



FURTHER INVESTIGATIONS AT THE PUERCO SITE,
PETRIFIED FOREST NATIONAL PARK, ARIZONA

Calvin H. Jennings

Chapter I, Location and Environment

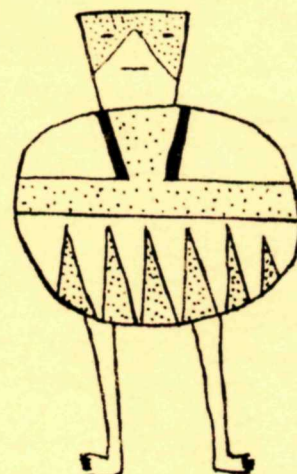
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Colorado State University
Fort Collins, Colorado 80523

Prepared for
Western Archeological Center
Tucson, Arizona 85717

Order No. PX810070338

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ACKNOWLEDGEMENTS

No modern archaeological report can be prepared without the assistance of many people. All of those contributing to the publication of this report cannot be named in this limited space. However, a few deserve special recommendation. First, Albert Schroeder, who is one of the architects of the project and gave me considerable support over the years leading to the final report. Dr. Keith Anderson read and commented on earlier versions. Ms. Sandy Edwards prepared the maps and plates. The Conservation staff of the Department of Anthropology, Museum of Northern Arizona, helped me to resurrect the collections and notes when I visited Flagstaff in 1978. My thanks go to all these people and many others for their help. Any errors or weaknesses of the report remain my responsibility.

Calvin H. Jennings
Fort Collins, Colorado
1980

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FURTHER INVESTIGATIONS AT THE PUERCO SITE,
PETRIFIED FOREST NATIONAL PARK, ARIZONA

CHAPTER I

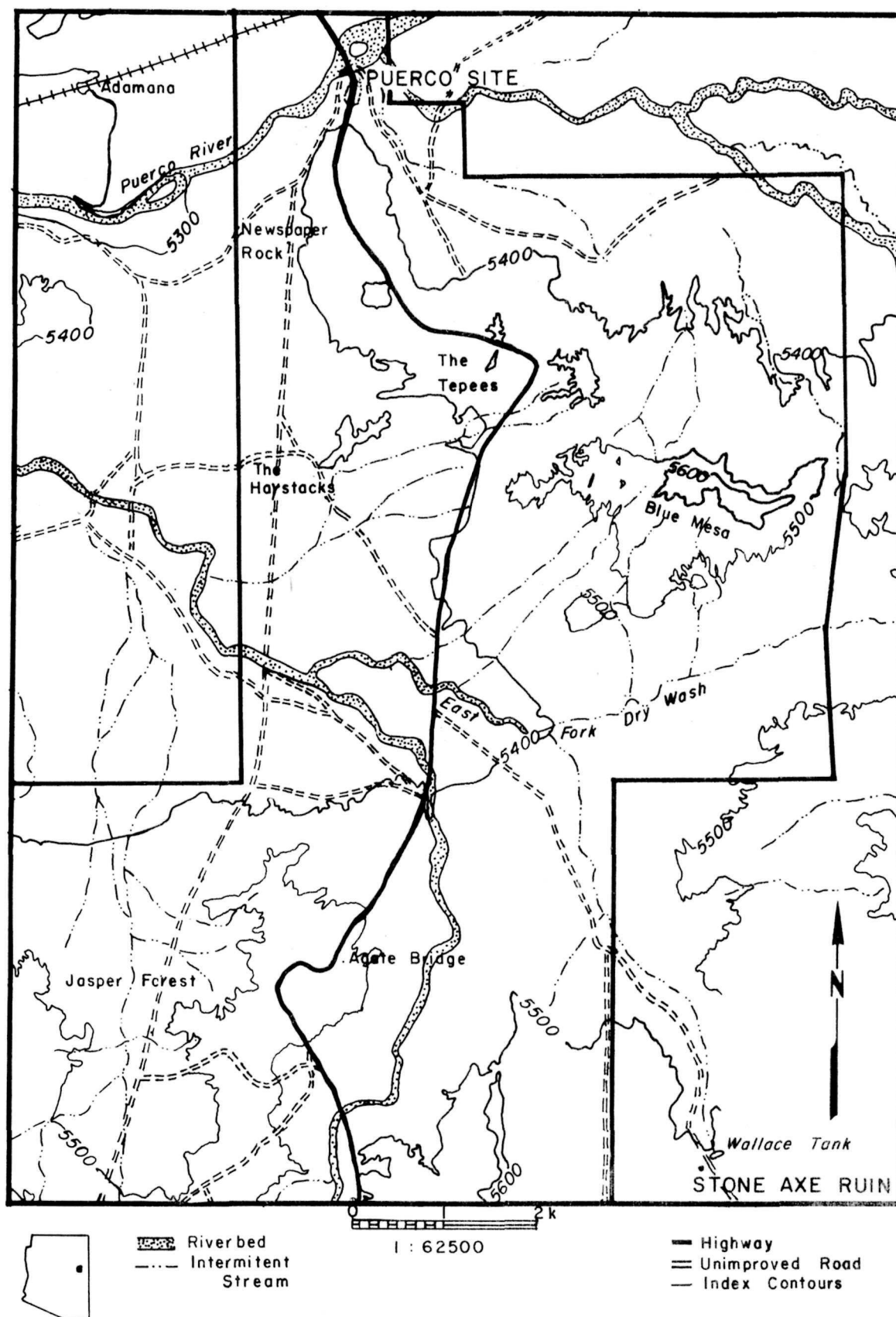
LOCATION AND ENVIRONMENT

Diane L. France

Project Location (Fig. 1)

The Puerco site is located on a terrace (Figures 2 and 3) of the Puerco River of the West in the narrow neck of land which connects the Painted Desert and Petrified Forest sections of Petrified Forest National Park. The site lies about 37 km east-northeast of Holbrook, Arizona, and about 121 km southwest of Gallup, New Mexico. The nearest modern geographic reference point outside the national park is the Adamana station on the Santa Fe Railroad which is about 2.7 km west of the ruin.

This location is in the midst of a number of prehistoric and modern Pueblo Indian communities which have figured importantly in the development of southwestern archaeology and ethnography. The Hopi Mesas lie only about 121 km to the northwest, Canyon de Chelly is about 145 km north of the Puerco site, and Zuni is 97 km to the east. The ancient Hopi villages making up the Homolovi group on the Little Colorado River lie only about 80 km to the west. Other well known sites such as the Four Mile, Pinedale, Chaves Pass, Chevlon, White Mound ruins, and many others, lie within a 120 km radius of the Puerco site.



PETRIFIED FOREST NATIONAL PARK, ARIZ.

Figure 1. Locational Map.



Figure 2. Puerco Site Location. Site is located on the lower terrace in the center of the view between the arrows. View is south-southeast from Puerco River bridge.

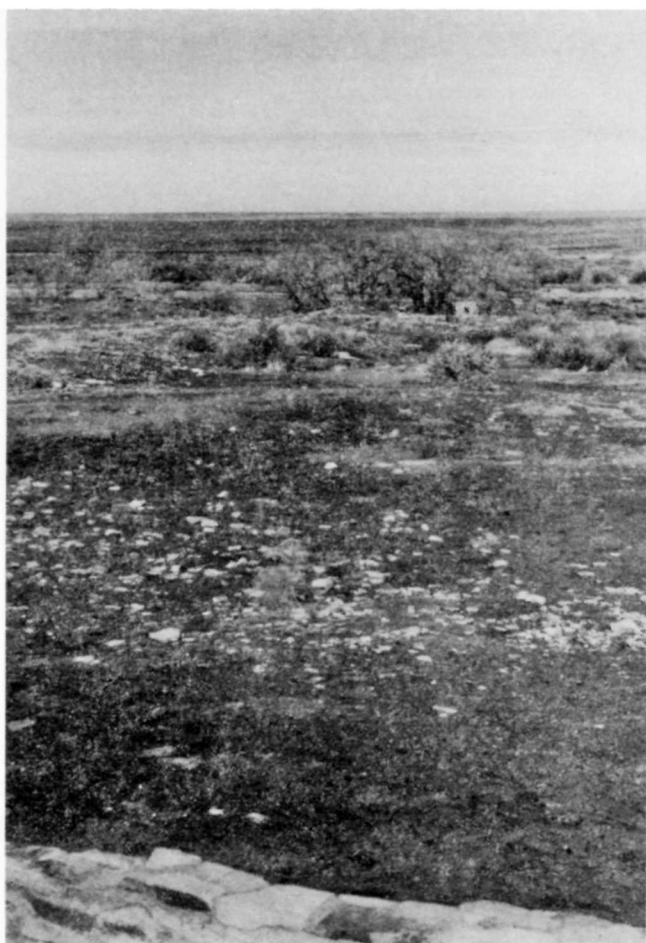


Figure 3. Puerco Site Environment. View faces northwest across plaza towards the Puerco River.

Regional Geology

The Puerco site is located generally within "Navajo Country," defined by Gregory (1917:11) as the Navajo and Hopi Indian Reservations and the area lying principally between the Colorado, San Juan, and the Little Colorado Rivers. The site itself sits at an elevation of 1637 meters on an alluvial terrace carved by the Puerco River, Nine Mile Wash, and Dry Wash, about 10 meters above the active channel of the Puerco River. The location is on a promontory set off from its surroundings by a low sandstone escarpment which reaches 4 to 5 meters in height on the east. To the north the terrain slopes to the river bed and to the south it climbs gently to elevations of 1676 meters.

The Puerco River skirts the southern edge of the Defiance Upwarp (Hunt 1956), and occupies a "flat structural trough included between the Tusayan downwarp and the rising limb of the uplift south of the Santa Fe Railway" (Gregory 1917:125). The Tusayan downwarp is referred to by Gregory (1917:112) as the southern part of a trough across the western part of the Navajo Country formed by the Karparowits and Black Mesa basins and the St. Johns Sag. The St. Johns Sag is approximately 40 km south of the site. The Mogollon Slope is approximately 113 km southwest of the site (Cooley *et al.* 1969).

The lower part of the Petrified Forest Member, the lowest exposed member of the Chinle Formation in the vicinity of the Puerco site, is slate blue and gray white, and has been eroded into buttes near the site and northward in the Chinle Valley and Defiance Plateau (Repenning *et al.* 1969). It is composed mainly of mudstone and contains more tuffaceous siltstone and sandstone near the Puerco River than in other areas in the

Navajo Country (Repenning *et al.* 1969). The whole sequence at the site probably consists of fluvial and lacustrine deposits "laid down on broad flood plains having gentle gradients," and is generally between 60 to 90 m thick (1969:B22). The Puerco River also flows on this part of the Petrified Forest Member.

Resting on the lower part of the Petrified Forest Member, and just under the alluvium, the Sonsela Sandstone Bed of the Petrified Forest Member exists as outcroppings on the south edge of the site. This bed is composed of two conglomeratic sandstone units separated by a siltstone unit, and is more conglomeratic south of the Puerco River than in other areas on the reservation. Here it consists of pebbles, concentrated along bedding planes, of silicified limestone, white chert, and dark jasper with small amounts of quartz and quartzite. "Bedding is irregular and lenticular, and cross-bedding is of the trough type and is composed of small- to medium-scale crossbeds deposited at low and medium angles" (Repenning *et al.* 1969:B22). The two sandstone beds consist of very light gray (N8) and very fine to very coarse quartz grains, and contain abundant quantities of feldspar, mica and argillaceous material. The lower sandstone bed is 8.5 m thick, the upper bed 18.5 m thick and forms the prominent irregular ledges suitable and amply used for petroglyphs at the site and at Newspaper Rock approximately 3.2 km south of the Puerco site.

Directly below the alluvium, the upper part of the Petrified Forest Member has been heavily eroded, and is less than 6 m thick at the site. It is generally more than 15 m thick in other areas in the region and consists of "a series of banded moderate-grayish-red (10R 4/4),

pale-reddish-brown (10R 5/4), and pale-red-purple (5RP 6/2) mudstone, siltstone and sandy siltstone beds" (1969:B23).

Petrified wood is virtually absent in the Petrified Forest Member of the Chinle Formation and, hence, is rare in the immediate vicinity of the site. This potential toolstone is abundant a few miles to the south of the site, however, where the upper members of the Chinle Formation, more noted for the abundance of petrified wood, are exposed (Harshbarger *et al.* 1957). Thus, petrified wood is easily available to the inhabitants of the Puerco River Valley.

Potential Sources of Toolstone

The only potential source of toolstone immediately available on the site is in the chert cobbles and pebbles found on the bedding planes of the lower part of the Petrified Forest Member. However, in areas immediately surrounding the site other sources of toolstone are available, particularly in the upper members of the Chinle Formation and in other beds also rich with petrified wood. A sandstone member, approximately 15 m thick in the central portion of the Chinle Formation contains abundant clastic inclusions of chert, quartzite, jasper, and petrified wood (Childs 1948:360) and, although the bed is not exposed at the site, is a possible source of toolstone where exposed just north and south of the site.

The Shinarump conglomerate, usually included within the Chinle Formation, is exposed just north and south of the site. This bed contains pebbles and cobbles of quartz, quartzite, jasper, chert, and petrified wood (Repenning *et al.* 1969).

Other possible sources of toolstone do occur within reasonable distance of the site, including a source of chert which occurs as nodules,

lenses or layers in the limestones and shales of the Lukachukai Member of the Wingate Sandstone between 16 and 24 km north and northwest of the site (Harshbarger *et al.* 1957).

The lower member of the Bidahochi Formation may have some value as a source of toolstone, as it contains quartzite, quartz and petrified wood, but the primary outcroppings are at least 24 km north of the site (Repenning and Irwin 1954).

Water-bearing Units

The area of the Puerco site is generally characterized by few springs. Wendorf (1953), however, noted small springs near the National Park boundaries, many of which "were close enough to some of the prehistoric pueblos within the Monument that they could have been utilized as a source of water" (1953:10).

Climate

The climate of the region is semiarid. Precipitation in the Holbrook area, approximately 37 km to the west, takes the form of light winter snows, generally about 25.4 cm per season, and summer rains associated with sometimes violent convectional thunder storms (Green and Sellers 1964:223). This general pattern also occurs in the Petrified Forest area. For the period 1931 to 1953 the mean annual precipitation was 225 mm in the Petrified Forest National Park. July, August and September are the rainiest months of the year when the mean monthly precipitation is over 25 mm, while the driest months, May and June, receive means of only 9 mm and 6 mm respectively. Most months average 13 mm or less (Sellers and Hill 1974). The area in general lacks the winter precipitation maximum seen over most of the rest of the state (Green and Sellers 1964:223).

The open terrace location of the site exposes it to wind from all directions. That the wind and accompanying sand-dust storms are critical factors is attested to by the occurrence of approximately 105 km per hour winds (clocked at the south entrance to the Park) on one day during the period of excavations. On several other days the winds in the afternoon rose into the 32 to 64 km per hour range. The wind is generally from the south and southwest, and probably was so in the past, judging from the evidence in eolian-deposited sediments (Cooley *et al.* 1969:A30).

The Petrified Forest is characterized by summer temperatures of about 15.5° C at night, and near 32° C in the afternoons of July and August. The mid-winter temperatures typically range from about -6° C in early morning to about 7° C in the afternoon (Sellers and Hill 1974:370). The mean annual temperature is about 12.6° C (Cooley *et al.* 1969).

During the years between 1931 and 1945, the average length of the growing season in the Petrified Forest National Park was 180 days. The date of the last killing frost in spring averaged May 18, and the first in autumn averaged October 9 (Smith 1956).

Hydrography

The Puerco River is an intermittent stream, running only seasonally and generally then only after storms. The flow rate between 1905 and 1906 and between 1950 and 1960 was estimated to be 13.1 m³/sec and 38.2 x 10⁶ hectoliters/yr (Cooley *et al.* 1969:Plate 2). The proximity of the water table to the surface of the river bed is indicated by the standing pools of water which appear occasionally along the south bank in the area of the site even in the dry season.

Soils

In the Petrified Forest region, two types of soils, eolian and alluvial, exist. As the Chinle Formation, composed in part of argillaceous material, is the major source of the alluvial soils, they are usually clayey, poorly drained and alkaline. More suitable areas for agriculture and natural vegetation occur where thin layers of eolian sand overlies this alluvial material. This thin canopy of sand occurs in most areas of the Park, though at the bases of some escarpments both climbing and falling dunes have accumulated. Most of these dunes are ancient and have been stabilized by vegetation (Wendorf 1953:13).

Vegetation

Because of "high temperatures and high evaporation the greater part of the Plateau has an arid climate during the growing season" (Hunt 1956:6), hence the flora of the region consists of northern desert shrub species. This type of vegetation is grass and shrub-dominated, and is characterized by a relatively low diversity of species of both plants and animals, "many of which are specialized for salt and cold tolerance" (Lowe and Brown 1973:30). Rabbitbrush (*Chrysothamnus* spp.), winterfat (*Eurotia lanata*), horsebrush (*Tetradymia canescens*), and Mormon tea (*Ephedra viridis*) are important shrub species (1973:30). Table 1 lists species noted in the area by different authors, and listed by the Painted Desert Visitor Center of the Petrified Forest National Park.

According to Nichol (1952) snakeweed and rabbitbrush were probably minor species before excessive grazing but are now often the dominant plants. He states also that the soil "is too heavy to permit sufficient water penetration or too shallow to support deeper rooted plants" (p. 205).

TABLE 1

Species Noted in the Area by Various Authors

	Wendorf 1953	Lowe, Brown 1973	Cooley et al. 1969	Nichol 1952	Hough 1903	P.F.N.P. * Verification
Sagebrush (<i>Artemisia nova</i>)		X	**	**	**	
Sagebrush (<i>Artemisia tridentata</i>)		X	**	**	**	X
Rabbitbrush (<i>Chrysothamnus</i> spp.)	X	X		X		X
Saltbrush, shadscale (<i>Atriplex</i> spp.)	X	X		X		X
Poplar, cottonwood (<i>Populus</i> spp.)	X		X		X	X
Greasewood (<i>Sarcobatus vermiculatus</i>)	X	X	X			X
Winterfat (<i>Eurotia lanata</i>)		X		X		X
Mormon tea (<i>Ephedra viridis</i>)	X	X				X
Galleta grass (<i>Hilaria jamesii</i>)	X			X		X
Grama grass (<i>Bouteloua</i> spp.)	X			X		X
Salt grass (<i>Distichlis stricta</i>)	X	X				X
Yucca, soapweed (<i>Yucca</i> spp.)	X			X		X
Coyote willow (<i>Salix exigua</i>)	X		X			X
Blackbrush (<i>Coleogyne ramosissima</i>)		X		X		X
Horsebrush (<i>Tetradymia canescens</i>)		X				X
Squawberry (<i>Rhus trilobata</i>)	X					X
Indian rice grass (<i>Oryzopsis hymenoides</i>)	X					X
Muhly grass (<i>Muhlenbergia</i> spp.)	X					X
Sand dropseed (<i>Sporobolus cryptandrus</i>)	X					X
Prickly pear (<i>Opuntia rhodantha</i>)	X					X
Silver spined cholla (<i>Opuntia whipplei</i>)				X		X
Actinea (<i>Hymenoxys acaulis</i>)	X					X
Sacred datura (<i>Datura meteloides</i>)	X					X
Golden segalily (<i>Calochortus nuttallii</i>)	X					X
Locoweed (<i>Astragalus</i> spp.)	X					X
One seed juniper (<i>Juniperus monosperma</i>)	X		X			X
Pickleweed (<i>Allenrolfea occidentalis</i>)		X				X
Needle grass (<i>Stipa</i> spp.)				X		X
Snakeweed (<i>Gutierrezia</i> spp.)				X		X
Bluestem (<i>Andropogon</i> spp.)				X		X
Tamarisk (<i>Tamarix</i> spp.)			X			X
Pinyon (<i>Pinus edulis</i>)			X			X
Hackberry (<i>Celtis reticulata</i>)			X			
Alkalai - sacaton (<i>Sporobolus airoides</i>)			X			X

*Petrified Forest National Park

**Listed as *Artemisia* spp.

Kearney and Peebles (1951:Plates 32 and 33) cite a rare plant, the Navajo cactus (*Navajoa peeblesiana*) near Holbrook, "the only location where this plant is known to grow...."

Although primarily grassland forage types exist around the Petrified Forest, Pinyon-Juniper areas exist approximately 5.5 km to the northeast of the Puerco site and approximately 7.6 km south and slightly southwest of the site (Humphrey 1955:map 1).

Economically Significant Wild Plants

A more complete list of the economically significant plants of the Hopi is given in Whiting's (1966) *Ethnobotany of the Hopi*, originally issued in 1939, from which most of the following information was taken. Several grasses found in the Park have grains which fall easily from the chaff when ripe and were probably a source of food. These include:

Indian millet, Indian ricegrass: *Oryzopsis hymenoides*
 Alkalai - sacaton; *Sporobolus airoides*
 Dropseed, Spike dropseed; *Sporobolus contractus*

Those plants potentially useful as a source of seasoning include:

Pale wolfberry, Tomatilla; *Lycium pallidum*
 Wild onion; *Allium* spp.
 Cactus fruits; *Cactaceae* spp.
 Fetid Marigold; *Pectis angustifolia*
 Tansy mustard; *Descurainia sophia*, *D. pinnata*
 Wild potato; *Solanum jamesii*

The leaves of the following plants are usually available, particularly in the spring.

Saltbush; *Atriplex* spp.
 Lamb's quarters; *Chenopodium* spp.
 Skeletonplant; *Lygodesmia grandiflora*
 Fetid Marigold; *Pectis angustifolia*
 Tansy mustard *Descurainia sophia*, *D. pinnata*, as listed in Kearney and Peebles, 1951; is listed as *Sophia pinnata* in Whiting, 1966)
 Desert Princesplum; *Stanleya pinnata*
 Jackass Clover; *Wislizenia refracta* variety *melilotoides*

Other plants useful as potential sources of food include:

Beeweed; *Cleome serrulata*
 Wild potato; *Solanum jamesii*
 Pinyon nuts; *Pinus edulis*
 Yucca fruits; *Yucca angustissima*, *Y. baccata*
 (No common name); *Astragalus ceramicus* var. *imperfectus*
 Mariposa lily; *Calochortus aureus*
 Chimaya; *Cymopterus newberryi*
 Indigo - brush; *Parosela terminalis* (as listed by Whiting 1966; is
 listed as *Dalea terminalis* in Kearney and Peebles 1951)
 Cactus fruits; *Opuntia whipplei*
 Cactus joints; *Opuntia* spp.
 Pale wolfberry, Tomatilla; *Lycium pallidum*
 (No common name); *Chamaesaracha coronopus*
 Groundcherry; *Physalis fendleri*
 Blazing star (seeds of); *Mentzelia* spp.

Plants Used Medicinally

Forty-three plant species found in the Petrified Forest National Park are listed by Whiting (1966) as having medicinal uses. There are often many uses listed for an individual plant. For example, the roots of the Globe mallow, *Sphaeralcea* spp., are chewed to aid in the healing of broken bones, diarrhea, and "bowel trouble in babies" (Whiting 1966:34). Also, Tumble ringwing, *Cycloloma atriplicifolium*, was eaten for the treatment of fevers, rheumatism, and headache. Some other common medicinal uses for plants include:

Sacred datura, Jimson weed, *Datura meteloides*, is used particularly by the doctor before making a diagnosis, used rarely as a stimulant, and "to cure a person of his meanness" (p. 37).

Pinyon, *Pinus edulis*; the gum of this plant is used to exclude air from cuts and sores, and sometimes combined with Skunkbush sumac, *Rhus trilobata*, for the treatment of tuberculosis (p. 35).

Actinea, *Hymenoxys acaulis*, var. *arizonica* leaves were brewed to make a drink used as a stimulant and for treatment of severe pains in the hips and back, especially in the pregnant state.

Cliff rose, *Cowania mexicana* var. *stansburiana* was probably used as a wash for wounds, as an emetic, and in relieving stomach-ache.

A tea of Sand sagebrush, *Artemisia filifolia*, was used as a treatment for indigestion if ingested and for boils if applied externally.

A tea of Painted Cup, *Castilleja linariaefolia*, was used to prevent excessive menstrual discharges (p. 35) and to prevent pregnancy.

In these lists of plant species, the most impressive aspect is the number of plants known to the Hopi for use medicinally and for food. Assuming that the individuals living at the Puerco site were related to the Hopi and that these plants existed and were recognized at the time of their occupation, it seems reasonable to assume that these plants may have been useful as a potential supplement to their domesticated plants.

Economically Significant Wild Animals

The following is a incomplete list of the potentially important mammals in the region today, as listed in *The Wildlife of Petrified Forest National Park*, a pamphlet distributed by the Petrified Forest Museum Association. The list includes no reptiles or amphibians, though these are included in the museum pamphlet.

Pronghorn antelope; *Antilocapra americana*
 Mule Deer; *Odocoileus hemionus*
 Bobcat; *Lynx rufus*
 Badger; *Taxidea taxus*
 Gray Fox; *Urocyon cinereoargenteus*
 Kit Fox; *Vulpes macrotis*
 Coyote; *Canis latrans*
 Porcupine; *Erethizon dorsatum*
 Desert cottontail; *Sylvilagus auduboni*
 Black-tailed Jackrabbit; *Lepus californicus*

Two species of skunk, the striped skunk and the spotted skunk, have been noted in the park by the Petrified Forest Museum Association, as well as several species of squirrel, mouse, rat, and other small rodents.

Several species of waterfowl are noted in the park, including a species of Grebe, an unburned humerus of which was noted in the Puerco site by Schroeder (1961:98). Two species of pelican are found in the park today, as well as several species of heron, geese, ducks, gulls, and shorebirds.

Other significant avian species include vultures, hawks, falcons, quail, pigeons, and owls.

CHAPTER II

PROJECT BACKGROUND

Project Purpose

The 1967 effort at the Puerco site was undertaken by the Museum of Northern Arizona with the author in charge of the excavations. The project was sponsored by the Petrified Forest Museum Association. The principal goal of the project was to expand the viewable area and the extent of the site's interpretation. This expansion was intended to provide visitors to the Southwest with their first opportunity to become better acquainted with the Anasazi culture. The Puerco site is the first easily accessible site to be met by visitors traveling from the east on Interstate Highway 40.

Previous excavations (Cosgrove 1934; Schroeder 1961) at the site had been limited to 11 rooms in the southwestern corner of the ruin and a kiva near the western wing. Schroeder (1961:93) followed Cosgrove (1934:8) in estimating the extent of the ruin at 125 rooms and the concentration of the previous work in the southwestern corner raised the possibility of bias in the interpretation as the result of small sample size and an obvious spatial bias in the previous investigations. The project was to offset these potential problems and to increase the amount of information available to the visitor by excavating 15 more surface rooms and another kiva, the depression of which was visible adjacent to the eastern wing. The project would more than double the number of surface rooms visible to the visitor. The kiva was to be backfilled after proper recording.

The effort was undertaken with no other design than to verify the determinations of the previous projects concerning the age and length of occupation of the site by means of typological comparisons among the artifactual material collected during the various excavations. No attempt was made to include support for chronometric analyses aside from tree-ring dating. Nor was support available for palynology or other ancillary studies which would have supported at least a description of the environmental context of the site's occupation.

The analysis was later supported in part by a grant from the Museum of Northern Arizona. The final analyses, literature review, and writing have all been supported by the National Park Service.

Summary Description

The Puerco site consists of a trapezoidal pueblo (Fig. 4) made up of four connected wings which completely enclose a court yard or plaza which averages approximately 54 m north-south and 38 m east-west. The northern exterior wall is 58.5 m long, the eastern exterior wall is 74.8 m long, the southern exterior wall is 45.7 m in length and the west exterior wall is 76.0 m long. The north and south exterior walls are essentially parallel, having True North azimuths from the northeast and southeast corners of 260° and 259° respectively. The azimuth of the east exterior wall from the southeast corner is 349° and it is, then, perpendicular to the northern and southern exterior walls of the ruin. The azimuth of the west exterior wall, as measured from the southwest corner, is 338° giving the ruin its trapezoidal form. The area enclosed by the exterior walls is 3900 m^2 . Of that amount, approximately 3265 m^2 is devoted to the plaza, including kivas and other subsurface features. The two kivas and Room 19 are deep enough to have allowed inclusions of their roofs as part of the useable plaza area.

Including the wall widths, the estimated total sheltered space in surface rooms is about 635 m².

Surface indications at the site in 1967 implied the presence of only 51 more surface rooms beyond the 25 excavated to date. Neither Schroeder nor Cosgrove give any indication of how they arrived at their figure of 125 rooms. Schroeder (1961:Fig. 2) does count as rooms areas adjacent to some of the excavated rooms in the southern wing. He had no indication that these areas are actually enclosed living or storage areas and they have not been included in the estimate of the number of surface rooms in the site.

Only two possible breaks appear in the exterior wall of the site. The most obvious is in the center of the north wall, about 23 m from the northwest corner, as was noted by Hough (1903:317) and succeeding workers at the site. This gate is about 3.8 m wide. The other possible opening in the enclosure is in the west wall 29.2 m north of the southwest corner and had not been noted prior to 1967. This possible western gate is only 2.1 m wide. The narrowness of the feature and the gap in the masonry of both the interior and exterior walls support the probability of the presence of a gate at the location. The gates have the effect of isolating the northern section of the western wing and the western half of the northern wing from the rest of the ruin.

Located within the plaza are three subterranean structures. Two are rectangular kivas, one excavated in 1958 by Vivian (Schroeder 1961) and the other as a part of the project reported here. The third, Room 19, is most certainly a domestic structure and relates to an earlier period of the site's occupation. The feature was located in the process of attempting to locate Kiva 2 during the 1967 excavations. Room 19 is the third kiva referred to by Gumerman and Skinner (1968:196). Schroeder

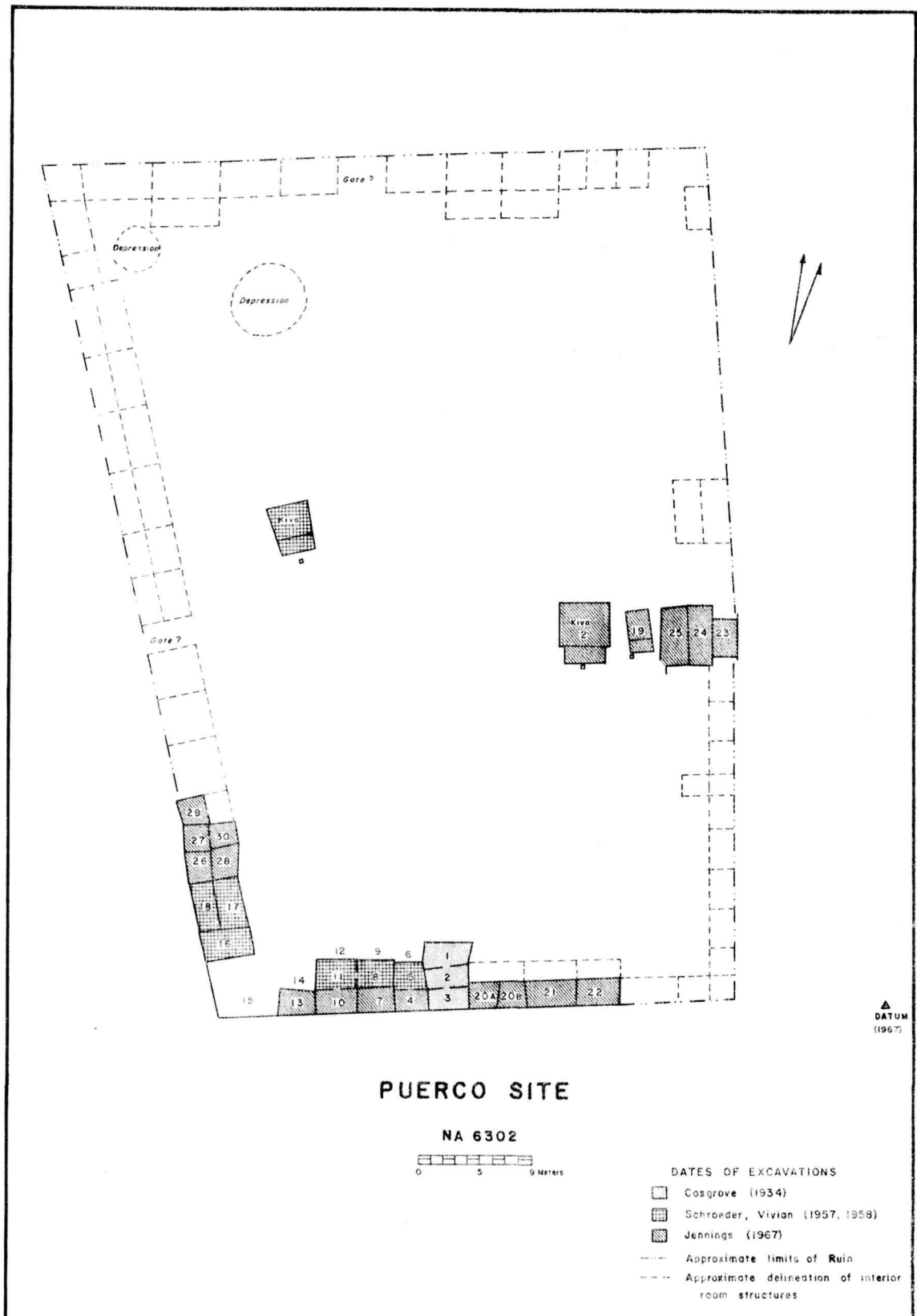


Figure 4. Puerco Site.

(Fig. 2 and p. 98) also reports the presence of masonry features below grade at the southwest corner of the ruin. However, these structures were not further investigated in 1967 due to the presence of an asphalt path and interpretive sign adjacent to Room 15 (Fig. 5). These features cannot be related to either the surface features or the other subterranean structures at this time.

The site lacks an obvious midden, a fact noted by Hough (1903) in his visit to the site. The ruin's location on the rim of the river terrace may have contributed to the absence of a midden by providing a simple and effective means of disposal of trash. It could simply have been thrown over the side of the terrace. The age of the terrace on which the site is located is not fixed, but it is not unreasonable to assume that it may correlate with the Tsegi-Naha erosional epicycle (Hack 1942:

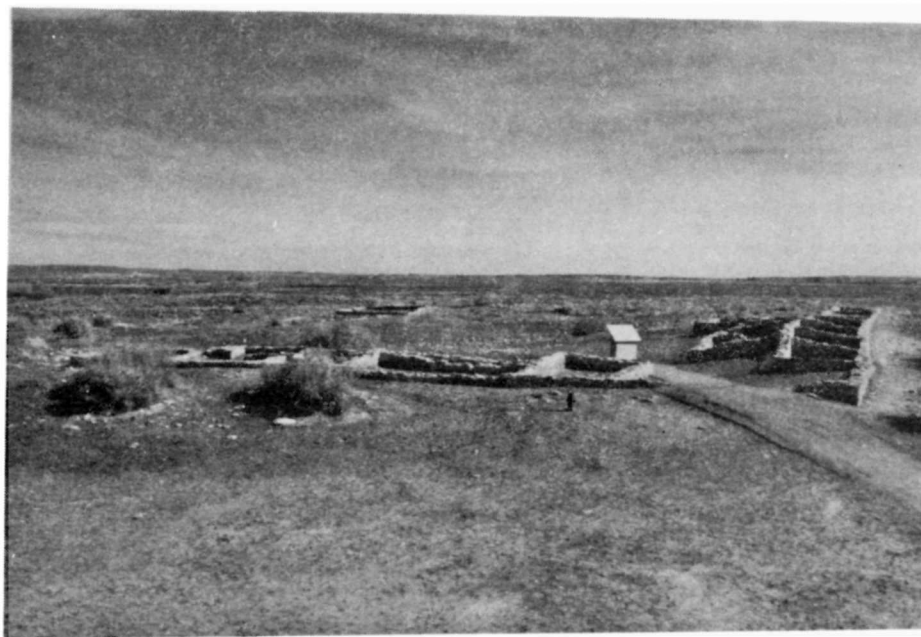


Figure 5. Southwest Corner of Ruin. View faces east down the southern wing. The paved walkway and interpretive exhibit rest over the below grade masonry features located by Vivian in 1958. The photo shows the condition of the rooms following stabilization. Note the rooms excavated in the eastern wing are visible in the center of the field of view.

51-53) of Late Pueblo III and early Pueblo IV times. At that time the Puerco River's main channel may have been both vertically and horizontally close enough to the site to have contributed directly to the loss of any trash thrown over the terrace rim.

Cosgrove (1934:10) tested outside the ruin in four separate trenches three to the east of the pueblo and one near the southwest corner. He located no great depth of cultural material in any of these excavation units. Testing inside the plaza, Cosgrove did locate "one pocket of trash 5'0" x 5'0" x 3'0" deep...." (p. 10). He did not identify this "pocket" as a subterranean feature, however. The results of Cosgrove's testing confirm the lack of a developed trash deposit outside the village.

On the exposed sandstone north of the pueblo is an area with numerous petroglyph panels which were originally noted by Hough (1903: 318). There is no remaining evidence of pictographs, if any ever existed at the site. Neither Schroeder nor Cosgrove attempted to deal with the rock art at the Puerco site though the petroglyphs add materially to the site's interpretive values.

Previous Investigations at the Puerco Site

The first scientific archaeological visit to the Puerco site was made by J. W. Fewkes (1904) in 1897 in the company of, among others, Mr. Walter Hough. Fewkes observes that "Not far from Adamana station ... there is a large ruin on a hill which visitors to the petrified forest have no doubt noticed. This ruin is of considerable size, and promises a rich yield of archaeological materials should reasonable excavations be made outside its walls" (p. 19). Fewkes was not impressed with the other of the antiquities of the area but did tarry long enough at one site to have located "a single

grave in one of the mounds, and excavated from it a few fragments of pottery, but these objects did not occur in sufficient quantities to justify extended work" (p. 19). There is no indication which site Fewkes worked at but it seems unlikely that it was the Puerco site.

In May and June of 1901 Walter Hough (1903) returned to the region and carried out a reconnaissance of the then Petrified Forest Reserve for the National Museum (p. 287). The effort included excavation at Stone Axe Ruin, 12 km south (Fig. 1), and at the Canyon Butte Complex, about 13 km west of the Puerco site. He visited several others in the region including the "Adamana Ruin" which is apparently his term for what is now known as the Puerco site. Hough implies that he did carry out some limited testing at several of the larger sites in the district possibly including the Puerco site (pp. 309-326).

