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Final Report on the 1965-1966 Excavation

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OFFICE OF ARCHAEOLOGICAL STUDIES

THE ORMAND VILLAGE: FINAL REPORT ON THE 1965-1966 EXCAVATION

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ADMINISTRATIVE SUMMARY

Between September 7, 1965, and January 7, 1966, the archaeological excavation phase of the Cliff Highway Salvage Project was completed. Laurens C. Hammack, Stanley D. Bussey, and Ronald Ice of the Museum of New Mexico lead field crews investigating three sites: LA 5793 (Ormand Village), LA 5779 (Lee Village), and LA 6783 (Dinwiddie site). Field interpretations recognized three separate temporal periods at these sites, including late Archaic pithouses, Mogollon period pithouses, and a fourteenth to fifteenth-century occupation at the Ormand site commonly referred to as the Salado or Cliff phase. A preliminary report dated October 31, 1966, was filed at the Archeological Records Management Section (ARMS) with the original field documentation.

Thirty years after the original excavation began, a joint-powers agreement was signed between the Museum of New Mexico, Office of Archaeological Studies, and the New Mexico State Highway and Transportation Department to support artifact analysis and a final report. Funding was provided by the Federal Highway Administration, Transportation Enhancement Program, Intermodal Surface Transportation Efficiency Act of 1991, and the New Mexico State Highway and Transportation Department. The Ormand site was chosen as the site with the broadest temporal representation and strongest scholarly demand for detailed information. The Salado period at the Ormand site is of considerable interest to scholars of the prehistoric Southwest, particularly since Salado sites in southwestern New Mexico are known but poorly reported. Our final interpretation of the Ormand site includes important revisions from the preliminary report of 1966.

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INTRODUCTION

Between September 7, 1965, and January 7, 1966, an archaeological highway salvage project was conducted by Laurens C. Hammack, Stanley D. Bussey, and Ronald Ice of the Museum of New Mexico. Named after a nearby town, the Cliff Highway Salvage Project included three sites: LA 5793 (Ormand Village), LA 5779 (Lee Village), and LA 6783 (Dinwiddie site). Field interpretations recognized three separate temporal periods at these sites, including late Archaic pithouses, Mogollon period pithouses, and a fourteenth to fifteenth-century occupation at the Ormand site termed the Salado or Cliff phase. A preliminary report dated October 31, 1966, was filed at the Archeological Records Management Section (ARMS), Historic Preservation Division, with the original field documentation.

Thirty years after the original excavations were begun, a joint-powers agreement was signed between the Museum of New Mexico, Office of Archaeological Studies, and the New Mexico State Highway and Transportation Department (NMSHTD) to support funding for artifact analysis and a final report. After careful evaluation, the Ormand site was chosen as the site with the broadest temporal representation and strongest scholarly demand for detailed information. The Salado period at the Ormand site is of considerable interest to scholars of the prehistoric Southwest, particularly since Salado sites in southwestern New Mexico are known but poorly reported. As research and analysis of remains progressed, the Salado component revealed strong support of an earlier migration hypothesis established by Emil Haury (1945, 1958) from excavation at the Point of Pines Pueblo in east-central Arizona. Our final interpretation of the Ormand site includes important revisions from the preliminary report of 1966.

The generous offer of federal monies to complete this project finishes an effort begun by archaeologists associated with the Office of Archaeological Studies of the Museum of New Mexico, formerly called the Research Section. This project could not have been completed without the earnest and dedicated help of a number of volunteers who enlisted their services after visiting our office during open house events, and through the newsletter for the Friends of Archaeology, a Museum of New Mexico Foundation support group. These fabulous volunteers included Robin Lyle, Dennis and Margie Hall, Bob Greene, Martha and Roland Mace, and Tonya Emsweller. This report could not have continued without their help through all phases of artifact analysis. Dennis Hall received a Director's Award for outstanding volunteer service for 1995-1996 from the Museum of New Mexico for his unflagging energy, enthusiasm, and commitment to seeing this project through. Ceramic analysis was also aided by Kelly Hoodenpyle, Patrick Severts, and Macy Mensel—all employees at the Office of Archaeological Studies. Special thanks are also extended to Tim Maxwell, director of the Office of Archaeological Studies; Steve Koczan, Environmental Section, New Mexico State Highways and Transportation Department; Pat Neitfeld, curator of the Archaeological Research Collections at the Museum of Indian Arts and Culture; Louise Stiver, curator of collections at the Museum of Indian Arts and Culture; Steve Lekson, archaeologist at the Henderson Museum, University of Colorado, Boulder; Patricia Crown, professor of archaeology at the University of New Mexico; Mr. and Mrs. Larry Hopkins, present owners of what remains of the Ormand Village site; and Dr. John P. Wilson, director of Archaeological and Historical Research in Las Cruces, New Mexico—an original excavator on the crew in 1965 and 1966.

