattened stem of cattail (*Typha* sp.). The selvage is a continuation of the body elements slanting at an angle from them, with none of the elements cut where the selvage begins. However, a pair of twined rushes is inserted, serving to hold the elements firm at a point just before they are bent at an angle to form selvage. At the border the warps and wefts are doubled back into the selvage and at the inside border are doubled back in the same fashion, leaving a short flap on the underside of the mat.

Enough of the corners remain to indicate that the same type of selvage bordered all four sides, and that the corners of one mat are nicely curved or rounded while in the other, the corners are roughly squared. No patterns in the main body, such as concentric squares or chevrons achieved by variously manipulating the warp and weft, were discernible. Mats from the East Ruin are similar to those from Mesa Verde (Nordenskiöld 1893: 4) and northeastern Arizona (Kidder and Guernsey 1919: 112).

One mat was coarsely made, the rushes varying considerably in width from three-sixteenths to one-half inch; the uneven selvage averages 1-3/4 inches in width and the specimen is 2 feet long. The second mat, from upper Room 14, is finely plaited of smaller elements and the rushes were either uniformly graded or trimmed to size. Here the selvage measures 1-1/4 inches wide; the elements are one-fourth inch wide, and the largest of several fragments of the mat is 18 inches long.

Cordage

The terminology used in this paper follows Dixon 1956 and Kent 1957. In referring to yucca,

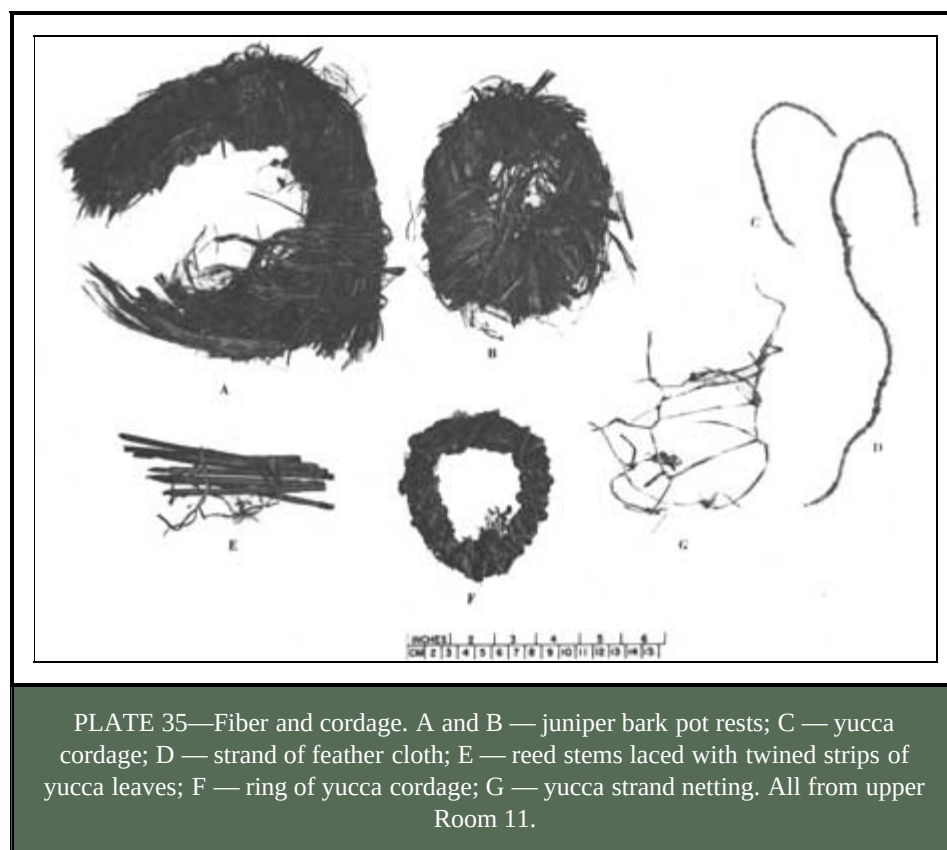
yarn is a bundle of loose bast fibers which have been twisted together; a strand refers to two or more yarns twisted together. A vertically held yarn or strand is Z-twisted if the fibers of the yarn trend from right to left. A vertically held yarn or strand is S-twisted if the fibers spiral down from left to right, following the center line of the letter S. When referring to cotton, yarn is a bundle of loose fibers which have been spun together to form a single continuous thread. This is a single-yarn thread. A single-yarn thread in which the fibers parallel the diagonal center line of the letter S is S-spun. A single-yarn thread in which the fibers parallel the diagonal center line of the letter Z is Z-spun.

Distinction of terms between yucca and cotton is made on the basis of the two different methods by which yucca and cotton yarns are made. A yarn of yucca was made by twisting together the individual fibers by rolling them between the hand and thigh (Kent 1957: 478), while cotton was spun from a lap of loose fibers with the aid of a spindle (ibid: 472).

Yucca Cordage

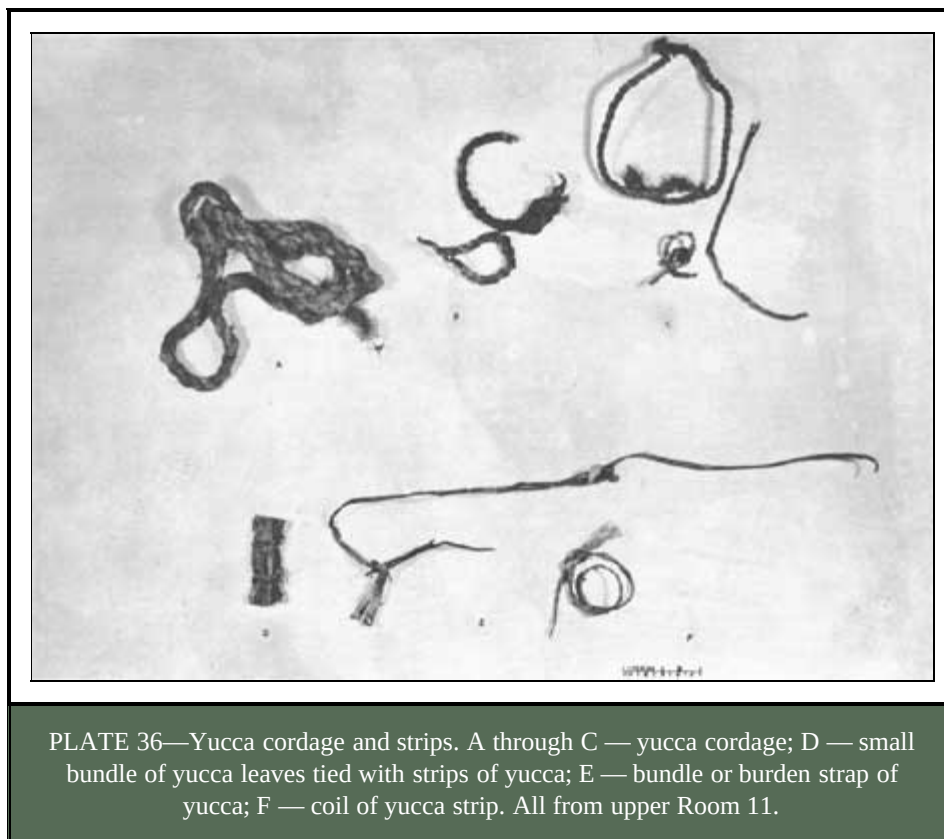
Thirty fragments of yucca fiber cordage came from the East Ruin, most of it from upper Room 11. The only cotton cordage found was included in a border for the plain weave cotton fabric described under *Textiles*.

In all cases, with one exception, the strands are two-yarn, the yarns S-twisted, and the strands Z-twisted. The cordage varies in size from one thirty-second of an inch in diameter to a rope three-fourths of an inch in diameter. An example of the smallest cordage is shown in the wrapping around a bundle of yucca fibers (plate 29E). The most common examples are from one-eighth to one-fourth inch in diameter (plates 35C, 36B and C).



Of special interest is the short but thick and strong loop of rope shown in plate 36A. Beginning with the larger elements first, it is composed of three S-twisted strands; each strand is Z-twisted. and is made up of two S-twisted yarns. Thus, the component elements of the rope are three strands totaling six yarns. Formed into a loop, it suggests use for carrying

or suspending a heavy object.



Hair cordage was not found although it is reported for the West Ruin.

Feather Cloth

It was represented by a single example of a yucca cord (plate 35D) wrapped with quills, in poor condition, with only three or four turns or twists of quills remaining. The cord is made of two yarns of yucca fiber. The individual yarns are S-twisted, and the two yarns forming the strand are Z-twisted. The few turns of quills remaining are wrapped around the cord in an S-twist. Specimen is 12-1/2 inches long, and the foundation cord is one-eighth inch thick. This single element was probably once part of a feather-cloth robe similar to specimens in the Preservation Laboratory from the West Ruin.

The prehistoric Anasazi used fur cordage during Basket Maker II and III, from about the beginning of the Christian era to A.D. 750, although feather cordage made its appearance in Basket Maker III, probably contemporaneous with the capture and domestication of the wild turkey. In Pueblo III feather cordage is predominant (Nusbaum, Kidder, and Guernsey 1922: 104; Kidder and Guernsey 1919: 174).

Yucca Leaf Bundles

There are two small rectangular bundles of yucca leaves, folded and packed so the ends do not unravel. They were tied, one with strips of yucca leaf near the ends, the other about the middle with strips and a wrapping of two-yarn yucca cord. Both were from upper Room 11 and probably represent a method of stowing raw material for future use.

Ball of Yucca Cordage

Reversed from the usual pattern the cordage is of two loosely Z-twisted yarns, loosely S-

twisted into a strand. The ball is tied with a very thin two-yarn yucca cord of the usual twist (yarns S-twisted; strand Z-twisted). The Z-twisted yarns could have been produced with a spindle, or may be the work of a left-handed person; both may be wrong. It may have been merely the result of reversing the usual right-hand (S) twist for producing yucca yarns from fiber. To our knowledge, it is not yet possible to determine the method employed in producing a particular yarn with out either direct evidence of observing manufacture or of yarn attached to spindles.

Bluhm and Grange (Martin, Rinaldo *et al.* 1952: 205-211) give an interesting, though admittedly theoretical, discussion on this problem which will require further research before it may be fully resolved.

Yucca Netting

This is a very small fragment of what appears to have been a net (plate 35G), with only two or three large meshes intact. It is made of cut strips of yucca leaf, the intersections of central meshes being tied with overhand knots while those at the edge of the net are tied with reef knots. Intact meshes average 1 inch wide, 2 inches long. Use is problematical. It may have been useful in carrying light though bulky materials; or possibly as a snare; or as a drier for herbs and agricultural products. It came from upper Room 11.

Cylindrical Reed-stem Container (?)

Plate 35E illustrates a bundle of nine very slender reeds (*Phragmites communis*), laced at an interval of 2 inches with twined strips of yucca leaf. Present average length of the object is 4 inches. At one end, all reed stalks are charred, suggesting possible use as a torch. On the other hand, it resembles the cylindrical container mentioned by Morris (1919: 59) in which he suggested that these were sheaths for the protection of feathers and plumes used in ceremonial rites. He mentions that one of these reed-stem cylinders is enclosed in a wrapping of cornhusks, bound in place with yucca cord (*ibid.*).

Whatever may have been their use, it should be noted that out of several similar specimens in the Preservation Laboratory all except one are charred at one end only, like this example from refuse in upper Room 11.

Knot and Ties

From the dry refuse in upper Room 11 came a fair sampling of knotted pliant sticks. In many cases these were probably for tying bundles of raw materials such as yucca leaves for basketry and matting, juniper splints and bark for roofing, for carrying agricultural products, etc. Some suggest that they are broken and discarded carrying straps. Three types of knots were noted in order of frequency: reef or square knot, overhand, and figure-of-eight.