Fewkes' and Hough's primary interests lay outside the Puerco site area with the larger sites along the Little Colorado River near Holbrook and Winslow and in the river's upper reaches at such large sites as the Four Mile Ruin. Consequently, there is little information directly relevant to the Puerco site in the early literature on the region.

C. B. Cosgrove, Jr. (1934), working under the auspices of the Civil Works Administration, and the direction of H. P. Mera (1934), carried out excavations and stabilization at Agate House (in the southern part of the Park) and at the Puerco site. Cosgrove excavated Rooms 1, 2, and 3 (Fig. 4) in the southern wing and a series of trenches, three outside the ruin to the east, one outside at the southwest corner and one, 32 m long, running diagonally from the southeastern corner of the plaza to its center. This last trench was connected to a shorter east-west trending test unit which approached the eastern wing of the ruin and terminated about 5 m

south of Room 19. These trenches are not shown on the site plan (Fig. 4) as they could not accurately be relocated from Cosgrove's data. Cosgrove left no recoverable datum for reference.

Cosgrove (pp. 8-14) did not interpret the results of his work in any way. It is clear, however, that the period of occupation represented by the rooms he excavated and trenches he excavated is late in Pueblo III times. The site had been at least partially burned at or after abandonment judging from the quantity of burned vegetal material in Room 3. Rooms 1 and 2 showed no signs of having been burned. Room 1 had been remodeled at least once and the old hearth in the northwest corner of the room covered by the new floor.

Mera (1934) makes no serious mention of the Puerco site in his discussion of the ceramics collected in the survey of the Park and the excavations.

Wendorf (1953:20-21) worked in the southern portion of the Park at the Flat Top and Twin Buttes sites in the early 1950s for the purpose of expanding understanding of the historical relationships of some of the earlier puebloan ceramic styles. His interest in the later Basketmaker and Pueblo I periods excluded the Puerco site from his work.

In 1957, Albert H. Schroeder (1961) excavated "several rooms ... on the south end of the quadrangle...." and tested Kiva 1 (p. 93) as part of the Mission 66 Program undertaken by the National Park Service. Schroeder's investigations were followed up in 1958 by excavations by Gordon Vivian in Rooms 15, 16, 17 and 18 and Kiva 1, as shown in Figure 4 (Schroeder 1961:93).

Vivian also located, but did not fully explore, two subterranean features adjacent to Room 15. The first of these consisted of a masonry wall extending from the southeastern corner of Room 16 and the other is a circular masonry wall extending as a 3/4 circle whose center seems to lie beneath the southwestern corner of the exterior wall of the pueblo (pp. 95, 98).

Schroeder does not make clear his rationale for identification of some features as rooms and some doubt exists as to why the areas he designated as Rooms 6, 9, 12, 14, and 15 were in fact included in the total room count. Schroeder excavated in the areas identified as Rooms 6, 9, and 12, failing to find floors and noting only a "slight amount of rubble" in the areas (p. 94). Apparently, the inconsistencies in alignment of the north walls of Rooms 5, 8, and 11 (Figure 4) provide the primary support for the numbering of the areas north of these rooms. Such misalignment seems to be common throughout the site except in the case of the exterior wall. It seems likely that those areas designated as Rooms 6, 9, 12, and 14 were not enclosed and did not function as rooms. The same conclusion must also be drawn about Room 15 as well, even though it is at least partially enclosed by the exterior wall and the adjacent Rooms 13 and 16.

We have chosen not to attempt a re-numbering of the rooms, however, on the grounds that Schroeder's report has already been widely circulated and only confusion could result. No further attention will be given these areas, however.

The information recovered by Schroeder and Vivian indicated a uniformity in construction techniques between the southern and western wings. The walls all consist of a single row of horizontal slabs laid up in moderate

amounts of mortar. The walls are all between 25 and 30 cm thick and stand to a maximum of 1.06 m above the floors of the rooms. The fill of the rooms consists of wall rubble, and sand beneath which, in some cases, is fragmentary roofing material. Schroeder (p. 93) noted the presence of a thin layer of wind-deposited sand and clay wash on the floors of several of the rooms. This phenomenon is taken by Schroeder to indicate a short period of abandonment before the rooms collapsed sealing the floors. The 1957 and 1958 excavations also revealed a paucity of cultural material on the floors of most of the rooms. Only Rooms 11 and 17 of the six rooms excavated yielded significant amounts of artifactual material in floor contact (p. 93). Even less material was recovered from the fill above the room floors (pp. 96-97) supporting the idea that the surface construction represents the final period of occupation at the site.

No doorways opened from the rooms either to the plaza or the exterior of the pueblo though several rooms were found to be interconnected by interior doors. Schroeder speculated that entry to the rooms from the outside was made by ladders and hatches (pp. 94-96). The interior doorways carry the implication that the structure was divided into self-contained living areas which included domestic and storage rooms. Schroeder points out the possibility that each of the interconnected room complexes may have been assigned to specific "family units" (p. 97).

Three of the rooms, Rooms 5, 8, and 17, excavated in the 1957-58 work had burned and been left without subsequent cleaning or repair. Two of these were clearly domestic quarters judging from the presence of hearths in them. Schroeder reports no evidence of remodeling of any of the rooms supporting his assumption of a relatively short period of occupation.

Kiva 1, when fully cleared by Vivian, proved to have been previously disturbed by unknown excavators. These earlier excavators apparently destroyed part of the flagstone floor of the kiva, a few slabs of which remained in place in 1958 (p. 98). Part of the structure's fill remained undisturbed and it was possible to determine that the site had seen aboriginal occupation *after* the kiva had been abandoned and filled with trash (p. 98). Schroeder also feels that "the lack of masonry in most of the kiva walls may have been due to the Indians reusing the stones in some other portion of the pueblo" (p. 98).

The yield of ceramic materials indicates that the site was occupied between A.D. 1250 and 1350 (pp. 99-104). Pre-1250 types, such as Holbrook Black-on-white, do occur in the assemblage though only in small proportion to the later types such as Jeddito Black-on-yellow or Homolovi Polychrome (p. 100). No tree-ring dates were obtained from the site to verify the ceramic dating.

The state of our knowledge at the time of the 1967 excavations was, then, that the site definitely had a short term, perhaps less than 100 year long occupation between about A.D. 1250 and 1350. The visible surface rooms and Kiva 1 are most certainly the vestiges of that occupation though Kiva 1 appeared to have been used only during the earlier part of the late Pueblo III to early Pueblo IV occupation.

Indications were also noted of a possibly earlier component in the form of the buried masonry elements in the vicinity of Room 15. Adequate documentation was not available to verify that these features were in fact related to a pre-1250 use of the site. The ceramic evidence for a pre-1250 occupation was also considered to be weak at best. The few sherds of Holbrook Black-on-white and Padre Black-on-white present in

earlier collections do not constitute adequate grounds for assuming the presence of a Pueblo II component, for example.

Also, Schroeder argued that the style of construction, including not only the virtually completely enclosed plaza but the absence of doorways leading either to the plaza or the outside, did not necessarily indicate needs for defense. He feels that the method of construction is as justifiable on environmental grounds as on military (pp. 102-103). The area occasionally experiences winds of gale force and more frequently of less violent but still disturbing force. The plan of the site certainly would have contributed materially to the comfort of the villagers on windy days and the lack of exterior openings would have made the rooms much warmer in winter and cooler in summer days. The plaza would have been inviting on sunny winter days and during the cooler parts of summer days.

The site had apparently been abandoned in a reasonably peaceful manner. Evidence in 1967 indicating that rooms burned during their active use period is limited to Rooms 3, 5, 8 and 17 and those fires were regarded as accidental (Schroeder 1961:93). This contention was further supported by the general paucity of cultural materials on the floors of the rooms implying the occupants had time to remove their belongings as part of the abandonment process. On the basis of the foregoing it was anticipated that we would not find any signs of violence relating to the abandonment as a part of the 1967 excavations. Nor did we expect to encounter any clear evidence of a buried occupational component on the site. These assumptions determined the methods used in the excavations.

CHAPTER III

EXTENT AND METHODS OF THE EXCAVATION

Control

The horizontal control established by Schroeder and Vivian, who simply continued the room numbering system where Cosgrove had stopped, was retained for this project. Cosgrove did not establish a recoverable datum and Schroeder does not reference such a point. However, evidently as a part of the 1957 excavations, a construction grid map was prepared for the site with Cosgrove's three excavated rooms located. None of the rooms excavated by either Schroeder or Vivian are shown but an "excavation" is shown at a location about 3 m southwest of the southwestern corner of Kiva 1. We used Schroeder's map (1961:95) to locate the approximate position of Kiva 1 in Figure 4 of this report. This was necessary as no clear indication of the kiva's true location remained in 1967 as the result of its having been backfilled nine years earlier.

The datum selected for horizontal control in 1967 is a steel rod set in concrete about 13.2 m west of the southeastern corner of the exterior wall. This location is the highest on the site. From this point a plane table map was prepared which is the source of the base map in Figure 4.

No absolute vertical datum was established for the site but the elevations of room corners were taken from the horizontal datum. Vertical control was maintained in each surface room by means of measurement from the highest corner of the room. Vertical control for the subsurface structures was taken from the southern reference point for each of the north-south room cross sections.

The fill of each of the surface rooms was separated into three vertical units defined by their relationship to the room's most recent floor level and the content of the fill. The uppermost excavation level in each room was defined as general fill and extended either to within 10 cm of the room floor or to the bottom of roof fall if such could be defined in the room. The second unit was termed floor fill and consisted of either all of the material between the most recent floor, but not in contact with it, and the bottom of the roof material or from immediately above the floor level to 10 cm above the floor. Finally, floor contact items were separated from the other two sets of material. This division is consistent with the previous work at the ruin and separates materials deposited in the rooms as direct consequences of their occupation from those introduced after their abandonment.

Extent of the Excavations

The primary interest of the Petrified Forest National Park management was the expansion of viewable rooms in the southern and southwestern areas of the village and the recovery of more information on kiva architecture. Consequently, excavation was extended from the rooms already open in the southern and western wings. It was also part of the plan to investigate elements of at least one other wing to verify the assumptions of continuity in construction techniques throughout the ruin. Consequently, three rooms were excavated in the eastern wing. No work was undertaken in the northern wing.

Five more rooms were opened in the western wing and numbered 26-30. In the southern wing seven more rooms were excavated: Rooms 4, 7, 10, and 13 west of Room 3, excavated by Cosgrove and south of Rooms 5, 8,

and 11 excavated by Schroeder, and Rooms 20, 21, and 22 are east of Room 3. Room 20 was found to be subdivided by a low adobe wall and will be treated as two separate rooms, Room 20A on the west and 20B on the east, where possible. The work in the southern wing was intended to carry out two purposes in addition to those stipulated by the National Park Service. The first was to relieve the pressure that the deeper fill of Rooms 4 and 7 was placing on their walls common with the previously excavated rooms. These walls were showing substantial stress and seemed to be approaching collapse. The second reason was to pursue Schroeder's (1961:97-98) speculations concerning the function of the rooms in this portion of the village as the dwelling of one or more family units.

In the eastern wing three rooms were opened, Rooms 23-25 (Figure 6). The proximity of these three rooms to the depression indicating the presumed location of Kiva 2 was the principal consideration leading to their selection for excavation. We felt it desirable to relate the surface structures to the subsurface units as directly as possible in the light of the presence of a possible remodeling or abandonment of the kiva prior to final abandonment of the village. Selecting three rooms very close to the probable kiva site greatly simplified the problems of vertical control and determination of the detailed stratigraphic relationships between the surface and subsurface features.

Aside from the exploratory trench used to define the location of Kiva 2 and Room 19, no test trenches or other units were excavated outside of any of the architectural features. All the trenches along the exterior walls of the pueblo were dug as a part of the stabilization



Figure 6. Rooms 23, 24, 25. Scene shows the locations of Kiva 2 and Room 19, marked by masonry outlines at left-center and center of view respectively. The three surface rooms are in the right-center of the view which faces northwest. Note the low mound created by the collapsed rooms of the eastern wing in the foreground.

effort which followed our excavations. Those trenches were made only to the limit necessary to expose the wall and were not carried to any great depths.

Kiva 2 and Room 19, located immediately adjacent to the eastern wing were included in the excavation plan for the reasons noted above. Room 19 was excavated because the depression marking it was first identified as Kiva 2. As the excavation progressed it became obvious that the structure was not, in fact, comparable in size to Kiva 1. The exploratory trench had also revealed the presence of another subterranean structure which was ultimately identified as Kiva 2. Consequently, two subsurface features were excavated, one of which demonstrates the presence of a different architectural element at the site than that represented by the surface rooms and Kiva 2.

In all a total of 122.9 m² of domestic, storage, and ceremonial floor space was excavated as part of the project. 92.8 m² of that total was in the surface rooms, 22.1 m² in Kiva 2, and 8.0 m² in Room 19.

Excavation Methods

In the surface rooms hand excavation was used exclusively. The walls in one corner were followed downwards to the floor so that the stratigraphic details of the room's fill could be determined before beginning full excavation of the room. Once the three major fill divisions were located the excavations proceeded by removing each stratum with shovels. The sherds and other artifacts were placed in a box left at each room. When the stratum was completed the materials were placed in appropriately labeled bags and the next unit was started. Artifactual material was left in place on the floors of the rooms until they could be photographed and placed on the room's floor plan. None in any level of the room fill was screened.

Plans were drawn of each room locating all floor features, wall features, and floor contact artifacts. Room sections were drawn only in those cases where stratigraphic information which deviated from the pattern outlined above was present. Floor plans were not prepared for the rooms excavated prior to this project as none of their floor feature locations were visible.

The subterranean structures were first defined by means of hand trenching. When the limits of the features were clear the fill was then removed from the upper portions by a combination of backhoe and hand excavation. The general fill was excavated to within 50 cm of the floors

of each of the rooms in this manner. The final 50 cm of the general fill and the floor fill of the kiva and Room 19 were then removed entirely by hand excavation. Objects in floor contact were treated in the same manner as with the surface rooms. Plans and cross sections were prepared for each of the features.

All features were recorded on the standardized forms employed by the Museum of Northern Arizona. In addition, miscellaneous observations were recorded in a journal kept by the senior author. The excavated rooms were mapped using standard plane table techniques. All of the maps, forms and notes are on file at the Museum of Northern Arizona.

The excavations at the Puerco site spanned the period from March 27 through April 7, 1967, with a labor expenditure of 84 man-days of crew and 11 man-days of supervisory effort.

CHAPTER IV

PUERCO SITE ARCHITECTURE

Introduction

Our initial approach to the excavations was heavily conditioned by the results of previous work at the site. We expected, and did find, evidence that the structure represents only a single phase of construction. The hypothesized short term of occupation implies an even shorter construction period, at least for the exterior wall of the building.

As the following discussions of the architectural features and their associated artifacts indicates, the assumption of a single component of occupation is fallacious. However, in so far as the surface rooms are concerned, there is still no evidence that the building of the major portion of the village took place over a long period of time or that it represents a widely spaced series of building phases. To test this we used the following procedure. First, the masonry in each corner of each room was examined to determine whether or not the walls forming the corners were structurally integrated or simply abutted. Integration of the walls was deemed present if the courses of one wall were overlapped by the courses of its adjoining wall at the room corner. This "feathered" condition of the masonry blocks at the room corners can only be taken to mean that the two walls were laid up at the same time to gain the advantage of greater structural strength by interdigitating the courses. Walls so joined at the room corners must, therefore, be regarded as contemporaneous with one another and part of the same general building plan.

Abutment of the walls at a corner was defined as a total absence of overlap between any of the courses of the walls and, therefore, structural independence. However small the temporal separation, walls with this sort of association at room corners cannot be regarded as contemporaries and, therefore, not necessarily parts of the same construction phases or building plans. Such walls may have been added as a remodeling of the related rooms.

To relate these wall junction classes to building phases at the Puerco site it was assumed that the exterior wall and its integrated extensions represent the primary plan of the village. This assumption is based on the fact that the southwestern corner of the exterior wall is integrated and most of the room walls are integrated with the exterior wall or with integrated extensions of the exterior wall. These walls are called primary walls in the following discussion. Walls which have at least one abutment with a primary wall are called secondary walls because they potentially represent secondary modifications of the primary building plan. Walls which have at least one abutment with secondary walls and no contact with primary walls are called tertiary walls and potentially represent even further modification of the primary village plan following construction of the secondary walls. No tertiary walls were located in the excavated rooms.

In addition to the foregoing analysis, the unexcavated portion of each wing was examined in detail for evidence of walls and their alignments. The dashed lines in Figure 4 indicate the results of that study. The enclosed areas represent definite rooms. The fact that some of these rooms may have been further subdivided as in Room 20 or that the indications of room division may have been obscured by wall collapse and

subsequent disturbance cannot be accounted for. What we have produced in Figure 4 is the basis for a minimal surface room count.

Using the classification of wall junctions and the room count data we can generally characterize each of the wings before initiating the detailed descriptions of each room. This general discussion of the wings is intended to place the subsequent room descriptions and discussions of artifactual material in clearer reference to the nature of the site.

Beginning with the northern wing we have the segment of the village with the smallest number of probable rooms, which in turn are divided by the gate in the northern exterior wall. The wing has only 14 rooms, including the one in the northwest corner. Eight are east of the gate and six to the west. A distinctive feature of the wing, in addition to the presence of the gate, is the fact that there are only three rooms in the second tier of rooms inward from the exterior wall. This is contrary to the practice, evident in the western and southern wings, of stacking rooms at least two deep along most, if not all, of the exterior wall. The rooms of the northern wing appear for the most part to be larger than those of the other wings. This observation is not highly reliable, however, as the estimates of the wall locations are based solely on surface indications. Finally, the northern wing wall is some 9.0 m or 20 percent longer than the southern wall, excluding the portion of the northern wall given over to the gateway. However, the northern wing accounts for only 18 percent of the estimated 76 rooms in the pueblo. For purposes of comparison with the other wings, it has a ratio of 3.9 m of exterior wall length per probable room in the wing.

The eastern wing has the next smallest number of rooms, only 17 if the room in the southeastern corner is included. The length-room ratio is 4.4m/room, the highest of the four wings. The wing has 22 percent of the probable surface rooms in the village. The distribution of rooms in the wing is anomalous when compared with the other wings. North of Rooms 23, 24, and 25, there are only clear indications of the presence of three more rooms. There may be a room adjacent to Room 23 on the north but no clear evidence of the presence of walls is visible on the surface. In addition, the use of tiers of rooms adjacent to rooms which have the exterior wall as part of the room enclosure occurs at only three points in the eastern wing.

Excavation of three rooms in the wing revealed that at least Rooms 23, 24, and 25 are not fully enclosed by primary walls. Evaluation of the construction sequence for these three rooms is not possible given the lack of information about adjoining rooms. It is certain, however, that Room 23 was enclosed after the construction of the exterior wall had proceeded past the room. Rooms 24 and 25 may possibly have been constructed with at least two primary walls but only excavation of the adjacent rooms to the south can demonstrate the construction sequence.

No reason can be presented at this time concerning the paucity of rooms north of the Room 23-25 complex. It seems possible that the population of the village was not large enough to have required the additional shelter which could have been built along the northern half of the eastern exterior wall. Given the possibility that the Room 23-25 complex is not part of the primary construction phase, it may be that rooms were added along the eastern exterior wall as required by growth in the village population. Excavation in the southeastern

corner will be necessary to test this speculation. In this regard it should be noted that immediately north of Room 23 the eastern exterior wall changes its azimuth slightly. This discrepancy was noted by Cosgrove (1934) as well. Considering all of the possibilities it seems most likely that this section of the eastern exterior wall was added to the village after the construction of the more southerly parts of the wing.

The southern wing has the next largest number of rooms, not including the room in the southeast corner. Nineteen rooms are located in the wing if Rooms 20A and 20B are treated separately. Following this convention the wing has a length/room ratio of 2.4 m/room and accounts for 25 percent of the total probable surface room inventory. The very low length/room ratio is the result of the construction of a second tier of rooms along a substantial portion of the wing's length and adding at least a third room at one point in the form of Room 1. This is the shortest wing in the pueblo.

Of substantial interest is the fact that all but Rooms 7, 20A, and 20B are fully enclosed by primary walls. Rooms 7 and 10 are separated by a masonry secondary wall and Rooms 20A and 20B by a low puddled adobe divider also considered secondary. The southern wing was probably completely built during the initial construction effort at the village.

The western wing, with 26 excavated and probable rooms which account for 34 percent of the total room count, has a length-room ratio of 2.8 m/room. Twelve rooms are south of the gateway and 14 to the north. The lower ratio is again the result of the extensive use of double tiers of rooms along a substantial portion of the wing. The ratio estimate excludes the space included in the possible gateway. The rooms in the western wing seem to be the most variable in size in the pueblo.

As with the southern wing, all but two of the excavated rooms are fully enclosed by primary walls. Rooms 27 and 29 are separated from one another by a secondary masonry wall as is Room 29 and its unexcavated neighbor to the north.

It is worthy of note that the large and nearly perfect square rooms between Room 29 and the gateway have no indication of internal division. It may be, of course, that the rooms are divided by adobe partitions as exist between Rooms 20A and 20B. However, it is certain that these three rooms represent a variation from the pattern of room construction in the rest of the village. Consequently, these rooms may represent a different activity than seen in the excavated rooms.

It is obvious that, like the southern wing, at least the portion of the western wing south of the western gateway was included in the primary design of the village. In addition, given the consistency in alignment of the western exterior wall from south of the gateway to north of the gap, it is likely that the northern section of the wing was built at the same time as the southern section.

In summary of this overview of the construction of the pueblo, we have the picture of the southern and western wings being built as the part of the same major building effort. The northern wing may have also been included in this effort as was the southern portion of the eastern wing. The wall connecting the eastern wing to the northern wing may have been built at a later time but no data exist at this time to either support or refute the speculation.

The purpose for adopting the overall construction strategy seems most likely related to Schroeder's (1961:102-103) speculation that the village plan was a response to wind conditions at the time of the

occupation. The prevailing winds are from the southwest and construction of an "L" or "U" shaped pueblo with the open area to the north or east would certainly have provided the occupants with substantial shelter from the sometimes violent southwesterly winds which rake the Puerco River valley. This interpretation does not conflict with the strong possibility that there are few if any exterior breaks in the room walls. Hatch entry to the rooms would have greatly reduced the problems related to the wind such as dirt and sand deposits and drafts. The post-occupational floor deposits indicate that there was relatively little transport of aeolian materials prior to the collapse of the roofs. The primary issue is not the protection of doorways, however, but the development of an effective windbreak for the plaza in which the bulk of the village's daily activity surely took place. The single story design of the pueblo would certainly have produced a substantial turbulence-free zone in the area enclosed by the western and southern wings. Easterly winds are less common in the area and the eastern wing would not have constituted as important a part of the structure with regard to wind shelter.

The construction of a substantial part of the village as in a single and apparently highly coordinated effort is undeniable. Of the 22 excavated rooms in the western and southern wings only four are not fully enclosed by primary walls. These four have at least two primary walls. The construction of Rooms 23-25 cannot be tied to the western and southern wings. Rooms 23-25 and those to the south of them in the eastern wing may have been built in a piecemeal manner perhaps in response to increasing population. The number and spacing of rooms in the eastern, and northern wing as well, can be interpreted as creation of rooms against the exterior walls though not enough data are presently available to substantiate such a conclusion.

Surface Room Descriptions

Introduction

In the following descriptions of the rooms at the Puerco site each room has been treated separately and as completely as can be done within the limitations of space. The only rooms described here are those excavated in 1967. This decision was made on the grounds that the best that could be done for rooms 1-3, 5, 8, 11 and 16-18 is the reiteration of material presented elsewhere.

The measurements made for each room during the excavations were limited to wall thicknesses, maximum and minimum heights of standing walls above the room floors, and maximum floor dimensions. Floor features were also measured. The areas of the excavated rooms were determined using a compensating polar planimeter and the floor maps of each room made as part of the excavations. The floor areas of the previously excavated rooms were measured in the same way using the unreduced version of the base map in Schroeder's report (1961:Fig. 2). This technique was employed as the floors of all of the rooms are irregular four-sided polygons making estimation of the area using any of the regular figure formulae impossible. The area estimates are of total floor area and include features but do not include wall thicknesses as do the estimates of the total area in excavated and probable rooms given earlier in this report. As a result, the sum of the areas of the rooms do not necessarily equal the product of the room's dimensions. Finally, the wall heights reported here were measured before stabilization and do not necessarily represent the present conditions at the site.

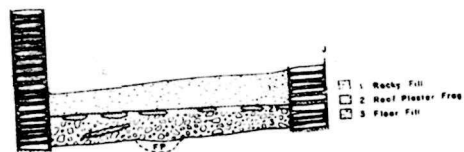
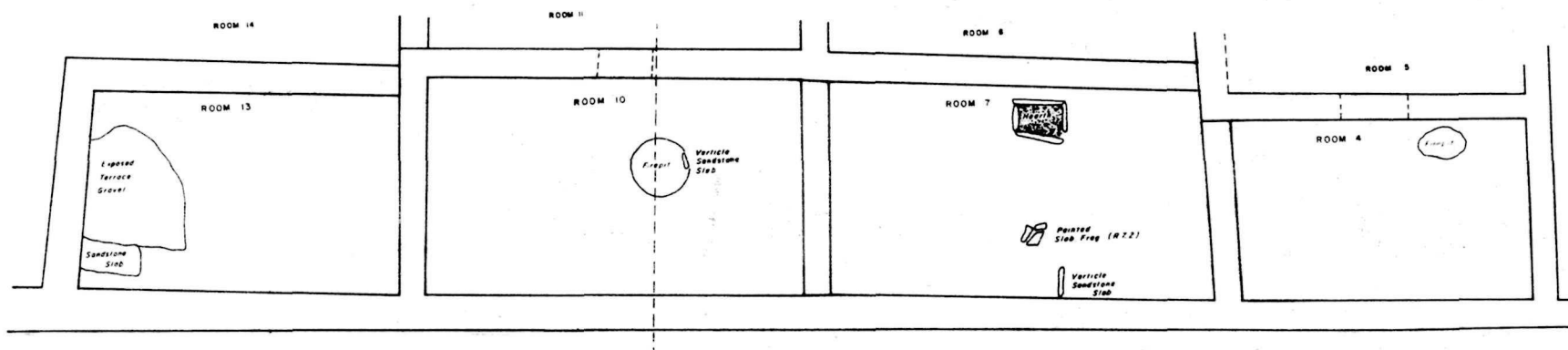
The order of progression is in numerical order. This was done out of no special respect for the integrity of numerical sequences but rather to make the recovery of information about specific rooms a simpler task for the user of the report. Using the numerical sequence also has the effect of keeping the rooms of a given wing together in the report.

Room 4 (Fig. 7)

Room 4 is located against the exterior wall in the southern wing and is west of Room 3 (Cosgrove 1934) and south of Room 5 (Schroeder 1961). The room's dimensions are 2.70 m east-west and 1.66 m north-south with a floor area of 4.6 m^2 . The fill of the room was a homogeneous mixture of sand and wall rubble covering the 60 cm span from the present surface to the floor. No roofing material was noted in the excavation nor was there a layer of aeolian deposit on the floor as occurred in most other rooms.

The walls vary in height above the floor from 52 cm to 88 cm. They range in thickness from 20 cm to 25 cm. The masonry is made up of thin sandstone slabs with a number of irregular sandstone cobbles interspersed. Only a moderate amount of mortar was used in the construction of the walls. Indications near the floor point to the walls having been plastered. One doorway is indicated in the form of a polished slab in the wall common with Room 5. The sill is 58 cm above the floor of Room 4 and is 33 cm wide.

The floor of the room consists of puddled clay resting on the terrace gravels. The clay was introduced to not only cover the gravels but to also level the otherwise slightly sloping floor. The floor was then



PUERCO SITE

Southwest Wing



0 50 cm

Slab Lined Hearth

Possible Doorway

(Rxx) Indicates Artifact Catalogue Number

Figure 7. Puerco Site, South Wing, West Section.

evidently plastered as indicated by spots of plaster still remaining at the curved floor-wall juncture.

The non-ceramic artifactual material recovered from the room was found in the fill. These items consist of a polished stone pendant (Fig. 32, e), a bone awl (Fig. 35, d), and a type II-A-1 mano fragment. No whole or restorable vessels were recovered from Room 4. However, three worked sherds, two of Walnut Black-on-white and one of plain gray were recovered from the fill of the room. The remaining 271 unmodified sherds, also all recovered from the fill, include a substantial number of black-on-white types dating from prior to A.D. 1200.

Room 7 (Figs. 7 and 8)

Room 7, located immediately to the west of Room 4 and south of Room 8 (Schroeder 1961), is one of the exterior tier of rooms. The room's dimensions are 3.42 m east-west by 1.95 m north-south and it has a floor area of 6.6 m².

The fill of Room 7 extended from 65 cm to 10 cm above the floor and consisted of wall rubble from the post-occupational wall collapse and sand blown into the room after its abandonment. The quantity of large stones was moderately high in this unit. The floor fill unit in Room 7 included substantially fewer rocks than the fill level and contained a sizeable amount of pottery. Resting on the most recent floor, and averaging about three cm in thickness, was a layer of fine sand, evidently of aeolian origin, deposited in the room before the collapse of the walls and introduction of the trash.

The walls of the room ranged between 63 cm and 106 cm above the level of the most recent occupational surface. Wall thickness varies

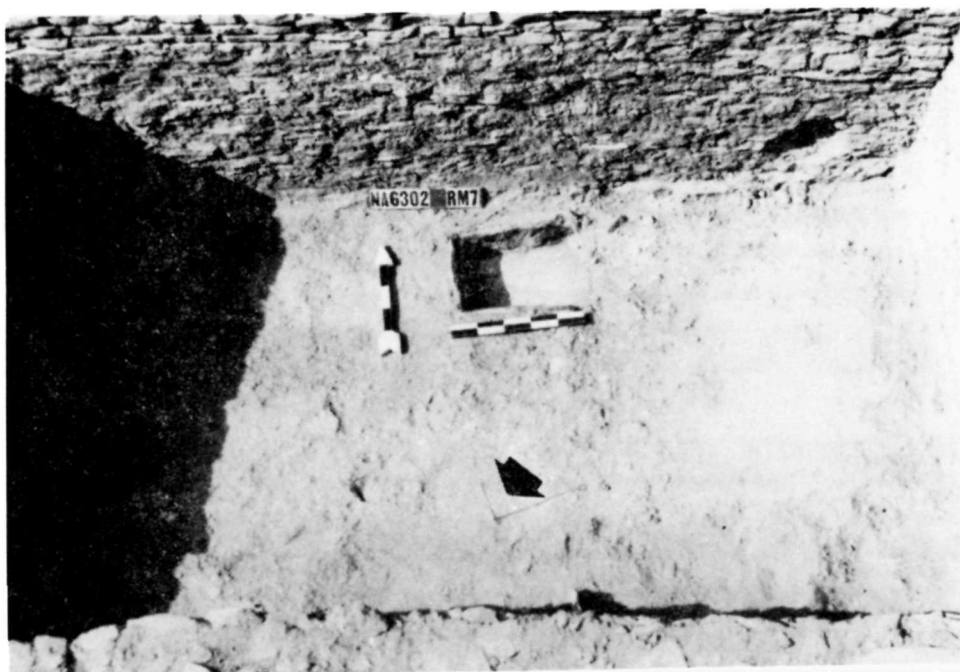


Figure 8. Room 7. Scene shows condition of the room following clearing of latest floor. Black arrow and chaining pin mark the center of the area in which the painted slab fragments were located.

between 25 cm and 27 cm. The method of construction included the use of relatively small sandstone slabs laid up in a moderate amount of mortar. The use of spalls to shim the blocks or fill out the mortared joints between the slabs is infrequent. The walls are set on the terrace gravels and extend only to a depth of one course below the latest floor level for the exterior wall. The interior walls end at the level of the earlier floor. No features or doorways are located in the walls of Room 7 and no plaster remained on the walls.

The earliest floor of the room was made of puddled clay which follows the slope of the underlying pre-occupational gravels. This gives the floor a dip from the northeast to the southwest. The room had burned and a second floor was laid down over the first. The later floor rests on a very thin bed of charred material. The second or later floor consists of a thin layer of clay which also follows the slope of the underlying deposits.

In use at the time of both occupations was a rectangular slab-lined hearth located on the north side of the room, 12 cm south of the north wall and slightly east of center. The hearth measures 50 cm by 36 cm and reaches an average depth of four cm below the most recent floor level. The joints between the slabs lining the feature had been completely closed with mortar. The hearth contained no ash or charcoal at the time of excavation.

A sandstone slab, set on edge in the floor, extends 29 cm into the room from the southern wall. No function could be determined for this feature.

The fill of the room yielded a type II-A-2 mano fragment and a single bifacially polished metate fragment. The floor fill yielded a single discoidal II-A-1 mano fragment which had also been employed as a hammerstone. In addition, the fill level produced 315 sherds representing a wide variety of types indicating that the final function of the room before its collapse was as a depository for trash. A substantial number of these sherds represent black-on-white types which date from before A.D. 1200.

Resting on the latest floor of Room 7 was a sherd of St. Joseph Black-on-white which has been ground to a circular form but lacked a center perforation. Also on the most recent floor were the fragments of a part of a thin sandstone slab (Fig. 30) which had been decorated with red and yellow zigzag lines and black stepped elements. The slab is similar in decoration to one recovered from the Pinedale Ruin (Haury 1931:56-59). No whole or restorable vessels were found in association with the latest floor of Room 7. The sherds in contact with the upper floor and in the hearth numbered only 29 specimens but the decorated sherds were again dominated by types dating earlier than the 13th century A.D.

Room 10 (Fig. 7)

Room 10 is in the exterior tier of rooms in the southern wing. The room is immediately west of Room 7 and south of Room 11 (Schroeder 1961) and is connected to the latter by a doorway. Room 10 measures 3.45 m east-west by 2.00 m north-south and encompasses a floor area of about 6.8 m².

The debris filling Room 10 (Fig. 7) was separated into three distinct segments. The uppermost unit consisted of post-roof collapse fill which included building stone, blow sand, and a few artifacts and macro-plant remains. This unit lay between 51 and 20 cm above the floor.

The upper fill is separated from the floor fill by a layer of plaster fragments, adobe fragments with impressions of poles and sticks, and charcoal. The layer averages about 4 cm in thickness.

The floor fill of Room 10 consisted of a very fine-grained sand matrix which encased a few pieces of fallen masonry and, in the eastern half of the room, burned corn cobs. Trash may have been thrown into the room following its abandonment but prior to the collapse of the roof.

The remaining portions of the walls of Room 10 vary in height above the floor from 50 cm to 102 cm and in thickness from 23 cm to 30 cm. No plaster remained on the walls. A single doorway connects the room with Room 11 through the north wall. The sill is 58 cm wide and 68 cm above the floor at the present. There is no evidence of the presence of a step on either side of the doorway.

The floor of the room is constructed of puddled clay and is 42 cm below the present ground surface at the southern wall of the room. A single basin shaped fire pit, which may have once been slab lined, is located near the center of the room. The fire pit is oval with a minimum diameter of 47 cm and a maximum of 55 cm. The pit reaches a depth of 12 cm at its center. No earlier occupation levels could be detected below the floor.

The room fill produced a single bone awl (Fig. 35, b). A total of 62 sherds were recovered from the floor fill only four of which are decorated and all of post-1300 types. No sherds, whole or restorable vessels, or other artifacts were found on the floor of the room. All useful items were probably removed from the room at the time of its abandonment.

Room 13 (Fig. 7)

Located at the western extreme of the block of fully enclosed rooms that make up the southern wing of the Pueblo, Room 13 shares a wall only with Room 10. The exterior wall of the structure forms the south wall of Room 13. Rooms 14 and 15, as numbered by Schroeder (1961), lie to the north and west respectively but neither is a true enclosed living or storage area.

Room 13 measures 2.93 m east-west by 1.80 m north-south and has a floor area of about 5.1 m².

The fill of the room was the ubiquitous wall rubble and aeolian sand deposit and ranges from 50 to 54 cm in thickness. The lower 4 cm of the fill consisted of a dense layer of charcoal, the remains of what appeared to be small shrubs which were evidently packed in the room. The charcoal included no large sections of tree limbs or trunks that would be associated with roofing material. This lower charcoal level was designated as the room's floor fill.

The walls of the room range from 52 cm to 101 cm in height above the floor. They vary in thickness from 23 cm to 39 cm. The style of construction does not deviate from that described for the other rooms in the wing. No doorways or other wall features were found in the room. No plaster remained on the walls.

The floor of the room was made up of a thin layer of clay. The flooring is absent from a large irregularly shaped area in the western part of the room exposing the underlying alluvium. In the eastern portion of the room the remaining floor covering had been baked hard and oxidized when the room burned. No features are present on the floor of Room 13.

Nothing but 16 sherds was recovered from the fill of Room 13. The floor fill was slightly more productive in that a polished circular stone and a sandstone disc, both of uncertain function, were found at that level. The floor fill had 32 sherds but repeated the distribution of decorated sherds in the fill where Jeddito Black-on-yellow was dominant. The floor contact material includes a single partially restorable Awatovi Black-on-yellow bowl and 35 sherds from other vessels. Homolovi Polychrome dominates the decorated sherds found on the floor of Room 13.

Room 20 (Fig. 9)

Room 20 is treated as a single unit with regard to the fill and construction of the walls. It is obvious that the room filled as a single unit after the adobe room divider was covered by the floor fill. Also, the room was built as a single masonry unit. The adobe divider was clearly added as an afterthought. The descriptions of Room 20A and 20B, which follow this discussion, are limited to the floors of those rooms. The wall construction detail given in the Room 20 discussion is applicable to both Room 20A and 20B.

Room 20 lies to the east of Room 3 (Cosgrove 1934) and south of an un-numbered room along the exterior wall of the southern wing. The room measures 4.84 m east-west by 1.83 m north-south and has a total area of about 9.3 m².

The fill of the room included an upper level, between 65 and 35 cm above the floor, which contained abundant rocks fallen from the upper portions of the walls and sandy soil deposited by the wind. The lower portion of the fill, which lay between 35 and 10 cm above the room floor, was made up of brown fine-grained material which had abundant charcoal and roofing material inclusions. Below the roofing debris was the floor fill which was made up of wind deposited sand and charcoal. The floor fill was separated into two discrete horizontal units by the puddled adobe wall which divides the room into two nearly equally sized portions. The floors on both sides of the divider wall were covered with carbonized twigs but no charcoal was noted above the floor contact level in the floor fill material indicating that the room experienced a minor fire and then stood empty for some time before the roof collapsed sealing the floor fill.