PREHISTORY OF THE REGION

Paleoindian (10,000-7000 B.C.)

The Paleoindian period in North America covers the earliest known evidence of man in the New World during the late Pleistocene age. Subsistence strategies relied on a mobile, hunting and gathering lifeway. Most sites consist of highly ephemeral camps for food processing, or the better recognized large game kill sites with distinctive tool types. Two of the diagnostic projectile point styles include the large (7 cm average length), lanceolate and fluted Clovis points, and the distinctive fluted Folsom and Midland projectile points (Cordell 1984:127-135).

Very little is known about this archaeological horizon in southwestern New Mexico. Isolated projectile points indicative of this period have been reported (Huckell 1972; Fitting 1972b; Fitting and Price 1968; Baker and Campbell 1960; Wendorf 1959), primarily from lower desert locations. Mountain and mountain-transitional zones have been the most studied areas, with no Paleoindian sites reported thus far (Lekson 1992a:8).

Archaic (7000 B.C.-A.D. 200)

The Archaic period represents a continuation of hunting and gathering strategies with an increased use of plant resources, and the introduction of corn as a cultigen around 1500 B.C. The tools from Archaic sites are typically made from local materials, suggesting a more localized adaptation. The Archaic period represents a worldwide post-Pleistocene adaptation as climates changed to resemble the vegetation and faunal distributions found in their present form, and with this an adaptation to local resources. The archaeology of the Archaic period has many of the same problems associated with the Paleoindian period: sites tend to be ephemeral and obscured by geologic deposits, erosion has undoubtedly destroyed remains, few temporally diagnostic tools exist, and chronology and paleoenvironmental reconstructions are not as precise as one would hope (Cordell 1984:154).

Numerous Archaic sites have been reported from southwestern New Mexico, although this may reflect the fact that sites with no ceramics and nondiagnostic projectile points are assumed to be preceramic, as are large, nonarchitectural, aceramic sites. The possibility does exist, however, that these sites could represent food processing camps from later ceramic period societies, and possibly historic Apache sites (Lekson 1992a:9).

New data on late Archaic occupations in southern Arizona has documented the presence of agricultural villages along major Sonoran Desert waterways by 550 B.C. (Roth 1993). The presence of these villages challenges previous interpretations of the late Archaic as a culturally homogeneous adaptation of mobile hunters and gatherers following seasonal rounds. Similarities do exist between late Archaic and early ceramic period occupations, but there appears to be no direct continuity between these time periods (Roth 1993:123-137). These data have interesting implications for the possible late Archaic occupation at Ormand Village, and other late Archaic sites found along the Gila River drainage. If we can assume contemporaneity for all of the possible late Archaic pithouses at Ormand, then the grouping of 11 pithouses on the first terrace above a major waterway implies provocative similarities to Roth's research.

Mogollon (A.D. 200-1150)

The Mogollon have been described as a mountain and transition zone agricultural adaptation by Martin and Plog (1973:181-182). Following Haury's work at Mogollon Village and the Harris site (1936), and Martin's work in western New Mexico (Martin et al. 1949), the Mogollon were recognized as a separate cultural manifestation (Bronitsky and Merritt 1986:163). Circular pithouses with a single large central post and conical roof have been reconstructed for the Pine Lawn phase pithouses at the SU site (Bronitsky and Merritt 1986:175). Much of what we now know about the prehistory nearer to the Cliff Valley is a product of the research of the Mimbres Foundation in the Mimbres Valley (LeBlanc and Whalen 1980; Anyon et al. 1981; LeBlanc 1983; Anyon and LeBlanc 1984; Nelson and LeBlanc 1986). Architecture, ceramics, and burial practices appear to change with patterns delineating three distinct periods: the Early Pithouse period, the Late Pithouse period, and the Pueblo period.

Early Pithouse Period (A.D. 200-550)

Shallow round or oval pithouses with brown ware pots and a few vessels with a red wash are characteristics of this period. Red ware is also associated with this period (Gilman 1980), but apparently this is not San Francisco Red pottery, but a local variant (LeBlanc 1980a:119). Among the many villages found, several contain as many as 60 pithouses, but most sites average around 7 structures. Large pithouses found at these extensive multistructured sites may represent communal structures.

Early Pithouse period sites have been described as typically found on mesas or high, steep-sided locations far from the nearest water source. This generalized locational description has been argued as evidence for the need of defensible sites (LeBlanc 1980a), but research conducted by the Cuchillo Negro Project challenges these generalizations (Schutt et al. 1994:14), as does the Ormand Village site.