Pot Rests

At least three types are represented, all coming from organic refuse in upper Room 11: (1) twilled, of graded yucca leaves, (2) of either shredded juniper bark or bunched and coiled strips of yucca leaves, and (3) those made with yucca cordage.

The finest, and only example of the first type (1), is a head ring or pot rest of twilled, narrow yucca leaves in an over-two-under-two weave (plate 29A). Viewed from the top, it appears doughnut-shaped; one side is flat, the other concave. The central part of the outer circumference is constricted all the way around by a tight wrapping of split willow (?), giving the edge a "pulley" effect. This wrapping may have served the dual purpose of both retaining original shape and providing some resilience to an object which supported weight

and may have been worn on the head. Outside diameter is 4-7/8 inches, diameter of the opening at the center is 1 inch, average thickness is 1-1/4 inches.

There are four of the second type (2); three are of bunched juniper bark, two tied with bark, and the other with strips of yucca. A fourth is of coiled strips of yucca with a spiral wrapping of the same material.

A single example of a yucca cordage pot rest has a foundation of three revolutions of a heavy, loosely twisted normal two-yarn strand, this wrapped and tied with a smaller, normal cord; the pot rest is 3-1/2 inches in diameter.

Corn Stems on Stick

Strung on a willow loop (*Salix?*), like keys on a ring, are two stems of corn ears. A number of such rings of corn were found in the West Ruin (Morris 1919: 62). Presumably these loops with suspended corn were hung up for drying, with the ears subsequently broken off as desired for use. Length of stick is 17 inches. It was from the refuse in upper Room 11.

Textiles

Cotton Cloth

There is one fragment, from upper Room 11. Only 4-1/4 by 5 inches, there is no hint of its original form (plate 29D). It is a plain weave in natural, brownish-gray without design or decoration. The warp threads are more tightly spun than the weft. There is a border on one side only, made of two S-twisted strands, each strand containing three Z-spun yarns. This border cord is twined through loops of warp yarns, with a half twist of the cord alternating between each warp loop. The warp count averages 25 to the inch, the weft 23 to the inch. Warps and wefts are all single yarn and Z-spun. characteristic of Southwestern cotton plain weaves.

Kent (1957) lists the following finds at Aztec, citing Brand (1937), Morris (1919 and 1924), and Smiley (1951): seeds and fiber; thread, disc whorls and yucca needles, batten (?) plain weave; plain weave tapestry tumpline; twill breach cloth (?); Anasazi twill blanket; diamond twill. The fabrics are said to be primarily mummy wrappings from the Mesa Verde Annex. In this connection, however, we note that out of 186 burials at Aztec (Morris 1924: 224-225) cotton cloth is shown as having been found with only 7 bodies, and that none of these include burials from the West Ruin Annex. Possibly they were recovered and taken to the University of Colorado Museum after his 1924 publication, at which time they were seen and studied by Kent.

Miscellaneous

Worked Sherds

There were three worked sherds, two roughly rounded and the third triangular. All are from bowls and are unperforated. One is a disc of Chaco Black-on-white, a miscellaneous surface find, another a disc of Mesa Verde Black on-white, while the third is a triangular rim sherd of Mancos Black-on-white.

Feathers

The dry fill of upper Room 11 yielded several loose feathers identified by Lyndon Hargrave as from turkey.

Egg Shells

Several fragments of egg shell, large enough to have been from turkey came from upper Room 11.

Pitch

In a large sherd from the bottom of an indented corrugated jar, was a thick residue of resinous pitch. The sherd may have been a crucible for pitch used as cement or as a coating for baskets.

Gourd (plate 31F)

A gourd fragment, charred along one edge, came from disturbed contents of upper Room 14. It was identified as a thin-walled bottle gourd (*Lagenaria*) by Hugh Cutler, who also noted that it had been picked before ripe and then peeled, leaving narrow, incised bands around the body.

Unfired Clay

A chunk of adobe bearing impressions of a single corn cob was found in lower Room 11. Obviously part of an originally larger object, it may have served as a jar stopper.

Pottery

Like so many other late Pueblo III sites of the Mesa Verde Branch, the East Ruin shows a lack of diversity in indigenous ceramic types. In fact, the purity of the collection is the most significant clue to the cultural identification of the site, with Mesa Verde Black-on-white representing over 90% of the total decorated sherds. Since reliable stratigraphic sections were found in such few instances, it must be said that our evidence lies largely in gross sherd counts. Sherds near floors and 5 to 6 feet above, except as noted in the following comments on individual pottery types, showed no discernible change.

Both decorated and utility sherds were used as chinking material in walls. Logically, both early and contemporary sherds would be used as spalls, and this appeared to be true from random examination; the spalls included Indented Corrugated, Mancos, McElmo and Mesa Verde Black-on-whites as well as intrusives. Refuse areas on three sides of the West Ruin were possible sources, as sherds were brought to the East Ruin for use both as temper in pottery and as spall material.

Although all sherds recovered were saved, the total for the excavation was only 3,448, with no complete vessels found.

As the major wares have been described in detail elsewhere (Morris 1939, Brew 1946, Reed 1958, Kidder 1924, Abel 1955), only a brief survey will be included here, along with observations on amounts and percentages, and a few comments pertaining to temper based on examination under an X45 binocular microscope. It was possible to distinguish clay, sand, crushed rock and sand, and crushed sherd inclusions. Only a petrographic analysis could give an accurate content of temper. We also admit to possible errors of identification between Mancos Black-on-white and Chaco Black-on-white and between McElmo and Mesa Verde. Since Chaco, Mancos, and McElmo sherds were so sparse, we believe that possible errors would not materially affect the results.

The following are the pottery types recovered from the East Ruin, as classified after Colton (1955 & 1956).

Mogollon Brown Ware

Reserve Series

Reserve Indented Corrugated, smudged interior

Shiwanna Red Ware

Wingate Black-on-red

Wingate Corrugated

Puerco Black-on-red

St. Johns Polychrome

Querino Polychrome

Tsegi Orange Ware

Tusayan Black-on-red

Tusayan Polychrome

Mesa Verde Gray Ware

Mancos Corrugated

Mesa Verde Corrugated

Mesa Verde White Ware

McElmo Black-on-white

Mesa Verde Black-on-white

Cibola White Ware

Puerco-Chaco Series

Chaco Black-on-white

San Juan Series

Morfield Black-on-gray

Mancos Black-on-white

Cortez Black-on-white

Decorated Wares

Mesa Verde Black-on-white (plates 37, 38): ca. A.D. 1200-1300 (Abel 1955). This ware is the dominant decorated pottery of the site, comprising 91 percent of decorated types, and 92 percent of black-on-white types. In some rooms, it ranged from 95 to 100 percent of all black-on-white sherds. Bowl shapes predominate over jar shapes in the collection by a ratio of 2:1.

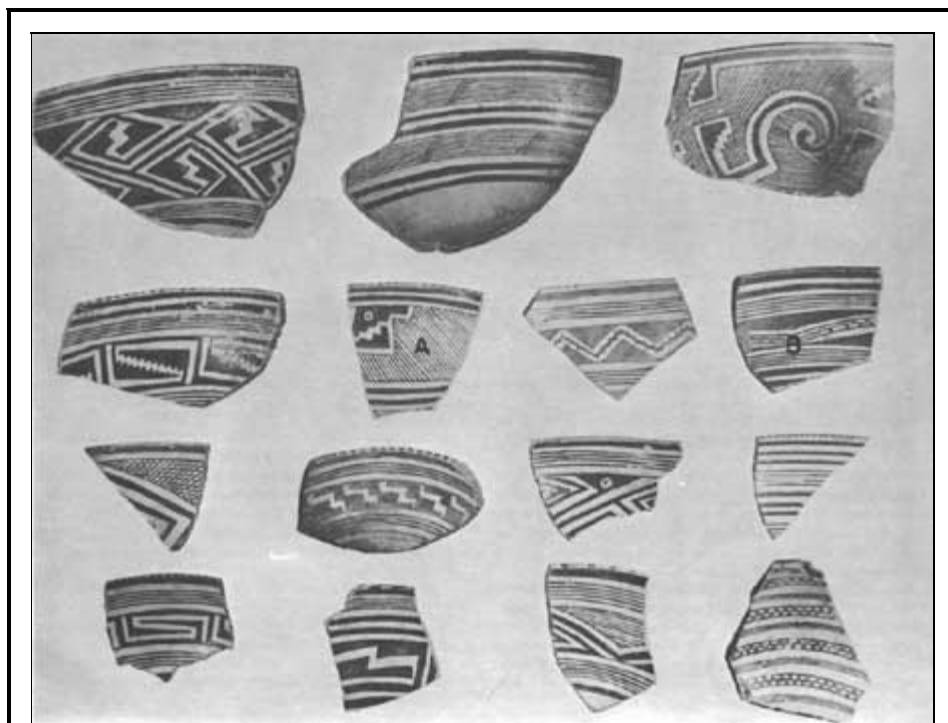


PLATE 37—Mesa Verde Black-on-white sherds. Large Mesa Verde Black-on-white bowl sherds, interiors. All from general fill, upper Room 14.

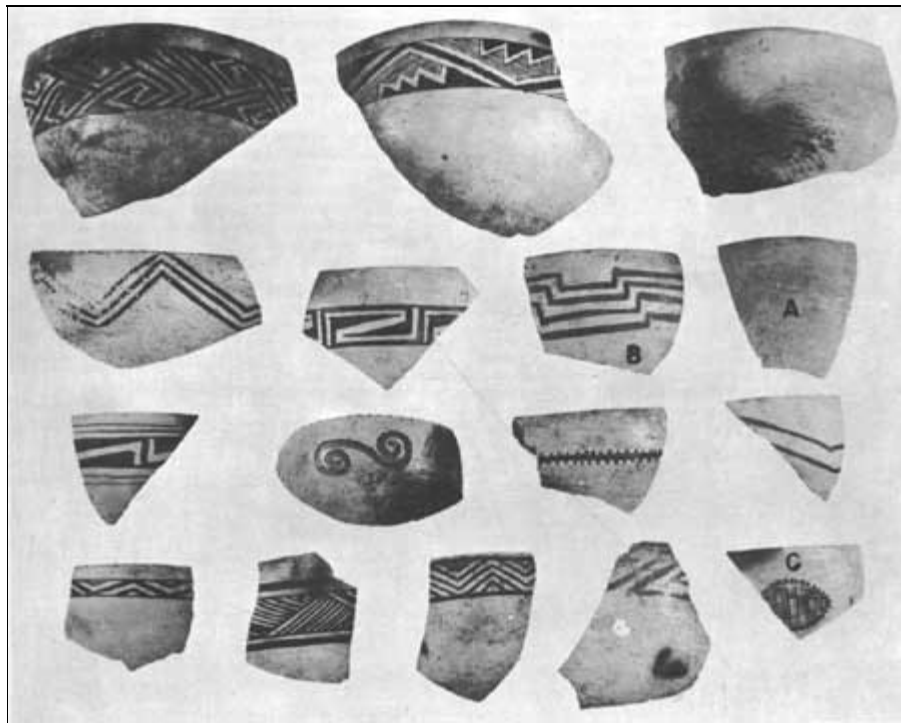


PLATE 38—Mesa Verde Black-on-white sherds. Sherds in plate above have been reversed to show exteriors. One sherd, C, has been added.

Both large and small water and storage jars are represented, and mugs, though present, are rare, with only 8 in a total of 1,691 sherds. Abel (1955) states that Mesa Verde Black-on-white has sherd temper, but the majority of Aztec sherds are tempered with crushed rock and sand, as in the Mesa Verde Black-on-white of the La Plata River area (Shepard in Morris 1939: 276). He also describes a "new" variety, Mesa Verde Polychrome. We noticed a few sherds of this description but did not make the separation, as the time element is the same.