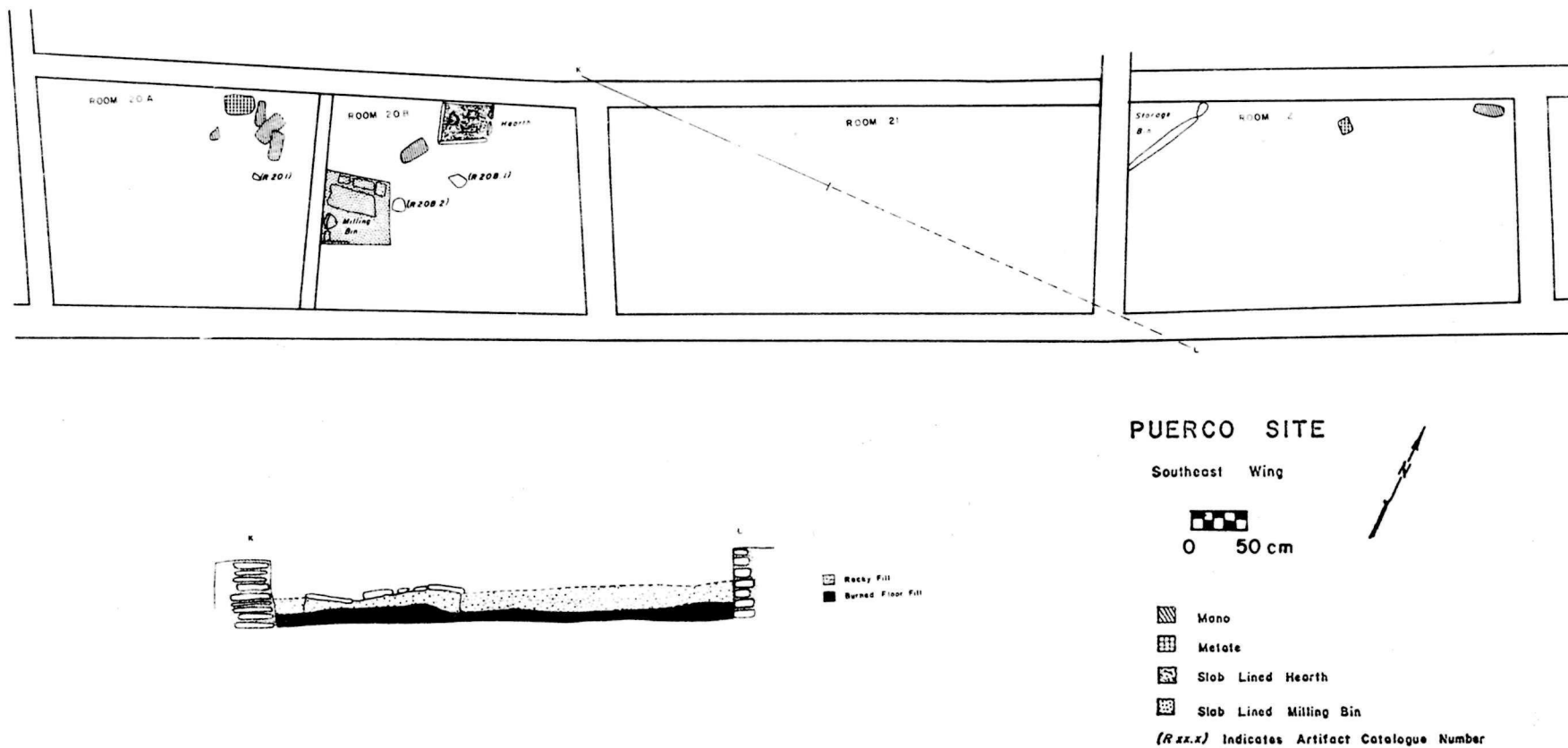


Figure 9. Puerco Site, South Wing East Section.

The masonry walls enclosing Room 20 stand between 36 and 65 cm above the floor. They vary from 20 to 33 cm in thickness and are built of small, thin sandstone slabs with very few spalls in the moderate amounts of mortar used in laying up the slabs. No doorways or other features were noted in any of the walls.

The adobe divider stands between 10 and 18 cm above the floor and is 13 cm thick. There is no clear evidence to indicate the actual height of the wall at the time of the room's occupation. Some tapering of the wall is evident indicating that it may not have stood to full room height. This supposition is supported by the wall's reduced thickness. The adobe wall was certainly not a bearing wall and may not have stood higher than a meter. There was no indication that the divider had an opening to permit movement of people between the two parts of Room 20.

The walls of Room 20 had been covered with a base coat of red clay. The base was then plastered over in white. Only enough plaster remained along the bottom courses of the walls to determine the nature of the wall covering. If the walls were painted by the builders, no indication remained at the time of the excavation.

The fill of Room 20 yielded 16 sherds, the decorated types being dominated by representatives of the locally made Winslow Orange Ware. A type I-A-1 mano, a type I-C mano, and a fragment of the neck of a slightly purpled medicine or condiment bottle were also recovered from the fill. The bottle fragment is too fragmentary to permit determination of its date or place of manufacture.

Room 20A (Figs. 9, 10)

Room 20A is the western half of Room 20 and measures 2.46 m east-west by 1.96 m north-south and has a floor area of approximately 4.8 m².

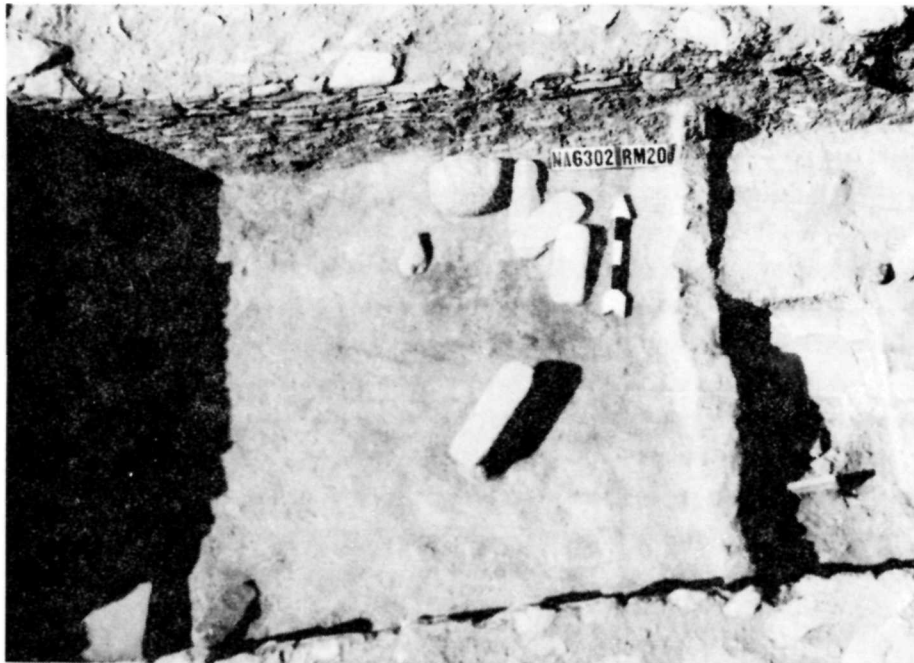


Figure 10. Room 20A. A near vertical view of the room after completion of the excavation. Note the adobe wall separating the room from Room 20B which lies to the right of the wall.

No floor or wall features are located in Room 20A indicating that it may have had a function as a storage area rather than as an active work or living space.

The artifactual material recovered from the floor of Room 20A includes a large, well-made biface which most likely served as a knife (Fig. 32, d). Also found on the floor of the room were four complete manos and one fragmentary specimen representing types I-A-1, I-A-2, I-B-1, II-A-1 and II-B-1. A unifacial shallow basin metate fragment was also found on the floor of the room. No sherds or other ceramic material were found on the floor of Room 20A.

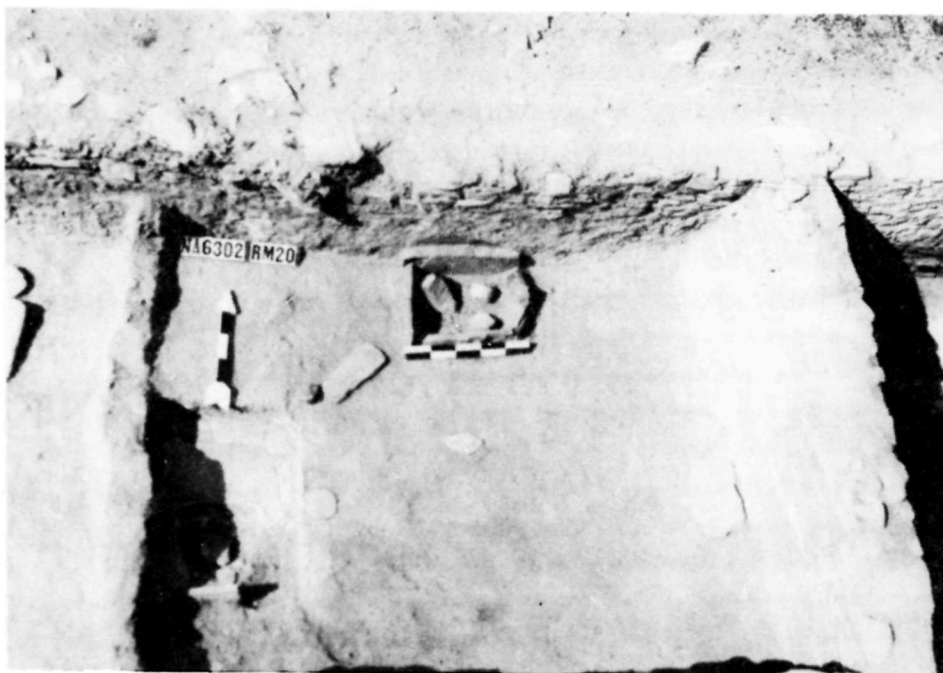


Figure 11. Room 20B. An oblique view of the room floor after it had been cleaned. Note the dismantled milling bin on the left adjacent to the divider wall and the hearth adjacent to the north wall of the room.

Room 20B (Figs. 9, 11)

This area is the eastern half of Room 20 and measures 2.24 m east-west by 1.86 m north-south covering an area of about 4.3 m².

The room possesses two floor features. The first is a rectangular slab-lined hearth built against the north wall of the room. The hearth measures 41 cm by 30 cm and is 14 cm deep. Some ash and charcoal remained in the hearth at the time of its discovery.

The second floor feature in Room 20B is a milling bin, located against the divider wall on the west side of the room. The bin measures 72 cm by 30 cm and extends 6 cm below the floor level. The bin at one time was fully slab-lined but most of the slabs, as well as the metate, had been removed prior to the time of the excavation.

The artifacts found on the floor of the room include a scraper, a sandstone disc and a type I-A-1 mano. A single Jeddito Black-on-orange sherd was recovered from the storage bin and considered to be in a floor context. Seventeen sherds were recovered from the hearth but only two were decorated, one is Pinedale Polychrome and one is Awatovi Black-on-yellow.

Room 21 (Figs. 9, 12)

Room 21 lies to the east of Room 20 and south of an undesignated room along the exterior tier of rooms in the southern wing. The room measures 4.35 m east-west by 1.85 m north-south and has a floor area of 7.8 m².



Figure 12. Room 21 Floor Fill. The view faces to the north after the completion of the excavation of most of the room's fill. The black areas just above the floor in the section are clusters of fused carbonized corn-cobs lying beneath the fallen roofing material. The sandstone slabs were evidently resting on the roof when the room burned and fell to their present position with relatively little disturbance when the roof collapsed during the fire.

The fill of the room, as indicated in the cross section in Figure 9 and the photograph (Fig. 12), was clearly divided between post- and pre-collapse sections. The post-collapse fill, which varied between 51 cm and 69 cm above the floor at its surface and 15 cm and 28 cm above the floor at its base, was composed of a matrix of brown aeolian sand which held numerous pieces of building stone. Substantial amounts of roofing material occupied the lower portion of the fill ranging from 15 cm to 28 cm above the floor and resting on the charred cobs.

The floor fill distinction was abandoned in Room 21 as the cobs, which seemed to have been in several mounds on the floor of the room, reached up to the roofing material level. Consequently, the floor contact level actually reaches well up into the pre-collapse fill of the room.

The walls of the room vary from 48 cm to 69 cm above the floor level and from 25 cm to 35 cm in width. The walls differ slightly from most of the other rooms. Some irregular cobbles have been used as in Room 4 but, in addition, there are several quite long slabs in the walls. These large building stones vary between 70 cm and 80 cm in length. The room was plastered in white as indicated by a small patch remaining on the west wall of the room. No doorways or other features were noted in the walls of Room 21.

The floor of the room was covered with clay which had become so hot during the fire that, at one point along the bottom of the north wall, it had fused, forming a ceramic-like material. The clay had been put down to a thickness of 5 cm and then plastered over in white. No features were found on the floor of the room.

The artifactual yield of the fill included a bone awl (Fig. 35, f) and 54 sherds. Half of the decorated sherds are of Awatovi Black-on-yellow. A mano and metate were found on the floor of the room but the heat from the burning corn had so affected the matrix of the sandstone from which the tools were made that they could not be recovered. Only three sherds were recovered from the floor of Room 21 and they are all of Homolovi Corrugated.

A sample of corn cobs was radiocarbon dated at the University of Pennsylvania. The date of A.D. 1429 ± 46 (P-1544) is certainly too recent. Elizabeth Ralph (personal communication) offered a corrected date of A.D. 1202 which seems too early. The detailed discussion of this age estimate is given later.

Room 22 (Fig. 9)

Room 22 is located east of Room 21 and is south and west of unexcavated rooms. The room is in the exterior tier of rooms in the southern wing of the village. Room 22 measures 3.46 m east-west by 1.84 m north-south and has a floor area of 6.5 m^2 .

The fill of Room 22 consists of a single brown sandy unit which included a large number of building stones. This level fell between 72 cm and 5 cm above the floor. The floor fill consisted of a 5 cm thick layer of fine clean sand which certainly arrived on the floor as a result of wind transport prior to the room's collapse.

The walls of the room vary between 52 cm and 74 cm in height above the floor level. The wall thicknesses vary from 24 cm to 30 cm. The bulk of the stones used in the walls are small sandstone slabs but irregular cobbles also occur as in neighboring Room 21. The amount of

mortar used in building the walls is moderate and no spalls were observed in the mortar. There is no remaining evidence of plaster on the room walls nor were any doorways or other features noted on the wall.

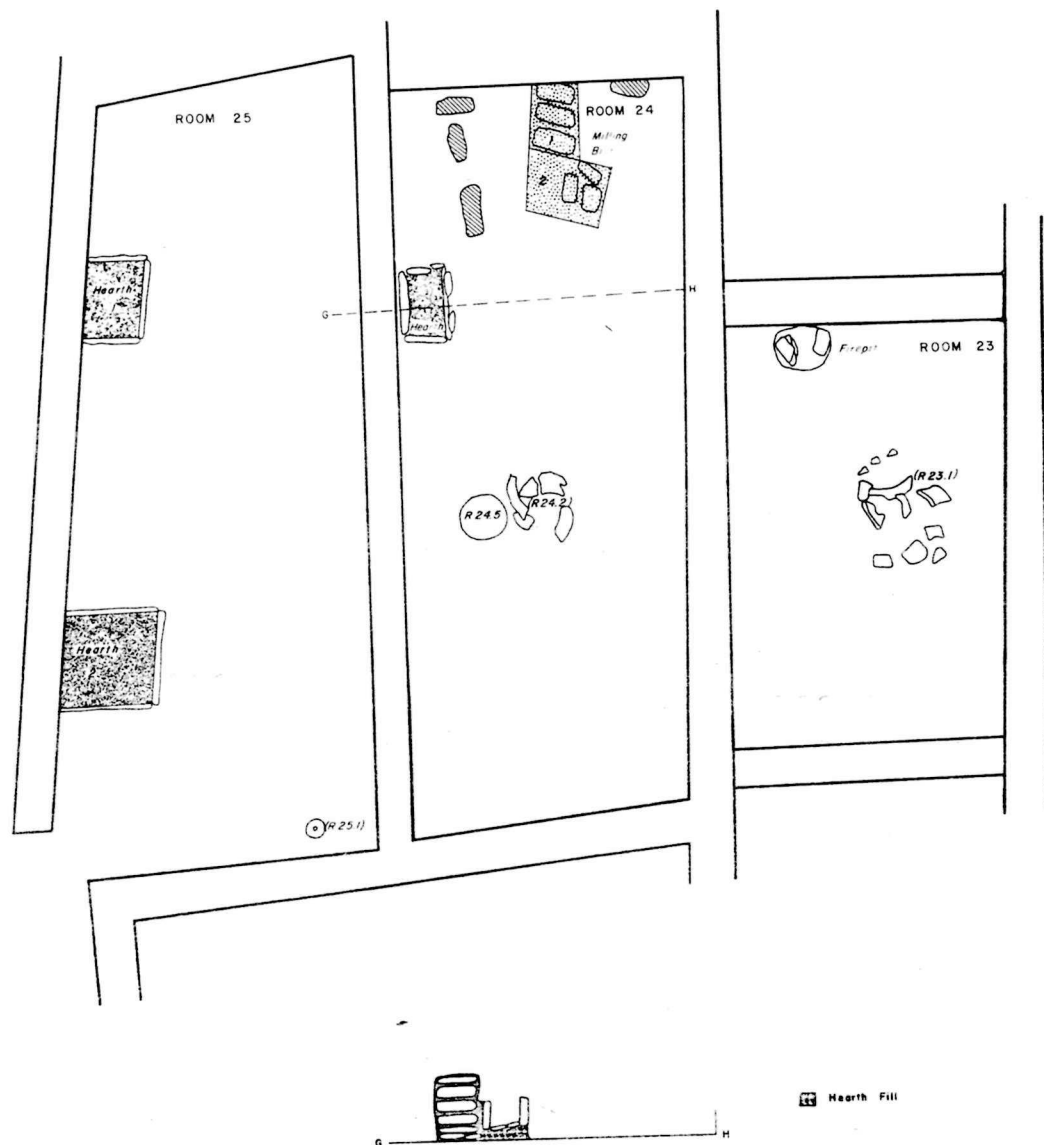
The room is floored with a 5 cm thick layer of puddled clay which was in turn covered with white plaster. The only floor feature in the room is a storage bin in the northeastern corner.

The fill of the room produced 66 sherds. The dominant decorated types are Jeddito Black-on-yellow, Pinedale Polychrome, and Homolovi Polychrome. The floor fill contained a single Showlow Black-on-red sherd. There were no sherds or vessels on the floor of the room but four sherds were recovered from the storage bin, two of which are Chaves Pass Polychrome. The other objects on the floor of Room 22 included a type II-C mano and a slab metate.

Room 23 (Fig. 13)

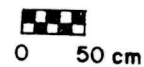
This room is located in the eastern wing of the Puerco Site against the exterior wall. Room 24 is on the west side of Room 23 but the rooms to the north and south are not numbered. The room measures 1.78 m east-west by 2.80 m north-south and has a floor area of about 5.0 m².

The surface of the room's fill varied between 50 cm and 74 cm above the floor of the room. To a depth of about 10 cm above the floor, and the top of the floor fill, the material in the room consisted of a brown sandy aeolian matrix with substantial numbers of cobbles and slabs. The floor fill, averaging 10 cm in depth across the room, consisted of a lighter colored fine sand, also probably of aeolian origin. Scattered pockets of charcoal and ash lay on the room floor but there was no evidence that the room had burned.



PUERCO SITE

East Wing



- Mono
- Slab Lined Hearth
- Slab Lined Milling Bin

(R xxx) Indicates Artifact Catalogue Number

Figure 13. Puerco Site, East Wing.

The walls of Room 23 vary between 59 cm and 70 cm above the floor of the room but are very consistent in width ranging between 25 cm and 26 cm wide. The northern and southern walls have been built using two rows of stone rather than the single row construction method used in the eastern and western walls and in the southern wing. The slabs were laid up in moderate amounts of mortar and no spalls were noted in the mortar. The walls extended two full courses below the floor of the room and rested in native sandy soil which evidently caps the terrace gravels in this part of the site. The walls were plastered, if we may judge from the small amounts of white covering adhering to the base of the western wall of the room.

No doorways were noted during the excavations. However, apparently a door was found when the stabilization crew was working in the room. The opening, visible in the north wall of the room in Figure 6, leads to the plaza and not into another room as nearly as can be determined from the surface indicators.

The floor, as in the rooms in the southern wing, is made of a layer of clay, averaging 4 cm in thickness, which has been plastered over in white. The only feature located on the floor of Room 23 is a small basin-shaped fire pit adjacent to the north wall of the room. The pit has an oval plan with a minimum diameter of 31 cm and a maximum of 38 cm. The pit extends to a depth of 6 cm below the floor of the room. The floor gives no evidence that the room had burned or that it had been remodeled at any time during its period of use.

The fill of Room 23 produced a sandstone abrader and sherds from two gray ware vessels whose major portions were found in neighboring Room 24. The rest of the sherd inventory from the fill amounted to 24 sherds, only two of which were decorated. These two represent Fourmile

Polychrome and Awatovi Black-on-yellow. The floor fill had no artifactual content. The floor of the room produced one restorable Homolovi Corrugated jar (Fig. 29, d) and one unassociated sherd of Homolovi Corrugated. The jar sherds were found scattered over the floor near the center of the room (Fig. 13).

Room 24 (Fig. 13)

This room is located between Rooms 23 and 25 in the eastern wing of the pueblo. It measures 4.8 m north-south by 1.82 m east-west and has a floor area of about 9.0 m².

The fill of Room 24 reached between 50 cm and 10 cm above the most recent floor. The material included in the fill was the usual sandy material mixed with substantial numbers of slabs from the collapsed room walls. The floor fill, which was arbitrarily defined as falling between the most recent floor and 10 cm above that floor, produced slightly smaller amounts of rock. Between the two living surfaces of the room was a layer of trash in a very sandy matrix. The most recent floor was not plastered and activities in the room evidently took place directly on the sandy layer. It may be that the remodeling of the room simply consisted of placing a layer of sand over the older floor and that the trashy element of the sand layer results from the intrusion of cultural materials into the soft floor. As the presence of the most recent floor was not detected until the completion of the cleaning of the earlier floor, which was plastered in the style of other floors in the village, it is impossible to do more than speculate about the construction of the later living surface. The evidence indicating the presence of the later floor consists of the level at which the hearth on the west wall of the room rests (Fig. 13). The bottom of the hearth is about 8 cm above the level of the earlier floor as shown in the cross section in Figure 13.

The earlier floor is made of puddled clay resting on the native sandy soil. The clay was laid to a depth of about 5 cm and then plastered in white.

The only feature associated with the later floor is the rectangular slab-lined hearth noted above. The hearth measures 43 cm by 29 cm and its bottom apparently rested at the same level as the second floor. The slabs lining the pit vary between 20 and 23 cm in height.

The features associated with the earlier occupation of the room are limited to two milling bins set side by side to form an L-shaped complex on the north side of the room. The northern bin measures 48 cm by 40 cm and its southern neighbor is 53 cm by 34 cm. The bins were both slab-lined and the metates rested on sloping clay supports. All that remained of the bins at the time of excavation were the clay seats for the bin's wall slabs and for the metates.

The walls of the room vary between 40 cm and 70 cm above the earlier floor. Their widths vary from 26 cm to 29 cm. The walls extend to a depth of one course below the earlier floor and stand on native soil. One doorway was found in the west wall of the room opening on Room 25.

The material culture from the room's fill includes a sandstone slab which had a small area of pecking and which has also been perforated with a biconical hole as though the slab may have been suspended by a piece of twine or tied to some other object. Two stone balls were also recovered from the fill of Room 24. One is sandstone and the other is of basalt and both show clear signs of intentional shaping. A total of 224 sherds were found in the fill of the room, only two of which are decorated. One of the decorated sherds is Awatovi Black-on-yellow and the other is from a Twiuka Black-on-orange vessel.

The floor fill of the room produced a single type II-B mano and two fragmentary bowls, one of Awatovi Black-on-yellow (Fig. 28, b) and the other of Tuwiuca Black-on-orange. Sherds from the Awatovi Black-on-yellow vessel were also found in the fill of Room 25. No other sherds were found in the Room 24 fill.

As nearly as can be determined, the most recent floor has only a single Awatovi Black-on-yellow jar fragment (Fig. 28, a) associated with it. No other pottery was found at appropriate levels to be assigned to the later floor.

The earlier floor has clear association with a Tusayan Corrugated jar (Fig. 30, b) and an Obliterated Corrugated jar. Sherds from these two vessels were also found in the fill units of Rooms 23 and 25. No other cultural items were found on the floor of Room 23.

The room had apparently burned and then was refloored, burying parts of the vessels on the earlier floor, and its occupation continued. It seems likely that the re-occupation of Room 24 took place at the expense of Rooms 23 and 25 which were apparently terminals for the refuse cleaned from Room 24 as part of its repair. This supposition is supported by the presence of sherds from the earlier floor contact vessels in the fill of both the adjacent rooms. Rooms 23 and 25 were apparently not in use at the time that Room 24 was re-occupied.

Room 25 (Figs. 13 and 14)

This room is the westernmost in the area excavated in the eastern wing. It has a common wall with Room 24 and is adjacent to the sub-surface Room 19 and the plaza. The room measures 5.14 m north-south by 1.70 m east-west and covers an area of about 9.2 m^2 making it the second largest of the surface rooms excavated to date. Room 16 in the western wing seems to be slightly larger.

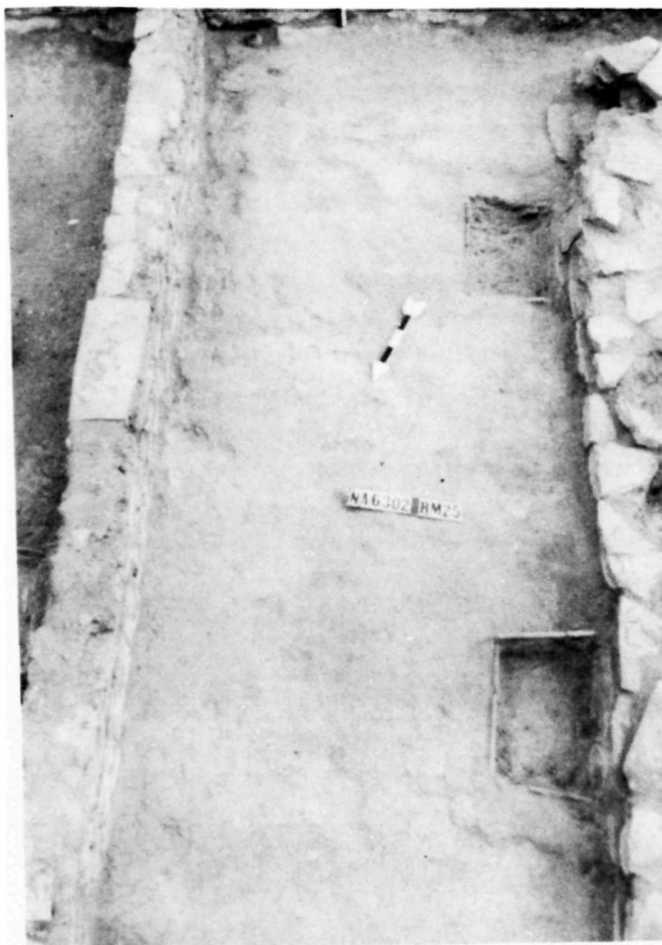


Figure 14. Room 25. A general view of the room after completion of the excavation. Note the miniature Chavez Pass Polychrome jar in the extreme left corner of the room.

The fill of the room was undifferentiated from the surface to the floor at a depth of 45 cm. The material included was the brown sandy matrix with abundant amounts of building stone. The floor fill simply consists of the arbitrary 10 cm level established in the manner previously described. There was no evidence of roofing material in any of the fill.

The eastern and southern walls do not vary appreciably in construction technique or state of preservation from that of the other rooms in the pueblo. They range in height from 40 cm to 49 cm above the floor and in thickness from 24 cm to 28 cm. The eastern wall has a readily apparent sill (Fig. 14) indicating the presence of a door into Room 24. No other wall features were noted in the eastern or southern walls.

The northern wall is badly decomposed. It presently stands to a height of only one course above the floor of the room. The presence or absence of wall features could not be determined under conditions of such poor preservation.

The western wall is anomalous. It stands in height to from one to three courses above the floor of Room 25 or to between 8 and 18 cm in height. Its width is a uniform 26 cm. As nearly as could be determined the west and north walls of the room are part of the same construction episode. At the southwestern corner of the room, however, no evidence remains, if it ever existed, of the manner in which the west wall was joined to the south wall. It is possible that the gap, readily evident in the illustrations (Fig. 13 and 14), was a part of the original building plan and that it provided ground level access to the plaza from Room 25. Corner doorways are not in evidence anywhere else in the site, however, making the presence of such a door in Room 25 at least a little suspect.

The floor of Room 25 was constructed of puddled clay and plastered in the same manner as in several of the other rooms in the village. The floor was in very poor condition. Two rectangular slab-lined hearths are located along the west wall of the room (Fig. 13). Hearth 1, the northernmost, measures 56 cm by 36 cm and is 13 cm deep. Hearth 2, the southern feature, measures 60 cm by 49 cm and is 20 cm deep.

In the southeast corner of the room is a rectangular unlined pit which measures 30 cm by 15 cm and extends through the floor to a depth of 8 cm. Located in the pit was a miniature Chavez Pass Polychrome jar (Figs. 14 and 28, a).

There were no signs that the room had been burned or remodeled. The poor condition of the masonry in the north and west walls may point to robbing of the stone for construction elsewhere in the village. Schroeder (1961:98) postulates that masonry materials were removed from Kiva 1 under the same circumstances. Unfortunately, no location in the pueblo can be identified where the stone may have been reused.

The fill of Room 25 included a total of 24 sherds of which 10 are Awatovi Black-on-yellow and six are Homolovi Polychrome. Several sherds, not included in the numbers cited above, were found to fit vessels found in Room 24. No other material culture items appeared in the fill of Room 25.

The floor fill contained three manos, one each of types I-A-1, II-A-2, and II-B. Three partial vessels were also found in the floor fill all in very small pieces. One (Fig. 26, a) of these is a white slipped jar made with Winslow Orange Ware paste and decorated in the Gila Polychrome style with carbon paint. Sherds from this vessel were also found in Room 19 which is immediately west of Room 25. The second vessel (Fig. 26, c) is also a white slipped and carbon painted Winslow Orange Ware which is decorated in a manner most similar to the style of Awatovi Black-on-yellow. Sherds from this vessel were found in Hearth 2. Finally, the third partial vessel is a Chavez Pass Polychrome jar. Sherds from this vessel were also found in the southern hearth of Room 25.

Objects found in the northern hearth of Room 25 include an argillite tcamahia (Fig. 33), a three-quarter groove basalt ax fragment, a slab

metate, two type I-A-1 and two type II-A-2 manos. The only other floor related cultural material is the Chavez Pass Polychrome jar found in the subfloor pit in the southeast corner of the room and one sherd of Homolovi Corrugated pottery. The concentration of heavy stone objects in Hearth 1 can only be explained as an attempt to fill the hearth. None of the objects found there show signs of exposure to heat.

Room 26 (Fig. 15)

Room 26 is located in the western wing of the village in the exterior tier of rooms. Room 18 (Schroeder 1961) is located to the south, Room 28 to the east and Room 27 to the north. The room measures 2.37 m north-south x 1.89 m east-west and has a floor area of about 4.3 m².

The fill of the room covers between 60 cm and 20 cm above the most recent floor and consisted of sand and very fine-grained materials of aeolian origin mixed with fallen masonry blocks. The fill contained very little cultural material. The floor fill, which lay between the most recent floor and a level 20 cm above the floor, consisted exclusively of fine sand, also most likely of aeolian origin. The upper floor was separated from the lower by simply peeling up the later plaster which covered the earlier floor to a depth of only 0.5 cm.

The walls of the room are constructed of thin sandstone slabs mixed with thicker, irregular cobbles, all laid up in a moderate amount of water. The walls stand to between 40 cm and 100 cm above the latest floor and vary in width from 23 cm to 28 cm. The walls were plastered in white judging from the well preserved sections on the south wall and in the southwestern corner of the room. The plaster seems to be the same as that used on the floors of several other rooms in the pueblo. No wall features or doorways were noted in Room 26.

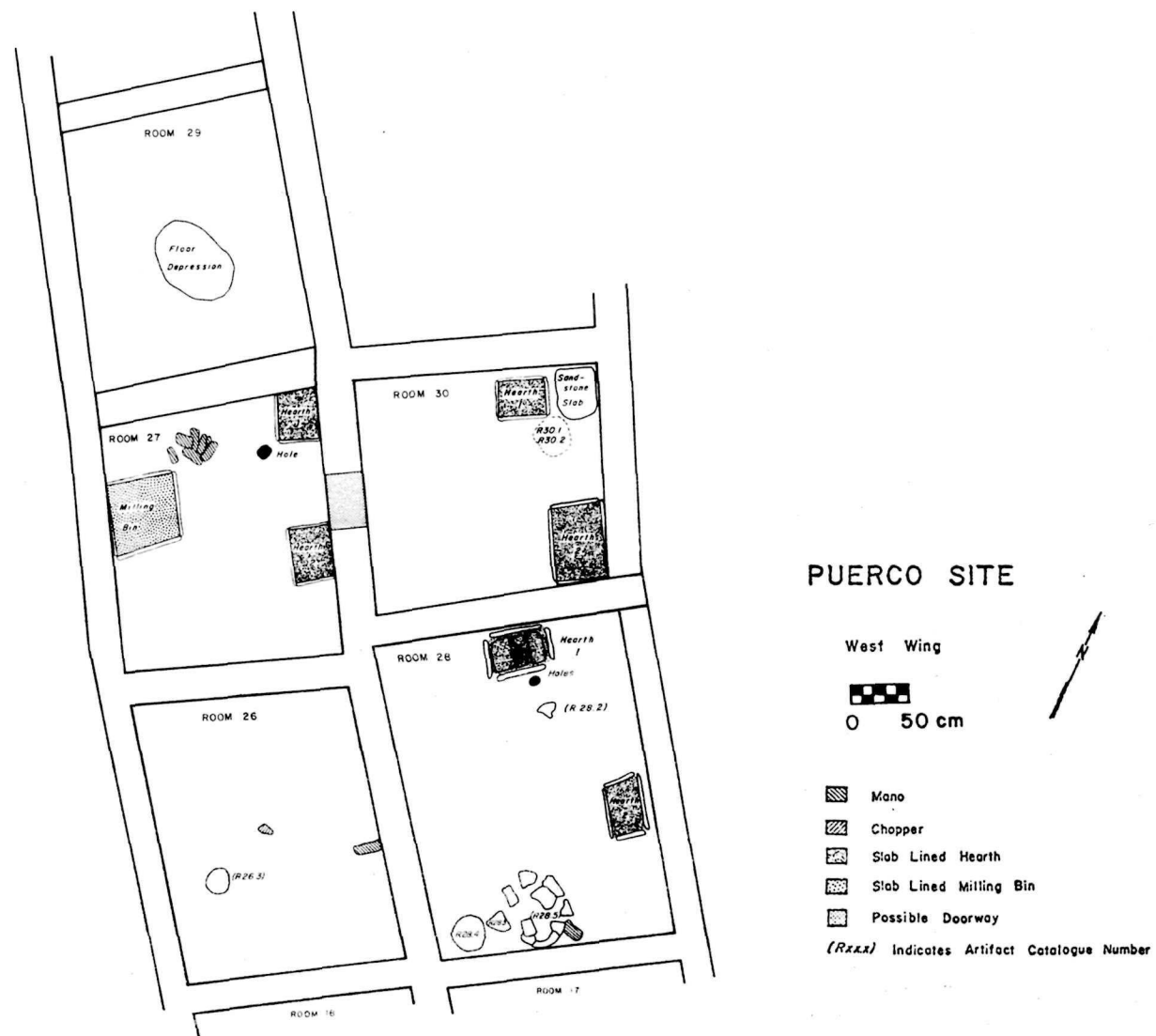


Figure 15. Puerco Site, West Wing

The latest floor consists of a single layer of plaster laid over the earlier floor, which in turn consists of a layer of puddled clay which has been hardened by a fire in the room. Beneath the clay of the earlier floor is a sandy layer which includes pockets of ash. No floor features are present at either level in Room 26.

The material culture in the fill of Room 26 consists of a worked shell, probably a tinkler (Fig. 32, b), a type I-A-1 and a type II-A-2 mano, and a slab metate. No sherds were found in the fill of the room.

The floor fill contained a type I-B-2 mano, a bone awl, and the major portion of an Awatovi Black-on-yellow dipper (Fig. 29, b). The sherd inventory from the floor fill totaled 30 specimens. Five of the sherds were decorated and represent Awatovi Black-on-yellow, Pinnawa Glaze-on-white, and Chavez Pass Polychrome.

The material culture from the floor of Room 26 includes a type II-A-2 mano, a very fragmentary grinding stone, which had also been used as a chopper, and a very large worked sherd. The sherd is from a white slipped, carbon painted Winslow Orange Ware bowl which had been decorated in the Pinto Polychrome style (Fig. 29, a). No unassociated sherds were found on the floor of Room 26.

Room 27 (Figs. 15, 16)

This room is located north of Room 26 and west of Room 30 in the exterior tier of rooms in the western wing. The room measures 2.22 m north-south by 1.90 m east-west and has a floor area of 4.0 m².

The surface of the fill varied from between 75 cm to 100 cm above the single floor of the room. The bottom of the fill level was again a consistent 20 cm above the floor. It consisted of the brown aeolian sandy matrix and substantial amounts of rock.



Figure 16. Room 27. View of the room with both hearths exposed. Hearth 1 is located beneath the niche in the northeastern corner of the room. Note the break in the masonry and rubble filling the doorway into Room 30. The mano cache is visible next to the large slab against the north wall.

The floor fill has substantially less rock and the sand was of much lighter color than that of the fill level and was, consequently, easily separated from the overlying unit. One disconformity occurred between the floor fill and fill of the room as the result of the presence of a large mano cache near the north wall. The stack of manos extended through the floor fill and into the general fill level.

The walls of the room vary between 72 and 100 cm in height above the floor and range from 27 cm to 32 cm thick. The walls are constructed of thin slabs with many irregular cobbles laid up in a moderate amount of mortar. No spalls are present in the mortar. Some plaster remains on all of the walls.