Corn and processing tools have been found at Early Pithouse period sites, although it is thought that corn had not yet become a major source of food. Low population levels supported continued hunting and gathering lifeways, with corn agriculture used for limited diet augmentation.

Late Pithouse Period (A.D. 550-1000)

Slipped or decorated pottery along with deeper and more formalized pithouses characterize this time period. Villages are larger and located on terraces above major drainages. Sites range from 100 to 200 pithouses, and are typically under later Pueblo period surface rooms, hiding the true extent of these large pithouse groupings. Very few Pueblo period sites have been excavated that do not have substantial Late Pithouse period sites beneath them, indicating the desirability of these locations for both temporal adaptations. Several patterns in behavior and material culture were established in the latter phase of the Late Pithouse period (Three Circle phase) and continued into the Pueblo period. Intramural subfloor burials, the production of Boldface Black-on-white, and a settlement location suggesting agricultural use of major drainages began during this phase and continued into the Pueblo period (Lekson 1992a:13-15).

The largest of these Late Pithouse period villages often had one pithouse several times larger than other pithouses, called "communal structures" by Anyon and LeBlanc (1980). It is unclear exactly how these larger structures functioned, hence the more generic designation. Their large size does suggest a communal effort for construction and use. Unlike the Anasazi area, where specialized communal/ritual structures (kivas) were distinguished by distinctive nondomestic interior features, Mogollon communal structures were clearly larger than domestic architecture but lack specialized features (Anyon and LeBlanc 1980:255-256).

Pueblo Period, Mimbres Phase (A.D. 1000-1150)

Mimbres phase sites are the most numerous and best understood of archaeological phases in this region. Small four to five surface room units mark the beginning of this phase, with a progressive shift to larger pueblos up to 200 rooms. Large, aggregated pueblos are rare compared to the many smaller, "household" units found throughout the region. What is unclear at present is the relationship between these smaller and larger sites (Lekson 1992a:16).

The Mimbres used irrigation canals, water-check dams, and terraces along small upland drainages. In the later A.D. 1000s, almost all of the land that could be used for agriculture was in use (Lekson 1992a:17). The southern desert areas were also inhabited by Mimbres people, with little evidence that this phenomena extended into present-day northern Chihuahua.

Pottery from this period includes the famous Mimbres Classic Black-on-white (Style III) with naturalistic depictions of people and animals. This style was found archaeologically as whole vessels inverted over the heads of interred individuals, and as small fragments in household trash (Lekson 1992a:17). Some of these vessels show daily use, but other vessels may have been created solely as burial offerings. It has been suggested that a few specialized craftspersons created all of these funerary vessels for the whole period (LeBlanc 1983:139). These vessels account for less than a fourth of all ceramics found at any one site, and seem to be localized in the Mimbres Valley (Lekson 1992a:17).

Large communal structures found in the Late Pithouse phase were superseded by a diversity of architectural features, including large unwalled plazas, large surface rooms, and small semi-subterranean kivas. Large unwalled plaza areas could have been used by the village as a whole, similar to the proposed use of the large communal structures during the Late Pithouse period. Large surface rooms and semisubterranean kivas are associated with specific surface habitation units, and appear to be used by particular segments of the village population (Anyon and LeBlanc 1980:266)

Late Pueblo (A.D. 1180-1450)

The later Pueblo phases are interpreted as a "local expression" of much larger regional phenomena. The Black Mountain phase is seen as a local variant of the "Casas Grandes sphere of influence" during the late twelfth and early thirteenth centuries (LeBlanc 1989). The Cliff phase has been named and interpreted as local evidence of the larger Salado period phenomenon during the late thirteenth through early fifteenth centuries (Nelson and LeBlanc 1986).

Black Mountain Phase (A.D. 1180-1300)

The Black Mountain phase was defined by LeBlanc (1980b) as a local development of the Casas Grandes system, dating from A.D. 1180 to 1300. Initial discussion focused on a perceived break in continuity from the Mimbres culture, with a repopulation from totally new cultural origins. The present prevailing view suggests evidence of continuity in the ceramic sequence, architectural records, and burial practices. Clearly, a serious depopulation of the area took place, and a "profound" reorganization occurred (Nelson and LeBlanc 1986:247; Lekson 1992a:20). Stone masonry changed to adobe construction, and ceramic assemblages changed and included other imported types like Chupadero Black-on-white, Playas Red, and El Paso polychromes. Burial patterns changed slightly to include cremations placed in jars with "killed" bowl covers, buried in subfloor pits, with a few individuals interred like the former burial practice of the Mimbres phase, in subfloor pits with "killed" bowls placed over the head (Lekson 1992a).