With respect to the beginning date for Mesa Verde Black-on-white, we are dealing here with a highly standardized design and form. Included in this distinctive style are: mugs, hollow-handled ladles, kiva jars with a molded rim, thick-rimmed bowls decorated both on interiors and exteriors, water jars, spherical and submarine-shaped canteens, all well-polished in a pearly white and decorated with heavy geometric designs in organic paint. When the above criteria are applied, few workers would see anything much earlier than A.D. 1200 for the type.

McElmo Black-on-white: ca. A.D. 1130-1200 (Abel 1955). Comprises 2.9 percent of black-on-white types, and is the third ranking ware among them. This ware marks the introduction of carbon paint to the San Juan area. Abel suggests it may have been introduced by the Virgin Branch of southwestern Utah, southern Nevada and the Arizona Strip (1955: 3). Trade contacts thus far noted at Aztec indicate that carbon paint could just as easily have arrived from the Kayenta or Little Colorado districts. In fact, McElmo bears a predominantly wide line decoration in Sosi style which might argue for its inspiration out of northeastern Arizona.

Temper appeared more variable than in Mesa Verde Black-on-white. Some sherds had an extremely fine paste, virtually of untempered clay, with stray fragments of either sherd or light colored rock. The temper in a majority of sherds was fine, containing minutely crushed dark rock. Abel gives temper as crushed sherds with occasional particles of crushed rock in some sherds (1955).

Discussion

Lancaster (1954: 78) believes that neither McElmo Black-on-white nor any Pueblo III black-on-white pottery was made prior to A.D. 1100 in the Mesa Verde. This is in disagreement with O'Bryan (1950: 109), who assigns McElmo Black-on-white a beginning date of A.D. 1050, which might argue for the genesis of McElmo in the area either to the northwest (Lowery Ruin) or to the southwest (La Plata district) of Mesa Verde.

Most workers agree that the change from iron to carbon paint implies experimentation begun perhaps by introduction of new ideas or a migration of people, and the only points of disagreement seem to be a more precise date for this change, and as to direction of movement, with the majority opinion favoring a general north to south trend.

The important point in concluding this discussion is that, regardless of one's interpretation of the evidence concerning origin and movement of McElmo Black-on-white, it was clearly on the wane when the East Ruin was occupied.

Mancos Black-on-White: ca. A.D. 950-1150 (Abel 1955). Constitutes 4.4 percent of the decorated pottery, and 4.5 percent of the black-on-whites. It is the second ranking ware in the black-on-white category. Abel gives crushed sherd as the temper. He also divides this into two types: Morfield Black-on-gray (ca. A.D. 950-1100) and Mancos Black-on-white (A.D. 950-1150), on the basis of form and finish. Obviously, these two types overlap in both time and technique and, until this separation was made by Abel, all were included in Mancos Black-on-white.

The most significant observation on Mesa Verde, McElmo and Mancos Black-on-white sherds from the East Ruin is the noticeable predominance of crushed rock and sand temper versus the crushed sherd temper of the same types at Mesa Verde (according to Abel). Vivian found this same situation to be true for sherd material from the Hubbard Site (1959: 31), and Shepard reports the same for the La Plata area (Morris 1939: 275).

Cortez Black-on-white: ca. A.D. 900-1000 (Abel 1955). It is represented by a single sherd, and considered a drift spall. It has a good slip and polish, mineral paint, and crushed rock temper.

Intrusive Decorated

Chaco Black-on-white: ca. A.D. 1100 (Hawley 1936: 43-44). Our sherd counts show three of this type. Two may be Mancos copies of Chaco Black-on-white, and one is a Chaco Black-on-white worked sherd disc, coming from the surface of the mound.

Puerco Black-on-red: A.D. 1050-1175. Only two sherds of this type were found, one in good stratigraphic position between the two floors of lower Room 11 in association with Classic Mesa Verde Black-on-white. These two examples have square rims, and wide line decoration identical to McElmo Black-on-white, except of course, for the heavy red slip. Colton and Hargrave (1937) discussed the ancestry and identity of the type. Later studies raised the time range, viewing the type as a late development from Wingate Black-on-red in simple, bold, linear designs.

Wingate Black-on-red: A.D. 975-1125 or extending to 1125-1200 if the North Plains variety is included. Nine sherds of this type were found, seven of them, including one with a corrugated exterior, in undisturbed fill of upper Rooms 9 and 11; at least one fits Dittert's description of the North Plains variety (1956: 303).

Querino Polychrome: A.D. 1250-1300 (Colton and Hargrave 1937). Only three sherds were found; two came from undisturbed situations of upper Rooms 9 and 11, the third from either doubtful or secondary deposition in lower Room 8.

St. Johns Polychrome: A.D. 1150-1275 (Kidder and Shepard 1936). Also represented by just three sherds from fill of lower Room 8, and upper Rooms 12 and 13, all probably of secondary deposition.

Tusayan Black-on-red: ca. A.D. 1050-1150 (Colton and Hargrave 1937). Two sherds were found in reliable association of undisturbed contents of upper Rooms 9 and 11.

Tusayan Polychrome: A.D. 1150-1300? (Colton 1946). Three sherds from lower Room 11 were found in drifted, and not occupational, deposit.

Tsegi Orange Ware: Unidentified, probably of the Black Mesa Series (Colton 1946). Total of three sherds, two from reliable deposits in Room 24, the other in redeposited fill of upper Room 12.

Local Utility Ware

Locally made utility ware comprised a total of 1,590 sherds or 46 percent of all types, decorated and utility combined. These ranged from a few plain sherds (19), through incised (3) to deeply indented, sometimes patterned corrugated which are comparable to exuberant or Mancos Corrugated (78) (Abel 1955) to finally the great majority of Mesa Verde Corrugated (1,490 sherds) (Abel 1955), or what Reed appropriately terms "Standardized Corrugated" (1958: 121).

The plain and incised sherds are of somewhat doubtful placement, probably holdovers from late Pueblo II. Since all were found either in the intentional fill between floors of the kiva over Room 1 or in the disturbed area above the third and final floor of the kiva, they may represent material carried in from various refuse areas for filling the space between floors, or construction of the kiva roof.

Abel gives crushed rock as temper for both Mancos and Mesa Verde Corrugated (1955). The only difference we could detect in the East Ruin examples is that toward the later end of the time scale (Mesa Verde Corrugated) the paste trended more to temper with dark crushed rock, sand, and occasional pieces of sherd, and was thus allied somewhat closely with its companion decorated ware, Mesa Verde Black-on-white.

Except for the few plain and incised sherds, the individual room summaries noted earlier do not give the breakdown for Mancos and Mesa Verde Corrugated; rather they are lumped together under "Indented Corrugated."

A summary breakdown for utility ware for the site as a whole is as follows:

	No.	Percent
Plain Ware (unidentified), probably late Pueblo II	19	1.2
Incised Ware, late Pueblo II, early Pueblo III	3	.1
Mancos Corrugated, Pueblo II and early Pueblo III	78	5.0

Mesa Verde Corrugated, Pueblo III	1,490	93.7
Total	<u>1,590</u>	<u>100.0</u>

From the above figures it will be seen that the dominant utility ware, Mesa Verde Corrugated, compares percentage-wise to the total utility ware in approximately the same amount that its companion ware, Mesa Verde Black-on-white, compares with the total black-on-white varieties.

Intrusive Utility Ware

Reserve Indented Corrugated, smudged interior: ca. A.D. 1050-1250 Reserve and Tularosa Phases, Pueblo II and III (Rinaldo and Bluhm 1956). There was one sherd, from lower Room 14. Vivian found a sherd or two of this type in 1949 while clearing upper Rooms 2 and 4 (personal communication). Morris also found a variant, a Tularosa Patterned Corrugated rectangular dish, in the West Ruin (1919: 73-74). The several occurrences of this unmistakable, burnished interior ware bespeak definite trade, either directly or through intermediary sources, from the Tularosa region of southwestern New Mexico.

Atypical Sherds From Upper Room 14

On the assumption that it may sometime be definitely proved, either through documentary sources or eyewitnesses, whether or not the redeposited sherds in upper Room 14 came from the East Ruin or elsewhere within the Monument, the sherd types which are not duplicated in preceding descriptions are briefly listed, along with a few comments. The several archeologists noted in the preface gave us their opinions on these sherds, providing basis for the following identifications.

Klagetoh-Kowina Black-on-white: ca. A.D. 1250-1300 (Colton and Hargrave 1937; Wendorf 1956: 319). Total of six sherds, three from a jar or pitcher. Temper appears to be finely ground sherds. Description most nearly resembles Klagetoh Black-on-white. Superficially, mainly on the basis of design, it appears to be a late variant of Tularosa Black-on-white.

Pinedale Black-on-red: A.D. 1200-1300 (Colton and Hargrave 1937). Total of 31 sherds. There was considerable disagreement among specialists regarding this group, with a majority vote for Pinedale Black-on-red.

Springerville Polychrome: A.D. 1300? Total of 15 sherds. The writer would have placed at least some of these in Keet Seel Polychrome an opinion shared by three other individuals. Others suggested that the sherds are not Keet Seel Polychrome but related to St. Johns Polychrome, a type called by Danson (1957) Springerville Polychrome, not yet described. I will now settle for the latter opinion.

Klagetoh Polychrome: ca. A.D. 1250-1300 (Colton and Hargrave 1937). Represented by 83 sherds.

Tularosa Patterned Corrugated: ca. A.D. 1050-1250 (Rinaldo and Bluhm 1956). One partly restorable, rectangular dish. There is no question regarding its identity.

Mogollon Brown Ware: Woodruff Brown? pre-A.D. 800 (Colton and Hargrave 1937). Represented by a partly restorable miniature bowl. This may be the "joker" of the lot. Only one individual out of the seven or eight people who examined it ventured the opinion that "it looks like Mogollon Brown Ware, types Woodruff Brown or Forestdale Plain." For all the writer knows, it may be modern. None of the other archeologists would commit themselves at

all.

It appears futile to pass judgment on sherds which may be of false deposition. Yet, with the exception of the last-mentioned they date between A.D. 1100-1300, with most of them ranging in the 13th century, and we see nothing that would extend later than A.D. 1300. Only within this narrow temporal sense could these sherds conceivably be in place at the site.

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AZTEC RUINS

Excavation of a Portion of the East Ruins, Aztec
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FOOD REMAINS

Maize

Corncobs form the most abundant single item of the remains of vegetal foods. At least one to several cobs were found in half of the rooms excavated. The largest concentration appeared in the dry refuse layer, from the floor to 3 feet above, of upper Room 11 where one-third of a bushel was found. Also associated with this were corn stalks, husks and stems.

The cobs show a considerable range in size; rows of kernels vary from 8 to 14 with the majority being 10. This is one less than the average of 11 rows of grains for Pueblo III corn from Cliff Palace studied by Cutler (1956: 176-177). In some specimens it was noted that the kernels were eaten while green.

Perhaps the most interesting observation regarding the collection is that while the corn is of the late Pueblo type, it very probably belongs to the Pima-Papago Corn Race (identified by Dr. Hugh C. Cutler, Missouri Botanical Garden, May 1959).

Squash

Stems and rinds or hulls were found in upper Room 11, plus one seed; these are *Cucurbita pepo* or common squash-pumpkin (identified by Cutler).

Other Foods

One unidentified seed pod or fruit was found in upper Room 11; also pinyon nuts (*Pinus edulis*).

Yucca Quid

One example of a yucca quid from the same location. It has been shown (Haury 1934: 60) that the practice of chewing yucca is widely spread over New Mexico, Arizona, and the western part of Texas, where it occurs at all times and amongst all peoples. The present writer is unaware whether it contains any food or medicinal value or merely serves as a "chewing gum."