Two features are present in the west wall. A doorway, of which only the sill remains, is located near the center of the wall at a height of 55 cm above the floor. In Figure 16 it is visible as a discontinuity in the masonry of the west wall above Hearth 2. The sill width is 39 cm. The absence of a lintel makes estimation of the maximum width of the door impossible.

The second feature in the west wall of the room is a small niche above Hearth 1 in the northeastern corner. The niche is 20 cm above the floor level and measures 23 cm high by 14 cm wide and 10 cm deep. The interior has been plastered. No other features were noted in the walls.

The floor is made of a layer of clay, laid to a depth of 5 cm, which has been polished but not plastered. Two rectangular slab-lined hearths are located in the floor, both on the eastern wall. Hearth 1, in the northeastern corner, measures 35 cm by 44 cm and is 10 cm deep. This hearth was in use at the time of the room's abandonment.

Associated with Hearth 1 on the floor of Room 27 is a small circular pit which measures 10 cm in diameter and 10 cm deep. No objects were found in the pit and no function can be assigned aside from the possibility that it may have served as a temporary repository for ashes from Hearth 1. No ash was found in the pit to support this speculation, however.

Hearth 2, which is located directly beneath the southern half of the doorway leading to Room 30, measures 40 cm by 60 cm and is 12 cm deep. At the time of the last phase of occupation of the room, Hearth 2 had been covered with a layer of plaster and was not in use. Presumably the abandonment of this hearth came as the result of the addition of the door way into Room 30. On cold days, the hearth's location, adjacent to the east wall of the room and beneath the doorway, would have made travel between the two rooms an enterprise palatable only to the most agile and daring of the village's inhabitants.

The remaining floor feature in Room 27 is a large milling bin located in the northwestern corner of the room. The bin measures 49 cm by 52 cm and is 15 cm deep. The slab liner, which is intact only on the southern and eastern sides of the bin, is made up of relatively large slabs when compared with those used in the construction of the walls. The joints and corners were sealed with clay. The metate had been removed prior to the excavation.

The fill of Room 27 contained one fragment each of type I-A-1, I-A-2, and III-A manos but no other tools. No sherds were found in the fill.

The floor fill included a type II-A-2 mano, a silicified wood hammer-stone, and one partially restorable Indented Corrugated jar. No sherds from this vessel were found in other proveniences. Parts of a Tuwiuca Orange jar which is associated with the floor fill of Room 30 were found in the Room 27 floor fill. A total of 84 sherds were found in the Room 27 floor fill. Of these, 13 are decorated types including Walnut Black-on-white, Showlow Black-on-red, Jeddito Black-on-yellow, Kokop Black-on-orange, Pinnawa Glaze-on-white, and Homolovi Black-on-red.

Room 28 (Figs. 15, 17)

Located in the interior tier of rooms in the western wing of the pueblo, Room 28 is east of Room 26, south of Room 30 and north of Room 17 (Schroeder 1961). The room measures 2.22 m north-south by 1.90 m east-west and has a floor area of 5.6 m².

The fill of the room could be divided into two units based on the frequency of occurrence of building stone in the sandy matrix. The uppermost segment, spanning from 30 cm to 54 cm above the floor had substantial amounts of rock. The lower portion of the fill unit, falling

between 5 cm and 30 cm above the floor, contained a somewhat smaller amount of building rubble. The floor fill, only a 5 cm thick unit, consisted of the clean fine sand found in several of the other rooms.

The walls range in height above the floor from 43 cm to 80 cm and vary in thickness from 24 cm to 28 cm. The walls are built of small sandstone slabs mixed with irregular, undressed sandstone cobbles. Only moderate amounts of mortar have been used and no spalls were observed in any of the walls. The walls are seated slightly below the floor level in the native sandy soil. A small patch of white plaster remains on the south wall of Room 28 indicating that the masonry was concealed from the aboriginal occupants of the room as in at least some of the other rooms



Figure 17. Room 28. High oblique view of the floor after excavation. Hearth 1 is in the upper portion of the view and Hearth 2 is on the right. Objects on the floor include vessel fragments and thin sandstone slabs apparently thrown into the room shortly before its collapse.

excavated as a part of this project. No doorways into Room 28 were located and no other sorts of wall features were observed.

The floor of the room is in good condition and consists of a polished clay base about 10 cm thick which had been plastered with the same white material used on the south wall. Two hearths are present in the room, Hearth 1 against the north wall and Hearth 2 against the east wall (Figs. 15 and 17). Hearth 1 is slightly east of the center line of the room. It is 57 cm long, 37 cm wide and 24 cm deep. The feature is fully slab-lined and the joints between the slabs in the bottom and sides have been grouted with clay to seal the rectangular basin. A small hole is present in the center of the bottom of the feature which connects with a 12 cm diameter hole in the floor of the room adjacent to the hearth on the south. No certain function can be assigned to the opening in the hearth bottom but it may have been placed there to improve airflow to the fire in the otherwise airtight hearth.

Hearth 2 is slightly south of the east-west axis of the room on the east wall. It has sandstone slab walls but its bottom has not been lined and there are no openings in the bottom of the hearth. The feature measures 52 cm long, 39 cm wide and 13 cm deep.

Both hearths had thin ashy layers on their floors and had been filled with sand and building rubble in the same sequence as the room proper.

No other features were noted in the room. The absence of milling bins clearly indicates its use as general domestic quarters.

The fill of Room 28 contained only one complete and two fragmentary type I-A-1 and two complete I-A-2 manos.

The floor fill yielded material associated with a large Homolovi Corrugated jar (R28.5 in Fig. 15) which extended from floor contact into the sandy floor fill layer.

Isolated from floor contact and extending slightly into the fill of Room 28 was a large rim sherd from a Winslow Orange Ware bowl, the decoration of which has strong affinity with Kwakina Polychrome from the Cibola area (Fig. 26, b).

The floor contact materials, in addition to the Homolovi Corrugated jar noted above included a red slipped Winslow Orange Ware bowl fragment (R28.2 in Fig. 15), a fragment of a Homolovi Plain plate (Fig. 15, R28.3; Fig. 29, e), a base sherd from a large Homolovi Corrugated jar worked into a plate (Fig. 15, R28.4), a bone knife fragment made on the rib of a large mammal (Fig. 31, a) which was found inside the restorable Homolovi Corrugated jar, and a single type I-A-1 mano, also associated with the corrugated vessel.

Of the total of 88 sherds from the floor fill and floor of the room which could not be associated with any of the vessels noted above, 27 are decorated. All of the decorated sherds were found in floor contact. Sixteen of the 27 decorated sherds are Awatovi Black-on-yellow, the rest are distributed among Winslow Orange Ware types, pre- and post-1200 black-on-whites and other Jeddito Yellow Ware types.

Room 29 (Fig. 15)

Room 29 is the northernmost room excavated in the western wing of the pueblo. It is in the exterior tier of rooms and is immediately north of Room 27. The adjacent rooms to the north and east were not assigned numbers. Room 29 measures 2.22 m north-south by 1.92 m east-west and has an estimated floor area of 4.0 m² making it the second smallest room in the village.

The fill of the room was a continuous unit of sandy matrix with substantial amounts of building stone from the surface to the floor. No distinction could be made on objective grounds between the fill and floor fill so an arbitrary level extending to 10 cm above the floor was designated as the floor fill.

The walls of the room range from 63 cm to 89 cm in height above the floor. The walls vary in thickness from 24 cm to 30 cm. The vast majority of the stones used in the walls are thin sandstone slabs but a few large blocks also have been used in the construction. There are none of the irregular cobbles which mark the work in other rooms of the village. The basal course of the north wall is made up of large blocks. Moderate amounts of mortar have been used in laying up the stone and no spalls were noted in any of the walls. Some oxidized plaster is present in the southeastern corner of the room.

Only one wall feature, a door sill in the eastern wall, was found in the room. The sill is 59 cm above the floor of Room 29 and is 42 cm wide.

The eastern wall of the room may have been repaired or remodeled at some time. The indications are two small sand stone spalls set vertically as though they might have been the sides of a niche or similar feature. Also, the eastern wall has a severe tilt to the west as though the room may have been in a poor state of repair even during the peak of the village's occupation.

The floor of the room is constructed of puddled polished clay with no evidence remaining of plaster. The floor shows no signs of having been exposed to intense heat as the plaster in the southeastern corner does.

The only feature noted in the floor is a shallow ovoid depression near the center of the room. The depression measures 92 cm by 56 cm and is 15 cm deep at its maximum. No indications of its function were detected at the time of the room's excavation.

The fill of Room 29 produced a flake knife, one type I-A-2 mano and a sherd from a Black Ax Plain vessel, the bulk of which was found in the fill and floor fill of Room 30 and the floor fill of Room 27. The floor fill of the room included a bone awl (Fig. 34, c) and a bifacially worked stone tool. No sherds were found in the floor fill level of Room 29.

Room 30 (Figs. 15 and 18)

This room is located in the interior tier of rooms in the western wing of the village. It is north of Room 28 and east of Room 27. Room 28 is the smallest of the rooms excavated to date, measuring only 2.06 m east-west and 1.86 m north-south giving a floor area of 3.8 m². The room is unusual in terms of the orientation of its long axis in that it is the only excavated room in the pueblo whose longitudinal axis is normal to the longitudinal axis of the wing of which it is a part. The meaning of this remarkable attribute defies understanding, however.

The fill of Room 30 was essentially similar to that of Room 29 though there was perhaps slightly less rock in the arbitrarily defined 10 cm thick floor fill level. The depth of fill above the floor of the room ranged between 55 cm and 92 cm in thickness. The floor of the room had lenses of ash resting on it but they were much too thin to be able to use as floor fill levels and the material from them is treated as floor contact artifacts.

The walls of Room 30 vary between 63 cm and 96 cm in height above the room's floor and range between 24 cm and 28 cm in thickness. The

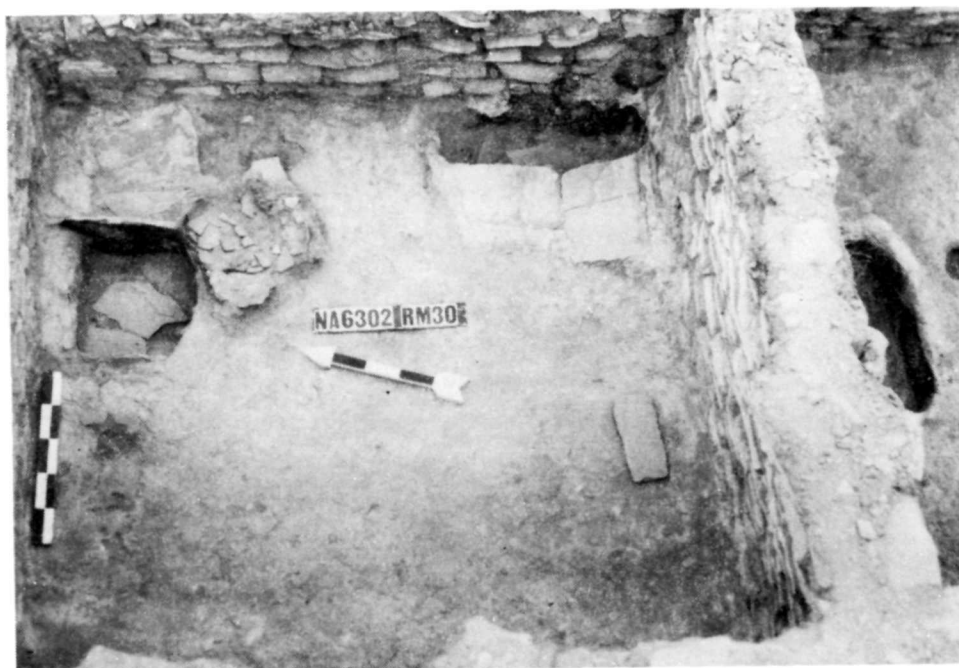


Figure 18. View of Room 30 facing east. Note location of hearths.

walls are built of thin sandstone slabs with irregular sandstone cobbles present at a number of places. The west wall of the room, that shared with Room 27, has a higher proportion of irregular stones and has more mortar between the stones than the other three walls. No spalls were noted in the mortar of any of the walls. The walls are seated on the native soil.

The only plaster visible on the walls is in the southwest corner of the room. A door was present in the west wall before the collapse of Rooms 27 and 30. The sill is 59 cm above the floor of Room 30 and is 39 cm wide. It is this doorway which may have led to the sealing of Hearth 2 in Room 27.

The floor consists of a 3 cm thick layer of puddled clay resting on the native soil. The clay layer was in turn covered with a white plaster layer. The floor was in excellent condition at the time of the excavations.

The floor features include two rectangular fully slab-lined hearths. Hearth 1, located in the northwestern corner of the room, is adjacent to the north wall. The feature is 40 cm long, 35 cm wide and 17 cm deep. Hearth 2 is located in the southeastern corner of the room and measures 62 cm long, 38 cm wide and 15 cm deep. Like Hearth 2 in adjacent Room 27, Hearth 2 in Room 30 had been sealed with four sandstone slabs adding about 24 cm² to the useable floor space in the small room. The sealing of Hearth 2 is the only surviving evidence that the room was remodeled in any way during its use.

The artifact content of the fill level in Room 30 included a fragment of a type I-A-2 mano and sherds from three partially restorable vessels, two of which were determined to be associated with the floor of the room and one with the floor fill. No other sherds were found in the fill.

The floor fill included a partially restorable Tuwiuca Orange bowl. Sherds from this bowl were also found in the fill of Rooms 27, 29 and 30. The floor fill also yielded a single hammerstone but no other artifactual material.

The floor of Room 30 produced two restorable vessels. Both had been broken and lay on the floor in the area just to the south of Hearth I; their sherds intermingled in the fill and floor fill. One of the vessels (R.30.1) is illustrated in Figure 29, c. The floor of Room 30 also yielded 51 sherds not associated with the two restorable vessels. Of these 44 are plain wares and dominated by Homolovi Corrugated. Seven are decorated and represent Awatovi Black-on-yellow, Puerco Black-on-white, and Homolovi Polychrome.

Summary (Table 2)

Fifteen surface rooms were excavated in the 1967 study of the Puerco site. Three are in the previously uninvestigated east wing, five in the west wing, first opened by Vivian (Schroeder 1961) and seven are in the south wing adjacent to rooms excavated by Cosgrove (1934) and Schroeder (1961).

The rooms of each of the wings are rooms of the other wings indicating that there was neither a lengthy period separating the construction of the wings nor was there any significant difference in function of each of the wings.

The surface rooms, including those excavated prior to 1967, range in total floor area from 3.8 m^2 to 9.6 m^2 . The mean floor area is 5.37 m^2 .

Table 2
Summary of Surface Room Characteristics

Room No.	Length in m	Width in m	L/W ratio	Area _s in m ²	Hearths	Storage Bins	Milling Bins	Peri-meters in m	Wing
1*	3.46	1.98	1.75	5.8	1	no	no	5.44	South
2*	3.37	1.92	1.76	6.6	no	yes	no	5.29	South
3*	3.24	2.22	1.46	5.1	no	no	no	5.46	South
4	2.70	1.66	1.63	4.6	1	no	no	4.36	South
5**	2.92	2.26	1.29	5.9	1	no	no	5.18	South
7	3.42	1.95	1.75	6.6	1	no	no	5.37	South
8**	3.48	2.27	1.53	7.8	1	no	no	5.75	South
10	3.45	2.00	1.73	6.8	no	no	no	5.45	South
11**	3.37	2.34	1.44	7.6	1	no	no	5.71	South
13	2.92	1.80	1.62	5.1	no	no	no	4.72	South
16**	4.02	2.56	1.57	9.7	no	no	no	6.58	West
17**	3.96	2.29	1.73	8.7	no	no	no	6.25	West
18**	3.90	1.44	2.71	5.4	no	no	no	5.34	West
20A	2.56	2.05	1.25	4.8	no	no	no	4.61	South
20B	2.40	1.94	1.24	4.3	1	no	yes	4.34	South
21	4.35	1.85	2.35	7.8	no	no	no	6.20	South
22	3.46	1.84	1.88	6.5	no	yes	no	5.30	South
23	2.80	1.78	1.57	5.0	1	no	no	4.58	East
24	4.80	1.82	2.64	9.0	1	no	yes	6.62	East
25	5.14	1.70	3.02	9.2	2	no	no	6.84	East
26	2.37	1.89	1.25	4.3	no	no	no	4.26	West
27	2.22	1.90	1.17	4.0	2	no	yes	4.12	West
28	2.70	2.07	1.30	5.6	2	no	no	4.77	West
29	2.22	1.92	1.16	4.0	no	no	no	4.14	West
30	2.06	1.86	1.11	3.8	2	no	no	3.92	West
Total	-----	-----	-----	153.5	17	2	3	--	--
Mean	3.25	1.97	1.63	6.1	--	--	--	5.22	--
Std. Dev.	0.80	0.24	0.56	1.77	--	--	--	0.84	--

*Excavated by Cosgrove.

**Excavated by Schroeder or Vivian.

The length of the rooms averages 3.25 m (± 0.80 m) and ranges between 2.22 and 5.14 m. The width of the surface rooms varied between 1.44 and 2.56 m around a mean of 1.97 m. The ratio of length to width for the surface rooms averaged 1.63 (± 0.56). There is no apparent consistency in relationship between size and function though it is tempting to assign storage roles to those rooms similar to Room 21, which clearly served as a granary. Room 21 has a length/width ratio of 2.35 and a floor area of 7.8 m². Rooms which are certainly domestic such as Room 4 or Room 28 have length/width values of less than 1.75 and floor areas smaller than 6.00 m². These rooms are clearly closer to square and much smaller than Room 21. Other rooms which may have served as storage areas, assuming that storage rooms have length/width ratios of equal to or greater than 1.75 and have floor areas equal to or greater than 6.00 m², Rooms 2, 7, 22, 24 and 25 may have also served as or been originally planned as storage units. If we accept one or the other of the foregoing criteria but not require both, Rooms 1, 8, 10, 11, 16 and 17 may also be added to the list of potential storage rooms. Several of these rooms have fireplaces in them indicating some sort of activity other than simple storage. In addition, at least Room 24 had been remodeled with the addition of the hearth indicating that the room may have served a different function in its earlier configuration.

The purpose behind the construction of rooms more closely approximating a square for living quarters may lie with the problem of heating a room with a larger perimeter during the winter months. Two factors are involved: 1) the fact that the longer walled rooms will have a greater rate of heat transfer to the outside as a result of their greater surface area and 2) the greater heat storage capacity of the larger room walls. In order to effectively heat a room with a perimeter of 6 m as compared with a room with a perimeter of 4.5 m it would require a third again as much heat input

for the larger room assuming the same wall thicknesses and heights for both rooms. The smaller rooms, that is those with the shorter perimeters, would be the most efficient with regard to heating fuel consumption.

Subterranean Room Descriptions

Introduction

Although it was the goal of this project to excavate only one subterranean feature, a kiva which was clearly indicated by the presence of a large depression adjacent to the east wing of the village, another feature was located during the search for the kiva limits. This second structure, Room 19, was not indicated by any surface evidence in its vicinity. The discovery of this feature has had considerable impact on our interpretation of the occupational history of the site.

In describing the following two features we have chosen to adopt the convention employed by Smith (1972:4) in his description of the kivas at Awatovi and other sites on Antelope Mesa. Basically, he has defined the end of the structure containing the ventilator tunnel and alcove as the rear of the structure. He then defines the right and left walls in terms of a viewer sitting in the alcove and facing the front of the room. At the Puerco site, the right walls of all the subterranean features is also the western wall due to the consistency in orientation of the ventilator-fire pit axis on an essentially north-south line. We will also employ Smith's convention in the use of the terms alcove, niche, and bench.

Room 19 (Figs. 19-21)

Room 19 was discovered as the result of the search for the limits of Kiva 2 and the latter structure's stratigraphic relationships with the

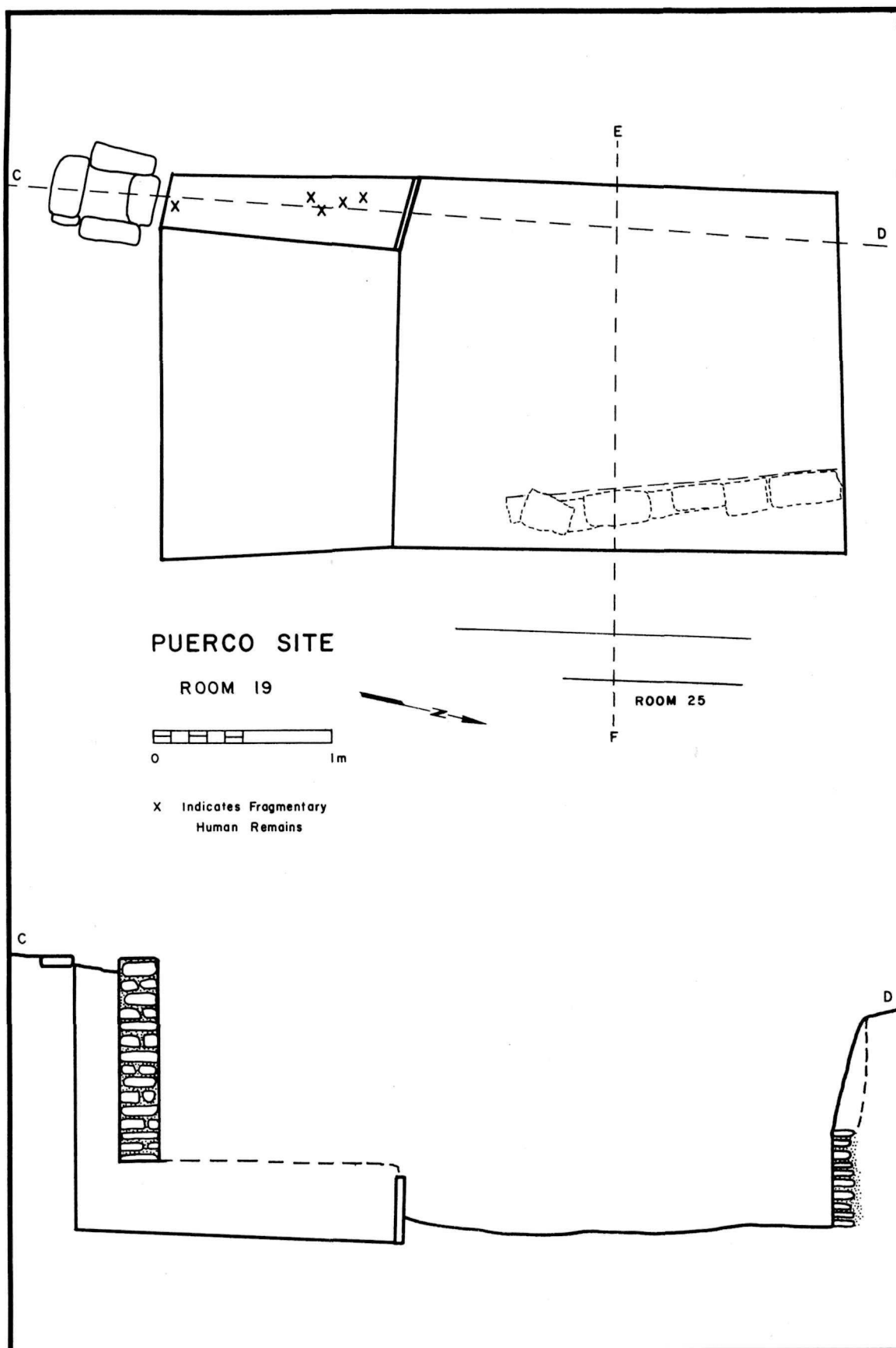


Figure 19. Puerco Site, Room 19

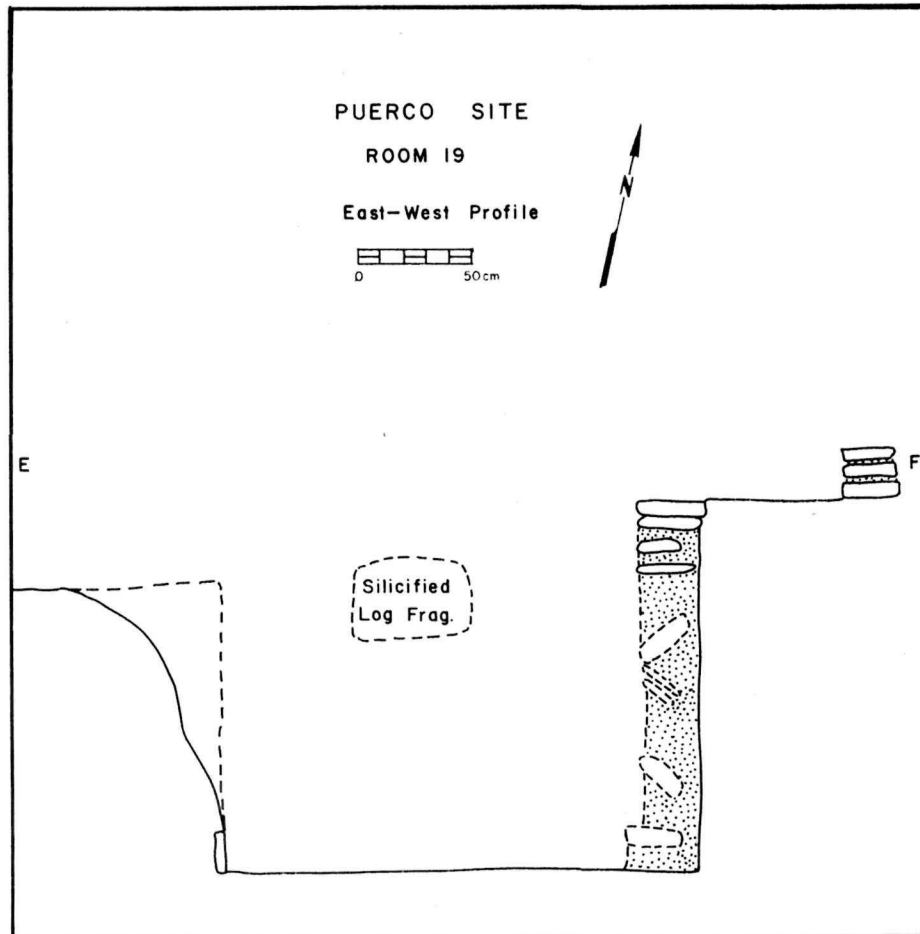


Figure 20. Puerco Site. East-west Profile of Room 19.

eastern wing of the pueblo. The first indications of the presence of a possible buried structure at the location occurred in the form of a very roughly laid retaining wall shown with broken lines in Fig. 19. In addition, Room 25 was not clearly identified as an enclosed feature at the time of the initiation of the test trenches excavated to locate the limits of Kiva 2. In the earliest stages of the work on Room 19 we believed that it was merely an isolated surface room standing free of the eastern wing in the plaza.

Room 19 measures 2.05 m wide by 3.81 m long including the alcove at the rear of the room. The alcove is 1.35 m deep leaving the lower general living floor an area only 2.46 m long. The floor of the room varies between 1.50 and 1.60 m below the ground surface at the time of excavation. The alcove floor stands 35 cm above the level of the general living area. The total horizontal area of the structure is 8.02 m^2 with 2.80 m^2 of that in the alcove. The remaining 5.22 m^2 in the floor area is comparable with areas of the domestic quarters in the surface rooms.

The fill of Room 19 consisted of a homogeneous light gray sandy matrix which included relatively little cultural material. An unmodified section of a silicified log was found in the fill of the room (Fig. 20). There was no stratigraphic break in the fill on which to base a separation of the floor fill from the overlying material so the fill of the room was cleared to about 10 cm above the floor and the cultural material in the remaining 10 cm arbitrarily designated as floor fill as with the surface rooms with the same lack of stratification. There were indications that at least the upper portions of the fill had been disturbed either by rodents or recent human activity or both. The floor fill showed no such indications.



Figure 21. Room 19. Near vertical view shows the room following completion of its excavation. A portion of the west wall of Room 25 is visible in the extreme right of the scene. The view is toward the north and front of the room.

The occupational surface associated with Room 19 can only be estimated from the height of the remaining vent shaft masonry. There is no compelling reason to assume that the surface associated with the pit structure is the same as the one related to the surface rooms. In fact, it seems likely that Room 19 represents an earlier occupational component at the Puerco site.

Given the foregoing it is not possible to determine the exact height of the walls of Room 19. The floor of the room varies between 1.50 and 1.60 meters below the present surface. Masonry fillers and plastered sections on the walls indicate that the walls extended to at least 1.20 m above the floor in some parts of the room. The use of masonry in the construction of the room may have served to prevent sandy units in the terrace deposits from collapsing into the room. Substantial areas of the wall surfaces are covered with plaster essentially identical to that found in the surface rooms. It showed no signs of having been subjected to heating such as might happen if Room 19 had burned. There was no evidence of niches in the walls of Room 19.

The face of the step from the living level to the floor of the alcove is faced with well-laid masonry. No cists or niches were apparent in the face of the step.

The ventilator tunnel runs along the western wall of the original pit in which the room was built. It has a cross section 35 cm in height and 42 cm in width at the opening in the face of the alcove step. At the junction with the ventilator shaft the tunnel measures only 25 cm in width and 30 cm in height. The shaft, which is fully masonry lined, has an apparently uniformly square cross section of 25 cm on a side from top to bottom.

The means of roofing the top of the ventilator tunnel could not be immediately determined. There was no clear evidence indicating whether a sort of miniturized viga and latia system with an adobe covering or a slab covering was built over the tunnel.

The fill of the ventilator tunnel included several fragments of human bone, including a small portion of mandible from an adult. It is our interpretation that this bone arrived in the tunnel as a result of filling the

room with trash and other materials from an earlier occupation, perhaps also represented by Room 19 itself. No grave goods were found in association with the human remains and they were in such poor condition that it really seems unlikely that they actually represent an intentional secondary interment.

The floor of Room 19 is made of the virtually ubiquitous puddled clay covered with a thin coat of plaster. No features were found in the floor, such as a fire pit to complement the ventilation system. No indication of the nature of the roof construction remained in the fill of the room.

Room 19 was almost entirely devoid of non-ceramic artifacts. The only non-ceramic item is a small coil of copper wire found in the proximity of a rodent burrow in the upper 30 cm of the fill. It is not clear whether the wire was introduced by the rodent or by earlier excavators at the site.

The fill of the room yielded only a few sherds, the vast majority of which are Awatovi Black-on-yellow representing many different vessels. Some sherds are part of a vessel which also had fragments in Kiva 2. The floor of the room reverses the distributions and Homolovi Corrugated is the dominant type. Surprisingly, there are no black-on-white types which one would expect to be associated with domestic pit structures.

The function of Room 19 is equivocal. The floor plan agrees with that of Puerco Phase pit houses and combines elements, the corner ventilator and a rear bench of the McDonald Phase pit houses and kivas respectively of the Hopi Buttes area (Gumerman and Skinner 1968:192). The relatively small size of Room 19 as compared with the neighboring Kiva 2 and the absence of such features as niches and elaborate fire pit argue against interpretation of Room 19 as a ceremonial structure.

The room seems most likely to have been constructed before Room 25. The casual wall in the upper fill of Room 19 looks very much like an attempt

to stabilize the fill of the pit structure which may have been settling beneath the western wall of Room 25. From this it is clear that Room 19 can be associated with no later a period in the site's occupation than that associated with the hypothetical first building effort in the western or southern wings discussed above. This supposition is certainly open to question in the absence of clear cut superpositioning of the eastern rooms over Room 19 or of a much earlier ceramic assemblage on the floor of the pit structure. The buried masonry features reported by Schroeder (1961:98) support the hypothesis that an even earlier phase occupation is present at the site with which Room 19 may be associated. This issue is explored further in the following chapters.

Kiva 2 (Figs. 22 and 23)

The charge to excavate a second kiva at the Puerco site was based on the assumption that the obvious depression located about 8 m west of the inner wall of the east wing was in fact the location of a second ceremonial structure. The depression was trenched from east to west and the walls of both Kiva 2 and Room 19 located in the process. The kiva was then cleared using a combination of hand and machine excavation techniques.

Kiva 2 (Fig. 22) is the largest architectural unit excavated at the Puerco site to date. The maximum extent of the kiva is 5.85 m long by 4.23 m wide. The floor area, including the benches, but excluding the alcove, is 15.7 m^2 . With the alcove the kiva has a useable total area of 22.1 m^2 , the alcove itself being larger in area than several of the domestic surface rooms. At least in terms of area, Kiva 2 is the central feature among those so far excavated at the Puerco site.

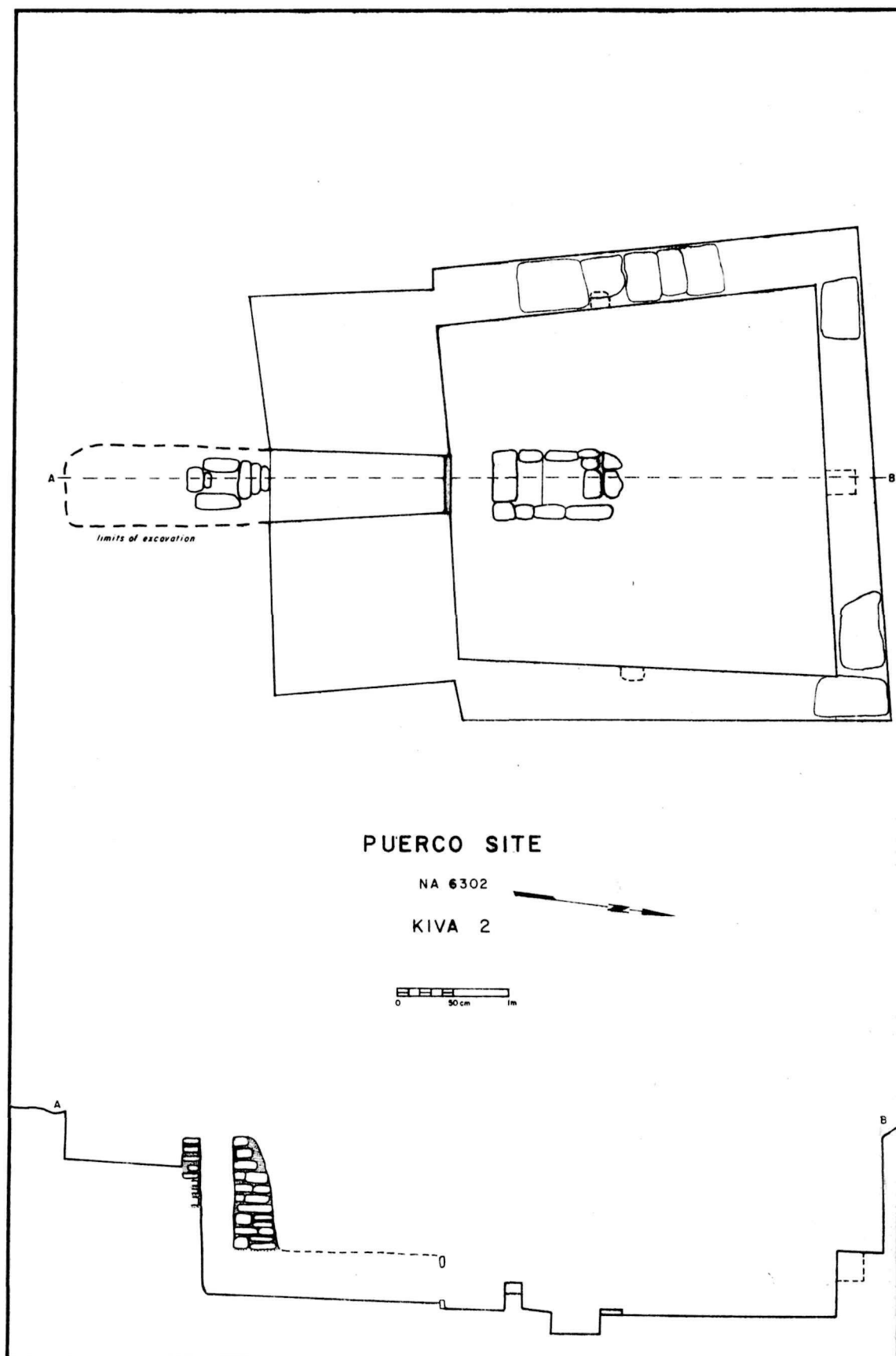


Figure 22. Kiva 2.

The longitudinal axis of the kiva is very nearly parallel to that of the eastern wing of the village. The western wall of Room 25 is approximately 4.5 m due east of the eastern wall of Kiva 2. This location is on the eastern side of the plaza approximately equidistant from the northern and southern wings.

The fill of the kiva was similar to that of Room 19 in that it was a nearly homogeneous light gray sandy matrix from the surface to the top of the floor fill unit. There seemed to be a larger amount of building rubble in the kiva fill than in the Room 19 fill. The floor fill was a very thin level of fine sandy material lighter in color than the fill and dotted with ash lenses. At no place did the floor fill level exceed a thickness of 5 cm and in several places it could not be detected between the fill and the floor.

The walls of the kiva could be traced to a height of about 1.25 m above the floor in most places. The floor is 1.50 m below the present surface. In most areas the walls above the benches were made of plaster over the native deposits of the terrace. Masonry work of a very crude sort was found, which divides the bench, on the west wall of the kiva. A much better made masonry plug is also present in the eastern wall of the structure. No openings or other features, such as painted areas, were found on the kiva walls above the benches.

The benches are masonry faced native earth features which occur on the left, right, and front sides of the kiva. Kiva 1 evidently lacked benches. The Kiva 2 benches average 40 cm in width, about half of which is made up of the masonry facing and the remainder of native terrace deposits. The tops of the benches are 45 cm above the floor level. Three niches are located in the kiva, one each in the faces of the three benches. The niche in the front bench is on the longitudinal axis of the kiva, and the

left and right niches are on the transverse axis. No features occur in the face of the alcove wall aside from the mouth of the ventilator tunnel.

The niches are small gaps left in the masonry of the bench face and extend only to the earth backing of the bench. The niche in the front bench is the largest measuring 20 cm wide by 15 cm high by 28 cm deep. The left and right niches are approximately half the size of the front niche. All three are located 30 cm above the kiva floor. No artifacts were found in any of the niches.

Plastered areas remain on the faces of the benches and the alcove which in a few spots extend down over the curved bench-floor juncture. The type of plaster is the same as that found in the surface rooms and Room 19.

The floor of the kiva was evidently plastered but there is no clear indication in the central portion of the floor area. All that remained at the time of excavation was exposed sandstone bedrock in some areas (Fig. 23) and a layer of clean sand in others, principally near the front or northern side of the kiva. This sand layer was used to level the floor as the surface of the bedrock dips to the north.