Investigations of known Black Mountain phase sites from the New Mexico Cultural Resource Information System (NMCRIS), Archeological Records Management Section, Historic Preservation Division files for southwestern New Mexico reveal an interesting pattern. Most of these sites cluster around USGS quadrangles in the vicinity of the modern town of Truth or Consequences (USGS quadrangles Black Bluffs, Elephant Butte, Cuchillo, Williamsburg NW, Thumb Tank, Saladon Tank, Williamsburg, Skute Stone Arroyo, and Caballo). Other known sites stretch the western edge of this dense cluster to the USGS quadrangle area of Mangus Springs, just south of Cliff, New Mexico. The total number of sites known for this phase is 53, with the dense cluster of sites numbering 37. Overall, the Black Mountain settlement pattern forms an area more to the east (or south-central New Mexico) than does the later Cliff phase site clusters. It has been suggested that the Mimbres Valley population of the Classic phase may have reorganized into smaller social units to the east, on the eastern slope of the Black Range (M. Nelson 1993:42-44). El Paso Polychrome pottery is present in relatively high numbers at Black Mountain sites, interwoven with the continuous production of Classic Mimbres Black-on-white pottery (Creel 1997:25-31), indicating cultural ties to the Casas Grandes influence in the El Paso area.

Salado or Cliff Phase (A.D. 1300-1450)

Defined as the Cliff phase by Nelson and LeBlanc (1986), this period is thought to represent a distinct cultural break from all previous occupations, due to the presence of Salado polychromes (Nelson and LeBlanc 1986:16). Adobe architecture and cremations placed in jars continues in practice. From the most recent information in the NMCRIS files, Cliff phase sites appear to be fewer in frequency and population than Black Mountain phase sites. Known Salado sites, identified mostly through the presence of Salado polychromes and adobe architecture, are clustered in the Cliff, Buckhorn, Antelope Ridge, and Mangus Springs USGS quadrangles. A few sites are found in areas near to this central clustering. Twenty-five known sites are identified in this general Upper Gila River area. Between sites near the Gila River and possible Salado sites in the bootheel region of southern New Mexico is an empty stretch of space suggesting a "buffer zone." Sites labeled as Salado in the bootheel region have architectural and ceramic profiles, however, that more closely resemble a Casas Grandes influence.

In the Upper Gila River area, the presence of Tucson Polychrome and Maverick Mountain Polychrome pottery types reflect connections to ceramic traditions from areas in east-central and southeastern Arizona. The Upper Gila River Salado phenomenon appears tied to multi-ethnic origins west of the Upper Gila during the late thirteenth and early fourteenth centuries A.D. (Crown 1994), following subsequent migrations south and east. Archaeological studies of Salado sites cluster along the Gila River and tributaries south, and have long been discussed as migrant communities originating in east-central Arizona (Brown 1973; DiPeso 1958; Franklin 1980).

The issue of the "Salado culture" is still controversial 65 years after its initial development as a cultural and temporal marker. Much of the argument revolves around origins, influences, and the fact that architecture and ceramic types vary greatly across the total area now defined as Salado. This area extends from the Agua Fria River in west-central Arizona, to the Mimbres Valley in southwestern New Mexico, and into the Casas Grandes polity in northern Chihuahua, Mexico. Certain scholars interpret the Salado presence in southwestern New Mexico as part of a "sphere of interaction" centered at Casas Grandes (LeBlanc 1989:192; Lekson 1992b, n.d.). Specific traits cited as supporting this view include changes in the roof-support pattern, the construction technique used for postholes, the type of interior hearths (LeBlanc 1989:193), the presence of Redrock, New Mexico serpentine in Casas Grandes storage rooms (Lekson 1992b:20), and the enormous size of Casas Grandes, which by dint of size was ". . . a polity without a peer" that must have cast a wide net of influence (Lekson n.d.).

Much of the interpretation of Upper Gila Salado sites stems from speculation on poorly reported sites and survey impressions. Very little Chihuahuan influence is noted at the Ormand Village site; one Ramos Polychrome sherd was found out of 23,805 sherds analyzed. Locally made Tucson Polychrome and Maverick Mountain Polychrome pottery types, with stylistic origins in the Point of Pines area of east-central Arizona, indicate maintenance of ceramic traditions originating in east-central and southeast Arizona. Architectural features at Ormand follow an aggregated, "puebloan" pattern. This puebloan architecture contrasts with "compound" architecture, considered a hallmark of "heartland" Salado architecture, but is actually found throughout east-central and southeastern Arizona. What emerges most strikingly from our studies is the fact that attention to details becomes ever-more important as sites from the Salado period are studied; it is the details that will inform us on the nature of the larger picture.