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FAUNAL REMAINS

Bones of animals are listed below in order of their frequency. It was not possible to identify deer as to species except in three instances for mule deer. Nor was it possible to identify rabbit other than cottontail.

- Deer (unidentified)
- Mule deer (*Odocoileus hemionus*)
- Desert cottontail (*Sylvilagus audubonii*)
- Rabbit (unidentified)
- Bighorn sheep (*Ovis canadensis*)
- Merriam's turkey (*Meleagris gallopavo merriami*)
- Rodent (unidentified)
- Great horned owl (*Bubo virginianus*)
- Beaver (*Castor canadensis*)
- Golden eagle (*Aquila chrysaetos*)

Bones of the deer and rabbit were commonest, followed closely by bighorn sheep and turkey. Lyndon Hargrave who identified the turkey believes they represent domesticated birds.

It was noted previously that turkey feathers were used for making robes and the bones were fashioned into tools. All examples not used as tools were found loose and unarticulated in the refuse, suggesting that the meat had been removed for food. In two sites at Mesa Verde, O'Bryan found only turkey burials and no scattered loose bones or implements, from which he concluded that the birds were kept only for feathers (1950: 101). In other sites, however, he found numerous loose turkey bones (ibid.). In summarizing the trait list for the Montezuma Phase, he states . . . turkeys were kept for meat, feathers, and the bones were used as raw materials for tools. Hunting remained of secondary importance to agriculture" (ibid.: 111).

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THEORIES

We will begin with a summation of Morris' views (1939: 37-40) on the Chaco-Mesa Verde sequence in the area north of the San Juan and at Aztec Ruins in particular. He demonstrated first that makers of Classic Mesa Verde pottery took over the West Ruin at Aztec after it had lain abandoned for some time. In this same period the makers of Mesa Verde pottery also came to occupy many small houses already built along the valley, as shown by the fact that burials in the refuse heaps there contain mostly Chaco wares, while the pottery in the house burials is usually of Mesa Verde type. Such excavations as Morris made in the East Ruin at Aztec led him to conclude that it was built during the Mesa Verde occupation of the region.

The Mesa Verde reoccupation of the West Ruin, of numerous small sites, and construction of the East Ruin were parts of a large-scale occupation of the area. Another Mesa Verde site which Morris considered to be of "great house" proportions lay on the south side of the Animas, opposite Flora Vista (since largely bulldozed into a diversion dam), and another site known as the Old Fort south of the confluence of the Animas and San Juan. Hence, in the lower Animas Valley there were four Mesa Verde "great houses," three built by Mesa Verde groups, and a fourth marking the reoccupation of a previously existent structure.

After summing up the extent of the Mesa Verde occupation in the area, Morris' final point was that in the light of available evidence the "great houses" seem to have been the product of an architectural vogue rather than the results of "fear driven necessity."

Today, another hypothesis, or a modified version of it, is gaining acceptance which seems to fit the architectural facts equally well, namely, that the great houses, and perhaps unit types as well, of the Mesa Verde of Pueblo III times lying in proximity to structures of rather bizarre ground plan like the Hubbard Ruin and Mound F were the result of socio-religious forces impelled by rites, ceremonies, and group action, perhaps guided by a cult, guild, or priestly class, in the propitiation and furtherance of an expanded agricultural economy. In other words, the settlement pattern grew out of a religious system involved in rain-producing ceremonies and crop production. (For a discussion of this concept, see following sources: Haury, Wendorf, in Willey 1956; Vivian 1959).

Within the framework of the above hypothesis, it appears very possible that the East Ruin was a village divided into two approximately equal parts, representing dual socio-ceremonial units. It is clear that the Mesa Verde Anasazi were expending major efforts in the building of religious structures, and it seems plausible that these efforts were guided by priests, some of whom may have had multicomunity affiliations. There are at least two so-called tri-wall structures at Aztec, one (Mound F) being located just 50 yards west of the East Ruin. The Hubbard Ruin (Vivian 1959) is about 100 yards north of the West Ruin. It could be inferred that the Hubbard Ruin was associated with either the West Ruin or its Annex or both; and possibly the second tri-walled building was, by its proximity and similarity in architecture and surface pottery, related to the East Ruin.

The superficial resemblance between the Great Kiva and the tri-walled structures has been

pointed out by Morris (1921: 137). He further shows (ibid.: 127) that the Great Kiva in the plaza of the West Ruin was initially built and used by people of Chaco derivation, and that it was subsequently occupied by the newcomers from Mesa Verde. He further points out that the building needed repairs, and the Mesa Verde people were responsible for the later poor workmanship during their reoccupation and use of the same structure (ibid.: 137)

Presumably then, the Mesa Verde people used it for ceremonial purposes for an indeterminate period, but ultimately abandoned the Great Kiva and used it for a trash repository. This abandonment may well be contemporary with development of the tri-wall structure, which may have grown out of a changed religious ceremonial pattern in vogue by the middle of the 13th century.

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AZTEC RUINS

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SUMMARY

Architecture

In spite of some disturbance, very few construction details have been lost in the 13-1/2 rooms excavated. Masonry and architecture are analogous to and contemporaneous with the Montezuma Phase at Mesa Verde National Park, and are synchronous at least in part with the reoccupied portions of the West Ruin at Aztec. Uniformity of construction displayed in the 12 upper and lower Rooms 8-14 almost bespeaks a preconceived building plan; certainly they were built as a unit, and exemplify a very high order of Pueblo architecture. These rooms also display unique construction of doorways in the use of pole sills and lintels which may be a secular adaptation of a feature sometimes found in a religious structure, the Great Kiva.

Although not enough of the ruin has been excavated to outline the building sequence or mechanics of growth, it is thought that the north section was the highest, with lower rooms terraced down toward the south. At least walls of the north tier are thickest. No outside entrances have been found but they are believed to exist at the south, probably in the form of either a vestibule or hallway entry to ground-floor rooms. Both halves of the East Ruin appear to be rectangular houseblocks with incorporated kivas, an estimated 200 to 300 rooms. During the span of occupation in the area tested, there is a hint that the interior was modified. The unexcavated kiva adjacent to Rooms 8, 9, and 11 probably came into use at this time.

We found conclusive evidence that building materials such as face stones, shakes and poles were reused, probably salvaged from the West Ruin. Tree-ring dates, when compared with pottery dates and architectural remains, point to similar reuse of main beams. Therefore, the tree-ring dates, and those which may be obtained in the future, should be viewed with considerable caution and their association carefully noted.

It is significant that in the seven rooms containing original ceilings, nearly all of the main beams and secondary roofing materials are juniper. This suggests either a drier climate in the 13th century or, more probably, an imposed choice whereby the people resorted to the use of wood growing in the Aztec vicinity.

A rebuilding spurt by Mesa Verdeans in the West Ruin is noted for the period 1225-1252 when the supply of reusable pine and fir was apparently exhausted and new timbers were cut. Apparently, after usable beams from the West Ruin were no longer easily available, juniper was used exclusively for main beams in the East Ruin during the final years of construction there.

At this point, an admittedly speculative synthesis of 86 tree-ring dates obtained thus far at Aztec temptingly suggests that the period 1225-1252 witnessed the following more or less contemporary events: (1) the movement of Mesa Verde people in considerable number to Aztec, (2) their rehabilitation and/or salvage of portions of the West Ruin, and (3) their inauguration of an ambitious building program consisting of the East Ruin, the West Ruin Annex, and the two tri-wall socio-religious structures.

Obviously, the answer is not quite this simple, because there are four or five additional mounds within the area whose study might alter this interpretation. Mound F, the second tri-wall building, has been merely tested. It should be noted that the wood found on the pilasters of the central kiva, partially uncovered in 1953, was juniper. Surface sherds here are mostly Mesa Verde Black-on-white and the exposed masonry is identical to that in the East Ruin.

In support of the foregoing, it has been shown by Morris (1939), Martin (1936), and O'Bryan (1950) that Chaco Branch characteristics dominated both to the south and northwest of Mesa Verde at A.D. 1121, when the West Ruin was built, and in the decades immediately preceding that date. By A.D. 1225, the resurgence by the Mesa Verde Branch at Aztec occurred, involving the construction of the East Ruin and at this time also the La Plata and Animas Valley sites possessed the same traits as their Mesa Verde cave-dwelling neighbors on the north side of Mancos Canyon.

Pottery

Evaluation of room deposits shows that out of 13-1/2 rooms excavated, there are 6 lower rooms which were abandoned and left vacant in which the fill was largely secondary, the result of natural agencies. Out of six upper rooms, one had been previously excavated and backfilled; contents of only two were not appreciably disturbed, while the remaining three were disturbed in varying degrees, either in prehistoric or modern times. Deposits in the kiva over Room 1 were valid for the three successive floors which were laid in a relatively short time. Collapsed material in the remaining one-half of Room 24 was likewise valid and undisturbed.

Simultaneous trade contacts with the Little Colorado and Kayenta areas are indicated by intrusive sherds.

The preponderance of Mesa Verde pottery is in agreement with the architectural data, indicating that occupation followed the initial abandonment of the West Ruin and the Hubbard Site. From this it may be inferred that either in the late 1100's or early 1200's there was a migration to the Aztec vicinity from the Mesa Verde. Presumably this was slow and intermittent, since the Mesa Verde not only remained populated but was also flourishing with the inhabitants mainly concentrated in the large cliff dwellings. This movement out of Mesa Verde may have been the result of overcrowded living conditions or, more probably, lack of arable land for the expanding population. While the Mesa Verde area apparently suited the people's predilection for caves, unquestionably the well watered and fertile Animas Valley was equally favorable.

In seeking causes for this gradual movement southward, there is also the possibility that by A.D. 1200 or shortly thereafter, people in the Mesa Verde either had heard rumors of nomadic tribes operating in the vicinity, or may have actually encountered them in brief, outlying skirmishes, which, singly or combined, touched off their large-scale movement from the mesa tops to the caves (Lancaster *et al.* 1954: 106). If this motivated a southward migration it is difficult to see how these newcomers proposed to defend themselves in open valleys like the Animas, unless by construction of massive-walled pueblos such as the East Ruin.

There is still another possibility. Lacking tangible evidence for enemy peoples, it is quite possible that climate was the controlling factor. Admittedly difficult of proof in the light of present knowledge, it is not inconceivable that several cold and dry or cold and moist, unseasonable years, drove the Mesa Verde people to the shelters provided by the caves. Obviously, tree-rings record in sequence only in a relative manner the dry, normal, and moist years, but do not reveal how cold the climate was. Crop shortages or partial failures could

have resulted from too short a growing season due to extremely cold and wet weather.

As for the general abandonment of the San Juan area at the end of Pueblo III times, there is now a tendency to seek multiple causes or combinations thereof, citing factors such as drought, arroyo cutting, inter- and intra-village feuds, guerilla raids by hostile tribes, disease, dietary deficiency, and land shortages (*see* Jett 1964: 295-297), for an excellent and comprehensive discussion).

A clear-cut case cannot yet be made for Aztec. However, according to Schulman (1956: 65) "the average annual [tree] ring growth and, perhaps, . . . rainfall and runoff during the 85-year drought of 1215-1299 seems to have been about half that during the drought since 1930 in this basin [in the Southwest; in the Colorado River Basin]." Therefore, the intensely dry 24-year period of 1276-1299, which apparently exceeded disastrous droughts in our times, could well have tipped the scales against farming, particularly corn, which is not an especially drought resistant annual, and would be unable either to germinate or mature properly.

The fact that exceptional rainfall occurred in 1300 and subsequent years (Schulman 1956: 65) could mean that the abandoned pueblos were not reoccupied with the return of favorable farming conditions on grounds of either superstition or dispersal of the original population.