The floor is 150 cm below the present surface over the entire area of the kiva. The only features located on the floor are the firebox and deflector. No evidence of the presence of a sipapu, loom anchors, or other floor features was located. The proximity of the bedrock may have discouraged the construction of such features.

The firebox consists of a rectangular pit pecked into the sandstone to a depth of 20 cm below the floor level. The pit, which has horizontal dimensions of 43 cm and 35 cm for length and breadth respectively, is enclosed by a low, narrow masonry wall on the left, right and front sides. The southern wall of the enclosure also serves as the deflector and is built up to a height of 15 cm above the kiva floor. It may have stood slightly higher when the kiva was in use.

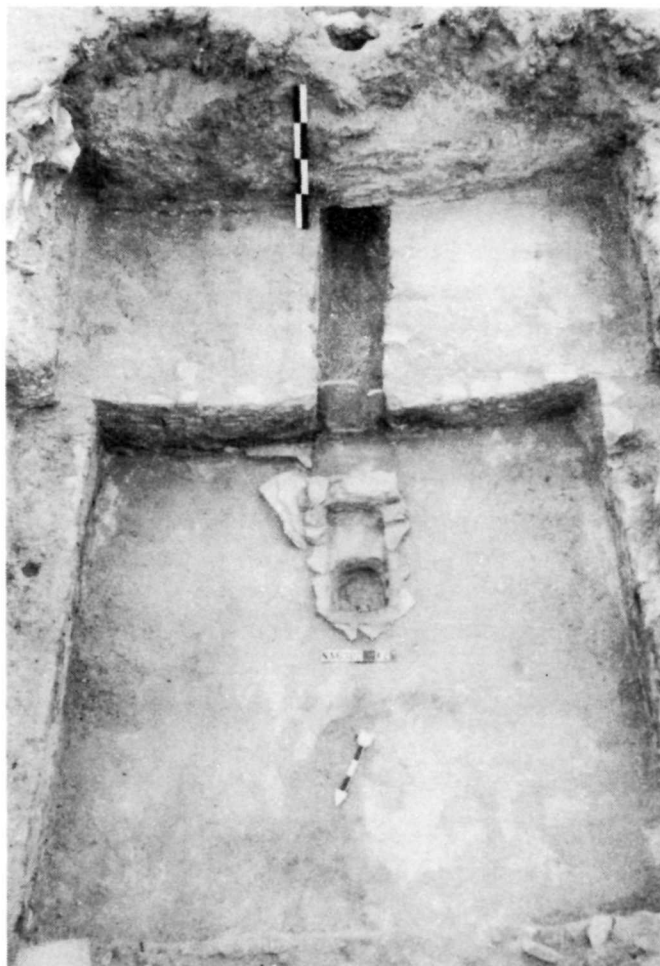


Figure 23. Kiva 2. View of the kiva at the completion of the excavations. The lighter area above the left of the north arrow is exposed bedrock. Note the integration of the fire box wall with the masonry deflector. The view is south towards the rear of the kiva and the alcove. The outer edge of the front bench is visible in the immediate foreground.

The mouth of the ventilator tunnel in the face of the alcove riser was formed by a thin rectangular sandstone slab which covered the tunnel's cross section. The center of the slab had been removed leaving a rectangular opening 25 cm high and 21 cm wide. The tunnel itself measures 40 cm wide by 40 cm high and extends 2.14 m from the mouth at the face of the alcove riser to the bottom of the shaft. The tunnel was covered by a layer of adobe laid

on a series of cottonwood branches placed side-by-side across the tunnel. The species identification was made at the Tree-Ring Laboratory at the University of Arizona from sections sent for tree-ring dating.

The ventilator shaft consists of a hollow masonry column recessed into the rear wall of the kiva. The north wall of the shaft is flush with the eastern wall of the alcove. The masonry of the north wall of the shaft tapers substantially from a maximum width at its base to a 15 cm width for the two courses. The interior of the shaft has a cross section area of 20 cm by 30 cm. The top of the remaining masonry is 1.38 m above the bottom of the tunnel indicating the approximate level of the occupational surface associated with the kiva.

The artifactual yield of the fill of Kiva 2 consisted of one Type I-A-2, one Type I-C manos and a fragment of a Type II-A-2 mano. One bone awl (Fig. 34e), a lump of hematite which had been polished or ground on one surface and a single hammerstone were also recovered from the Kiva 2 fill.

The ceramic material in the fill of Kiva 2 included seven partially or wholly restorable vessels including three Chavez Pass Polychrome vessels (Fig. 27 b and c), one Homolovi Polychrome jar, one Black Ax Polychrome jar, one Awatovi Black-on-yellow jar (Fig. 28c), and one Homolovi Corrugated olla. Sherds fitting the Awatovi Black-on-yellow vessel were also found in the fill of Room 19.

The decorated sherd counts from the fill of Kiva 2 agree with the vessel count in being nearly equally divided between Awatovi Black-on-yellow and Winslow Orange Ware types. Small amounts of other Jeddito Yellow Ware types also occur along with a few sherds of the later White Mountain Red Ware types. Homolovi Corrugated is in the preponderant majority for undecorated types.

Finally, though it is not artifactual in the strict sense, is a fossil oyster which was most likely collected from the Mancos Shale. It is a cast of the bivalve's interior and may have been collected as a curiosity and carried to the site by one of the village's Anasazi inhabitants. The isolation of the Puerco site from exposures of the Mancos Shale reduces the probability that it arrived at the site by natural processes. The identification was made by Mr. Bill Breed, Curator of Geology at the Museum of Northern Arizona.

Due to its tenuousness as a layer nothing in the artifactual inventory could be definitely assigned to the floor fill of the kiva. However, the fill of the ventilator tunnel did yield some objects which may represent the earliest post-occupational deposition in the structure. These items, which include a fragment of a shell ornament (Fig. 32c), another bone awl (Fig. 34a), and a slab metate, are unfortunately not chronologically or culturally sensitive enough to be of value in dating or developing further interpretation of the structure.

The floor contact material included only two sherds, both Awatovi Black-on-yellow, and a restorable Indented Corrugated vessel in the fill of the fire box.

The ceramic complex from Kiva 2 indicates a date for the fill comparable with the earlier kivas at Awatovi (Smith 1972) and with the Kiva KT-I at Kin Tiel (Hargrave 1931:81-90). The latter feature has been tree-ring dated between A.D. 1226 and 1276 (Bannister, Hannah and Robinson 1966:25-29). The plan of the structure also agrees best with the early Awatovi features and particularly with the Kin Tiel kiva. In fact, aside from the gross size differences, KT-I has a total area of about 13.8 m^2 and Kiva 2 an area of 22.1 m^2 , the two kivas have a great deal in common. The absence of a masonry liner and the use of a constructed wall rather than a slab as a

deflector are notable similarities. Kiva 2 has a number of features, such as the alcove and full circuit bench which indicate that it probably does not belong to as late a period as that represented by the Antelopa Mesa Pueblo IV ceremonial structures (Smith 1972:105-108, 115; Hargrave 1931:103-116). In addition, other features such as cists in the riser of the alcove which are common to the later kivas are not present in Kiva 2 at the Puerco Site.

Kiva 1, excavated by Vivian (Schroeder 1961) better fits the floor plans of the later kivas mentioned above. The absence of a rear alcove and of benches aside from the large one at the rear of the structure is the dominant plan in the Pueblo IV kivas of Awatovi, Kawaia-a (Smith 1972:115) and at Kokopnyama (Hargrave 1931:103-116). Contrary to Schroeder's (1961:98-99) implication, it seems certain that Kiva 1 is associated with the later phase of the site's occupation and Kiva 2 with the earlier. The sharing of sherds from the same Awatovi Black-on-yellow vessels between the fills of Kiva 2 and Room 19 also supports the proposition that Kiva 2 is the earlier unit and Kiva 1 the later.

Nonetheless, it is clear that the earliest occupation of the site as represented by Kiva 2 and Room 19 is no older than early Pueblo III. Room 19 seems most likely to be a McDonald Phase pithouse (Gumerman and Skinner 1968:192) and Kiva 2, though rather large in comparison with the kivas of the Hopi Buttes, may also relate to this period. These two structures, and others of similar age on the site, may have been robbed of roof construction material during the later PIII-PIV occupation represented by the bulk of the surface rooms and Kiva 1. This would account for the absence of indications of the method of roofing and of large fragments of wood in general. Large roof beams would have been a relatively scarce material in the region and those remaining in any abandoned structures would have been reused in later construction as the village was expanded.

CHAPTER V.

CERAMICS

Introduction

The ceramics of the Little Colorado River region of northern Arizona have been the subject of considerable amounts of discussion during the last 80 years. Fewkes (1904) following his investigations at Homolovi, Cheylon, Chavez Pass and in the Petrified Forest recognized the major classes characteristic of the region's prehistoric pueblos. Fewkes also noted that the Little Colorado sites' ceramic assemblage "is as a rule more varied in character than the pottery from the true Tusayan ruins, Shumopovi, Awatovi, and Sikyatki, though its decoration has many likenesses to that on the pottery from these Tusayan ruins" (pp. 56-57). The use of designs characteristic of other, better known wares was also noted by Hough who felt that some of the vessels from Stone Axe ruin were done as "imitations of the Gila ware" (1903:314).

Two important points were already apparent to archaeologists by 1904: 1) the Little Colorado valley had an indigenous ceramic tradition which could be contrasted with traditions of contemporaneous peoples to the north and south of the region. 2) The decoration of these native wares tended, at least to a noticeable extent, to imitate the design styles associated with the ceramic traditions of neighboring peoples. These two issues are of interest in this study for the value they might have in improving our understanding of the events which took place in late PIII through early PIV times among the peoples of the Winslow Branch.

Following Fewkes' and Hough's tentative analyses of the ceramic assemblage of the Winslow Branch little was done until Hargrave (1932: 25-27) squarely faced the issue and defined a series of "yellow paste" types which he identified as indigenous to the Little Colorado River valley, Homolovi Plain and Corrugated, and to the Jeddito area, Jeddito Plain, Corrugated and Tooled. The unabashed application of a Linnaean classificatory scheme to the organization of Hopi and San Francisco Mountain area ceramics and the placement of the utility wares of the Little Colorado Valley ruins of the Homolovi complex and those of the Jeddito Wash-Antelope Mesa sites in the same "Order" nearly bludgeons the reader with the implication of genetic relationships between the ceramic traditions of the two areas. Hargrave seems more than a little brash in his implication of genetic relationships when one has the opportunity to compare a larger collection of materials than available in the early 1930's. The technological differences between the Jeddito and Little Colorado types are substantial.

In 1937 Hargrave, in collaboration with H. S. Colton, revised his earlier position and described Homolovi Orange Ware (p. 132). In addition, a decorated ware was recognized which shared technological characters with Homolovi Orange Ware which they termed Winslow Orange Ware (p. 137). The Jeddito types were gathered under the term Awatobi (*sic*) Yellow Ware (p. 143). This reorganization of the plain wares of the region is carried through to the most recent discussion of the ceramics of the region (Colton 1956: Wares 6A and 7A).

Colton (Ware 6A) notes that Homolovi Orange Ware is produced by a "people with a culture closely related to that of the Hopi. . . ." during the Pueblo IV period. He also identifies the ware as being associated with the Winslow sub-branch.

Colton (Ware 6B) also revised the type associations in Winslow Orange Ware which he identifies as "the service types which are the companion to utility of Homolovi Orange Ware." He also rejects the earlier (Colton and Hargrave 1937:137) inclusion of Jeddito Black-on-orange in Winslow Orange Ware and Showlow Black-on-red in Alameda Red Ware which permits the collapsing of the remaining types into two series within a single Winslow Orange Ware. Alameda Red Ware is dropped from the taxonomy. Winslow Orange Ware is also assigned a late PIII-PIV age and Winslow sub-branch cultural affiliation.

At the same time that Hargrave was attempting to classify the relationships between Little Colorado PIII-PIV ceramics surveys were being undertaken in the Petrified Forest as part of the CWA program under the supervision of H. P. Mera (1934). Cosgrove's excavations at the Puerco site were a part of this program as well. Mera (pp. 15-20) reports the presence of a number of types known to be of late PIII and later vintage. Pinto Polychrome and Homolovi Polychrome receive particular attention in Mera's (pp. 15, 17-19) discussion. Mera sees Homolovi Polychrome and the closely associated Homolovi Black-on-red as being similar in paste characteristics to both Pinto Polychrome and Showlow Black-on-red. Mera's description of the type much more clearly identifies the characters which separate Homolovi Polychrome from its Hopi cognates than Hargrave was able to do with the plain wares in 1932.

Mera devotes but little space to the undecorated wares. He does note that "Although Jeddito Black-on-yellow occurred in great abundance, extremely few fragments of its accompanying utility wares [now Awatobi Yellow Ware] were brought to light" (p. 21). This phenomenon is also evident at the Puerco site in that in the Schroeder-Vivian excavations and the Museum of Northern Arizona project reported here, no Awatobi Yellow Ware was recovered. It is not possible to tell from Cosgrove's report whether any was obtained

as part of the CWA excavations. None was found in the collections held at the Park headquarters, Gila Pueblo, or the Laboratory of Anthropology in Santa Fe when they were examined by the author in 1969.

Reed (1947) has also worked with ceramics from surveys in the national park and, drawing on his earlier studies of the development of the Zuni ceramic tradition (1941, 1944), developed a five part division of the park's prehistory. The final two periods, of relevance to this study, are the "Pueblo III period," which is subdivided into a "Walnut horizon" and a "Tularosa-St. Johns horizon" (p. 23), and a "Homolovi horizon" which represents the early PIV period (p. 24).

In the later PIII Tularose-St. Johns horizon Reed identifies Holbrook Corrugated as the dominant utility type and sees the continuation of the Showlow group, which includes Showlow Smudged and Showlow Black-on-red. These types are seen by Reed as made in the White Mountains to the south (p. 22). The dominant utility ware is "Holbrook Corrugated," which is a brown ware (p. 23) and probably belongs in what is now called Homolovi Corrugated. Reed feels that the "Holbrook Corrugated" (p. 22) and Walnut Black-on-white (p. 23) are locally made and that "most of the decorated types are definitely or very possibly imports" (p. 23).

In the succeeding Homolovi horizon Reed (p. 24) recognizes the possibility of local manufacture of Homolovi Polychrome in addition to Homolovi Corrugated. However, he seems unable to fully incorporate the idea that the brown paste sand tempered polychrome was actually produced in the Petrified Forest as he goes on to say that "Possibly the Homolovi Polychrome is actually trade from the Winslow direction, as it is not notably more abundant than..." (p. 24) such obvious trade types as Four Mile, Pinedale, and Gila Polychromes from the south and Awatovi and Jeddito Black-on-yellow and Sikyatki Polychrome from the north.

Finally, Schroeder (1961:99-102) in his discussion of the ceramics recovered in his and Vivian's excavations at the Puerco site fully adopts the following types as locally made: Homolovi Corrugated; Black Ax Plain; Homolovi Red, White-on-red, Black-on-red, and Polychrome. The most common trade ware is Jeddito Black-on-yellow. Schroeder (p. 102) also adopts the convention proposed by Reed (1955:186) for renaming Arauca Polychrome, a term proposed by Colton and Hargrave (1937:131-132), as Pinnawa Glaze-Polychrome. Schroeder also uses Colton's (1956: Ware 6B) own renaming of Arauca Plain to Black Ax Plain. The renaming is the result of the inappropriate use of an extinct tree's genus name (*Arauca*) rather than a geographic term as part of the type's binomial (Woodbury and Woodbury 1966: 321). Reed's (1955:187) proposal creates further confusion as Colton and Hargrave (1937:115-116) use Pinnawa Glaze-Polychrome to identify a rather different type. Woodbury and Woodbury (1966:321) have suggested the name Kechipawan Polychrome. The Woodburys' renaming seems to satisfy most of the difficulties surrounding the nomenclature of the rarely occurring, at least in the western portion of the Puerco River area, type and is used here.

As it was not the goal of this project to undertake a major restudy of the ceramics of the late PIII and early PIV periods in the Little Colorado and Puerco drainages, we have not defined any new types. Rather, we have tried to incorporate the detailed ceramic studies undertaken by Smith (1971), Woodbury and Woodbury (1966), Carlson (1970), and Colton (1955, 1956) in definition and recognition of the types present in the materials collected in our 1967 excavations. Consequently, the classification of sherds and vessels substantially reflects the thinking of these authorities. Unfortunately the detailed study of gray wares from the Jeddito area undertaken by Gifford and Smith (1978) did not come to our attention until after we were well committed to the archaic, and perhaps arcane, classification of the corrugated wares used here.

By way of summary of this account of the development of ceramic classification in the Little Colorado and Puerco drainages it is certain that two wares native to the Puerco and Little Colorado valleys were in use in late PIII and early PIV times; Winslow Orange Ware, which includes both decorated and polished plain types, and Homolovi Orange Ware represented by one corrugated and one plain type. These two wares represent the local contribution to the ceramic horizon which developed in the triangle formed between the White Mountains, the Hopi Mesas, and the Cibola area during the latest parts of 13th and beginning of the 14th centuries. This is a period of major change in the Anasazi culture and is marked by substantial changes in the distributions of those people over northeastern Arizona and northwestern New Mexico. The ceramics of the Puerco site give witness to the complexity of the spatial interactions of the period.

The Puerco site clearly played a role in the Little Colorado or Winslow Branch of the Anasazi culture. Winslow and Homolovi Orange Wares, which are virtually indistinguishable in terms of their paste, fracture, temper, and core color characters, account for 68.6 percent of the 2077 sherds collected in the 1967 excavations. Schroeder (1961:Fig. 3) indicates that of the 1666 sherds collected in his work, 1420, or 85.2 percent, are representative of Winslow and Homolovi Orange Wares.

The restorable vessel counts reiterate the relationship between native and exotic wares. Of the 28 vessels which were either wholly or partially restorable, 13 represent Winslow Orange Ware types and seven are Homolovi Orange Ware accounting for 71.4 percent of the total. Jeddito Yellow Ware, in the form of Awatovi Black-on-yellow, accounts for all but two of the remaining restorable vessels or 21.4 percent of the total. Clearly, then, if we

consider Winslow and Homolovi Orange Wares to be the home wares of the Winslow Branch during the later parts of the PIII and earlier PIV periods, the Puerco site is an excellent representative of the branch and period. The following discussions are based on that assumption.

Finally, the earlier occupation postulated on the basis of the architectural evidence is not as prominent in the ceramic assemblage as we had hoped it might be. Nonetheless, we did obtain at least as clear an indication as did the previous workers at the site and the composite picture drawn from all three efforts gives adequate support to the presence of an earlier component. This issue will be developed further in the following discussion.

Ceramic Analysis

As indicated above no attempt has been made to develop new type descriptions. We have worked within the existing descriptions partly because they seem to cover most of the variation we found in the assemblage and partly because it was not a goal of this project to propose yet another revision of the regional ceramic taxonomy.

All of the material collected was analyzed using traditional techniques of macroinspection of design and hand lens examination of temper and other core characters. Comparisons were made with existing descriptions of wares and types and type specimens available at the Museum of Northern Arizona. The restorable vessels were treated in a similar manner and then, based on the observations discussed below, the sherd analysis was reviewed and some resorting done.

Homolovi and Winslow Orange Ware (Fig. 24 e and f; Fig. 25 h and i)

Given the lack of clearcut distinctions between these two wares in terms of any characters but the states of the surface of the vessels they should be regarded as having been produced using virtually identical materials and processes up to the point of surface manipulation, slipping, or painting. Consequently, the classification into types rested mainly on the surface characters of the vessels and sherds identified as being either Winslow or Homolovi Orange Ware rather than being certainly a member of one or the other ware first and then assigned to a type.

This situation leads to difficulties in the separation of Homolovi Plain from Black Ax Plain as the only "diagnostic" criterion is the degree of smoothing of the surface where Homolovi has the rougher surface. A subjective character such as "roughness" leaves much to be desired as a truly diagnostic criterion for classification.

Some unexpected problems arose in the classification of the decorated types with the Winslow-Homolovi ware characteristics. First, three restorable vessels (Fig. 26) and 22 sherds were recovered which are unequivocally made using the clays, tempering materials, and firing techniques characteristic of the Winslow-Homolovi technology but which have design characteristics and used pigments falling outside the range of expression in the established Winslow Orange Ware types. These hybridized cases have been classified with the Winslow Orange Wares, because they are slipped or decorated but they have also been identified in Tables 3 and 4 giving the sherd distributions by Affinis pre-fixed to their proper non-Winslow binomial type name. New type descriptions were not undertaken for these hybrids on the grounds listed above. Also, these specimens are poorly represented in the collections and we are reluctant to introduce new types to the literature on such weak grounds. Perhaps future work in the area

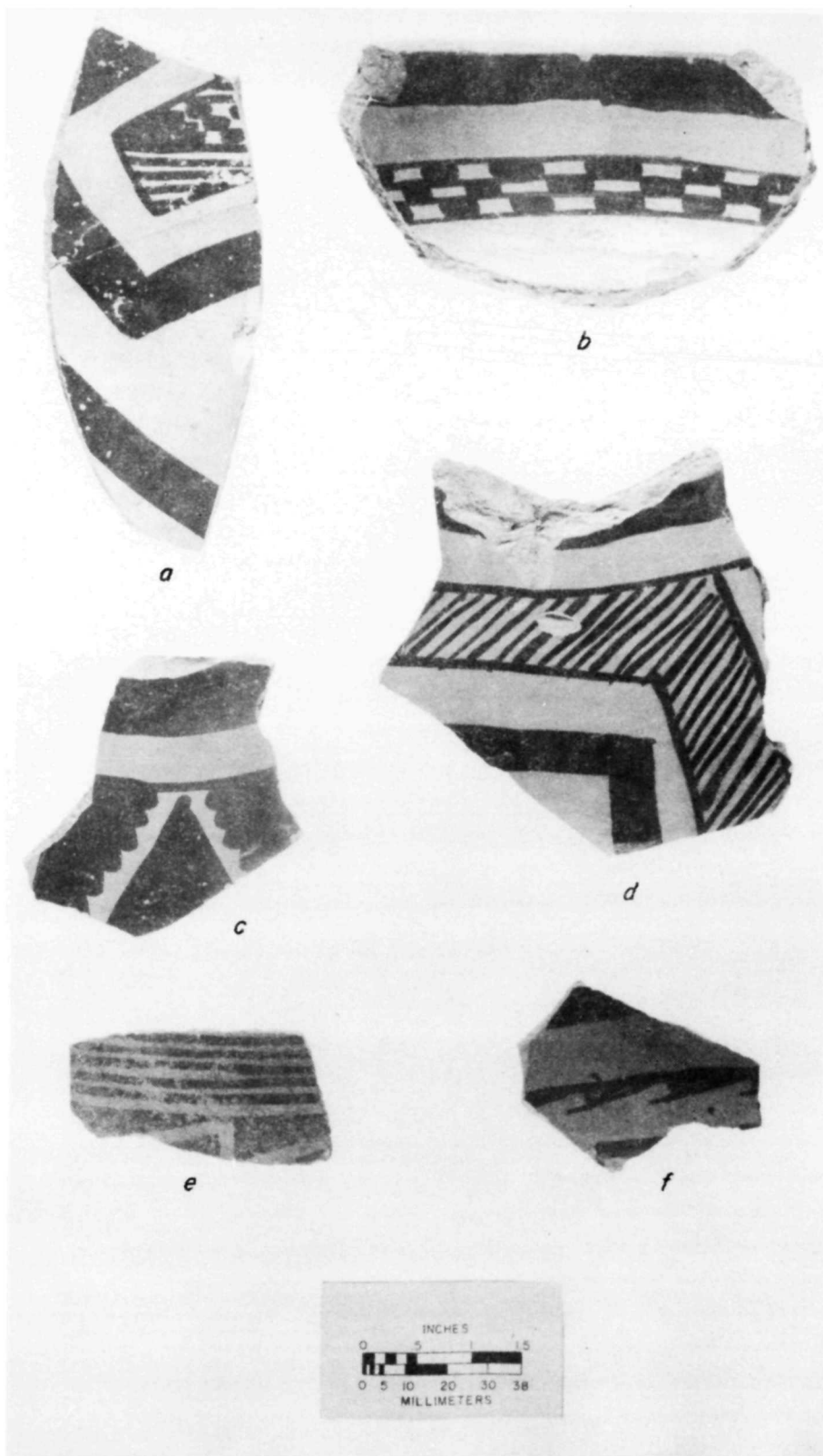


Figure 24. Puerco Site Type Sherds.
a-d, Awatovi Black-on-yellow; e and f, Tuwicuca Black-on-orange.

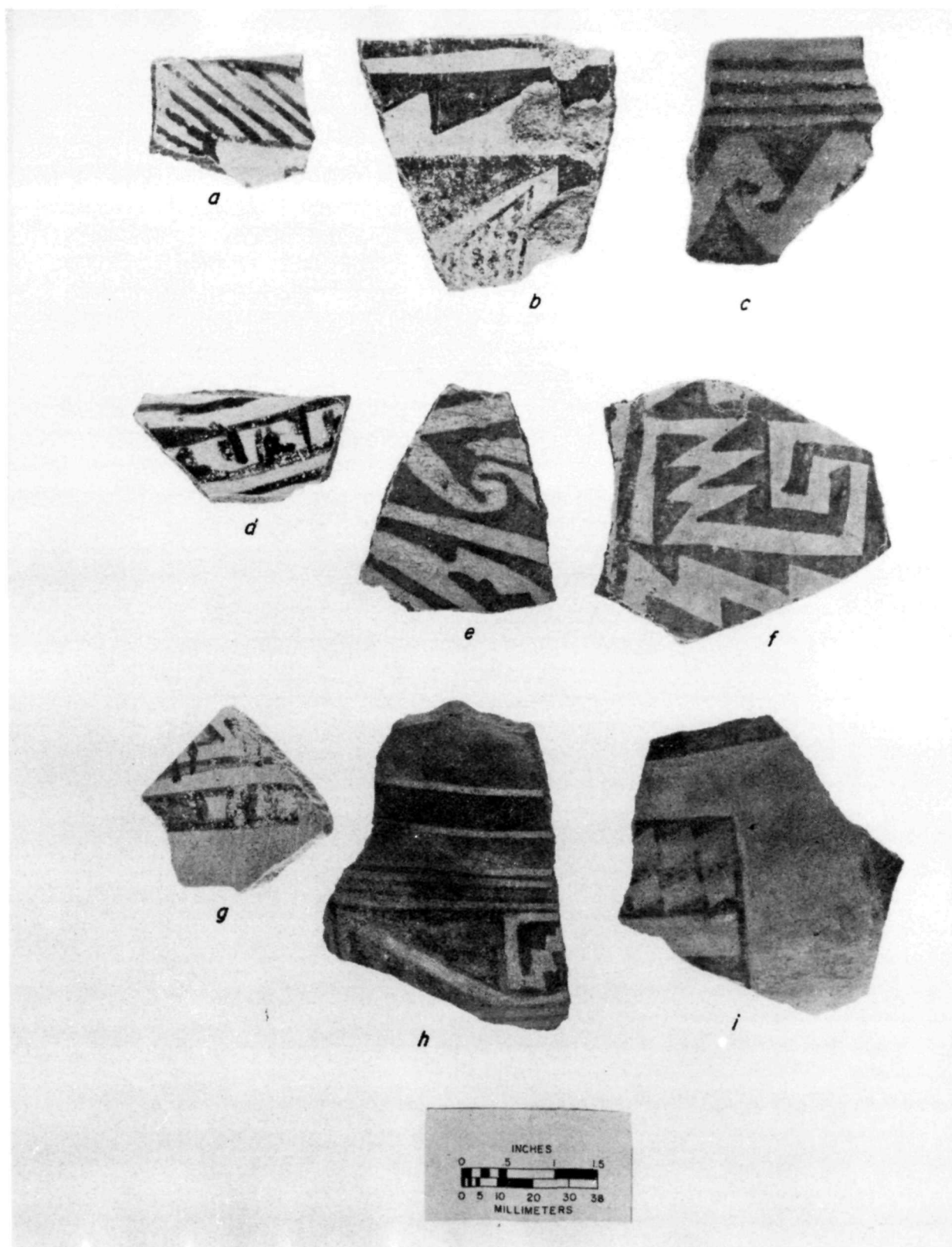


Figure 25. Puerco Site Type Sherds.
 a, Kwakina Polychrome; b, Puerco Black-on-white;
 c, Puerco Black-on-red; d, Pinnawa Glaze-on-white;
 e and f, Walnut Black-on-white; g, Jeddito Black-on-
 yellow; h and i, Chavez Pass Polychrome.

will produce sufficient amounts of similar types to permit the expansion of Winslow Orange Ware with the inclusion of types using the Gila and Zuni decorative styles and materials.

The other major difficulty found in dealing with the Winslow Orange Ware types was the fugitive nature of the black and white paints (Fig. 27). Several sherds were recovered which in the initial sorting were classified as either Chavez Pass Black-on-red, Homolovi Black-on-red or Homolovi White-on-red, a new type introduced by Schroeder (1961:99) but not fully described by him or any subsequent student of the region's ceramics. During the study of the restorable vessels, which followed the classification of the sherds as the result of the time required for making the restorations, it was noted that on three vessels the following phenomena occurred. First, the vessel Catalog Number R25.1 (Fig. 27 a) is at first glance clearly a good example of Chavez Pass Polychrome. However, on closer inspection it becomes immediately evident that some sherds from the vessel should be classified as Chavez Pass Black-on-red. This results from the fact that the white paint outlining of the black design has been blackened in some areas or removed leaving no trace of its existence on other parts of the vessel. The result is the introduction of a level of ambiguity intolerable to even the most liberal ceramic taxonomists with regard to the distinction between polychrome and black-on-red types.

In another case, Catalog Number R25.4, also finally classified as Chavez Pass Polychrome, the black and white paint have been removed from some portions of the vessel leaving no trace of their existence. In other areas of the vessel the black paint was removed but the pattern was left etched in the slip. Individual sherds from this vessel could have been classified as Chavez Pass "Plain", Black-on-red or Polychrome when studied in isolation.

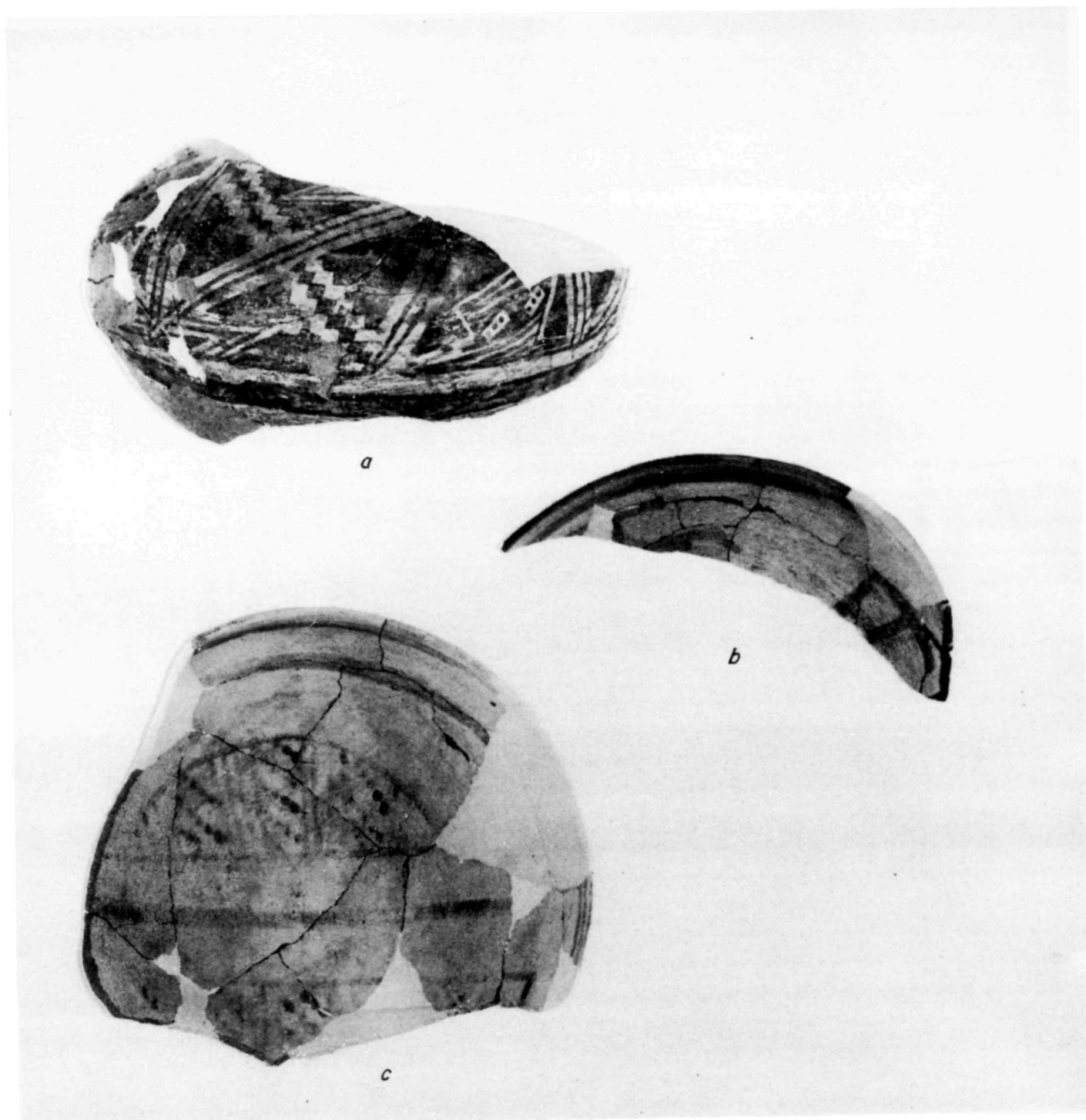


Figure 26. Winslow Orange Ware Vessels.
a, affinis Gila Polychrome (Cat. No. R25.3); affinis Kwakina Polychrome (Cat. No. R28.6); c. affinis Awatovi Black-on-yellow (Cat. No. R25.6). Vessel a is 32 cm in diameter.

CERAMIC ANALYSIS: DECORATED WARE

[illegible]

Table 4.
CERAMIC ANALYSIS: UNDECORATED WARE

	Room 4 Fill	Room 7 Floor	7 Hearth Floor	7 Floor Fill	Room 10 Floor Fill	Room 13 Fill	13 Floor	13 Floor Fill	Room 19 Fill	19 Floor	Room 20 Fill	20B Storage Bin Fill	Room 21 Fill	21 Floor	21 Floor	Room 22 Fill	22 Storage Bin Floor	22 Floor Fill	Room 23 Fill	23 Floor	Room 24 Fill	Room 25 Fill	25 Floor	Room 26 Floor Fill	Room 27 Floor Fill	Room 28 Floor	28 Floor Fill	Room 29 Fill	Room 30 Floor	Kivo 2 Fill	2 Firebox Fill	2 Vent Fill	Totals by Type
LITTLE COLO GRAY	3			2									1							1													7
Gray Ware																																	
Little Colo. Corr	27	1	1	18																					1				3	2			53
Little Colo. Corr Sm	1																																1
TUSAYAN GRAY WARE									4			2		8							1									1			16
Tsagi Series																																	
Tusayan Corr	8			14																					1				1	21			45
Moenkopi Corr										1												2					2			2			7
GRAY WARE																																	
Plain Corr	7			9																							1						17
Indented Corr				6																													6
Indented Oblt. Corr	2																																2
Zoned Ind Pl. Cor	4			4																													8
Tooled Plain Corr	2																																2
BROWN WARE																																	
Plain Corr																																	
Indented Corr										1																							1
HOMOLOVI ORANGE																															3		3
Homolovi Corr (tot)	77	9	2	127	46	9	21	12		49	3		28	3	7	21			20	1	219	94	1	16	68	26	30	27	36	194			1146
Tusayan	51	4		76	24	4	7	5		5	1		15	2	2	5			4		16	4		1	7			3	12	21			269
Moenkopi	9			6	4	3	2			9	1		8		9						12	44	1	2	6	11	13	1	17	40			200
Kiet Siel	17	5	2	45	22	1	11	5		35	1		5	1	3	7			16	1	191	46		13	55	15	17	23	7	133			677
Homolovi Smudged	1																																2
Homolovi Plain	8	1		2	7		3	4		1			3								1			1									31
MOGOLLON BROWN																																	
Forestdale Series																																	
Woodruff Brown	1			2							1																			2			6
Woodruff Smudged	5			1									1		1				2											3			13
Winona Series																																	
Winona Corr	2			3																													5
WHITE MTN BROWN																																	
Linden Corr				4						12												2											18
PLAIN WHITE WARE																																	
WINSLOW ORANGE																																	
Winslow Series																																	
Tuwaca Orange	3			7						11	2		2				2					5					2		24	2			60
Chavez Pass ungl	3			5												20																	28
Homolovi Series																																	
Black Axe Plain	3			3		1	6	4				6								2				8					1				34
WHITE SLIPPED	3									2		2				1								1						10			19
White Slip Sm Ind																															1		1
Totals by Room	157	14	3	202	58	10	30	20	4	76	7	2	44	3	15	43	2		22	1	222	106	1	25	71	28	33	50	44	239			1532

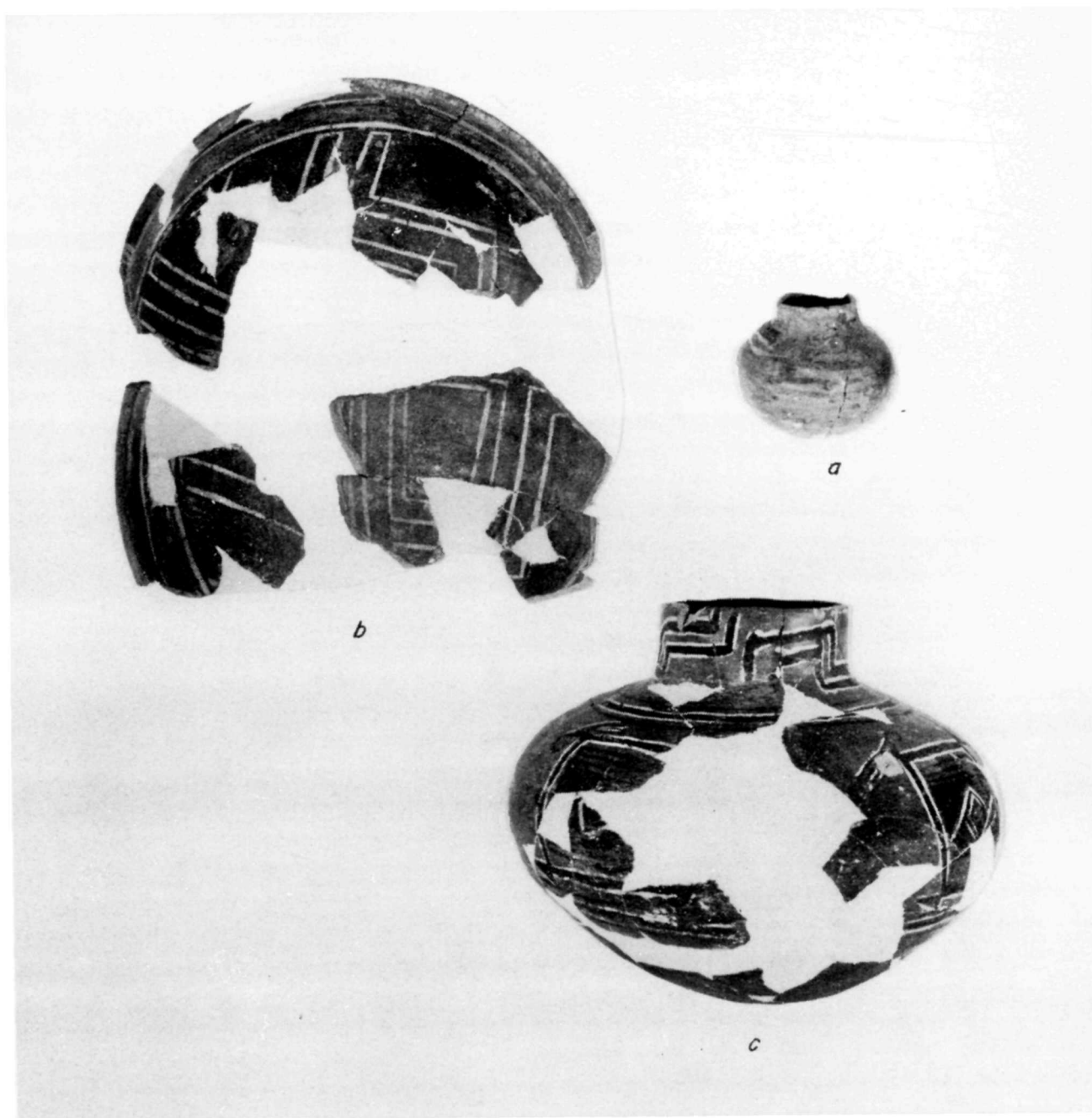


Figure 27. Chavez Pass Polychrome Vessels.
a, Miniature jar (Cat. No. R25.1); b, bowl fragments
(Cat. No. K2-3.1); c, large jar (Cat. No. K2.10).
Vessel a is 9 cm in diameter.