ENVIRONMENT

Physiography and Geology

The general physiographic setting of the Upper Gila River area is the site of one of the world's greatest volcanic provinces. Volcanic rocks mainly of Tertiary age are visible through much of the area. The great volcanic mountain-mass of southwestern New Mexico consists of a complex succession of andesites, latites, quartz latites, and rhyolites (Elston 1965:167, 170). Much of southwestern New Mexico was covered with lava flows, and extensive lava-capped mesas and benches can be found. Numerous volcanic necks add interest to the landscape. Along the Upper Gila River, Pleistocene and recent surfaces are inset below the floors of ancient basins, plains, and valleys whose late Cenozoic fills have been part of the Gila Conglomerate intermontane basin-fill deposits (Fitzsimmons and Lochman-Balk 1965:12-13).

Soils

Soil information in this chapter is cited from soil surveys conducted by the Soil Conservation Service, under the U.S. Department of Agriculture (Parham et al. 1983). Soil is made of non-consolidated mineral matter that supports plant growth. It is formed through the interaction of five factors: (1) plants and animals, (2) climate, (3) the parent material, (4) relief, and (5) time. All of these factors determine soil characteristics, and due to this complex interaction, it is difficult to isolate the effects of any one factor (Parham et al. 1983:2-3).

The Ormand Village site is located 30 m due west of the Gila River on the first terrace above the river. This terrace rises abruptly 20 m above the floodplain, and consists of Lonti gravelly clay-loam, which is more suitable for rangeland. The surface layer is typically a dark brown, gravelly clay about 10.2 cm (4 inches) thick. The subsoil is reddish brown clay about 48.26 cm (19 inches) thick. The substratum is a light brown gravelly sandy loam to a depth of 152.4 cm (60 inches) or more (Parham et al. 1983:28). Following conventional wisdom, it is assumed that corn agriculture was possible along the flood plains adjacent to the Gila River. Soils within a 1.6 km (1 mile) radius of the Ormand Village site were examined for their variety and suitability for agriculture.

The flood plains along the Gila River, Duck Creek, and Bear Creek contain soils best suited for irrigated crops and pasture. Six types of soils best suited for agriculture are present: (1) Manzano loam with 0 to 1 percent slopes, (2) Manzano loam with 1 to 3 percent slopes, (3) Paymaster-Ellicott complex with 0 to 1 percent slopes, (4) Paymaster-Ellicott complex with 1 to 3 percent slopes, (5) Stirk Variant silty clay loam with 0 to 1 percent slopes, and (6) Tesajo-Manzano complex with 1 to 3 percent slopes. All of these soils have some shared characteristics. Effective rooting depth is 152.4 cm (60 inches) or more. Runoff is slow, with very brief periods of flooding from July through September. Flooding can be controlled through the use of major flood control devices. The hazards of soil erosion and soil blowing vary greatly.

Manzano loam with 0 to 1 percent slopes is a deep and well-drained soil found in floodplains and upland valleys, formed in alluvium from mixed sources. The native vegetation is mainly grasses. The surface layer is typically a very dark, grayish brown loam about 7.6 cm (3 inches) thick. The subsoil is a very dark, grayish brown clayey loam about 38.1 cm (15 inches) thick. The substratum is a very dark, grayish-brown clayey loam extending down 152.4 cm (60 inches). Permeability is moderately slow, with available water capacity very high.

Manzano loam with 1 to 3 percent slopes is nearly exact in description to Manzano loam with 0 to 1 percent slopes. Subsoil is somewhat thicker, at about 58.4 cm (23 inches) thick.

The Paymaster-Ellicott complex with 0 to 1 percent slopes is found on floodplains and alluvial fans. The native vegetation is mainly grasses. The Paymaster soil is deep and well drained, formed in alluvium from mixed sources. The surface layer is a dark, grayish brown loam about 35.6 cm (14 inches) thick. The substratum is grayish-brown and dark grayish brown sandy loam and loam extending down 152.4 cm (60 inches). Permeability is moderately rapid, with available water capacity high.

The Ellicott soil is deep and somewhat excessively drained. Formed in alluvium from mixed sources, the surface layer is grayish brown gravelly sand about 20.3 cm (8 inches). The substratum is a grayish brown sand and loamy sand with a thin strata of finely textured materials, extending down 152.4 cm (60 inches). Permeability is rapid, but available water capacity is low. Irrigated crops in this soil face limitations such as drought, moderately rapid to rapid permeability, soil blowing, and frequent flooding (Parham et al. 1983:38).