On the other hand there is a suggestion that Aztec was untenable during at least part of the 14th century for another reason. Schulman (1956: 65) further points out that the interval 1300-1396 was the wettest during the past eight centuries. Aztec is not particularly well drained and it is quite possible that former fields were flooded during the planting or growing season. Thus, there is some evidence that flood stages of the Animas River destroyed a section of the East Ruin at the southeast side.

At present, however, there is only indirect and negative evidence from which it is not yet possible to make a more precise assessment of the question concerning abandonment.

Definitive answers to this and other questions may be forthcoming as result of the studies of the National Park Service-National Geographic Society in their jointly sponsored archeological project on Wetherill Mesa in Mesa Verde National Park.

Lastly, we may ask ourselves: is this study based on a sufficient number of specimens and examples for the site thus far exposed, and will the largely unexcavated remainder of the site yield approximately the same correlation? It is the writer's considered opinion that the first question may be confidently answered in the affirmative, while the second must be relegated to the now somewhat overworked phrase "more spadework and intensive research is needed" in both mounds of the East Ruin.

Morris tentatively concluded that the East Ruin is a large open Mesa Verde Pueblo. The work reported herein does nothing to detract from his conclusion but tends, I believe, to confirm it.

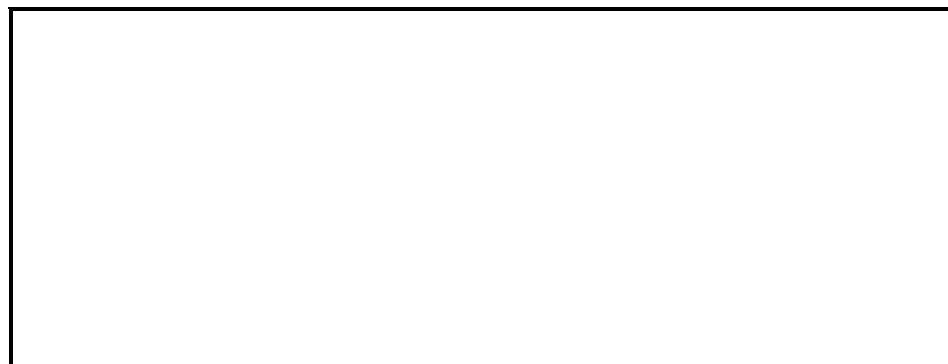




PLATE 39—A general view of the partially excavated northwest corner of the East Ruin

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AZTEC RUINS

Excavation of a Portion of the East Ruins, Aztec
Ruins National Monument, New Mexico



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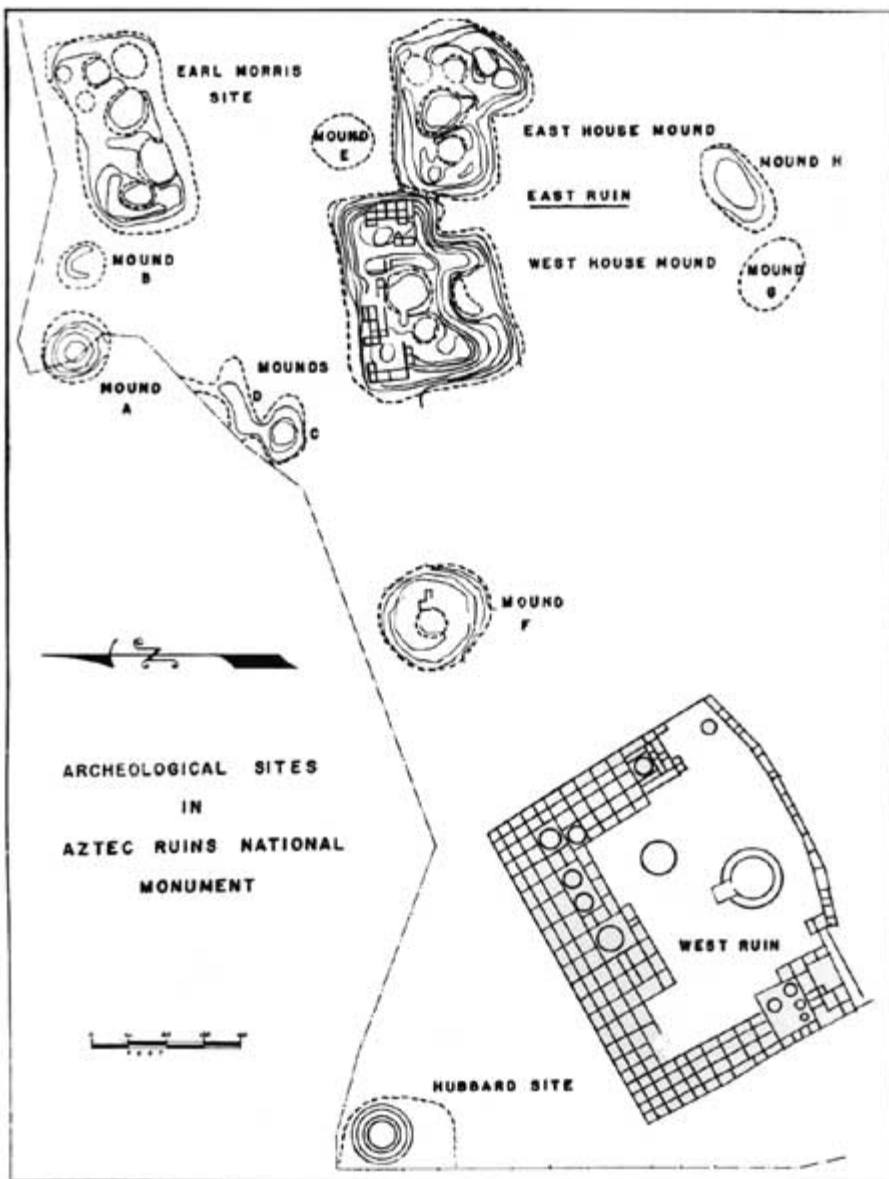
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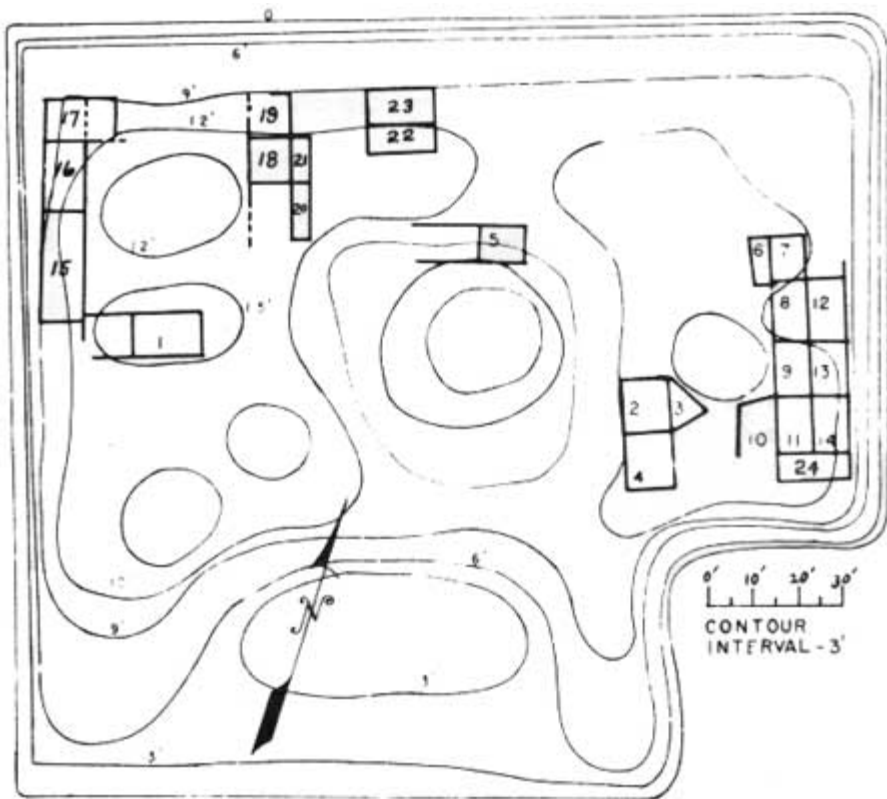
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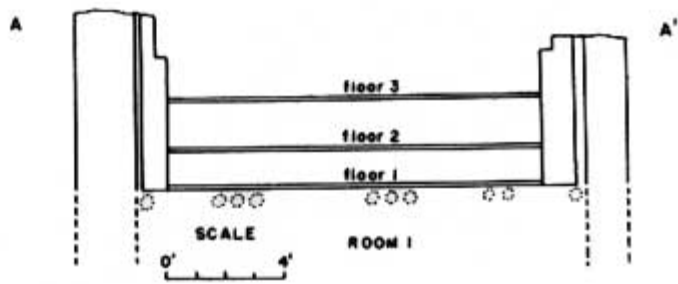
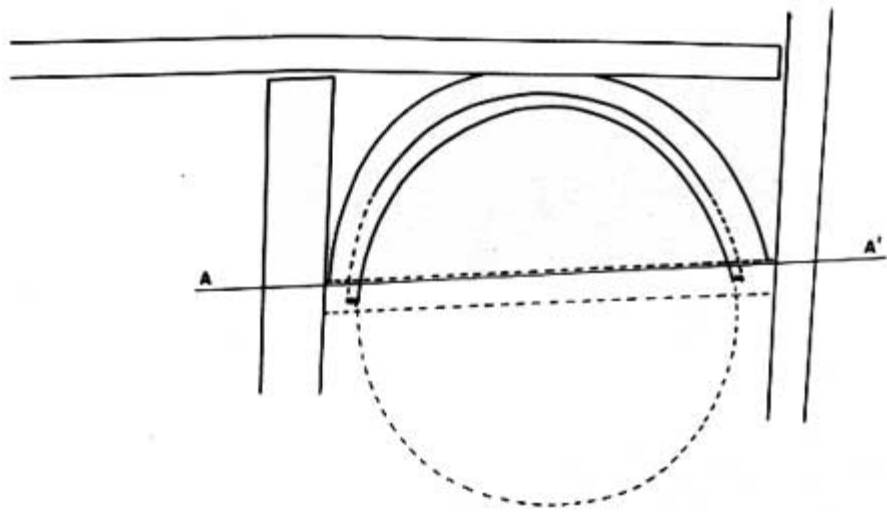
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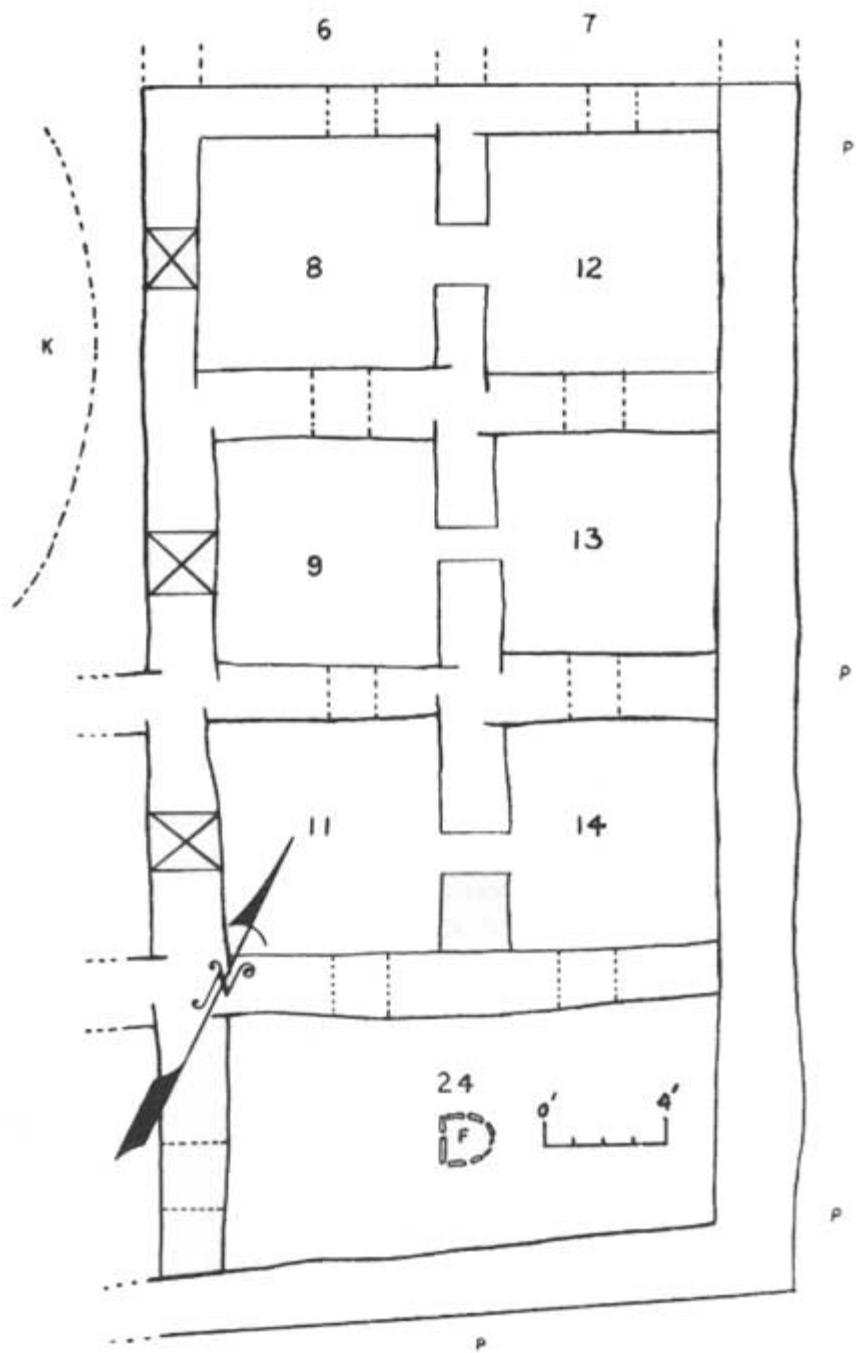
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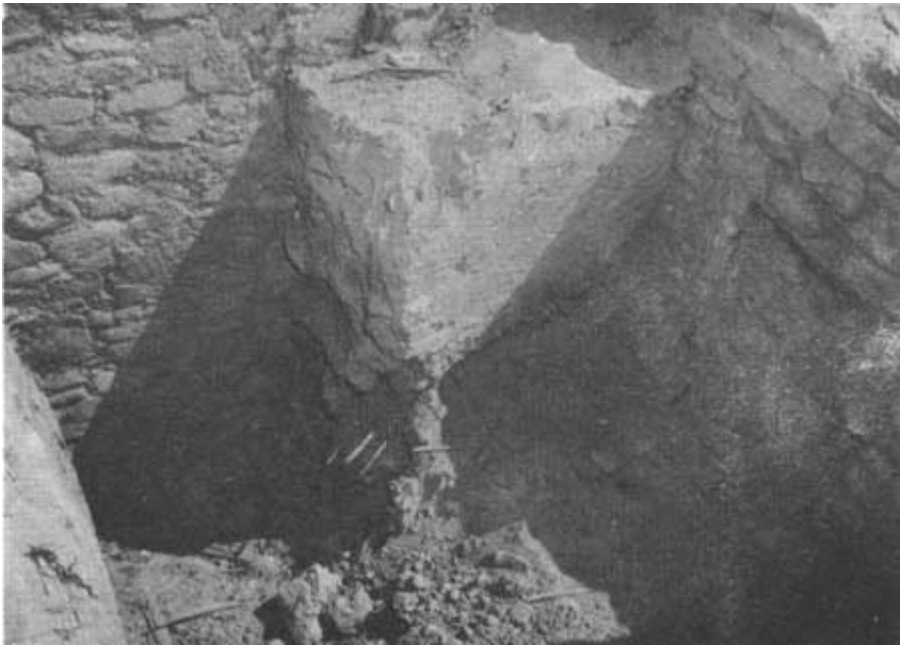