Finally, on Catalog Number K2.7, several areas of the vessel were decorated in white alone but the bulk of the decoration was black outlined by white on an unslipped orange surface. This vessel is certainly an example of Homolovi Polychrome but, again, sherds from some portions of them might be classified as Homolovi "White-on-orange" in the absence of larger vessel fragments or whole vessels for comparison. Schroeder's Homolovi White-on-red may be just such a case.

Another problem presents itself with Schroeder's new types, however, in that he says "These are new types which are the same as Homolovi Black-on-red and Homolovi Polychrome in all respects except for final decoration. Several large rim sherds and one restorable bowl of undecorated slipped red as well as ten sherds of white-on-red were recovered from different rooms" (1961:99). Following Colton (1956:Ware 6B) this is rather confusing as Homolovi Black-on-red is unslipped or only very lightly slipped on a dark paste. Homolovi Polychrome is not slipped and occurs on a lighter paste. The red slip referred to by Schroeder seems to better fit Chavez Pass Polychrome and Black-on-red rather than the Homolovi pair.

The Homolovi Corrugated vessels (Fig. 28) and sherds were sorted in terms of the nature of the coil treatment. The same variation in coil treatment was found in Homolovi Corrugated as occurs in the Tusayan Gray Wares and Table 4 reflects this variation in the use of the place name portion of the type binomial to designate the style of surface manipulation. The stylistic variation was not quantitatively investigated but a subjective review of the distributions shows no obvious deviations from what might be expected if no particular value were placed on one style over another.

Jeddito Yellow Ware

Awatovi Black-on-yellow was only firmly defined with the publication of Smith's (1971) analysis of the ceramics from the Awatovi Expedition's excavations on Antelopa Mesa in the 1930s. Jeddito Black-on-yellow had been the catch-all type for the black painted yellow ware from the Hopi country though Colton (1956:Ware 7B, Type 6) recognizes early and late varieties. Previous workers at the Puerco site, lacking Smith's data, lumped all of the material into Jeddito Black-on-yellow.

Examples of the two types are shown in Figures 24 a-d, 25 g, 29 and 30 b. The identification of the preponderance of Awatovi Black-on-yellow over the other Jeddito Yellow Ware types has substantially aided in establishing the time of occupation of the Puerco site given the absence of materials suitable for tree-ring dating. The Ware's presence also indicates close trade contacts with the Hopi to the north.

Other Wares

The remaining wares present in the 1967 ceramic collections are not particularly notable. The range of types and their geographic sources reaches, not surprisingly, from the White Mountains to the Zuni area. Both of these areas are adjacent to the Winslow Branch territory and were, as with the Hopi country, actively occupied during the late 14th and early 15th centuries A.D. The presence of Showlow Black-on-red in small amounts is not unexpected nor is the moderate amount of late PIII through PIII Black-on-white material. These latter types agree with the earlier occupation also implied by the architectural superpositioning reported by Schroeder and our own observations in Room 19 and Kiva 2.



Figure 28. Plain Ware Vessels.
a, Indented Corrugated (Cat. No. R27.1); b, Tusayan Corrugated (Cat. No. 24.2); c, Homolovi Corrugated (Cat. No. R30.1); d, Homolovi Corrugated (Cat. No. R23.1); e, Homolovi Plain (Cat. No. R28.3).

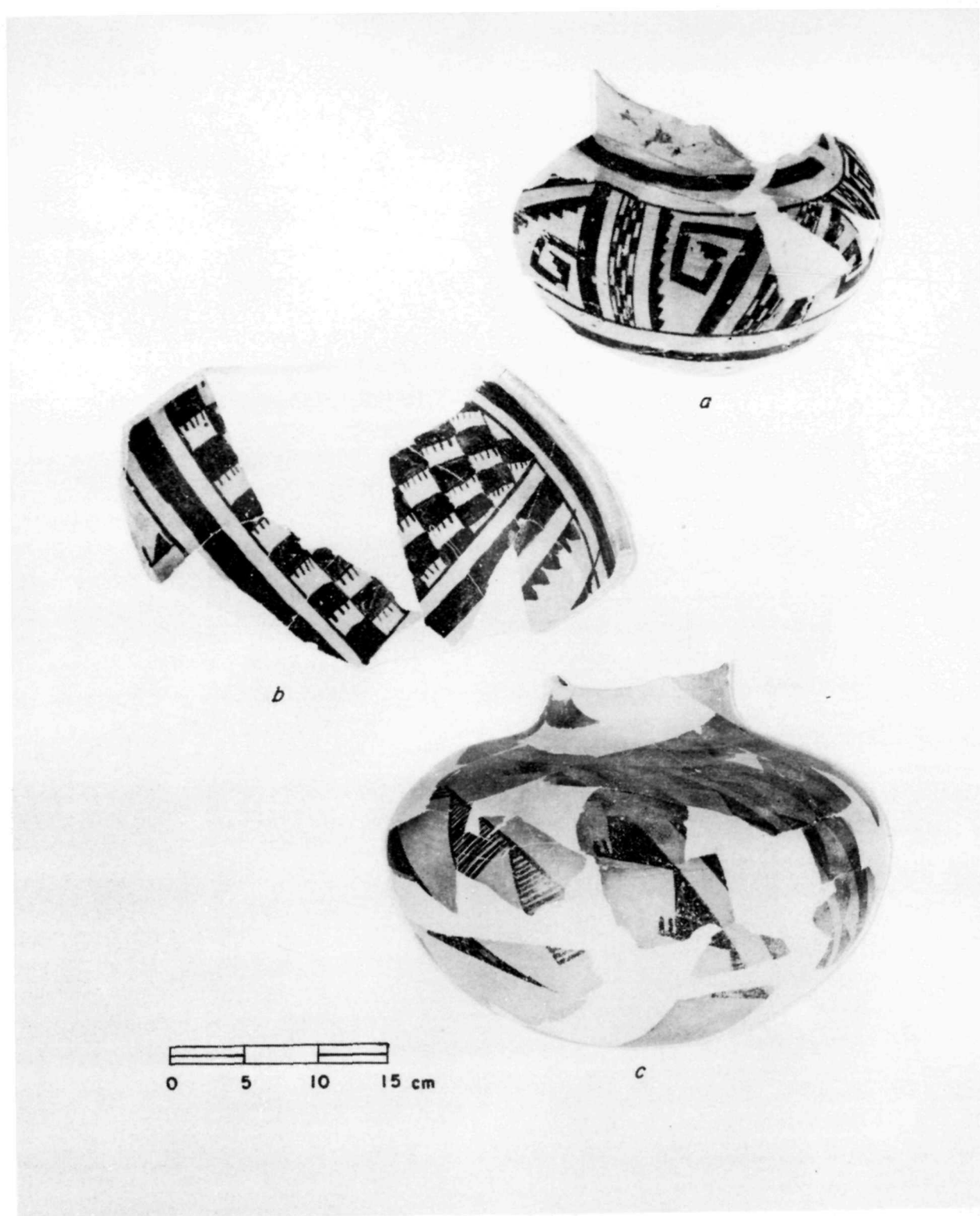


Figure 29. Awatovi Black-on-yellow Vessels.

a, jar fragment (Cat. No. R24.1); b, bowl fragment (Cat. No. R24.4); c, restored jar (Cat. No. K2.9).

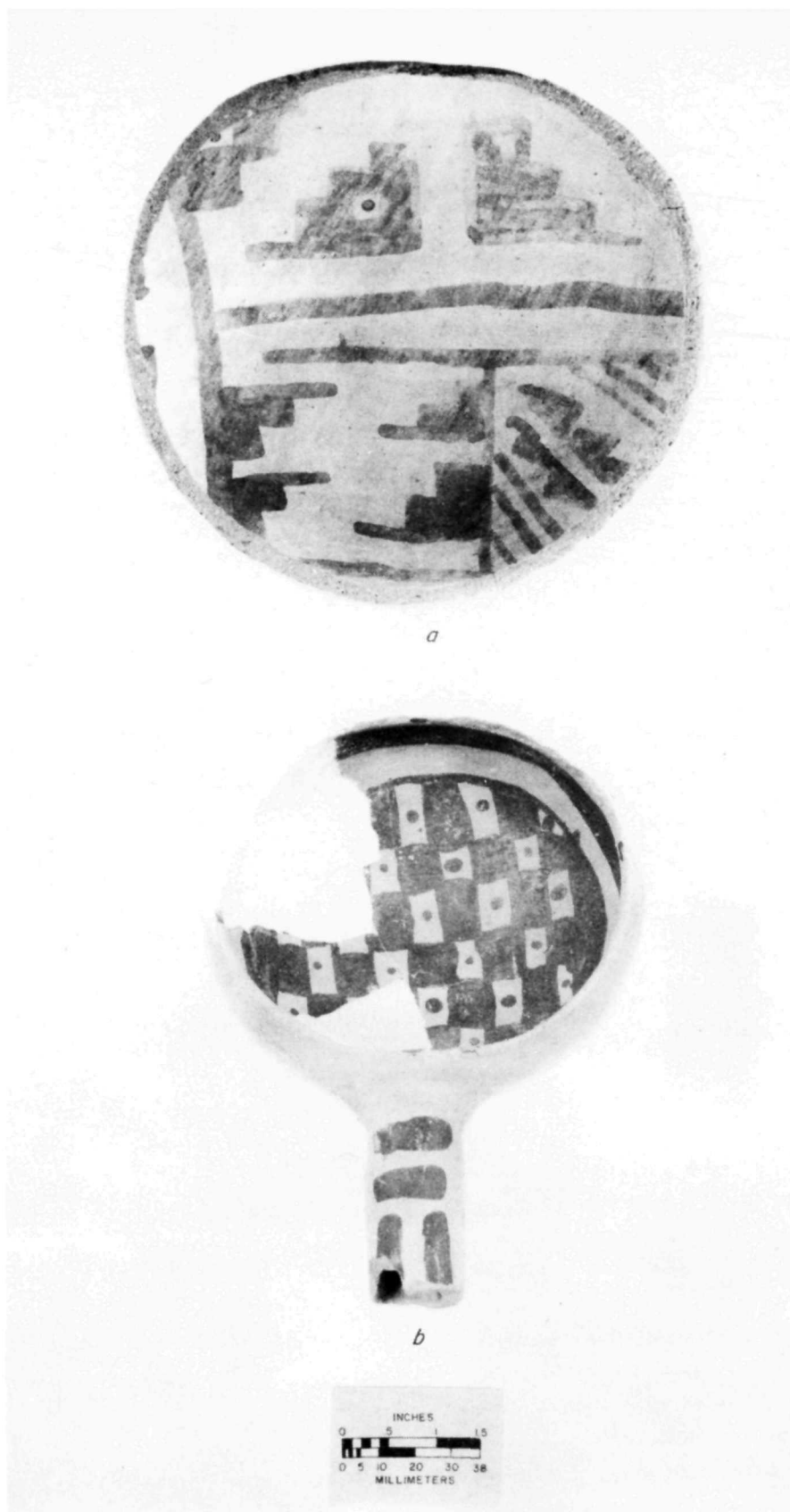


Figure 30. Miscellaneous Decorated Vessels.
 a, bottom sherd from a Pinto Polychrome bowl ground to a plate form (Cat. No. R26.3); b. Awatovi Black-on-yellow dipper, partially restored, portion of handle is missing (Cat. No. R26.4).

Good examples of Tusayan Corrugated (Fig. 28b) indicate contacts with northern peoples during the earlier occupation. These contacts may not have been limited to simple trade given the presence of the Kayenta utility ware. The large worked sherd (Fig. 30a), actually the symmetrically ground bottom of a large Pinto Polychrome bowl indicates direct contacts with areas in the Gila River region. The presence of Pinnawa Glaze-on-white sherds, even if in small numbers, along with examples of Kwakina Polychrome demonstrates the ties with the Zuni area.

Restorable Vessels: Winslow Orange Ware

Tuwiuca Black-on-orange

A single partial bowl (Cat. No. R24.3) with an incurving rim with a lip. The form, paste and temper characteristics all agree with Colton's (1956:Ware 6B, Type 2) description as does the layout of the decoration. The design elements differ somewhat in that a pattern of small open boxes laid out in a grid is used rather than those elements mentioned in the type description. The vessel measures 9 cm high with a maximum diameter estimated at 22 cm.

Homolovi Black-on-red

Cat. No. 25.5 was found spread between the fill of Kiva 2 and Room 25. The vessel is a bowl which measures 11.2 cm high and an estimated 24 cm in diameter at its lip. The paste is dark tempered with sand and other particles as described by Colton (Ware 6B, Type 7). No slip is evident. The decoration consists of a 2 cm wide black band 2.5 cm below the rim on the interior. The center of the bowl is missing but the lower portions of the wall are free of decoration. The paint is very thin and the band's boundaries are very vague. Some decoration may have been present in the

areas now empty as the results of natural deterioration of the inferior paint as discussed above.

Tuwiuca Orange

Another bowl, Cat. No. R30.3, is a deep vessel with strongly convex sides and an incurving rim. The form falls outside the range identified by Colton (Ware 6B, Type 1) but agrees in all other characters with his description of Tuwiuca Orange. The vessel is not well finished and has a light orange slip on a paste of the same color. Munsell 2.5R 6/6 gives the best approximation from the color chart included in Smith (1971). The bowl measures 10.6 cm high and has an estimated diameter of 18 cm at the lip.

Black Ax Polychrome

The single partially restorable specimen of this type (Cat. No. K2.8) is an incomplete jar. It could only be restored to two large sherds but enough detail is present to treat it in the restorable vessel category. The vessel has a very dark sand tempered paste with angular particles, red or yellow in color. It is slipped with a dark orange which extends partially down the interior of the neck of the vessel and appears as isolated smears on the interior of the body. Black decoration is used with white outlining and no independent white elements occur. The black elements present consist of black hachures with white filler and black outlined areas. The decoration is limited to the body of the large globular jar. On some portions of the body the paint has etched the slip leaving a negative design. The black paint has etched itself more deeply than the white. The jar is estimated to have been at least 25 cm high and 40 cm in diameter when complete.

Rigid adherence to Colton's description would leave this vessel without a home in that the slip is darker than the paste and not the red described by Colton. We feel justified in assigning the vessel to Black Ax Polychrome as it better fits here than in any of the other Winslow Orange Ware polychromes.

Homolovi Polychrome

Specimen Cat. No. K2.7 is another large sherd, accounting for about one-half of the original jar. The paste is a light orange on the exterior and gray in the core. The sand temper is readily observable and includes black or red angular fragments. The walls are unslipped. The decoration consists of black and white elements on the buff to orange field. The black elements include elongated solid triangles outlined in white. The white paint is more easily discerned as the black has deteriorated badly in most parts of the remaining surface. There appears to be use of white lines in isolation from black elements in a few areas. The vessel's size cannot be usefully estimated from the available fragments. The sherd was found in the fill of Kiva 2.

Chavez Pass Polychrome

Specimen Cat. No. 25.1 (Fig. 27 a) is a complete miniature jar found in the southeastern corner of Room 25 in a rectangular subfloor pit. The neck of the vessel appeared to be at the height of the room's floor. The jar measures 7 cm high, 4 cm in diameter at the mouth and 9 cm in maximum body diameter. The paste is light orange with sand temper visible where the red-orange slip has worn through or exfoliated. The decoration consists of parallel horizontal black and white lines which span the jar's circumference. Some of the white lines are quite dense over parts of the circuit,

turn abruptly black or disappear altogether in other parts of the vessel. The black lines are very faint and the remaining detectable black decoration is limited to one line on the upper part of the body and to a set of very faint, watery, discontinuous lines around the central portion of the body. This vessel is one of those indicating the problems encountered in classifying sherds of Winslow Orange Ware at the type level.

Another large jar, Cat. No. R25.4 was found in the fill, floor fill, and Hearth 1 fill of Room 25. This example of Chavez Pass Polychrome provides a good example of Colton's Winslow Orange Ware, Winslow Series paste (Ware 6B) and of the slip-core contrast one should expect of Chavez Pass Polychrome. The slip is red-orange (Munsell 7.5R 6/8 to 5/6) but has several fire clouds which introduce substantial variation from area to area over the body. The decoration is done in black outlined in white in the Tularosa style (Carlson 1970:90-91). The black has etched the slip. The decorative elements include circular interlocking scrolls and other geometric elements framed in black, outlined in white and hatched in black. The decoration is limited to the high rounded shoulder of the straight-necked jar. The vessel has a height of 27.2 cm, a mouth diameter of 11 cm and a body diameter of 33 cm. Three mending holes are present on the remaining sherds.

Cat. No. K2.6 was recovered from the fill of Kiva 2 in many sherds. Only about one-half of the vessel has been restored. The paste is light orange (Munsell 5YR 7/6) with sand temper and red, yellow or black angular fragments. The slip is darker (Munsell 7.5R 6/8 to 5/6) than the paste. The vessel is a bowl with an interior design band of black stripes and solid half terraces outlined in white. No decoration appears in the center

of the bowl interior. The exterior is decorated with black meanders outlined in white. The rim is bevelled. The restored portion of the bowl is 8.8 cm high and 22.8 cm in diameter.

Cat. No. K2.10 (Fig. 27 c) was in very fragmentary form when recovered from the Kiva 2 fill and is, in its restored condition, very nearly as much plaster as original vessel. However, the distribution of recovered sherds is quite good and the restoration is felt to be an accurate one. The paste is light orange (Munsell 5YR 7/6) with a gray core (Munsell N/6) and agrees thoroughly with Colton's description (Ware 6B, Type 5). The slip is red-orange (Munsell 7.5R 5/6) and quite thick in some areas of the vessel. The decoration is strongly reminiscent of the style used on Pinedale Polychrome. A dual set of parallel meanders encircle the neck of the jar. The body is decorated with a band of three panels, possibly originally four, filled with interlocking black frets outlined in white. The panel framing lines are also white outlined. The corners of the panels carry the "rain bird" element. The white paint is of uniformly high quality but the black paint is thin, though not as watery as found on other specimens of Chavez Pass Polychrome described here. The restored version of the jar measures 25.8 cm high, 11.8 cm in diameter at the mouth, and 32.5 cm maximum diameter on the body.

Specimen K2-3.1 (Fig. 27 b) is, as one might imagine for a vessel found in the fills of two different structures, Kiva 2 and Room 19, not in very good condition. As the illustration shows it has been restored to three large fragments. Restoration was not taken further because the final version would have been more plaster than pottery. The specimen is a medium-sized shallow bowl with an orange paste (Munsell 2.5YR 6/6) and a heavy, red-orange (Munsell 7.5R 5/6) which has been well polished. The decoration of the interior includes a broad black line below the rim

broken to open the central portion of the interior to the rim. The rest of the interior is decorated with weak black hachured elements, which have etched the slip in places, outlined in white. Korbelled lines, solid triangles, and rectilinear scrolls make up the decoration. The exterior has a black figure outlined in white but is too fragmentary to identify.

Affinis Gila Polychrome

This specimen, Cat. No. R25.3 (Fig. 26 a) is an excellent example of the attempts of local potters to imitate the styles of other regions. The imitation does not come off at all well due to some of the worst workmanship found in the Puerco site's ceramics. What remains of the vessel is about one-half of the body wall, the neck, shoulder, and base are missing. The paste is typical Winslow Orange Ware in that it is buff in color and has abundant sand temper including red, black, or yellow angular fragments. The fracture is crumbling and the core texture is medium to fine. A heavy dark gray slip has been applied to the outer surface and that was in turn covered with a light gray to white wash. The watery carbon paint was then rather sloppily applied in a band of solid triangles, oblique stepped lines, diagonally aligned squares and dots in rectangles. The band is framed above and below by a bold black line. No orange or red slip is apparent but the vessel is too fragmentary to rule out or assume the existence of a different color slip on the base or neck. This vessel fragment is from the fill and floor fill of Room 25 but portions were also found in the fill of Room 19. The jar was quite large judging from the 15 cm height and 32 cm estimated diameter of the fragment.

Affinis Kwakina Polychrome

The mechanical characteristics of the paste of Cat. No. R28.6 (Fig. 26.b) agree with the descriptions of Winslow Orange Ware cited above.

The paste color is orange (Munsell 5YR 7/6) but the slip is a cream color (Munsell 10R 6/8 is the best match from the chart in Smith 1971). This surface color agrees with the description given by Woodbury and Woodbury (1966:312) as do the form, decoration, and surface finish attributes. A red slip (Munsell 7.5R 5/6) extends from the rim 2.5 cm down the incurving wall of the bowl. The rim has a pronounced lip. A sloppy black line runs around the bowl interior setting off the red and cream slipped areas. A faint rectilinear design is on the bowl interior. The exterior evidently had a set of parallel white lines running around its circumference. Unfortunately the fragment is too small to obtain reliable estimates of the original vessel size. The fragments from which the recovered portion of the vessel was restored were all found in the floor fill of Room 28.

Affinis Awatovi Black-on-yellow

Cat. No. R25.6 (Fig. 26c) was restored from sherds found in the floor fill, on the floor and in Hearth 1 of Room 25. The restored portion of the bowl accounts for about one-third of the original vessel size. The paste is identical with that seen in all of the previously described Winslow Orange Ware vessels. The core color is pink to red (Munsell 2.5YR 5/4). The exterior has been slipped nearly white (Munsell 10YR 8/1) and has been decorated with three open squares with single dots. The interior slip is a buff (Munsell 2.5Y 8/2). There is no indication that the slip was polished. In the central portion of the bowl interior the slip is crazed. The decoration consists of a semicircular zone in the center of the vessel which has been divided into three areas crossed by three diagonally running series of solid squares. Each square is joined to its neighbors at the diagonally opposite corners. The divisions between the panels of solid squares have been set out as panels themselves made up of four vertical black lines. Four of these line panels are present in the

decorated zone. A nearly identical design is illustrated for Awatovi Black-on-yellow by Smith (Fig. 264e). The paint is the usual watery black but no etching of the slip is evident. The remaining fragment of the vessel is 10.2 cm high and 24 cm long indicating a bowl of substantial size.

Restorable Vessels: Homolovi Orange Ware

Homolovi Corrugated

The specimen cataloged as R23.1 (Fig. 28 d) is a widemouthed medium sized jar or olla, with a flaring rim. The base is rounded and convex with clear impressions of the basket in which the vessel was rested during the coiling and subsequent obliteration. The obliteration of the coils achieves much the same effect as that found on Kiet Siel Gray. Fire clouds are present. The physical characteristics of the core, temper and paste agree well with the current description (Colton 1956:Ware 6A, Type 1). This is true of the remaining five restored Homolovi Corrugated vessels as well and no further reference will be made to paste, temper, fracture, core color or construction. The vessel measures 23.8 cm high, 21.3 cm in diameter at the mouth and 24.9 cm in diameter in the body. The specimen came entirely from the floor and floor fill of Room 23.

The Homolovi Corrugated jar from the floor fill of Room 27 was cataloged as R27.1 (Fig. 28 a). The vessel is incomplete, missing the base, but measures 18.5 cm high at present, 17.7 cm in diameter at the mouth, and 21 cm in maximum body diameter. The corrugations have not been modified significantly in the same manner characteristic of Moenkopi Corrugated. The exterior of this vessel has been heavily carbonized indicating long use over a smokey cooking fire.

Cat. No. R28.5 was collected from the floor of Room 28 with only a portion of the base missing. It is a large, rounded, low shouldered jar

with an outcurving rim. It measures 28.5 cm high, 25 cm in diameter at the mouth and 35 cm in diameter through the body. The coils on this vessel have been obliterated around its neck and mouth. In addition the coils on the base have been partially obliterated and basketry impressions are absent. This indicates that the vessel may have been placed on a large sherd rather than a basket so that it could be easily rotated during the fabrication and finishing phases.

The Homolovi Corrugated jar cataloged as R30.1 (Fig. 28 c) is a large globular vessel with a flattened and flaring rim. The uppermost coils, between three and five of them, have been completely obliterated providing a smooth rim and neck. The coils on the rest of the upper half of the vessel have been flattened but are still clearly visible. On the lower half they have been completely obliterated. There are uneven areas on the base of the vessel which may be obscured basketry impressions. The vessel is complete, having only a few plaster patches, and measures 30.9 cm in height, 24.2 cm in diameter at the mouth, and 32.4 cm in diameter through the body. The sherds were scattered over the floor, and through the floor fill and fill of Room 30.

Room 30 also produced Cat. No. R30.2, a medium sized, globular Homolovi Corrugated jar with a flattened but still flaring rim. The pattern of coil manipulation is the same as that seen on Cat. No. R30.1 in that the coils are obliterated on the rim and upper neck, flattened on the rest of the upper half of the body and obliterated on the lower half. No discontinuities were visible in the surface of the base which might indicate the vessel rested in a basket prior to firing. About a quarter of the vessel body and half of its rim are missing. Nonetheless complete dimensions can be estimated. The height is 25 cm, the mouth diameter is 21 cm, and the maximum body diameter is 26.3 cm. The vessel's sherds were found in the fill, floor fill and on the floor of Room 30.

Vessel K2.12 is the last restorable Homolovi Corrugated jar to be described here. Most of the neck and about a half of the body and base are missing. The body is globular as in the preceding examples. All of the remaining portions have had the coils obliterated and the base shows no signs of basketry impressions. The dimensions of the original vessel cannot be estimated from the remaining fragments. The sherds were found throughout the fill of Kiva 2.

Homolovi Plain

The only restorable Homolovi Plain vessel (Cat. No. R28.3, Fig. 28 e) is unusual in that it is a plate, a form not usually associated with Homolovi Orange Ware vessels. The paste is consistent with Colton's (1956: Ware 7a, Type 2) descriptions as are the other technical physical attributes. The surface is surprisingly rough with temper at least tactilely sensible through the cream to buff wash on the exterior. A single fire cloud is present on the face of the plate. Striations are readily evident on both surfaces. The plate was found on the floor of Room 28. The diameter of the remaining portion is 23.3 cm. The specimen is of interest primarily because the form is one normally associated with later PIV ceramics in the Hopi and Zuni areas. This is a surprisingly early version.

Restorable Vessels: Jeddito Yellow Ware

Awatovi Black-on-yellow

Contrary to the impression given in the sherd and vessel counts from earlier excavations at the Puerco site, Jeddito Black-on-yellow is not the most commonly occurring form of Jeddito Yellow Ware. The change in view point results from thy revision of the type content of the ware by Smith (1971). He has been able to define a very consistent earlier type

which he named Awatovi Black-on-yellow. We found, with some help from the staff of the Museum of Northern Arizona, Awatovi Black-on-yellow would be easily separated from the later Jeddito Black-on-yellow. At the Puerco site, at least in the sherds and vessels recovered in the 1967 excavations, we found Awatovi Black-on-yellow to be dominant. That dominance is reflected in the fact that not one Jeddito Black-on-yellow vessel was recovered. Even Jeddito sherds occur in relatively small numbers. All of the following vessels are Awatovi Black-on-yellow and they all conform to the description given by Smith (1971:474-527). The following discussions will be limited to descriptions of form, design, and provenience.

Cat. No. R24.1 (Fig. 29 a) is a jar with a parallel sided neck and a narrow mouth. The sherds were found in the fill and on the floor of Room 24. The restoration is incomplete leaving only about one-half of the side wall present. The decoration on the portion of the vessel remaining for study is limited to double-framed band around the body. The band contains repeated panels of diagonal broad lines joined to broadline rectangular scrolls with key elements at the center of each. Other panels consist of checkerboard bands running obliquely to the interior framing line of the band. Diagonal saw-toothed lines also occur in the band. Broad lines encircle the neck and body. The line around the neck is broken. Not enough of the vessel remains to tell if the body line is also open. The paste and surface are of the same color, ranging from 7.5YR 8/4 to 8/6. The paint is a fairly dense material with a fired color closest to 2.5YR 4/2. The elements in the design seem to represent a combination of elements typical of Awatovi Black-on-yellow and Jeddito Black-on-orange. However, the color of paste, paint, and surface all place the vessel clearly in the Awatovi range.

Cat. No. R24.4 (Fig. 29 b) is a bowl fragment found in the floor fill and fill of Room 24. A few sherds were also found in the fill of Room 25. The hemispherical bowl is small, only 18 cm in diameter. The decoration is laid out in quarters in the center of the bowl interior. The design is in panels with one checkerboard which has ticks on one side of each square. Two fragmentary panels remain which have sawtooth lines. A solid line encircles the interior just below the rim and solid lines separate the panels. The exterior has a portion of a stepped key design. The paste has a color closest to 7.5YR 8/4, the surface color is 7.5YR 6/6 and the paint is 5YR 2/1. Again, the design seems to combine elements from both Awatovi Black-on-yellow and Jeddito Black-on-orange.

The only dipper recovered in the 1967 excavations is the next specimen, Cat. No. R26.4 (Fig. 30 b). The dipper was found in the floor fill of Room 26. The bowl measures 5.1 cm high and 12 cm in diameter. The remaining portion of the handle is 4.7 cm long. The interior of the bowl is decorated with a checkerboard pattern in which the open squares have been elaborated with a single central dot in each. The layout is circular. A broad line circles the interior just below the rim and is broken at the point where the handle joins the bowl. Three linearly arranged dots lie just under the rim and above the break in the encircling line. Other dots occur on the rim in a distribution implying four equidistant clusters of three dots each. The hollow handle is decorated with broad lines occurring in parallel pairs. Each pair is perpendicular to its neighboring set. The dipper was evidently not discarded when the handle was broken as the exterior rim of the break is polished suggesting that it rubbed against some pliant object for some period before it was thrown away. The surface color of the dipper is 5YR 7/8 and the paint color is 5YR 2/2. Both the design and the colors of the paint and surface fall within the ranges of Awatovi Black-on-yellow

but these values also overlap Jeddito Black-on-orange. The decision to classify this vessel as Awatovi Black-on-yellow is based primarily on the handle's construction and decoration. Smith (pp. 528-534) reports that for the Awatovi collections hollow handles with decoration occur slightly more frequently on Awatovi Black-on-yellow than on Jeddito Black-on-orange ladles.

Cat. No. R13.3 is a small deep bowl which measures 7.4 cm high and 15 cm in diameter. It was recovered from the floor and floor fill of Room 13. The decoration is limited to the interior of the bowl. It consists of a line around the wall of the vessel which is broken as the rim lines are in larger bowls. Below this broken line is a band of decoration made up of two rows of triangles. The upper row consists entirely of solid forms. The lower row has open triangles each of which is crossed by two ticked lines. The ticked lines are parallel to the hypotenuse. The two rows of triangles are interlocked to form a wide negative zig-zag line. Below the band of interlocked triangles are two narrow continuous lines and, finally, nearest the open center of the bowl is a 2.75 cm wide line. This innermost line is also continuous. Nothing comparable appears in the illustrations of Awatovi or Jeddito Black-on-yellow, or Jeddito Black-on-orange in any of the sources consulted.

The last Awatovi Black-on-yellow specimen, Cat. No. K2.9 (Fig. 29c) is a large jar with a slightly outcurving neck and strongly convex sides. This large vessel was restored from many small sherds and has substantial areas in plaster. Nonetheless the distribution of sherds is such that reasonably accurate estimation of its size is possible. The vessel measures, as presently restored, 25 cm high, 12.5 cm in diameter at the mouth and 34.7 cm in diameter through the body. The sherds all came from the fill of Kiva 2. The decoration consists of a bilateral layout in panels on the wall of the jar. The elements include triangles with double hooks, hachured triangles,

bold sawtooth lines and broad solid lines all oriented obliquely to the horizontal line encircling the vessel above the decorated band of panels. No color analysis was made as there was substantial variation from sherd to sherd in the restoration. The vessel parts evidently have a highly varied history and determination of the original colors is impossible. The elements in the decoration all appear on a number of Awatovi Black-on-yellow vessels illustrated by Smith (pp. 495-515).

Restorable Vessels: Gray Wares

Tusayan Corrugated

The only restorable Tusayan Gray Ware vessel, Cat. No. B24.2 (Fig. 28'b) is a Tusayan Corrugated jar found on the floor of Room 24 with a few sherds appearing in the fills of Rooms 23 and 25. The restoration is complete and produced a vessel 27.8 cm high, 26 cm in diameter at the mouth and 37.2 cm in diameter through the body. The vessel is a large round shouldered jar with a short neck and flared rim. The coils are moderately indented. A few of the shoulder coils have the indentation pattern interrupted for a short distance. This vessel is a rather surprising find at the Puerco site given the intensity of reliance on local utility wares of later age. The vessel's presence may indicate greater interests in the trade of utility wares during the earlier period of occupation at the site.

Partially Obliterated Corrugated

Specimen R24.5 is a badly distorted jar fragment. Parts of the specimen were found on the floor of Room 24 while other sherds were recovered from the fill of Rooms 23 and 25. The dimensions of the vessel cannot be adequately estimated from the remaining section. The paste is gray. The temper includes rounded quartz sand, angular white particles and occasional subangular red or black particles. There are also objects with a mica-like appearance. The degree of obliteration of the coils

increases with increasing distance from the flared rim. The paste is similar to that of Little Colorado Gray Ware but the surface treatment of the vessel is like no example of Little Colorado Corrugated we have been able to observe for comparison. The surface treatment seems to agree more with styles employed further east but the paste attributes do not correspond with the gray wares described for that region. Consequently, this jar and the next to be described hang in a taxonomic limbo awaiting definitions of utility types for the region surrounding the Rio Puerco of the West by a future worker with a sample of more than two vessels.

The fire box of Kiva 2 yielded Cat. No. K2.11. This is a large globular large mouthed jar with a rounded shoulder, flaring rim and a diameter of 48.3 cm. The height cannot be determined as much of the lower portion of the vessel is missing. The corrugation has been indented and then lightly smeared or rubbed. The paste is a medium to coarse dark gray tempered with a combination of rounded quartz sand and crushed rock fragments. This vessel's characters agrees with no one available type description better than with any other list of typical attributes.

Interpretation

The raw sherd distributions presented in Tables 3 and 4 have been reduced to a more useful format for interpretation in Table 5. The arrangement in Table 5 indicates the most likely order of occupation and abandonment based on the sherd counts from each room. The floor contact sherds and the fill and floor fill sherds have similar patterns indicating that the seriation measures the same span of time with the same rough order of change. The table does not include the restorable vessels which will be incorporated in the following discussion.

Table 5

FILL & FLOOR FILL

	BLACK ON WHITES		JEDDITO YELLOW WARE			WHITE MOUNTAIN RED WARE		WINSLOW ORANGE WARE	MOGOLLON BROWN	Percentage of TOTALS
	Pre 1200	Post 1200	Awatovi B/Y	Jeddito B/Y	Other	Pre 1200	Post 1200		Showlow B/R	
ROOM 10								100.0		.8
ROOM 29				50.0				50.0		5
ROOM 22				22.2			22.2	50.0	55	4.8
ROOM 20			11.1	11.1				77.8		2.4
ROOM 23			50.0				50.0			.5
ROOM 24			50.0					50.0		.5
ROOM 19			100.0							12.4
ROOM 26			40.0				20.0	40.0		1.3
KIVA 2	1.3		30.1	5.3	18.7		5.3	38.7		20.2
ROOM 25	4.8		47.6		9.5			38.1		5.6
ROOM 13	16.7			50.0	5.6		11.1	16.7		4.8
ROOM 21	28.6		71.4							1.9
ROOM 27	45.4	9.1		9.1	9.1		9.1	9.1	9.1	3.0
ROOM 7	69.6			1.4	1.4	1.4		13.0	13.0	18.5
ROOM 4	76.2	4.8		2.4		2.4		2.4	11.9	22.6
Percentage of Total	33.3	1.3	23.9	6.2	5.1	.8	3.5	20.2	5.6	

FLOOR CONTACT

ROOM 22								100.0		9.0
ROOM 20B					100.0					6.0
KIVA 2			100.0							31.3
ROOM 28	8.0		64.0	4.0	4.0		4.0	16.0		1.5
ROOM 19			52.4		4.8			42.8		3.0
ROOM 21			50.0				50.0			3.0
ROOM 30	25.0		25.0		25.0			25.0		37.3
ROOM 13								100.0		6.0
ROOM 7	50.0							50.0		3.0
Percentage of Total	9.0		46.3	1.5	5.6		3.0	34.3		

A word about the construction of the columns in Table 5 is appropriate. The types represented by the various columns are those present in Table 3 which have reasonably secure tree-ring dates as indicated by Breternitz (1966). The exception is Winslow Orange Ware for which Breternitz (1966: 78) was only able to use the same estimates applied by Colton (1956:Ware 6B) for Homolovi Polychrome and Black-on-red. These dates, A.D. 1300-1400, are supported only by poor tree-ring evidence for Homolovi Polychrome according to Breternitz.