The Paymaster-Ellicott complex with 1 to 3 percent slopes is found on floodplains and alluvial fans. The native vegetation is mainly grasses. The Paymaster soil is deep and well drained, formed from alluvium of mixed sources. The surface layer is grayish brown fine sandy loam about 25.4 cm (10 inches) thick. The substratum is a dark grayish brown, very fine sandy loam and fine sandy loam 88.9 cm (35 inches) deep. Below this is a dark, gravelly, loamy sand up to a depth of 152.4 cm (60 inches). Permeability is moderately rapid, with a high available water capacity.

The Ellicott soil is deep and somewhat excessively drained, formed from mixed sources in alluvium. The surface layer is dark, yellowish brown, gravelly sand about 15.2 cm (6 inches) deep. The substratum is a dark, yellowish brown sand with layers of gravelly sand about 152.4 cm (60 inches) deep. Permeability is rapid and available water capacity is low (Parham et al. 1983:39).

Stirk Variant silty clay loam is a deep and moderately well drained soil found in floodplains and alluvial fans. It was formed in alluvium from mixed sources. The surface layer is light brownish gray, silty clay loam about 5 cm (2 inches) thick. The substratum is a light brownish gray, silty clay and clay 152.4 cm (60 inches) deep or more. Permeability is very slow, and available water capacity is moderate.

Tesajo-Manzano soils are found on floodplains and alluvial fans. The Tesajo soils are deep and well drained, formed from alluvium derived from mixed sources. The surface layer is a dark brown, gravelly, sandy loam about 22.9 cm (9 inches) deep. The substratum is a very dark brown, cobbly, sandy clay loam 152.4 cm (60 inches) deep or more. Permeability is moderately rapid, available water capacity is low, and soil blowing potential is high.

Manzano soil is deep and well drained, formed in alluvium from mixed sources. The surface layer is dark brown, gravelly, sandy clay loam about 27.9 cm (11 inches) thick. The substratum is a very dark, grayish brown and brown loam and clay loam 152.4 cm (60 inches) deep and more. Permeability is moderate, and available water capacity is high. The main limitations for irrigated farming are the gravelly surface layer of soils and the potential for flooding. Flooding can be controlled with dikes, levees, and diversions (Parham et al. 1983:52-53).

Biome Description

The range of flora and fauna found in the vicinity of the Ormand Village site is cited here from a major biological study of the Southwest, entitled *Biotic Communities: Southwestern United States and Northwestern Mexico*, edited by David E. Brown (1994). Ormand Village is located in the semidesert grassland biome, and is best understood as a desert to grassland transition. This terminology refers to a potential perennial grass-scrub dominated landscape with desert scrub in lower elevations and evergreen woodland, chaparral, or plains grassland in higher elevations. Desert grasslands adjoin and largely surround the Chihuahuan desert, and with a few areas in west-central Arizona, may be called a Chihuahuan semidesert grassland. Most of this biome receives an average annual precipitation of between 2.5 and 4.5 cm. Typically, over 50 percent of this total arrives during the April to September rainfall. Perennial grass production is dependent on rain during this period. Unlike Plains grasslands, the winters are mild and freezing temperatures occur less than 100 days per year.

Heavy grazing in the last century has changed the original perennial bunch grasses to low growing sod grasses, such as curly mesquite grass *(Hilaria belangeri)*, in areas with heavy to moderate rainfall. In times of low average rainfall, grasses tend to be annuals. In areas where soils are deep, however, perennial grasses may still cover the landscape. Most semidesert grassland cover has been reduced by competition with a wide variety of shrubs, trees, and cacti. There are now extensive areas in this biome where grass has been replaced by these life forms.

Although this biome is situated geographically between Plains grassland and Chihuahuan desert scrub, and shares some of the constituents of both, it is a distinct biome with evolutionarily distinguishable flora and fauna. These include numerous summer-active perennial grasses such as black grama *(Bouteloua eriopoda)*, slender grama *(Bouteloua filiformis)*, chino grama *(Bouteloua breviseta)*, spruce top grama *(Bouteloua chondrosioides)*, bush muhly or hoe grass *(Muhlenbergia porteri)*, several species of three-awn (*Artisida divaricata, A. wrightii, A. purpurea*, and others), Arizona cotton top *(Trichachne californica)*, curly mesquite grass, slim tridens *(Tridens muticus)*, pappus grass *(Pappophorum vaginatum)*, tanglehead grass *(Heteropogon contortus)*, and vine mesquite grass *(Panicum obtusum)*.