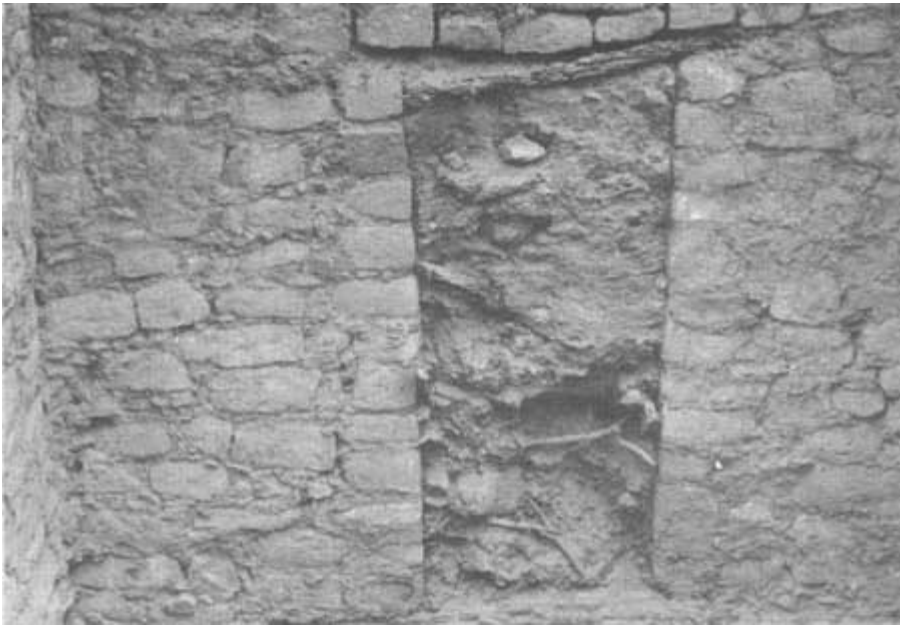












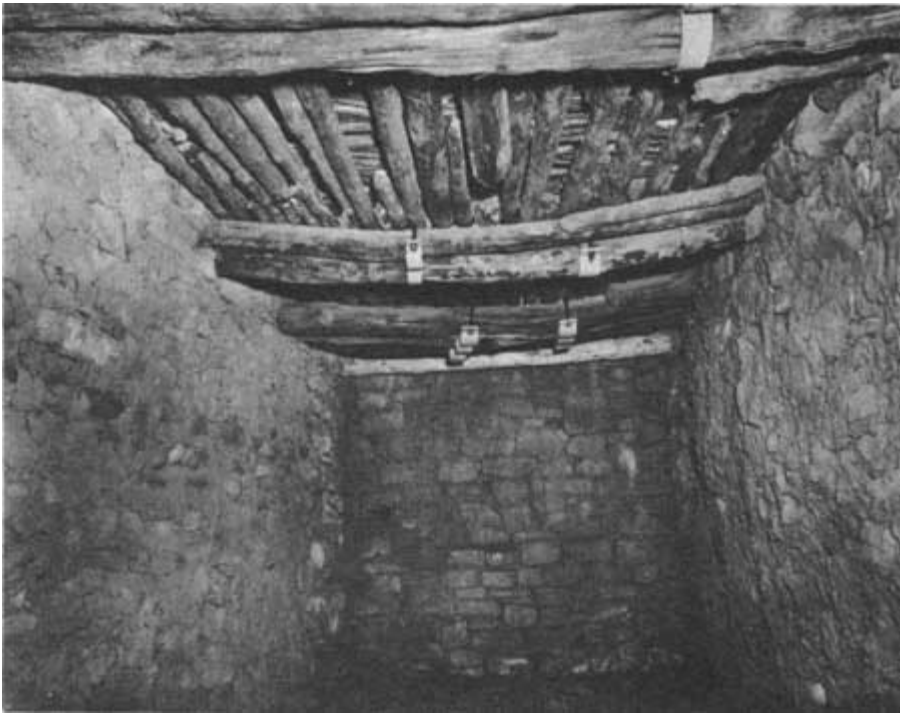


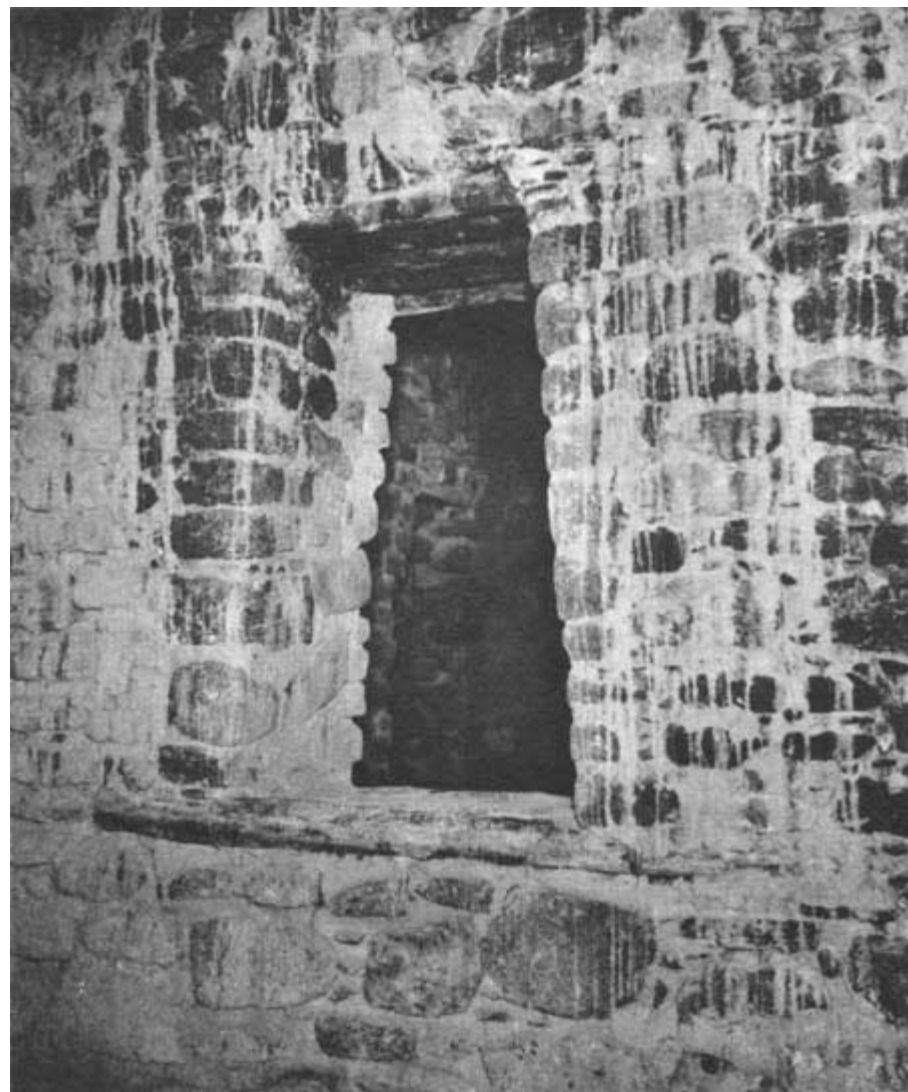


























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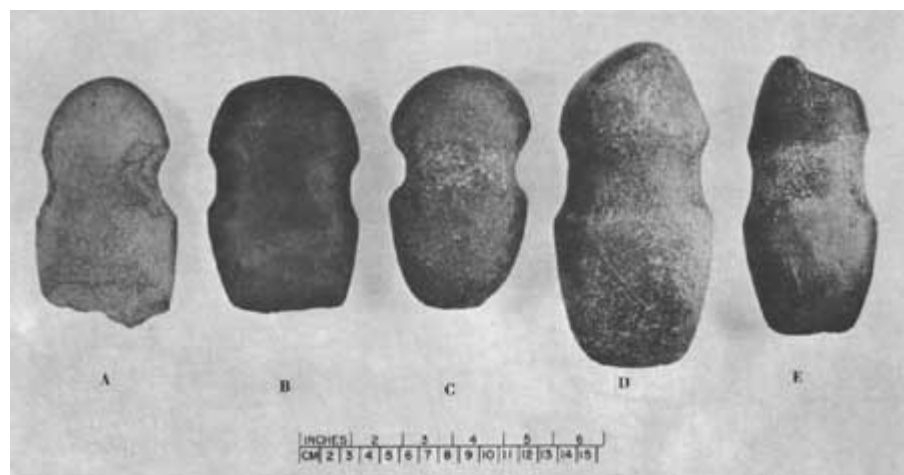