On another level, the reader should be cautioned about the rather low sherd frequencies and their effect on the apparent sequential development in Table 5. For example, the 100 percent of floor contact "other" Yeddito Yellow Ware in Room 20B consists of only four sherds.

It is immediately apparent that the fill of Rooms 4, 7, and 27 represent a much earlier period than the same levels in the other rooms. The presence of small but informative amounts of pre-1200 Black-on-white pottery in the fill of these rooms indicates that they may have been occupied at an earlier date or that they were abandoned earlier than some of the other surface rooms and were filled with trash relevant to the earlier period. This latter explanation seems the more likely.

No restorable vessels were taken from either rooms 4 or 7 leaving the question open. The Indented Corrugated vessel from Room 27 does little to resolve the issue there either. What is clear from this part of the analysis is the presence at the site of an occupational component dating from some time in the 12th century. Using the dates determined by Breternitz (1966: 102), this agrees in part with the interpretation of the architectural evidence and with the age estimates of the McDonald Phase offered by Gumerman and Skinner (1968:191). The rarity of post-1200 Black-on-white types at the Puerco site implies that there may have been an occupational hiatus there lasting from A.D. 1200 to 1300. It is after 1300 that Jeddito Yellow

and Winslow Orange Ware become popular in the region. The abandonment possibility is also supported by the White Mountain Red Ware distribution.

In comparing the Puerco site sherd counts with those from Awatovi it seems clear that the later component is representative of Smith's (1971: 19-24) ceramic groups B-4 or B-5. Comparison between the two assemblages is complicated by the absence of the orange polychromes at the Puerco site and the absence of Winslow Orange Ware at Awatovi.

The sherd distributions do little to help in identifying which rooms may have been abandoned earliest aside from the vague interpretations already offered. However, at least in the case of Rooms 19, and 23-25 the restorable vessels give a little clearer picture. Room 24 produced five restorable vessels from its floor and floor fill. Of those, three have sherds which appeared in the fill of Rooms 23 and 25. It is clear that the latter two rooms had already fallen into disuse before Room 24 was abandoned. Room 24 must have been among the latest of the rooms abandoned at least among those excavated to date.

Similar reasoning applies to Rooms 25, 19 and Kiva 2. Here sherds from the floor fill of Room 25 occur in Room 19's fill. Also, sherds from a vessel found in the fill of Kiva 2 were found in the Room 19 fill. Apparently, the fill of the two subterranean structures dates from the same approximate time as the floor fill of Room 25. These mixings of sherds from the same vessels support the argument that Room 24 was being used actively at a time when not only Room 25 but Kiva 2 and Room 19 were being filled.

A similar but, because of their isolation, less useful linkage occurs in the western wing where sherds from a vessel found in the floor fill of Room 30 also were found in the floor fill of Room 27 and the fill of Room 29. Perhaps Room 29 had been abandoned slightly earlier than Rooms 27 and 30. Both Rooms 27 and 30 had substantial amounts of artifactual material on

their floors, and may have been occupied as late as Room 24. Room 29 had apparently been cleaned of all useable material before the fill process began.

Another potentially late area of occupation is indicated by the presence of two Jeddito Black-on-yellow and a "plain undecorated Showlow bowl" (Cosgrove 1934:10) in Room 3. Schroeder (1961) reidentifies the Showlow vessel as "Homolovi Red." Room 3 had obviously burned in the same manner as Room 21 and had not had time to fill with the aeolian sand found on several of the other room floors. Also, the presence of restorable vessels on the floor indicates that the room burned while in active use. The Jeddito Black-on-yellow vessels point to a later time in the site's history and leave us with no choice to assume that the interconnected complex of Rooms 1-3 was occupied near the end of the village's existence.

A similar situation is also reported by Schroeder (1961:97-98) for Rooms 8, 10 and 11. These rooms are interconnected, one of the trio had burned but Schroeder did not excavate Room 10. Three Homolovi Corrugated vessels on the floor of Room 11 give it much the same appearance as Room 30. We found no dateable material on the floor of Room 10 and only two sherds of Homolovi Polychrome and one of Chavez Pass Polychrome in the floor fill of the room along with 58 undecorated sherds. The doorways argue for integrated use of the three rooms and the situation in Room 11 points to use during the latest part of the village's habitation, some time after A.D. 1300.

In addition to the chronological information implicit in the ceramic data there is also room for making inferences concerning the relationships with neighboring groups in the region. First, it is obvious that the occupants of the Puerco site were in close contact with the developing Hopi peoples to the north. The substantial influence of the Hopi is indicated by the relative abundance of Jeddito Yellow Ware in the sherd and vessel collections.

It is interesting that, even when the Winslow Branch peoples had access to a superior utility ware in the form of the Awatovi Yellow Ware they retained their allegiance to their own Winslow Orange Ware though it must certainly have been less durable.

Second, it is equally interesting that the White Mountain Pueblos and the Zuni exercised relatively little influence at least in the trade of pottery. Some of their styles are imitated at the Puerco site and a few sherds of their vessels are present in the inventory but, considering their proximity is roughly the same as that of the Hopi, it is surprising that these two areas did not show greater influence in the Puerco valley. It is possible that a closer linguistic and general cultural relationship existed between the Winslow Branch and the Hopi than the Winslow peoples had with either the White Mountain groups or the Zuni. The implication is in keeping with Fewke's (1896, 1898, 1904) speculations concerning Hopi-Little Colorado valley relationships.

CHAPTER VI

NON-CERAMIC ARTIFACTS

Introduction

The non-ceramic artifactual yield was surprisingly low for a late PIII-early PIV site. The low yield may be partly the result of the excavation technique which excluded screening the room deposits. Though commonly accepted as appropriate procedure at the time of the excavations it is nonetheless a highly suspect approach to the recovery of non-ceramic materials. The debitage shows the effects of not screening in the absence of retouch or resharpening flakes. Other small items such as beads are also missing from the inventory. That gap cannot be assigned any cultural meaning in the context of gross architectural feature approach taken to the excavations.

That the previous efforts at the Puerco site obtained similarly low yields of non-ceramic artifacts is not significant. The excavation methods employed in the earlier excavations were essentially identical with those employed in the 1967 effort. Given these limitations very little can be done with the interpretation of the non-ceramic artifacts. Description and comparison with the materials found at other sites in the region leads to some subjective evaluation of the behavioral implications of the artifacts. These implications can only be read in normative terms, however.

The gross nature of the excavations notwithstanding, some unusual and potentially informative objects were recovered in the 1967 effort. The presence of these items in the site assemblage helps at least to expand our view of the complexity of the non-perishable realm of Winslow Branch

culture after 1300. Further indications are also present concerning the nature of potential regional sub-cultural ties.

Altar Slab

The most intriguing item recovered from the excavations is a fragment of a thin painted sandstone slab (Fig. 31) which was found face-down on the floor of Room 7 (Figs. 7 and 8). The fragment was found in six pieces which were rejoined to produce the partial restoration shown in Figure 31.

The specimen measures 26 cm x 19.8 cm and is about 2 cm thick. The length and width dimensions are incomplete.

The slab is painted in red, yellow and black on the natural yellow-brown field of the sandstone. The field has been divided into at least three panels which are oriented horizontally, in Figure 31, and a vertical border panel, all framed with narrow black lines. The border panel has black single stepped elements which run from the shaped edge of the slab to the framing line. The stepped elements have been framed in fine dark black lines some of which have deteriorated and are difficult to detect on the specimen.

No decoration could be found in the portion of the uppermost horizontal panel.

The second horizontal panel from the top of the slab has two bold zig-zag lines crossing it, one in red and one in yellow. The space between the two painted lines is equal to their widths and actually constitutes a third bold negative zig-zag in the color of the sandstone. The upper margin of the upper, yellow line is framed in a black line of the same width as the panel framing lines. Similar treatment has been given to the lower margin of the lower, red zig-zag. The framing lines

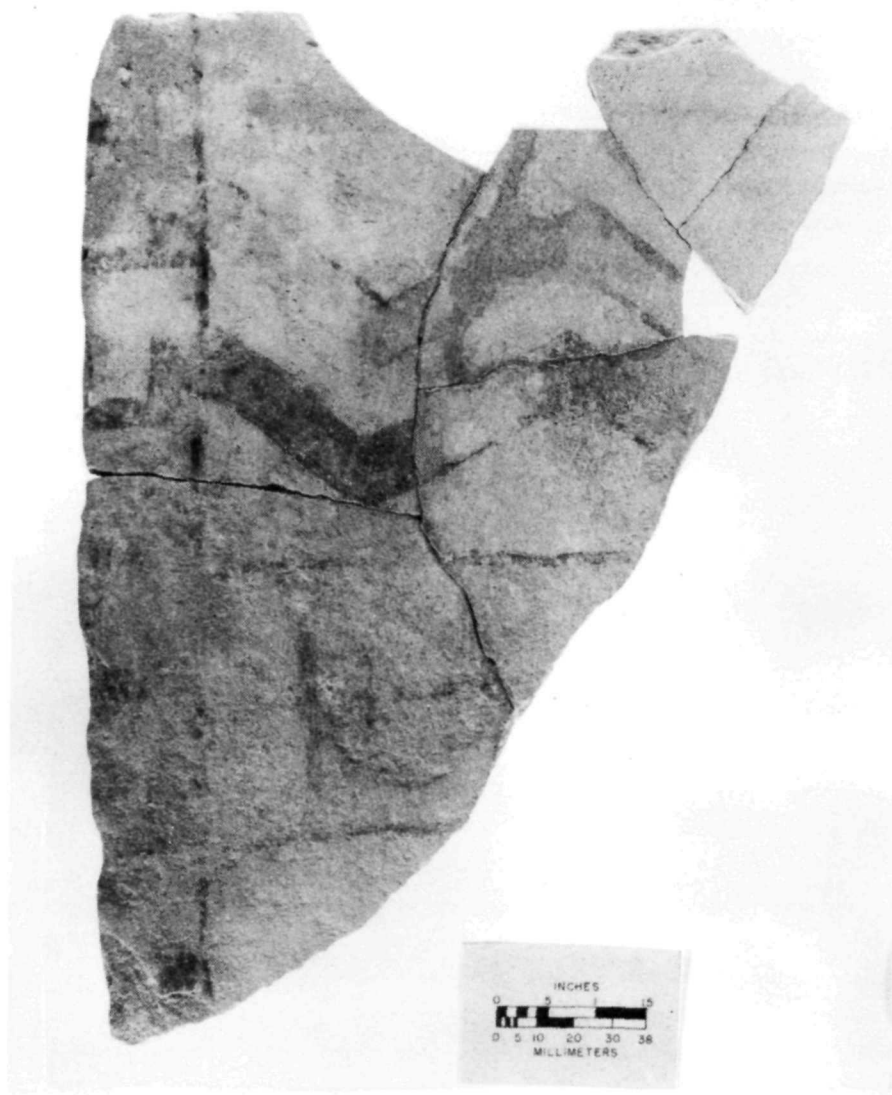


Figure 31. Alter Slab.

on the interior margins of the two painted zig-zags is about the same width as the framing used on the stepped elements in the border panel.

The third horizontal panel from the top of the slab, as oriented in Figure 31, has only a set of one black horizontal line intersected by two black perpendiculars. The left perpendicular is about twice as long as the right line and about three-quarters the length of the horizontal.

There is no evidence of the presence of a central circular void in the slab though we may have only the corner of a very large slab.

Similar specimens have been found at the Pinedale Ruin (Haury 1931: 56-59) and at Chevelon (Fewkes 1904:104-105). The Pinedale slab though found broken has been restored nearly complete to its original form and measures 19 in (48.3 cm) by 16 in (40.6 cm) and is 0.75 in (1.9 cm) thick. There is a 10 in (25.4 cm) void in the center of the slab. The stone was polished before painting and then treated over its entire surface with a thick kaolin wash. The decoration, including black framed yellow zig-zag lines on either side of the central hole, solid black pendant triangles on the upper margin, and horizontal straight yellow and black lines.

The Chevelon slab was found in a burial and is painted on both faces. Fewkes (1904:Plate 46) illustrates one face which he describes as having a rain-cloud design. The decoration consists of a single rectangular area which is framed with a single white line and a black painted area with indistinct outer borders. The field of the panel is yellow but it is not clear whether it is painted or simply the color of the native stone. Three black triangles nearly completely fill the lower framing line. Their apices are about three-quarters of the distance from the bottom to the top of the panel.

Each triangle has an interior white square which is small enough to not reach the margins of the triangles. Perched atop the apex of each triangle is a bird, which looks very much as though it is meant to represent a macaw, which has a red body, red and white tail and white beak. The central bird has two small black dots which could be meant to be eyes. Fewkes gives only a titilating comment on the decoration of the reverse of the slab when he describes it as having "highly suggestive designs of a symbolic nature" (1904:105). No indication of the size of the slab is given other than that it is larger than those used in ceremonial activities by the Hopi which Fewkes (1894:41-43) describes elsewhere as being 14 in (35.6 cm) by 10 in (25.4 cm) and 1.5 in (3.8 cm) thick.

Haury (1931:59) cites reports of painted slabs from the Whipple Ruin at Showlow where four slabs were recovered in living rooms. Fewkes (1904:162) also reports the recovery of four slabs at the Fourmile Ruin and indicates that one may have been found at Homolovi but he nowhere else mentions such a find. According to Haury (1931:59) none of these other specimens have central voids as does the Pinedale example.

Fewkes (1894:41-43) describes in detail slabs used on the Antelope altar at Walpi and mentions (1904:104) their use in the "snake rites at Shumopovi" (p. 104) and on flute altars. Stevenson (1904:94-102) describes the use of similar wooden slabs in Zuni ritual. There seems no doubt that Haury is correct in his observation that "It is not improbable that the stone slab . . . is precursory to the wooden tablet in use today and that both are manifestations of a ceremony that has survived for 600 years or more" (1931:58).

The Pinedale slab came from close association with a series of tree-ring dates, including an outer ring date of A.D. 1288 implying construction of the room between A.D. 1275 and 1325 (Bannister, Gell and Hannah 1966:36-37).

This date does not seriously conflict with Haury's (1931:58) date of 1286. Likewise, the date is reasonable for the Puerco site based on the ceramic evidence alone.

We have no difficulty, given the body of archaeological and ethnographic evidence in assigning a ceremonial function to this particular object. The situation is definitely not the oft cited resort to a hypothetical ceremonial function for some artifact for which no utilitarian function readily comes to mind. The occurrence of similar slabs in living rooms and burials and not in kivas is intriguing but cannot be explained at this time.

Chipped Stone

The chipped stone assemblage at the Puerco site was surprisingly small considering the availability of suitable materials within easy travel distance of the village. Perhaps naively, we had expected substantial numbers of chipped stone tools made from silicified wood. The material is highly suitable and was used widely in prehistoric technologies. In addition, as noted in Chapter I, several of the nearby outcrops of geological formations have the potential for yielding suitable silicious materials.

Only two tools with complete bifacial retouch were recovered in 1967. One, found in the floor fill of Room 29, is a large tool measuring 8.6 cm long, 5.4 cm wide and 2 cm thick. It has slightly convex margins which converge to a broad point at one end. The opposite end of the tool, the "base" for lack of a better term, is only very slightly convex. The transverse cross section is biconvex. The retouch is entirely percussion work producing irregularly shaped deep flake scars. However crude the final work on the tool might be it was adequate to the use planned for the biface as use flakes appear on the "basal" margin. The tool may have served as a chopper or

cleaver. Recent experience on the parts of Jennings, France and several other dedicated archaeologists in butchering a hapless circus elephant indicates that, for large mammals at least, the chopper or hand ax design is most efficient as a butchering tool. Smaller and more finely worked tools require more frequent resharpening, are more difficult to handle with bloody or greasy hands and lack suitable mass for use in breaking down the more resistant cartilagenous tissues.

The other biface is a finely worked specimen (Cat. No. R20.1) which was found on the floor of Room 20A. The tool (Fig. 32 d) is stemmed with a laurel leaf shaped blade and convergent lateral margins on the stem. The base is slightly concave. The shoulders are very narrow. The transverse cross section is lenticular. There is no evidence of either grinding or use flakes on any part of the margins. The tool measures 7.9 cm long, 3.6 cm wide and 0.8 cm thick. Substantial consideration has been given to the potential uses to which this biface could have been put. It could have served well as a knife or the tip of a larger projectile weapon or of a thrusting spear. If it is assumed that the hafted portion of the blade reached only from the base to the shoulders then the projectile-spear point speculation seems most reasonable. Such a short haft would not be as suitable in withstanding the transverse stresses associated with use as a knife. Perusal of the literature produced no evidence that similar forms have been collected at other contemporaneous sites in the region.

A tool (Cat. No. R20B.1) which was bifacially retouched but only along one margin of a thin sheet of obsidian was found on the floor of Room 20B. This is probably a knife and certainly is known from other sites in the region. Cat. No. R29.1 is an essentially similar tool found in the fill of Room 29. Woodbury (1954:136) describes similar tools from the Jeddito area.

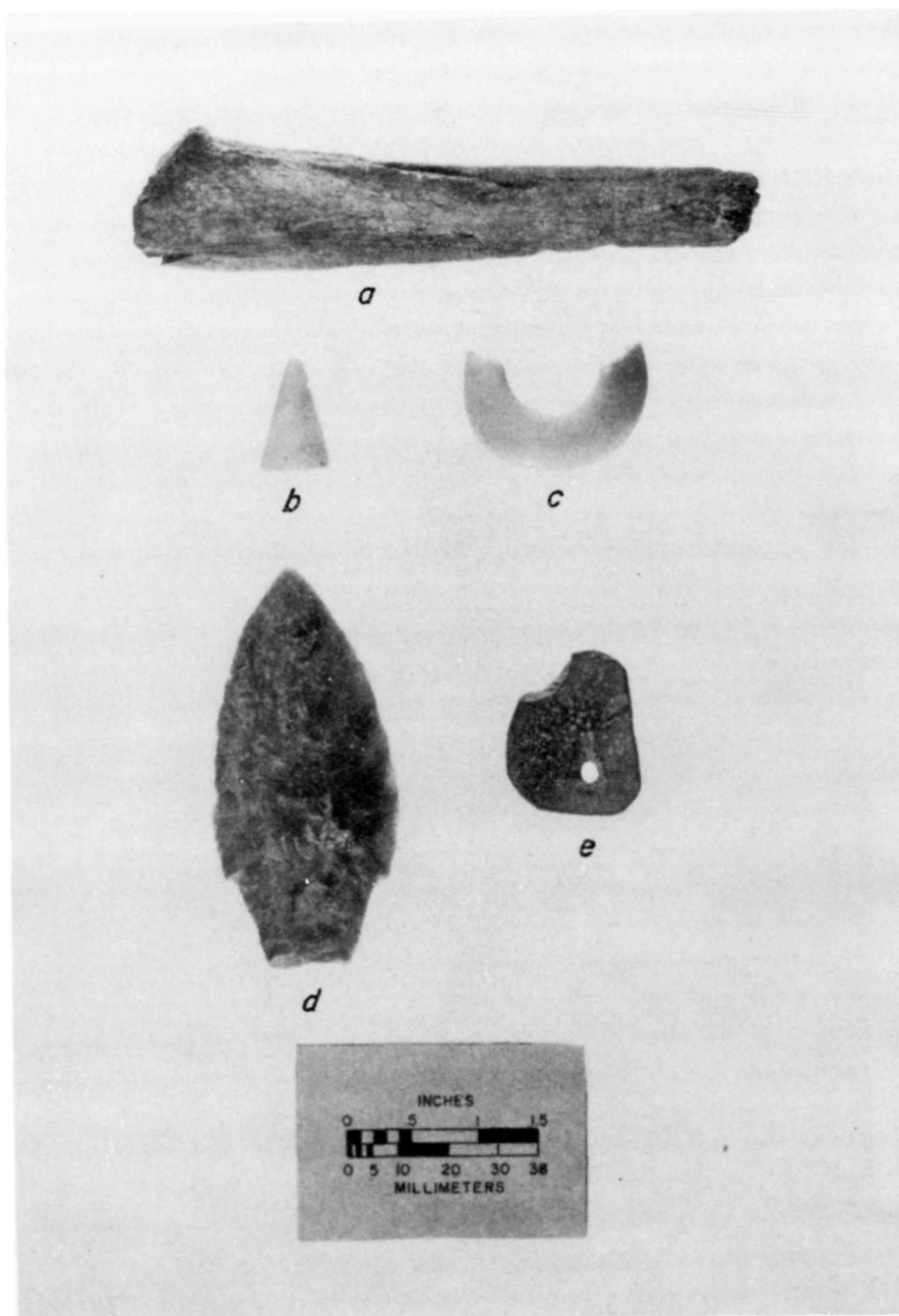


Figure 32. Miscellaneous Bone, Stone and Shell Artifacts.
a, bone knife (Cat. No. R28.1); b, tinkler shell (Cat. No. R26.1); c, shell ornament fragment (Cat. No. K2.1); d, knife or projectile point (Cat. No. R20.1); f, stone pendant (Cat. No. R4.1).

A chopper was also found at the Puerco site. The specimen was recovered from the floor of Room 26. It measures 20.9 cm long, 10.9 cm wide and 3.8 cm thick. It is made on a fragment of a micaceous sandstone grinding slab. One edge of the tool had been very crudely chipped and the resultant edge has been subjected to battering. The tool could have been used in a number of heavy chores.

Four hammerstones were recovered from the rooms and one from Kiva 2. Table 6 identifies their proveniences and gross attributes.

Table 6
Hammerstones from the Puerco Site

Provenience	Max. Diam.*	Min. Diam.*	Thick- ness*	Shape	Material
Room 7, Fill	10.2	6.0	3.9	Ovoid	Gray quartzite
Room 10, Fill	8.4	7.5	3.1	Circ.	Quartzite
Room 27, Floor fill	6.3	5.3	4.5	Cuboid	Silicified wood
Room 30, Fill	10.2	7.3	3.2	Ovoid	Chert
Kiva 2, Fill	7.0	5.9	4.8	Rect.	Silicified wood

*All dimensions are in cm.

The only item of note concerning these ubiquitous and unremarkable tools is the specimen from Room 10. It is interesting because it shows evidence of having been used not only to strike flakes from a core or tool but also has been used to abrade the lip of the potential striking platform and remove crushed or weakened areas along the lip to improve the strength of the platform. It is most certainly a part of a stone knapper's tool kit.

Woodbury (1954:120) remarks on the scarcity of chipped stone at the Jeddito sites and offers the idea that the chipped tools were more easily carried away when the site was abandoned than are the heavier ground and polished items. This may be the case but somehow is not a very satisfactory explanation in the face of the substantial quantities of chipped stone which occur in the sites of nomadic peoples, who would presumably be even more apt to carry off their tools than the sedentary horticulturalists of the Southwest. It seems more likely that the interest in and needs for chipped stone tools were not as great among the Anasazi, particularly among the PIV peoples, as we would like to assume. One of the factors reducing the need for chipped stone manufacture might be trade with neighboring nomads, such as the Havasupai with whom the Hopi had an active trade in hides. It seems simpler for the farmers to have traded for the chipped stone tools along with the hides.

We had anticipated that the Puerco site might be a chipped stone manufacturing center for the reasons noted above. The villagers could have had an excellent market for finished or preformed tools unless faced with superior competition in the field. Such may have been the case given the rarity of chipped stone at the site and the generally poor quality of workmanship on most of the few tools found.

Ground Stone

The most common class of ground stone tools at the Puerco site, as at most other Anasazi sites, is the mano. Fifty complete or fragmentary specimens were recovered from the 1967 excavations. The distribution by type and provenience are given in Table 7. The system used for classification is based on the number of ground facets and their locations. The scheme is as follows:

- I. Unifacial: The facet or facets appear only on one face of the cobble or slab.
 - A. Single facet.
 - 1. Thin cross section: 1.5 cm to 3.7 cm thick.
 - 2. Thick cross section: 3.9 cm to 5.3 cm thick.
 - B. Double facet.
 - 1. Thin cross section: less than 3.6 cm thick.
 - 2. Thick cross section: more than 3.7 cm thick.
 - C. Triple facet. Not further divided as only one specimen of this variety was recovered.
- II. Bifacial: At least one facet on each face of the cobble or slab.
 - A. Single facet on both faces.
 - 1. Thin cross section: 1.3 cm to 2.6 cm thick.
 - 2. Thick cross section: 3.7 cm to 8.6 cm thick.
 - B. Double facet on both faces. All specimens fall between 1.3 cm and 2.6 cm thick eliminating the need for further subdivision.
 - C. Single facet on one face, double facet on the other. Range in thickness from 1.7 cm to 3.0 cm and no need for further subdivision required.
- III. Concave faces. The ground face is slightly concave in the longitudinal cross section but convex in the transverse cross section.
 - A. Single facet.
 - B. Double facet.

Table 7

Puerco Site Whole and Fragmentary Manos

PROVENIENCE	TYPES										TOTAL	
	I					II			III			
	A		B		C	A		B	C	A		B
	1	2	1	2		1	2					
Room 4, Fill							1					1
Room 4, Floor						1						1
Room 20, Fill	1				1							2
Room 20A, Floor	1	1	1			1		1				5
Room 20B, Floor									1			1
Room 22, Floor									1			1
Room 24, Fill								1				1
Room 24, Late Floor						1	1		1			3
Room 25, Fill		1					1	1	1			4
Room 25, Hearth 1		2					2					4
Room 26, Fill	2			1		1	1					5
Room 26, Floor							1					1
Room 27, Fill	1	1					1			1		4
Room 27, Floor	2			1		1					2	6
Room 28, Fill	3	2										5
Room 28, Floor	1											1
Room 29, Fill		1										1
Room 30, Fill		1										1
Kiva 2, Fill		1			1		1					3
Total	11	10	1	2	2	5	9	3	4	1	2	50

Woodbury (1954:80-82) discusses the increase over time in multifaceted manos. He points out that in the Jeddito area single facet manos remain common even in late PIII and early PIV times but that grinding stones with more than one face are substantially more popular than in preceding eras. At the Puerco site 44 percent of the specimens recovered in 1967 have a single facet leaving those with more than one facet in a slim majority.

Woodbury also describes the application of finger grips to manos with increasing frequency. Only two specimens from the Puerco site were so modified. In all but one case, however, the manos had been at least slightly modified from the original cobble or slab from which they were made. Pecking is evident on one or more facets of 76 percent of the 50 specimens.

The number of manos is not surprising considering the subsistence pattern of the original occupants of the village. In fact, one might argue that there are too few specimens in the assemblage from the site. Given the relatively limited extent of excavation we do not feel this latter criticism to be serious.

The three concave "manos" from Room 27 are problematical. No comparable specimens can be found in the literature. The tools lack staining which one might assume would appear on a mano-sized pigment grinding slab ruling out that possibility. The most reasonable explanation seems to us to be that these three tools were possibly used in dressing roof beams. A cylindrical object is the only possible thing against which a mano could be rubbed to produce a longitudinally concave grinding surface. Use as a beamer has been postulated, but the absence of hunting equipment at the site with which the hides would be procured for such processing makes the speculation rather weak. The coarseness of the grains on the surface of the tools preclude

discovery of wear marks which might help us to understand the function of these tools.

In general, the manos from the Puerco site do not deviate significantly in form or application from what is known for other sites in the region. The tools are not particularly sensitive indicators of cultural change so little more can be said than has already filled an abundant literature on the topic.

The nether stone in the Anasazi milling apparatus, the metate, is also represented at the Puerco site but in rather small numbers. Only seven whole or fragmentary examples were taken from the site. In the three milling bins located in rooms excavated in 1967 no metates remained in place. Schroeder does not state (1961:96) whether the metate was still in place in the bin he found in Room 11. If it was not in place, there is a surprisingly small number of metates present at the Puerco site.

Table 8 provides the provenience and basic descriptive information concerning the metates. Little more can be said about their morphology.

Table 8
Puerco Site Metates

Provenience	Condition	Grinding Surface	Material
Room 7, Fill	Fragmentary	Two, both flat and pecked	Sandstone
Room 20A, Floor	Fragmentary	One, incipient basin	Conglomerate
Room 22, Floor	Fragmentary	One, concave with some pecking	Conglomerate
Room 25, Hearth 1 Fill	Complete	One, concave with central groove	Micaceous sandstone
Room 25, Hearth 1 Fill	Fragmentary	One, edge-to-edge, deeply concave	Fine grained sandstone
Room 26, Fill	Complete	One, edge-to-edge, longitudinally concave	Sandstone
Kiva 2, Vent tunnel mouth	Complete	One, edge-to-edge, flat	Coarse grained sandstone

Nothing distinguishes the metates of the Puerco site from those of other late Anasazi sites. One important fact needs to be pointed up, however. The removal of the metates from the milling bins and the general scarcity of the tools on the site indicates that they were removed when the site was abandoned. Apparently, suitable blocks for forming new metates are less easy to obtain than many "blanks" or else once a metate has been broken in it has a higher value making its weight a tolerable load on moving day. Implicit in the intentional removal of the metates is the likelihood that the abandonment was a carefully planned and executed event rather than a response to some natural or social disaster which would have precipitated flight from the village.

A tcamahia (Fig. 33) was found in the fill of Hearth 1 in Room 25. The specimen measures 25.5 cm long, 7.8 cm wide at its broadest point and 1.7 cm thick. It had been broken near the butt and a small fragment is missing. One margin has been pecked to form a slight indentation as though to facilitate hafting the tool. Woodbury (1954:165-170) provides an excellent summary of the past and present possible functions of these objects. The argillite from which the Puerco specimen is made may have been available locally, however, as argillite does occur in the Petrified Forest vicinity. The availability of such material might open the possibility of a second area of manufacture of tcamahias supplementing the San Juan center (p. 167). Florence Hawley Ellis (1967) has recently reviewed the ethnographic data and extended our understanding of the ceremonial value of the tcamahia among the Rio Grande pueblos. She (p. 42) has also revived the idea, put to rest by Woodbury (1954:166-167), that the tools were used as skinning knives with her description of the use of a "skinning stick" by a hunter from Santa Ana in the early part of this century. We cannot but help to join in this discussion. The visible wear striae on the Puerco specimen do not indicate that the tool

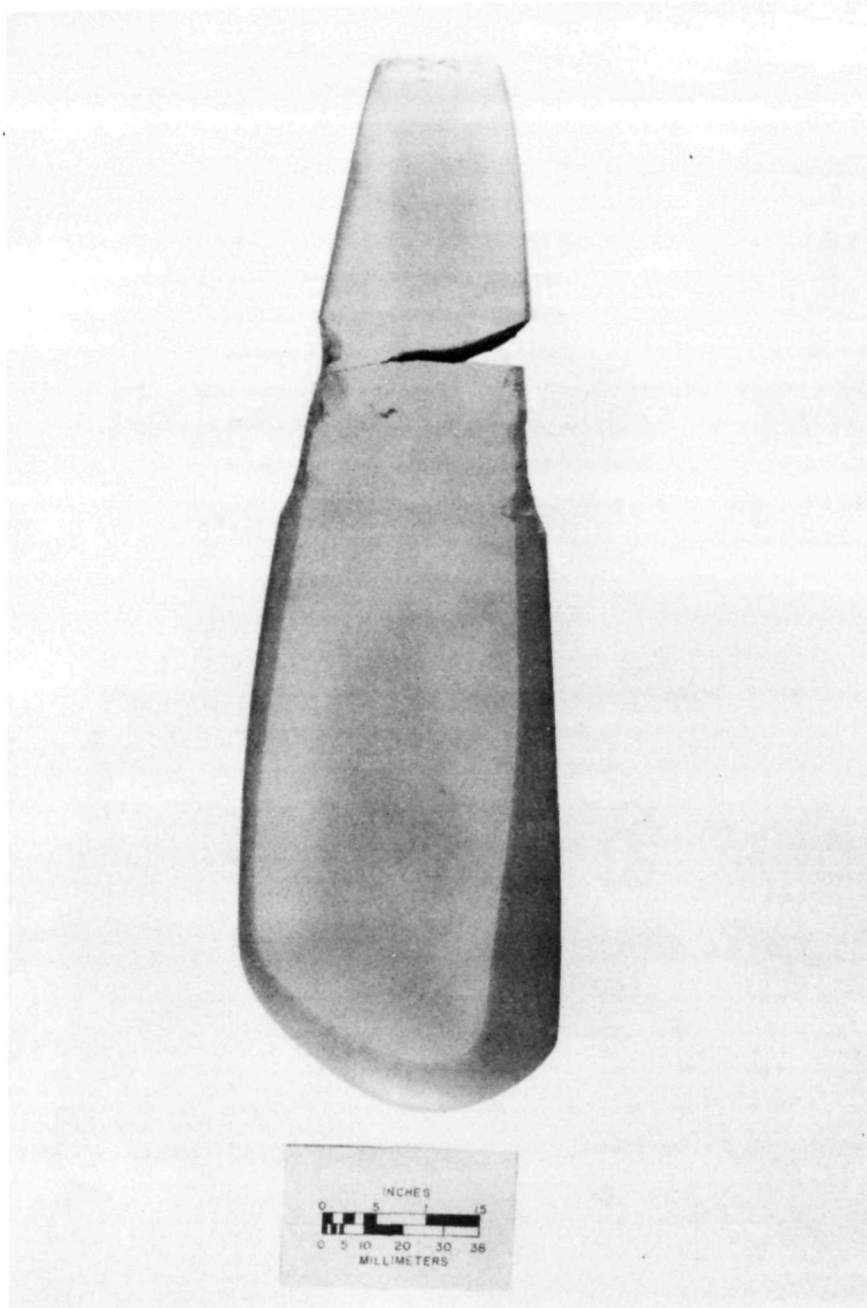


Figure 33. Argillite Tcamahia (Cat. No. R25.2). The specimen was found broken in Hearth 1 of Room 25. Note the shallow indentation at the fracture line on the left margin. Also note the assymetrical form of the lower margin indicating differential wear.

was used on soft or pliable materials. Clearly, a single example will not solve the dispute but in this case at least the wear patterns indicate that the tool was either used in the soil or that it was abraded rather severely in the manufacturing process. There seems no good reason to reject Woodbury's acceptance of the agricultural function of tcamahias at some time in the past. Of course, the ceremonial values are well substantiated for the modern Pueblos and no further discussion of that issue is warranted.

Two stone balls were recovered during the 1967 excavations. Both were found in the fill of Room 24. One is vesicular basalt and averages slightly less than 6 cm in diameter. The other is made of a calcareous sandstone and averages about 5.5 cm in diameter. Both show signs of having been pecked to modify the shape of the original cobble to the desired form. Judging from the data presented by Woodbury (1954:171) stone balls are highly characteristic of the PIV and PV periods in the Jeddito area. Their presence at the Puerco site is not out of keeping with this dating. We have no additional information to add to the confusion concerning the function of these problematical spheroids.

The remaining ground stone object from the Puerco site is a fragment of a 7/8 groove ax. The blade has been ground to a very narrow edge relative to the width of the tool. The poll has been battered indicating the ax was used in heavy work other than wood cutting. The specimen came from Hearth 1 in Room 25 which seems to have been the repository for a substantial amount of abandoned material.

Miscellaneous Stone Artifacts

A stone pendant, Cat. No. R4.1 (Fig. 32 e) was found in the fill of Room 4. The ornament is subrectangular and has had one corner broken off. The hole by which it was suspended is off the center line near one edge. The material is a dark red slate or shale.

Another problematical item is a triangular sandstone slab from the fill of Room 24. It has flat faces, one of which has a pecked depression in the center. A biconical hole has been ground into the slab. The slab may have been a lap stone for use with a drill. No other function can be hypothesized given the skimpy information contained in the artifact.

Finally, a sandstone disc was found on the floor of Room 20B. The disc had been chipped to shape and seems made to order as a lid for a narrow necked jar such as those found and restored as part of this project.

Bone Tools

Seven bone awls, a bone knife, and a spatulate object of bone were recovered as part of the 1967 work at the site. The most unusual specimen is the bone knife (Fig. 32 a). It was found in a large Homolovi Corrugated vessel resting on the floor of Room 28. The tool is 12 cm long and 2.7 cm wide. It is made on the rib of a large mammal and has a thin sharp edge which is highly polished. No comparable specimen could be found in the literature for the region.

The spatulate object is made on a bone splinter. It was found in either the fill of Room 27 or 29, the precise provenience being lost. The tool is only about 3.6 cm long and 0.6 cm wide. It is not a bone spatula such as those described by Wheeler (1978:Fig. 14 f-i). No function can be postulated for the tool at this time.

Of the awls (Fig. 34) four, Cat. Nos. R21.1, R26.2, K2.2 and K2.3, are made from splinters from long bone shafts ranging in length between 6.4 cm and 6.0 cm in length. Three of these are illustrated in Figure 34 a, e and f. The remaining three awls are made on whole cross section bones.

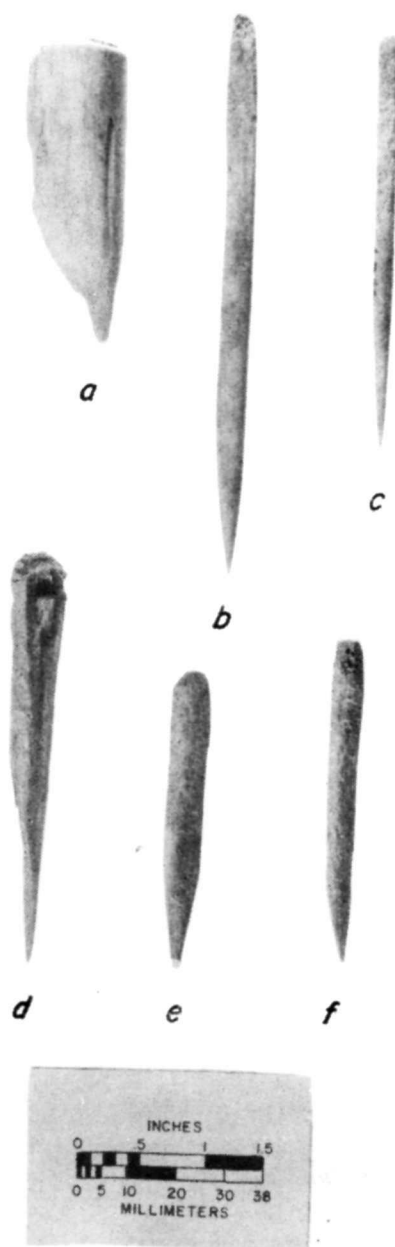


Figure 34. Puerco Site Bone Awls.
 a, awl made from long bone shaft of a large mammal as indicated by the size and beveling of the upper margin (Cat. No. K2.2); b, complete cross section is present on this specimen but the proximal and distal ends are no longer present (Cat. No. R10.1); c, whole bone with proximal and distal ends removed (Cat. No. R29.2); d, metapodial awl with proximal end unmodified; e, split shaft awl with rounded butt (Cat. No. K2.3); f, split shaft awl with squared butt (Cat. No. R21.1).