The most diagnostic grasses for semidesert grasslands are tobosa grass and black grama. Black grama is found on gravelly upland sites, and tobosa grass is found typically in floodland areas with heavier soils. Higher elevations can contain some grasses from the Plains grassland, such as blue grama *(Bouteloua gracilis)*, sideoats grama *(B. curtipendula)*, hairy grama *(B. hirsuta)*, buffalo grass *(Buchloe dactyloides)*, Plains bristlegrass *(Setaria macrostachya)*, Plains lovegrass, wolftail, and little bluestem. Frequently tougher, less palatable grasses are present to abundant including hairy tridens *(Tridens pilosus)*, fluffgrass *(T. pulchellus)*, red three-awn *(Aristida longiseta)*, and burrograss *(Scleropogon brevifolius)*.

Forbs and weeds are seasonally abundant with different species dominant during each season. Spring nourishes filarees *(Erodium)*, lupines *(Lupinus)*, buckwheats *(Eriogonum)*, and mallows *(Sphaeralcea)*. Summer heat supports spiderlings *(Boerhaavia)*, white-mats *(Tidestromia)*, devilsclaws *(Martynia)*, and amaranths *(Amaranthus)*.

Dry-tropic stem and leaf succulents are numerous and characteristic of semidesert grassland. These include sotols *(Dasylirion wheeleri, D. leiophyllum)*, beargrasses *(Nolina microcarpa, N. taxana, N. erumpens)*, agaves *(Agave lechuguilla, A. parviflora, A. schottii, A. scabra, A. parryi,* etc.), and yuccas *(Yucca torreyi, Y. baccata, Y. rostrata, Y. macrocarpa, Y. carnerosana,* etc). Soaptree yucca *(Yucca elata)* is particularly noticeable in the semidesert grassland of the Southwest.

Other important scrub-shrubs dominant in this biome are mesquite *(Prosopis glandulosa, P. juliflora)*, one-seed juniper *(Juniperus monosperma)*, lotebush *(Zizyphus obtusfolia, Condalia spathulata)*, allthorn *(Koeberlinia spinosa)*, Mormon or Mexican tea (*Ephedra trifurca, E. antisyphilitica)*, mimosa *(Mimosa biuncifera, M. dysocarpa)*, false mesquite *(Calliandra eriophylla)*, Wright's lippia *(Aloysia wrightii)*, catclaw acacia *(Acacia greggii)*, littleleaf sumac *(Rhus microphylla)*, desert hackberry *(Celtis pallida)*, javelina-bush *(Condalia ericoides)*, barberry *(Berberis trifoliata)*, and ocotillo *(Fouquieria splendens)*.

The naturally high species diversity of dry tropic shrubby species in the semidesert grassland produces native grasses that tend to be shorter in height than Plains grassland grasses. The resulting landscape is the presence of large, diverse, and well-spaced scrub.

Plants characteristic of the Chihuahuan Desert have invaded extensive areas and continue to increase. These include tarbush *(Flourensia cernua)*, whitethorn *(Acacia neovernicosa)*, and creosotebush *(Larrea tridentata)*. Common shrubs including snakeweed *(Gutierrezia sarothrae)*, burroweed, jimmyweed, and turpentine bushes *(Isocoma tenuisecta, I. heterophylla, and Ericameria laricifolia)*, buckwheats (*Eriogonum* spp.), mariola *(Parthenium incanum)*, desert zinnia *(Zinnia acerosa)*, threadleaf grounsel *(Senecio longilobus)*, and sages like *Artemisia ludoviciana* may be numerous, sparse, or absent depending on location and grazing history.

Cacti species well represented in the semidesert grassland include barrel cactus or visnaga *(Ferocactus wislizenii)*, Turk's head *(Echinocactus horizonthalonius)*, cane cholla *(Opuntia imbricata, O. spinosior)*, desert Christmas cactus *(Opuntia leptocaulis, O. kleiniae)*, the prickly pears (*Opuntia chlorotica, O. phaeacantha, O. violacea)*, rainbow cactus *(Echinocerus pectinatus* var. *rigidissimus)*, and hedgehogs *(Echinocerus)* and the pincushions *(Mammillaria wrightii, M. grahami, M. mainiae, M. gummifera)*.

Trees are uncommon in the semidesert grassland outside of mesquite and one-seed juniper, and usually restricted to drainages, where western soapberry *(Sapindus saponaria)*, desert willow *(Chilopsis linearis)*, and occasionally lower oaks of the Madrean woodland *(Quercus tuomeyi, Q. grisea, Q. emoryi, Q. oblongifolia, and Q. chihuahuensis)* can be found.