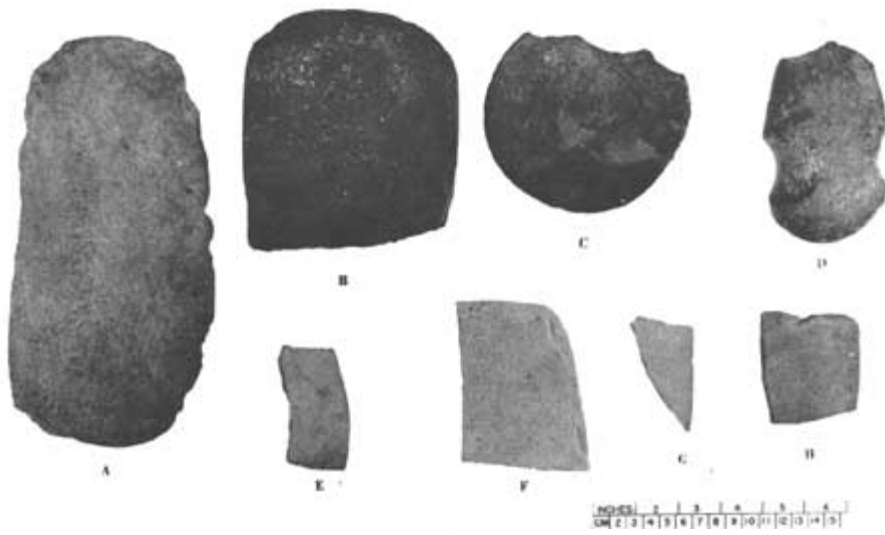
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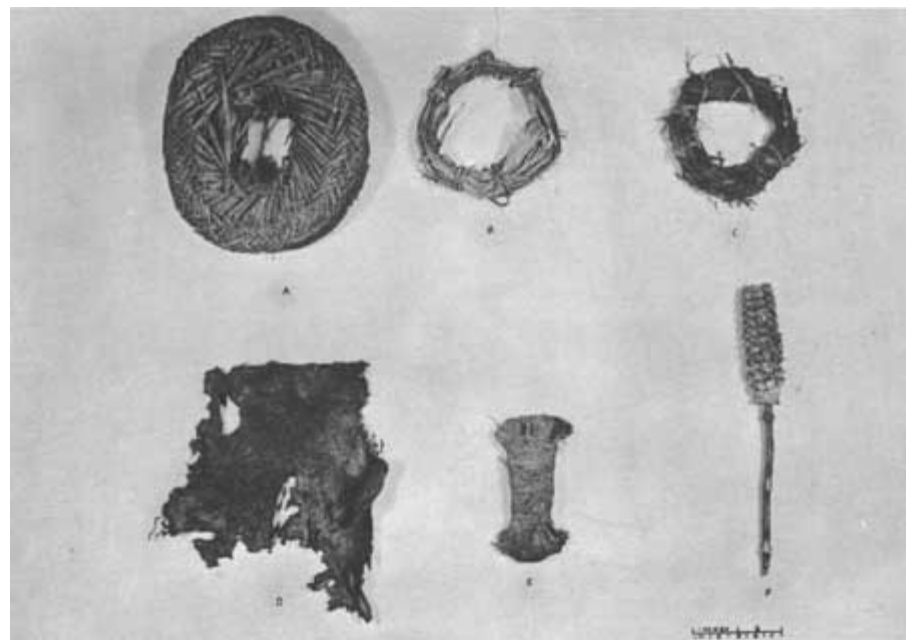


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A



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CM	2	3	4	5	6



A



B



C



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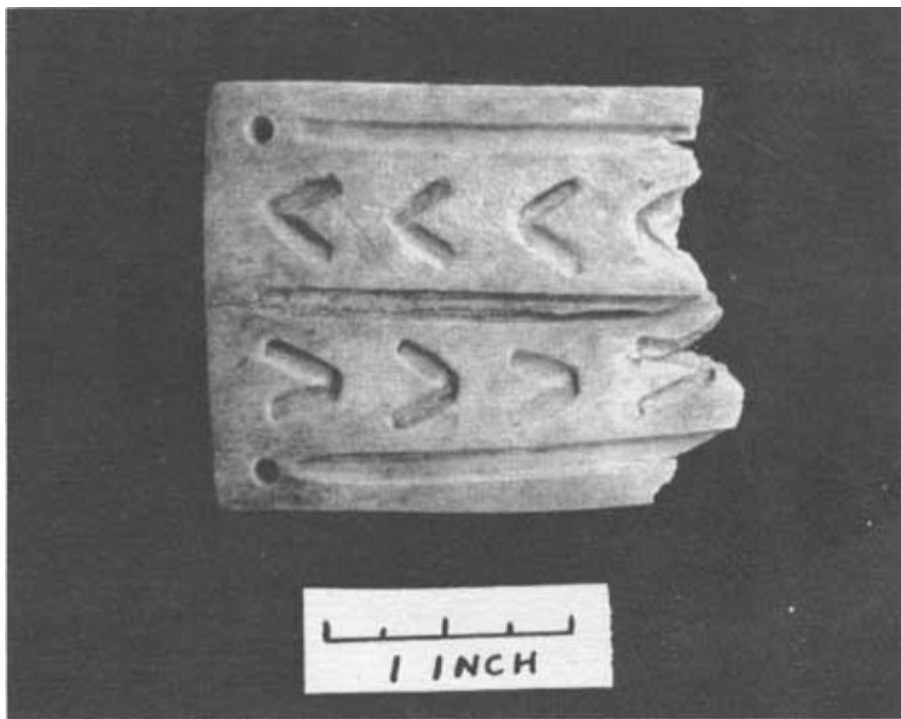


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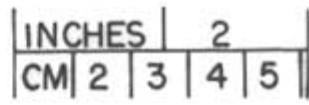
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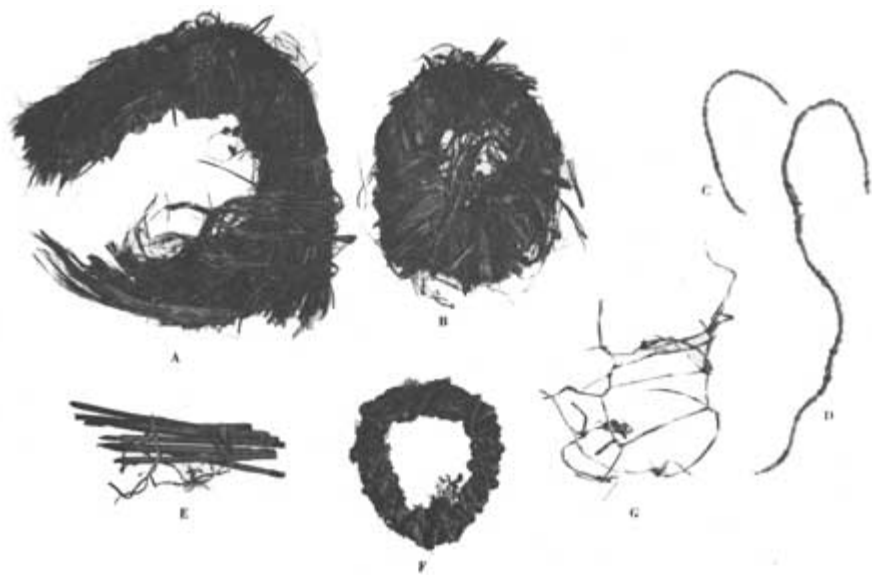
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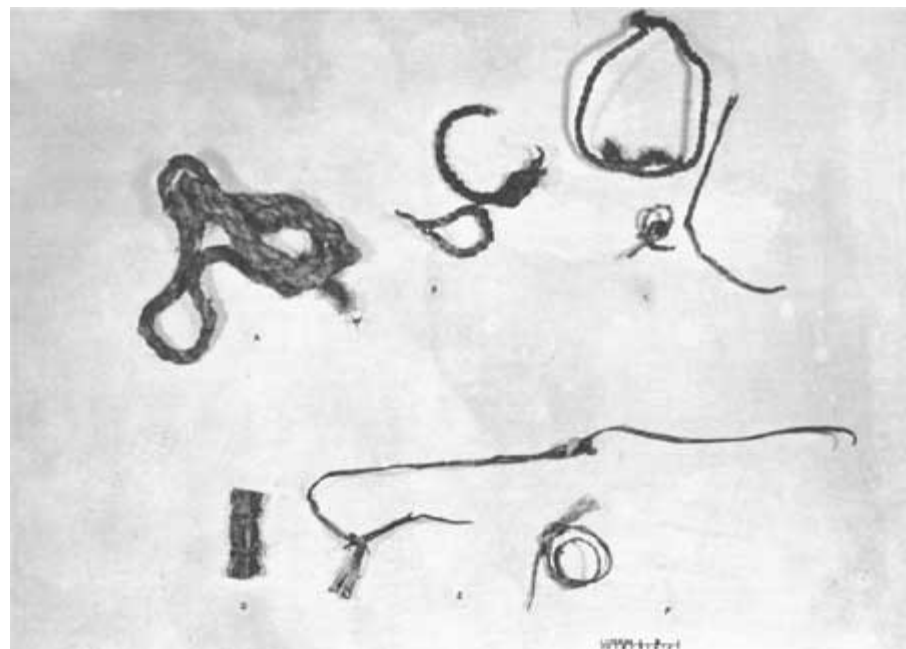
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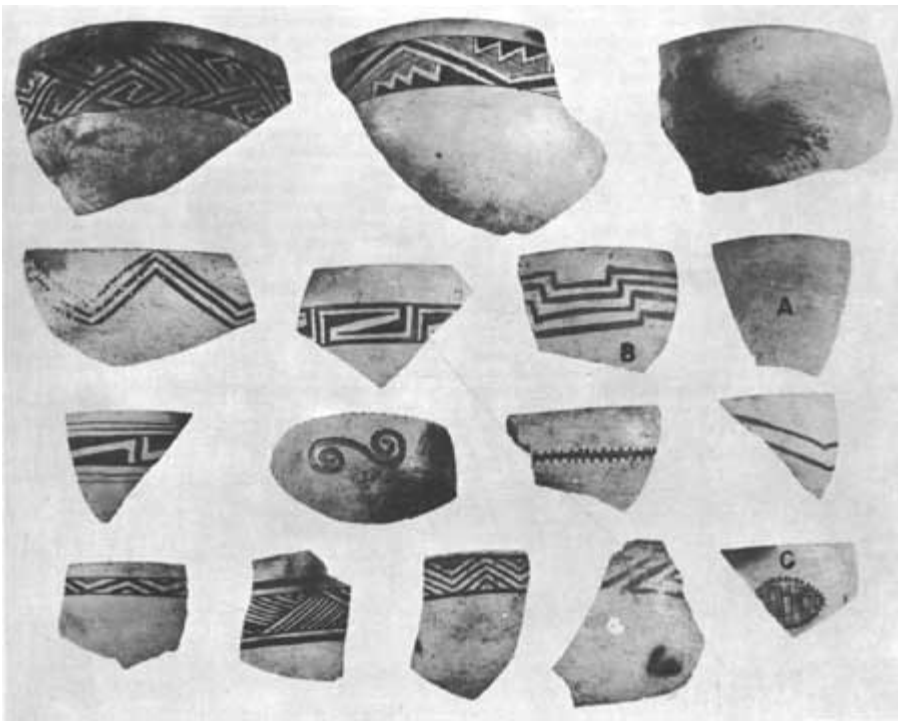