Two, Cat. No.s R10.1 and R29.2, have been extensively modified removing and diagnostic landmarks from the bone (Fig. 34 band c). The remaining specimen, Cat. No. R4.2, retains one articular surface (Fig. 34d) and is 8.3 cm long. The split awls conform to Wheeler's (1978:49) M-4 style. The unsplit awls have strong similarities with styles M-1 and M-2 (pp. 24-28).

Shell

Two shell objects were found at the site. The first is a fragment of a shell ornament, Cat. No. K2.1 (Fig. 32 c). The ornament was found in the fill of the ventilator tunnel of Kiva 2. Only half remains for description. The object is highly polished and no potentially diagnostic landmarks remain. The remaining piece is 3.6 cm in diameter.

The other shell item is a tinkler, Cat. No. R26.1 (Fig. 32 b). The conical shell has been ground at both the base and spire. It is 2.3 cm long by 1.4 cm in diameter. The tinkler was recovered from the fill of Room 26.

Historic Artifacts

A small coil of copper wire was recovered from the upper portions of the fill of Room 19 and a fragment of a purpled medicine or condiment bottle was found in the fill of Room 20. Given the period over which the site has been known to the professional community and the fact that it has been visited by innumerable users of the national park during the last 80 years, it is not surprising that there are some intrusive Euro-american artifacts in the site's deposits. These two items do not raise any serious doubt about the integrity of the site's deposits.

CHAPTER VII

ROCK ART

Introduction

Hough (1903) noted the presence of petroglyphs at the Puerco site in his visit to the Petrified Forest. The art is located on the face of the sandstone escarpment below and immediately south of the village. There are several large slump blocks with a number of faces suitable for decoration. Neither Cosgrove nor Schroeder discuss the petroglyphs.

We are reluctant to do more than to simply draw attention to the presence of the art and make some very general comparisons with the art of other regions as described in one or two sources. We feel that even this minimal effort is justified on the grounds that two degrees of patination were detected in our casual examination of the various panels supporting our contention that the site has at least two occupational components.

Motifs

As with most Anasazi rock art reported or directly observed by us, nature provides a substantial amount of the inspiration for the artistic enterprise. Figure 35 portrays a lizard, very common on the panels at the Puerco site and at Newspaper Rock about 4 km south of the village. Next to the lizard is one of the few insect figures found at the Puerco site. In our view the figure represents a butterfly, an important element in Hopi mythology.

Figure 35 is a view of the figure which drew Hough's attention and even moved him to comment on the rock art. The avian is either a heron or a crane, we favor the former over the latter though it is impossible to put forward an objective taxonomic justification for that decision. The circumstances are unusual in that there is a readily understandable dynamic element in the scene. The bird is consuming a frog, or possibly a man, and, even though the depiction is quite rigid in this style there is still a strong feeling of action as compared with other examples of Anasazi rock art. In addition, this scene was a comparatively ambitious undertaking for the artist. The bird is about 50 cm tall and 40 cm wide from beak to tail.

Figures 37 and 38 provide examples of both zoomorphic and anthropomorphic representations. Here the zoomorphs are horned quadrupeds which have been identified in other places as mountain sheep or goats. Given the abundance of pronghorn in the region and the importance of antelope in Pueblo cosmology it seems more appropriate to at least consider the possibility that these figures represent pronghorn rather than mountain sheep or goats. The horn form supports this view.

Typical of attempts to deal with anthropomorphic representations at the Puerco site, both of the humanoid figures are highly stylized and not easily susceptible of interpretation.

Figure 39 represents the only example of anthropomorphic art of the open stick figure style found at the Puerco site. These round faced humanoids may actually represent masks or masked dancers as in the case of the left figure which has a faint rudimentary body. These figures are of interest because of their greater degree of patination. The redevelopment of desert varnish on these figures is well along in comparison with the other figures illustrated here. This may indicate that the round faces date from an earlier period than the other panels at the site.



Figure 35. Puerco Site Rock Art. Pecked figures of a lizard on the left and a butterfly on the right. Facing north.



Figure 36. Puerco Site Rock Art. Crane or heron eating a frog. This may be the avian which drew Hough's attention to the rock art in his visit to the site. Pencil is 14 cm long. Facing east.

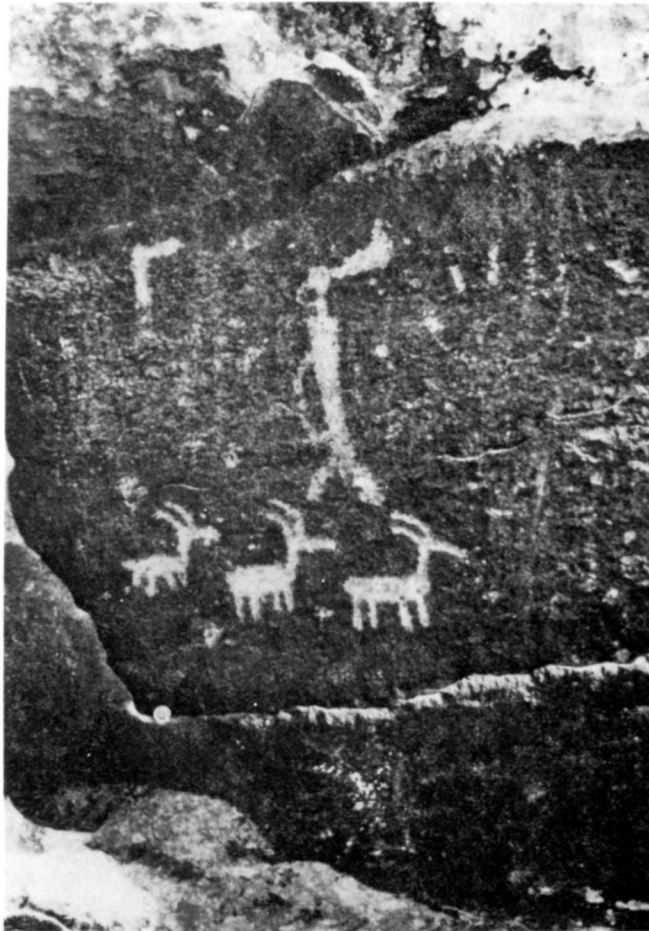


Figure 37. Puerco Site Rock Art. Possible representations of pronghorn, common in the area today. Upper figure is anthropomorphic but its meaning and referents are unclear. Facing northeast.



Figure 38. Puerco Site Rock Art. Upper figure is another possible pronghorn. The middle figure cannot be guessed at. The lower figure is a man carrying a staff or wand. Pencil below the standard bearer is 14 cm long. Facing northeast.



Figure 39. Puerco Site Rock Art. Human faces, or more likely masks on a boulder which has slumped free of the caprock. Note the rudimentary body on the figure on the left. Facing west.

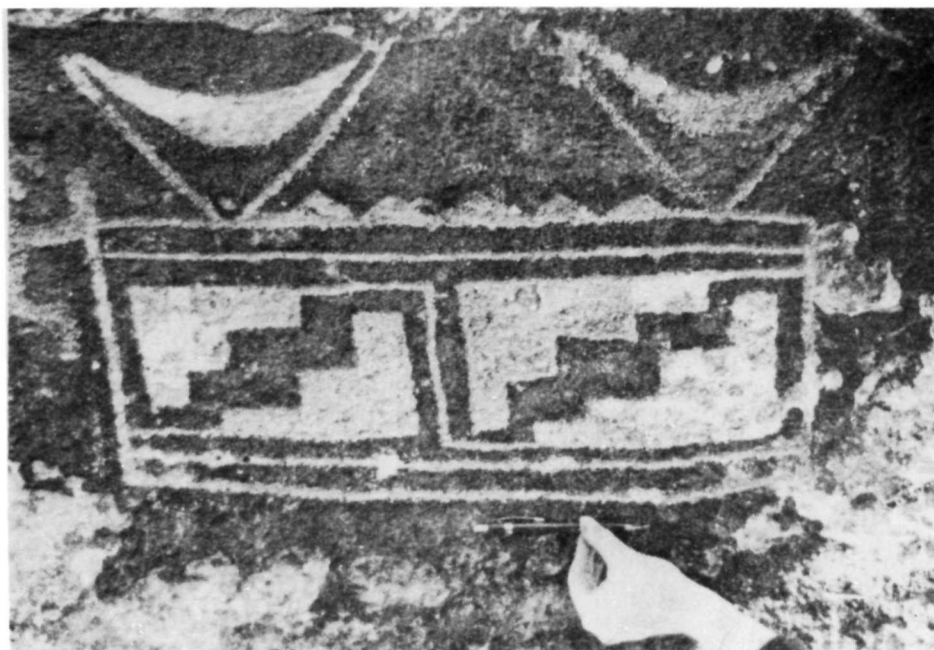


Figure 40. Puerco Site Rock Art. Geometric abstract on caprock cliff face below the village. Pencil is 14 cm long. Facing east.

Finally, Figure 40 is a quite striking and elaborate abstract. The interlocked terraces are reminiscent of decorative elements on PIII and PIV pottery. The curvilinear pair of "hammocks" above the rectangular panel are unique. The panel is 60 cm long and 21 cm high.

Methods of Production

All of the figures illustrated here are pecked. A few random scratchings were noted and a few of the pecked figures showed signs of light rubbing of some parts. However, well controlled pecking to remove the patina of the sandstone is the primary means for producing the figures.

Comparisons

Peter J. Pilles (1975) has summarized the rock art of the Little Colorado River valley identifying styles which correlate with the developed sequence of major cultural periods. Among others, he has identified a style characteristic of late PIII and early PIV sites which very thoroughly covers the art present at the Puerco site (pp. 12-14). Among other diagnostic figures, Pilles has identified the round outline figures as part of the PIV style contradicting our observations concerning the relative degree of patination of these figures as compared with other elements he feels are of PIII-PIV age such as the standard bearer in Figure 37. The style of wand is very nearly identical to one illustrated by Pilles (Fig. 16) for the late PIII and early PIV style. The geometric figure in Figure 40 is also characteristic of the PIII-PIV style.

Application of Turner's (1963) study to the Puerco site rock art met with less success. Nonetheless, it is clear that the styles present are associated with the styles of later PIII and early PIV in other parts of northeastern Arizona.

The conflict with Pilles' interpretation of the round faced figures is probably more the result of our inexperience with the rock art of the region than anything else. However, the degree of patination is clearly materially advanced over that seen in other parts of the site.

The dating of the rock art styles corroborates the dates arrived at through interpretation of the architecture and ceramic evidence. During the late PIII and early PIV period the Puerco site was evidently quite a busy place with substantial interests in rock art.

CHAPTER VIII

SUMMARY AND CONCLUSIONS

Summary

The return to the Puerco site in 1967 led to the exposure of 15 more surface rooms and the excavation of a kiva and a pit house. The results of the 1967 work essentially corroborates the work done by Schroeder (1961). No tree-ring datable material was collected and no indications of an occupation earlier than about 1100 or later than 1400 were noted.

A substantial number of restorable or partially restorable vessels were collected supplementing the vessels located in the earlier excavations. Relatively few sherds were found but there are enough to permit dating the occupations at the site. These vessels contributed materially towards establishing the dates of occupation at the site.

The rest of the artifact inventory is relatively small. No meaningful comment can be made on the basis of such a small number of artifacts.

Chronology

In the following discussion we have adopted the chronological terms used by Gumerman and Skinner (1968:187). All of the evidence we have available at this time points to the presence of two prehistoric components at the Puerco site. Reference to Tables 4 and 5 gives the first objective indication of the presence of an earlier component than the long recognized Homolovi Phase component of late PIII and early PIV times. Over 30 percent of the decorated sherds present in the fill of the rooms are pre-1200 black-on-white types such as Holbrook, Puerco, and Walnut. All of these occur in large enough numbers and great enough variety that they cannot be

written off as chance occurrences. These types represent the home town product and are frequently associated with one another in larger numbers at PII and PIII sites both to the west and east of the Petrified Forest. Corroborating the likelihood of these types occurring at the Puerco site as part of an earlier component is the presence of types normally associated with the Kayenta Branch PII-PIII period such as Black Meas and Sosi Black-on-white. These two types are commonly associated with Holbrook and Walnut Black-on-white in sites to the west of the Petrified Forest in the Little Colorado River valley.

The McDonald Phase, which dates from A.D. 1100 to about A.D. 1250 (Gumerman and Skinner 1968:187, 191), is characterized by substantial amounts of Holbrook and Walnut Black-on-white. Sites excavated in the Hopi Buttes area by Gumerman assignable to the McDonald phase and which contained substantial amounts of Holbrook Black-on-white are believed to relate to the earlier part of the period. Gumerman has argued elsewhere for a potential functional as well as temporal differentiation between Holbrook Black-on-white and Walnut Black-on-white (Gumerman and Sutton 1967:16-18) but the matter does not bear importantly on the question of the date of the earlier component at the Puerco site. Given the proportion of types it is not unreasonable to hypothesize that the earlier occupation of the site took place during the earlier two-thirds of the McDonald Phase, between 1100 and 1200.

The termination of the occupation at 1200 is supported in part by the paucity of post-1200 black-on-white and black-on-orange types in the collections. Given an occupation between 1200 and 1300 we expect that at least sizeable minority of the decorated types would include those also found in

the earliest occupational levels in the western mound at Awatovi represented by Ceramic Groups B-5 through D-13 (Smith 1972). The virtual absence of these classic PIII and earliest PIV types strongly indicates that the site was at least not in regular use during the 13th century. Negative evidence of course presents substantial problems in interpretation. However, our results duplicate those of Schroeder (1961) indicating that the inference may have some basis.

Finally, the distribution of pre-1200 types is of interest. Their virtual exclusion from the floor contact proveniences and absence from the restorable vessel collections for all three excavation projects at the site indicates that 1) some rooms were cleaned or a trash deposit was disturbed which had substantial amounts of the pre-1200 material which was placed in rooms already abandoned at 1200; 2) at least three rooms, 4, 7 and 27, were used as repositories for trash lacking significant amounts of Jeddito Yellow Ware. The traces of Jeddito Yellow Ware in these rooms can easily be assigned to later intrusions during the peak of the Homolovi Phase occupation in late PIII and early PIV times.

The architectural evidence supporting these conclusions has already been discussed in detail above. It suffices to say here that the buried masonry units reported but not fully explored by Schroeder (1961) in the southwestern corner of the ruin are tantalizing but not conclusive. Room 19 and Kiva 2 fit the pattern for the McDonald phase and the presence of surface rooms in the McDonald phase should be expected as well. The absence of roofing material and roof supports in the two subterranean units indicates that they may have been robbed of building materials for use in the construction of later features such as Kiva 1.

The radiocarbon date determined by the University of Pennsylvania (Ralph personal communication) does little to clarify the situation though it does support the foregoing hypothesis of occupation ending about 1200. The original date, using the 5730 half-life, was 521 ± 46 B.P. (P-1544). The sample C^{13}/C^{12} fraction was measured and the cobs were found to be enriched in C^{13} relative to the wood and limestone standards, +14 mils and -11 mils respectively. The date was then corrected using a factor of 2 C^{13} and an estimate of A.D. 1200 adopted. The value of the corrected date is convenient to the hypothesized abandonment of the site on or about A.D. 1200. However, a single radiocarbon estimate is not sufficient to support the hypothesis. The burning of the corn supply stored in Room 21 probably took place somewhere between A.D. 1150 and 1250 assuming that the corn represented the most recent crop. Association of this isolated event with a general abandonment of the site will have to await the dating of other rooms with similar features supporting the idea of evacuation of the village well before the end of the McDonald Phase.

The final point to be made in favor of the 13th century abandonment of the site is the fact that there seems to be a general hiatus in the occupation of the lower elevations of the Puerco and Little Colorado River valleys at this time. Climatic reasons for this hiatus have been offered by Gumerman and Sutton (1967) but Gumerman and Skinner (1968:195-196) state that the site was in fact occupied, along with a few other major villages during the Tuwiuca Phase. The issue is open to test as we did not obtain data which could be applied to the problem. Our data support the contention that the Puerco site was not occupied during the Tuwiuca Phase but rather during the following Homolovi Phase.

The evidence supporting the assumption that the last occupation of the Puerco site falls entirely in the Homolovi Phase rather than overlapping into the Tuwiuca Phase includes the restorable vessel collection which has only about 3 percent black-on-orange, that is one vessel, and the decorated sherd counts which include only eight black-on-orange sherds among three types. The most recent occupation clearly belongs in the period coming after A.D. 1300 and is similar in content to Ceramic Group B-4 from the western mound at Awatovi (Smith 1972:19). Awatovi Black-on-yellow is clearly dominant over both black-on-orange types and Jeddito Black-on-yellow in both the room fill and floor contact sherd inventories. The ceramic assemblage is not identical with the Awatovi material, however, as the Little Colorado ceramic tradition is dominant at the Puerco site. The abundant Winslow Orange Ware types certainly affect the proportions and in a manner that has no counterpart in the Awatovi collections. The dates for the Winslow material are shaky but the tentative agreement on 1300-1400 for at least some of the types supports our argument for a Homolovi Phase occupation.

The rock art, whatever its value in determining the presence of an earlier component at the site, also supports the presence of a PIV component on the site. The matter of exact dating cannot be addressed through the rupestrian medium unfortunately.

The length of the final occupation cannot be ascertained with any precision. However, the relative rarity of Jeddito Black-on-yellow in the collections analyzed after clear definitions of the type and reliable dates became available indicates that the village was not occupied until middle PIV and abandoned by PV times. This seems consistent with the scant information from other parts of the Little Colorado Valley from such sites as the Homolovi group and Cheylon which also seem to have been abandoned by 1400.

In summary, the circumstantial evidence for two distinct periods of occupation at the Puerco site is adequate to carry the weight of the hypothesis of an hiatus in the use of the site. The first occupation occurred between A.D. 1100 and 1200 and is certainly a local manifestation of the McDonald phase. During the Tuwiuca phase the site apparently was not occupied though this issue cannot be finally settled until more excavations have taken place as the assumption is based on negative evidence. The village was reoccupied, and probably expanded, between 1300 and 1400 by peoples with strong ties to the Winslow branch of the Anasazi. Therefore we assign the final phase of the occupation to the Homolovi Phase.

Final Abandonment

Nothing specific can be said of the events leading to the abandonment of the site at the end of the McDonald Phase. The reoccupation of the site in Homolovi Phase times and the limited extent of the excavations preclude any useful reconstruction of the events leading to the earlier movement of people away from the site.

The termination of the Homolovi Phase occupation seems to have taken place under conditions other than some sort of catastrophe. The presence of thin aeolian deposits on the floors of most of the rooms indicates that they stood open to the elements without disturbance for at least a few months following their abandonment. The paucity of metates and of restorable decorated vessels also implies that the rooms were fairly systematically emptied of their artifactual material. Most of the restorable vessels found in floor contact situations represent utility wares. Planned emigration would also help to account for the lack of other portable artifactual material at the site.

Only one room burned during the occupation of the village and was not subsequently cleaned and returned to use. Room 21 clearly suffered a conflagration while it was still in active use. The absence of other rooms burned while still in use in the site makes it impossible to attribute the Room 21 disaster to anything but isolated accident.

Not all of the rooms occupied during the McDonald Phase occupation were put to use during the Homolovi Phase. It seems certain that Rooms 4 and 7, and by implication Room 5, were not re-used during the later occupation. Rooms 8, 10, and 11, however, were certainly re-occupied and remained in use until the later stages of the Homolovi Phase.

It is not certain if the site was abandoned as the result of a single exodus of its former inhabitants to greener pastures or if the termination of occupation came as the result of a gradual decline in population. There is some indication that some of the Homolovi Phase rooms were abandoned before others. Room 24 was certainly in use after the abandonment of Room 25, for example.

The lack of certainty concerning the conditions under which the Puerco site was abandoned will only be relieved by further excavations at the site.

Community Structure

Continuing the theme of incomplete information, it is impossible to do more than to speculate about the nature of the community's organization or structure in the light of the available evidence. All that follows is based on the Homolovi Phase occupation of the site and assumes that the basics of Pueblo social organization apply to the Puerco site's former inhabitants.

An important set of evidence in support of the reconstruction of the community's structure and its changes over time is the sequence of architectural development at the site (Wilcox 1975). Given the incomplete nature

of the excavations, the information fundamental to understanding community development is absent.

The first step in reconstructing the community organization at the Puerco site is the identification of different functions in the architectural features. The two kivas are obvious and need no further discussion at this point. Room 19 has been assigned domestic status on the grounds that it is architecturally most similar to pit houses from McDonald Phase sites in other parts of the region.

The surface rooms are divided into three useage groups: domestic, storage, and indefinite. The domestic rooms are identified on the basis of the presence of hearths. Domestic quarters would certainly have been heated during the winter months. These rooms also have other floor features indicating their use as work areas in addition to general living quarters. Storage rooms are identified on the basis of size comparable with Room 21 and the absence of floor features and doorways. As noted in the discussion of the site's architecture, rooms of the size and shape of Room 21 would have been considerably more difficult to heat.

The indefinite use rooms have doorways, are smaller than the storage rooms and lack floor features. These rooms may have served a combination of needs for storage, work and living space in the community.

Using these criteria Rooms 3, 4, 5, 7, 8, 11, 20B, 23, 24, 25, 27, 28 and 30 are identified as domestic quarters. Rooms 7, 23 and 28 are the only members of the domestic group which do not have direct interior connection with a neighboring room. The isolation of these rooms may mean that they served other than domestic functions, having served as interior kivas for example, but no clear evidence supports any other useage interpretations. Table 8 provides quantitative information on these rooms to help in comparing them with the other two classes.

Only three storage rooms, Rooms 16, 17 and 21, could be identified using the size, lack of doors, and absence of hearth criteria. It could be that we have been too restrictive in application of the size criteria. Rooms 18 and 22 are also likely storage areas, for example. It is also likely that some storage rooms were remodeled to living quarters, such as Room 20, when increasing population and their proximity to other living quarters may have made them more desirable as domestic rooms. The loss of storage space in the older portions of the village could have been compensated by building more storage rooms along the north and east plaza walls.

The uses of Rooms 1, 2, 10, 13, 18, 22, 26 and 29 are not clearly indicated by their size or features. Rooms 1, 2, 10, 20A and 29 are obviously more closely related to general domestic activities as they are interconnected with domestic rooms. Rooms 13, 18, 22 and 26 are isolated from domestic rooms and may have served more as storage than as active or daily use space.

Table 9

Room Use Types and Their Characteristics

	Domestic Rooms	Storage Rooms	Indefinite Use Rooms
Number of Rooms	13	3	9
Total Floor Area in m ²	78.4	26.2	48.7
Ave. Floor Area/Room in m ²	6.0	8.7	5.4
% of Excavated Floor Area	51%	17%	32%
% of Excavated Rooms	52%	12%	36%

With the room types and their distributions identified, the next step in reconstructing the community's organizational arrangement is to attempt identification of social units in terms of groupings of the room types. Aside from truisms concerning the importance of lineage and clan in puebloan communities it is possible to also tentatively identify lineage areas.

The weakness in this approach is the possibility that some of the door sills have not survived in those rooms whose walls have deteriorated to a point about 40 cm above the room floors. Most of the doorways found to date have sills located about 50 cm above the floors. The situation in Rooms 24 and 25 is a case in point. A polished block is present in the wall between these two rooms which may be a door sill and is treated as such in the following discussion. Some uncertainty exists, however, as there is not enough wall remaining to indicate whether or not an opening existed above the potential sill.

Five definite clusters of interconnected rooms appear in the Puerco site rooms excavated to date. The Rooms 1-2-3 cluster excavated by Cosgrove served to lead Schroeder to the family unit hypothesis. The 1967 excavations supplemented the data gathered by Schroeder in demonstrating the presence of doorways between Rooms 4 and 5 and Rooms 10 and 11. The Rooms 4-5 cluster apparently was not in use during the Homolovi Phase occupation. Rooms 10 and 11 are also connected to Room 8 forming another three room cluster. Two more two room clusters occur in the western wing, Room 27-30 and Room 29 with the un-numbered room east of Room 29.

Two equivocal connections also are present. The first is the Room 24-25 cluster which seems to be justified as an interconnected pair. The other situation is Room 20A-20B. Here we have a subdivided masonry room which

does not present the degree of physical isolation between the members found in the other clusters but is still clearly a divided space with clear differences in the uses to which those spaces were put. It is possible that Room 20A served as a work room rather than as living quarters. However, there really seems to be no substantial difference with the other clusters aside from the use of a low adobe divider rather than a full masonry wall to separate areas. There is no good reason for not treating Room 20A-20B as another nuclear family room cluster.

Using the two marginal cases, there are indications in the portions of the site excavated to date of the presence of seven nuclear families at the site if all of the domestic-indefinite use clusters identified were in use during the McDonald Phase. It is certain that the Room 4-5 cluster was not in use during the Homolovi Phase reducing the number to six families at that time.

If we extrapolate from the distributions of room types and the proportions of domestic rooms in the excavated portions of the village (Table 9) it can be argued that in the remaining 50 unexcavated rooms about half will be domestic rooms. If we likewise project from the nature of the clustering in the excavated portion of the village, where 10 of the 13 domestic rooms are in nuclear family clusters, it can be assumed that about 19 of the 25 domestic rooms will be in similar cluster arrangements. Excluding the Room 29 pair as we have no information as to whether the unnumbered room is in fact a domestic area, domestic rooms average about 1.7 per family cluster. Dividing the anticipated 19 domestic rooms by 1.7 rooms yields an estimate of 11 more nuclear family room clusters in the unexcavated portion of the village.

The total of 18 nuclear families represents a maximum number of families in residence at any given time. It seems likely that the proportion of storage rooms will be higher in the more northerly parts of the village. It is also unlikely that all of the room clusters in the present ruin were occupied simultaneously. A maximum, then, of 18 nuclear families could have been sheltered at the Puerco site at the peak of its occupation. This value will be used in the rest of the discussion with the understanding that it probably represents a few more family groups than were actually present at any given time.

A more tenuous interpretation of the room clustering is also possible. The primary weakness being the concentrated nature of the excavations in the southwestern corner of the site and the limited extent of those excavations. Nonetheless, it is likely that the nuclear family room clusters are in turn grouped together in terms of extended family relationships (Hill 1970; Longacre 1970). Note that storage or indefinite use rooms separate the two groups of nuclear family clusters in the southern and western wings. Spatial separation of this sort may be the counterpart of room blocking in the Cibola and Red Mountain areas and may represent the establishment of lineage territories within the community. It is tempting here to attribute residence unit status to each of the wings but we lack the evidence necessary to support this level of interpretation. The results of the study of Carter Ranch pueblo (Longacre 1970) and Broken K pueblo (Hill 1970) imply that lineages and residence units can be detected through the detailed study of artifactual styles and architectural features. The strictly spatial analysis employed here will not bear the full weight of the conclusion that lineage areas do in fact exist as described. However, there is not the least doubt that such units must have been present at the Puerco site given their

contemporaneous existence at Carter Ranch and Broken K and their continued presence in the western Pueblos (Eggan 1950).

Another important issue in the discussion of the Puerco site as a human community is the size of its population. Recent years have seen a growth of interest in the estimation of prehistoric population sizes. We will seek to go no farther than estimation of the raw population size in this discussion.

The initial estimate of the site's prehistoric population was made using Naroll's (1962) model which simply relates numbers of people in the community to the amount of floor space. Naroll, with cautions about the use of his model as a means for estimating population without regard to other cultural variables, proposed that population (P) is equal to the floor area of the community (F) divided by a constant (10), or $P = F/10$. Using this model and an estimated total floor space of 701 m^2 , which includes the unexcavated surface and subsurface floor areas of the village, a population maximum of 70 persons is estimated. This value is subject to the same considerations raised in the discussion of the number of nuclear family units. Prior to determination of the maximum number of nuclear family units, the value seemed low given the size of the village and a second model was employed (Clarke 1974) which takes the form $P = F/3$. Table 10 shows that the estimated maximum population under this model is 234 persons yielding a person per room ratio of 3.11. Clarke (1974:286) also proposed that $P = 1.81R_r$ where R_r is the raw room count. Both approaches produce very large population figures as compared with Naroll's model (Table 10).

Two other models of the relationship between population and architectural characteristics have been proposed by Kvamme (1978). After

rigorous comparison of several spatial and architectural variables from the modern Pueblo communities in the Rio Grande and western areas using multiple regression techniques, Kvamme (1978:92) is able to recommend his Models 7 and 13 for the estimation of maximum population. Model 7 employs the areas of all of the surface structures at the site as well as a logarithmic transformation to fit the data to the regression equation. Model 7 states that:

$$\ln P = -.650401 + .7387841(\ln F_1 + F_k)$$

where F_1 is the area of the first floor rooms in the structures and F_k is the area of the kivas (1978:84). Model 13 states that:

$$\ln P = 1.166478 + .8812021(\ln R_f)$$

where R_f is the number of first floor rooms (1978:86). Changes have been made in Kvamme's notation of variables for the sake of continuity with the notation used in the presentation of the Clarke and Naroll models.

The results of the application of Kvamme's two models to the Puerco site data are also summarized in Table 10. Kvamme's Model 7 very closely approximates the results of Naroll's model. Both seem to provide the most realistic estimates of the maximum population in the light of the estimate of a maximum of 18 nuclear families. Using an average of 4 persons per family a maximum population of 72 persons would have been present at the site during its peak occupation.

Kvamme's Model 13 produces results comparable with Clarke's estimate of 1.81 persons per room. Though these figures are high (see below), they do not seem out of reason. Clearly, Clarke's F/3 model produces inappropriate results for sites of this age in the Winslow Branch area.

The continuously resident population of the Puerco site could not have reached 234. The estimates from Naroll's model and from Kvamme's Model 7 seem to provide the most realistic estimate of the community's maximum size.

Table 10
Comparison of Population Estimates for the Puerco Site

Population Characters	Kvamme 1978		Clarke 1974		Naroll 1972
	Model 7	Model 13	P = 1/3	P = 1.81R	
Raw Population Estim.	66	144	234	145	70
Persons per Surf. Room	0.88	1.92	3.11	1.93	0.93
F _l m ² per Person	9.6	4.4	2.7	4.7	9.1
F _t m ² per Person	10.6	4.9	3.0	5.2	10.0
R _r = 80*, R _f = 75, F _l = 635 m ² , F _k = 66 m ² **, F _t = 701 m ²					

*This number includes two possible kivas in the northwestern corner of the plaza (Fig. 4) as well as Kivas 1 and 2 and Room 19.

**This amount includes the known areas of Kivas 1 and 2 plus an estimated area of equal size for two possible kivas in the northwestern corner of the plaza (Fig. 4).

Enough adults would have been present to permit the formation of work parties adequate to the agricultural and maintenance chores necessary for continued survival of the community. The basic construction effort at the site would probably have been undertaken with the assistance of neighbors and relatives from other communities.

The estimates produced by the application of Kvamme's Model 13 and Clarke's P = 1.81R model represent the absolute maximum number of people that could have been continuously sheltered at the site. The domestic rooms average 6.0 m² (Table 9). If we can use the projection of 38 domestic rooms for the village in total with an average of 6.0 m²/room only about 228 m² of heated living space is available. The 144 persons present using

Model 13 would require a total of about 162 m^2 of sleeping space assuming that the average person, 1.5 m tall, would need about 1.1 m^2 to lie down in. That leaves a scant 66 m^2 for fire places, milling bins, floor storage, and walking space. Such a large population could have lived at the site during the summer months when the plaza could have been utilized but housing them during the winter would have certainly taxed the village's facilities.

Taking the evident subsistence, social organization and population data together we have the picture of a small farming community organized in terms of nuclear families and lineages in a matricentered kinship system. It is unlikely that any significant centralization of economic activity was present outside the lineage. Lineages apparently occupied groups of 10 or more rooms judging from the group in the western end of the southern wing. The population probably numbered between 60 and 70 persons.

Regional Relationships

Again, this argument is built primarily on ceramics. Unfortunately, pottery is not subjected to the same constraints of development and association applied to the cultural and biologically constrained human animal. We cannot treat the ceramic assemblage of an archaeological site as though it gives us a fully isomorphic model of the past activity in the extinct human community. However, there are some indications in a site's ceramic assemblage which can give us a very generalized model of the relationships between various subcultural units in the potential interaction area.

We have accepted the assumption that the later phases of the Winslow Branch produced Winslow and Homolovi Orange Wares and that these wares should be taken as native to the Little Colorado River valley and at least

the lower portions of the Puerco River valley. The whole vessel and sherd counts, then, strongly indicate that the occupants of the village on the Puerco river during the Homolovi Phase are Winslow Branch peoples.

The abundance of the exotic Awatovi Black-on-yellow and other Jeddito Yellow Ware types and the absence of Hopi utility Awatovi Yellow Ware indicates trade rather than Hopi occupation of the Puerco site. The trade must have been fairly substantial judging from the fact that Awatovi Black-on-yellow rivals Winslow Orange Ware in popularity during the Homolovi Phase. The apparent close contact with the Hopi of the Jeddito area is not surprising as there are no barriers between the Little Colorado valley and Antelope Mesa aside from simple distance.

The relative paucity of White Mountain and Zuni ceramics is surprising. The pottery of these two regions, not any more distant than the Hopi area from the Puerco site, is present but in such small amounts as to imply either very limited economic interaction or that the southern and eastern wares alone were not economically competitive with the northern yellow wares. Such decisions are not always conditioned by economics or technological superiority however. The yellow wares may also be present at the Puerco and other later Little Colorado sites because of a closer cultural relationship with the Hopi than with the other neighboring groups.

At a more specific level it is nearly impossible to determine where the Puerco site fits into either the McDonald or Homolovi Phase trade or social systems in the region. The nearest contemporaneous neighbor of the Puerco site is the major pueblo at Wallace Tank (Schroeder 1961; Hough 1903). No modern archaeology has been done at the site and, aside from the fact of simple contemporaneity, nothing can be said of the possible interaction between the Wallace Tank and Puerco communities.

The presence of a great kiva at the Sundown site (Gumerman and Skinner 1968:193-194) indicates that it may have been a regional center during the McDonald Phase. No great kivas are known for the Petrified Forest area and residents of the Puerco Valley may have at least occasionally traveled to the Sundown site to participate in ritual.

The pronounced orientation in the ceramic assemblage towards the Little Colorado River between Holbrook and Winslow and towards the Hopi Mesas indicates that any sorts of consistent interactions between the Puerco people and other communities were in those directions. It had been anticipated that we might uncover evidence of a trade center at the Puerco site or, at the very least, of a way station on a trade route leading up the Puerco valley which connects the Little Colorado and Cibola centers. No such evidence came to light.

Given the limited survey data and the small numbers of known late PIII and early PIV sites in the region it is not surprising that the Puerco site seems to stand as an isolate. This is primarily a function of little or no modern work in contemporaneous sites in the vicinity. Only more effort at such sites as Wallace Tank will help to place the Puerco site in proper perspective with respect to the regional PIII-PIV interaction sphere.

The matter of close cultural ties between the Hopi and the occupants of Homolovi has been recognized since the earliest period of systematic archaeological study in the region (Fewkes 1898, 1904). The idea is not newly presented here but, we feel, further substantiated by the evidence from the Puerco site.

The Future of the Puerco Site

We have explored only the most simplistic of cultural historical problems in this study. The demonstration of the dates of occupation and the identification of cultural affiliation cannot be regarded as anything but an initial step in the study of the site and the later prehistory of Petrified Forest National Park. The waxing and waning of populations implied by the variations in the ceramics demands a systematic explanation, not a historical description or speculative ecological puffery. If the site was in fact abandoned from 1200 to 1300 at least a series of radio-carbon dates could be collected to confirm the gap. More importantly, a pollen study should be conducted both on and off the site to determine the extent and direction of climatic changes during the period from 1050 or 1100 through about 1500. This information will certainly aid in explaining the abandonment, reoccupation and final desertion of the site area by Anasazi peoples.

The Puerco site is in a pivotal position with regard to both cultural relationships and responses to environmental changes during the PIV period. The coalescence of groups, which began in PIII times, and the apparent movements of large numbers of people between about 1250 and 1500 has long been a subject of speculation and argument in southwestern archaeology. Very few known sites bear directly on the problems but the Puerco site is one of those and should receive attention. The value of the site in tying prehistory, the well known PIII period with protohistory at the PV period is substantial. No further work of the sort reported here should be done at the site. Rather, it should be approached from the point of view of dealing with the issues of climatic influences on population distribution changes between the 12th and 15th centuries and on modes of subsistence

during that period. Considerable attention should also be given to relating the artistic expressions at the site to similar phenomena at Zuni, Hopi, and in the White Mountains. Such study has the possibility of isolating specific cultural ties and for contributing to the construction of a model of the historical and genetic relationships between the areas.

The Puerco site is a very important resource in terms of its potential for yielding information relevant to the reconstruction of social organization and demography of the PIII-PIV period. The tantalizing indications noted in the discussion of the community organization should be followed up in any future work at the site. The Puerco site may afford an excellent opportunity to verify the methods and results of the studies of the Carter Ranch (Longacre 1970) and Broken K (Hill 1970) pueblos. In order to accomplish this goal it will be necessary to extensively test in the plaza in addition to completely excavating the surface and obvious subsurface features. The plaza exploration should first locate original occupation surfaces and, hopefully, indicate with firm stratigraphic information whether Kiva 2 and Room 19 belong to the earlier occupation phase or not.

Further work in the plaza will also have the effect of clarifying the nature of economic activities in the village as well as dealing with the possibility of more buried structures which are not indicated on the surface. We cannot fully understand the sociological dimension of the Puerco site without a clear understanding of the historical and economic backgrounds against which social behavior is cast.

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