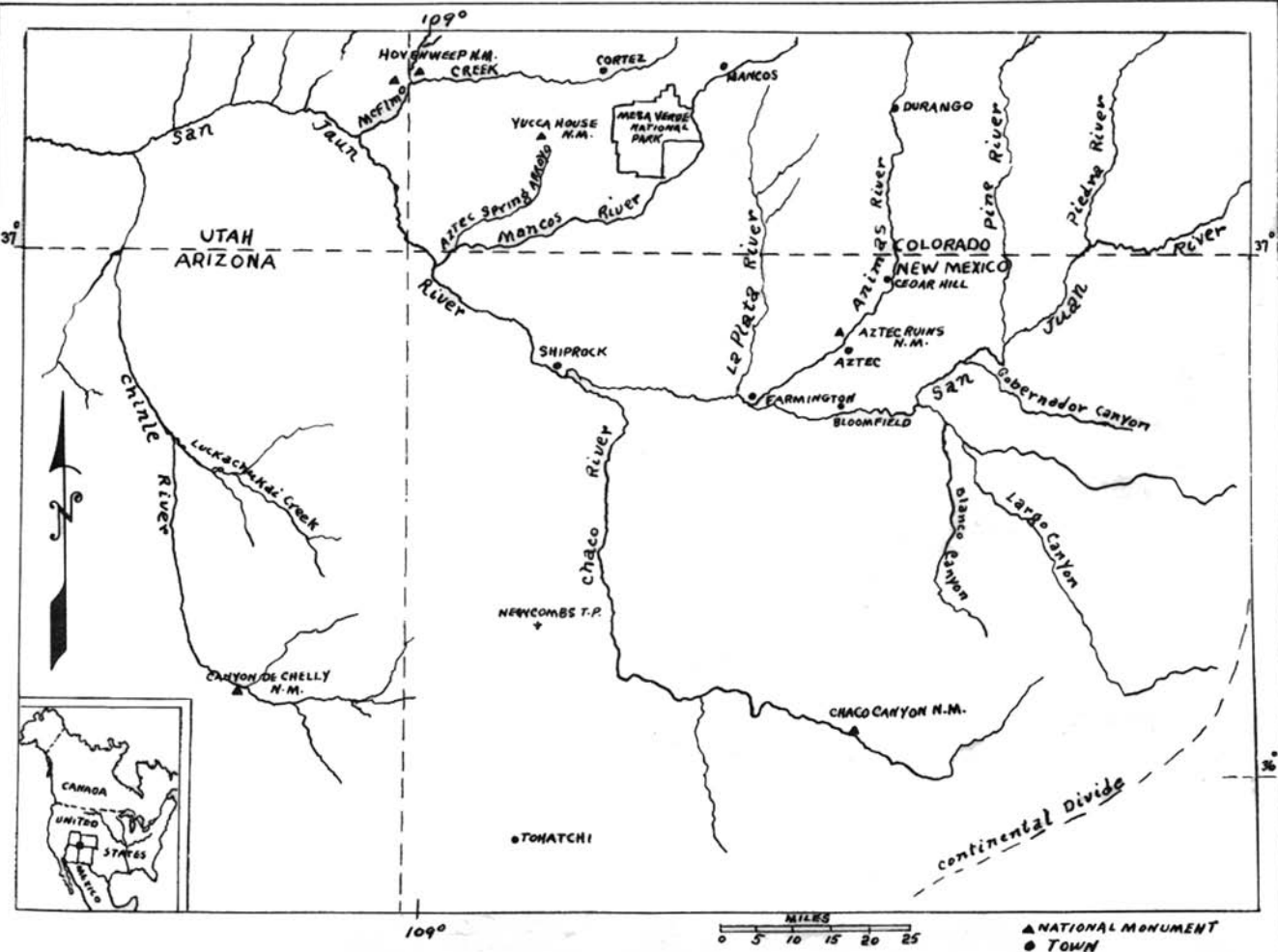
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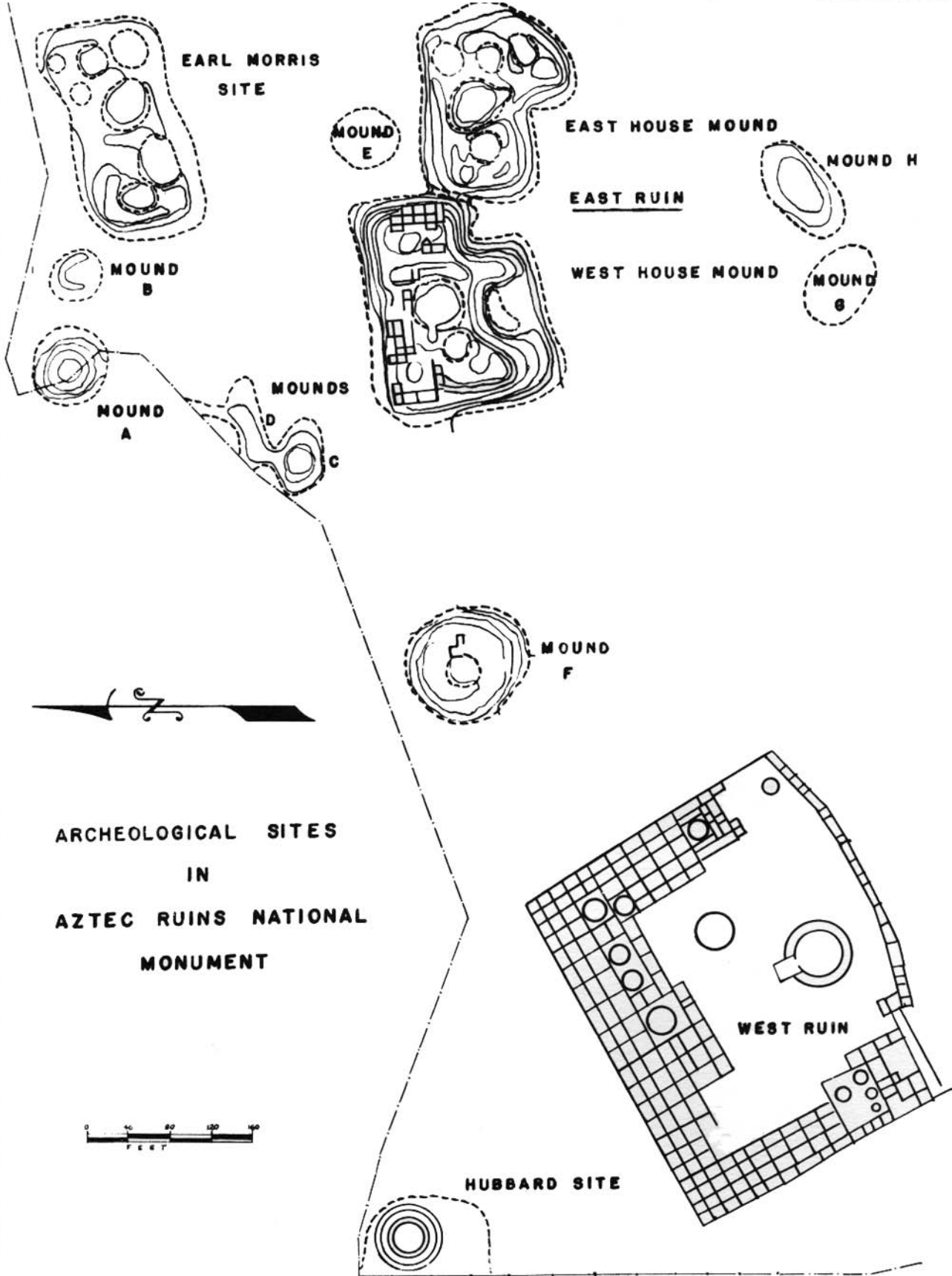
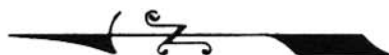


TABLE I — SHERD COUNTS — UPPER ROOMS

Pottery Type	Room No.		9		11		12		13		14		24		Total	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%				
Utility Ware																
Indented Corrugated	118	35.8	689	68.2	133	39.3	84	35.4	1,082	21.1	152	31.2	2,258	30.0		
Reserve Indented Corrugated ..	1	.3							2	T			3	.1		
Tularosa Patterned Corrugated										T				T		
Mogollon Brown Ware										T				T		
Decorated Ware																
Mesa Verde Black-on-white	195	59.0	306	30.2	200	59.2	144	60.8	3,282	64.2	292	60.0	4,419	58.7		
McElmo Black-on-white	6	1.8	3	.3	1	.3	4	1.7	11	.2	8	1.6	33	.4		
Mancos Black-on-white	5	1.5	5	.5	1	.3	4	1.6	2	T	32	6.6	49	.6		
Chaco Black-on-white											1	.2	1	.1		
Klagetoh or Kowina																
Black-on-white									6	.1			6	.1		
Unidentified Black-on-white	2	.6											2	.1		
Morfield Black-on-gray					1	.3							1	.1		
Wingate Black-on-red	1	.3	5	.5					338	6.6			344	4.5		
Wingate Corrugated			1	.1									1	.1		
Tusayan Black-on-red	1	.3	1	.1									2	.1		
Pinedale Black-on-red									31	.6			31	.4		
Querino Polychrome	1	.3	1	.1					194	3.8			196	2.4		
St. Johns Polychrome					1	.3	1	.4	70	1.4			72	.9		
Klagetoh-Kintiel Polychrome ...									83	1.6			83	1.1		
Springerville Polychrome									15	.3			15	.2		
Tsegi Orangeware					1	.3					2	.4	3	.1		
TOTALS	330	99.9	1,011	100.0	338	100.0	237	99.9	5,116	99.9	487	100.0	7,519	100.0		

TABLE II — SHERD COUNTS — LOWER ROOMS

Pottery Type	Room No. 8		9		11		12		14		Total	%
	No.	%	No.	%	No.	%	No.	%	No.	%		
Utility Ware												
Indented Corrugated	20	27.0	39	32.8	122	34.5	34	37.8	6	25.0	221	33.5
Reserve Indented Corrugated									1	4.2	1	.2
Decorated Ware												
Mesa Black-on-White	45	60.8	77	64.7	220	62.3	53	58.9	17	70.8	412	62.1
McElmo Black-on-White	3	4.0	2	1.7	4	1.3	2	2.2			11	1.7
Mancos Black-on-White	3	4.0	1	.8	1	.2	1	1.1			6	.9
Chaco Black-on-White					1	.2					1	.2
Puerco Black-on-red	1	1.3			1	.2					2	.3
Wingate Black-on-red					1	.2					1	.2
Querino Polychrome	1	1.3									1	.2
Tusayan Polychrome					3	.8					3	.5
St. Johns Polychrome	1	1.3									1	.2
TOTALS	74	99.7	119	100.0	353	99.7	90	100.0	24	100.0	660	100.0