Mammals living in this biome are the black-tailed jack rabbit *(Lepus californicus)*, spotted ground squirrel *(Spermophilus spilosoma)*, hispid pocket mouse *(Perognathus hispidus)*, Ord's, banner-tailed, and Merriam kangaroo rats *(Dipodomys ordii, D. spectabilis, D. merriami)*, white-footed mouse *(Peromyscus leucopus)*, the cotton rats *(Sigmodon hispidus, S. fluviventer)*, southern grasshopper mouse *(Onychomys torridus)*, Southern Plains and white-throated wood rats *(Neotoma micropus, N. albigula)*, badger *(Taxidea taxus)*, and the coyote *(Canis latrans)*.

The variety of birds is great, with well distributed nesting species including Swainson's hawk (*Buteo swainsoni*), prairie falcon, kestrel, mourning dove (*Zenaida macroura*), scaled quail

(*Callipepla squamata*), roadrunner (*Geococcyx californicus*), burrowing owl, poor-will (*Phalaenoptilus nuttallii*), ladder-backed woodpecker (*Picoides scalaris*), western kingbird (*Tyrannus verticalis*), ash-throated flycatcher (*Myiarchus cinerascens*), Say's phoebe (*Sayornis saya*), horned lark, barn swallow (*Hirundo rustica*), white-necked raven (*Corvus cryptoleucus*), verdin (*Auriparus flaviceps*), cactus wren (*Campylorhynchus brunneicapillus*), mockingbird (*Mimus polyglottos*), curve-billed thrasher (*Toxostoma curvirostre*), black-tailed gnatcatcher (*Polioptila melanura*), loggerhead shrike (*Lanius ludovicianus*), meadow lark (*Sturnella magna*), brown-headed cowbird (*Molothrus ater*), Scott's oriole (*Icterus parisorum*), house finch (*Carpodacus mexicanus*), lark sparrow (*Chondestes grammacus*), and Cassin's sparrow (*Aimophila cassinii*).

Species from adjacent scrublands and desertlands such as Gambel's quail (*Lophortyx gambelii*), mule deer (*Odocoileus hemionus crooki*), and black-throated sparrow (*Amphispiza bilineata*) can also be found in the semidesert grasslands. In areas where ocotillo and thornscrub species are present, javelina (*Dicotyles tajacu*) and white-tailed deer are also present.

Native species always found in semidesert grassland are the scaled quail, the western yellow box turtle (*Terrapene ornata luteola*), desert-grassland hognose snake (*Heterodon nasicus kennerlyi*), western hooknose snake (*Ficimia cana*), the all-female desert grassland whiptail (*Cnemidophorus uniparens*), the southwestern earless lizard (*Holbrookia texana scitula*), and the western green toad (*Bufo debilis insidior*).

In general, the grassland and other open landscape-adapted species have not fared as well as their scrub-adapted competitors. Antelope are now totally absent from large areas of their former range in semidesert grassland. Conversely, mule deer and javelina have extended their range and increased their density into this biome during this century. Livestock from Euroamerican settlement have played the major culprit by reducing and eliminating grasses and thereby facilitating the invasion of woody and shrubby species like mesquite and juniper.

Climate

Most of the semidesert grassland receives an annual precipitation between 25 and 45 cm. Typically, this total derives from the April to September period when rainfall averages 15 cm or more. The source of this precipitation is mainly moist air from the Gulf of Mexico (Tuan et al. 1973:20). This precipitation occurs as brief and occasionally heavy thunderstorms. Spring and fall are relatively dry. A small increase in precipitation is seen in winter, deriving from moist air from the Pacific Ocean. Relative humidity is low except during storm periods.

Winters are mild and freezing temperatures are usually less than 100 days per year. Freezing temperatures usually happen from early in November through March. Maximum temperatures in summer range from 12.4 to 17.4 degrees C, with an average of 27 days exceeding 32 degrees C (90 degrees F). Days with temperatures over 38 degrees C (100 degrees F) are rare. Winds are prevalent during spring and fall, particularly in the early morning and late afternoon (Brown 1994:123-124; Parham et al. 1983:2).

The frost-free season averages 150 to 225 days in Silver City (Tuan et al. 1973:82). This is roughly comparable to the Ormand Village, since Silver City is 424.8 m (1,416 ft) higher in elevation. The frost-free season is a "very liberal" measure of the time available for plant growth, since plant growth does not normally occur at temperatures under 4.5 degrees C (40 degrees F). Frosts are of particular importance agriculturally when they occur in spring after plant growth has begun. The variability of the growing season increases with higher latitude and elevation (Tuan et al. 1973:79-80).

SITE DESCRIPTION

The Ormand Village is located approximately 1.6 km (1 mile) south of Cliff, New Mexico, in the southwestern portion of the state. The site is situated 32 m (105.6 ft) west of the Gila River, on the first gravel terrace rising 13 m (42.9 ft) above the floodplain. The site elevation is 1,370 m (4,522 ft). The Cliff Valley is within a 5.4 km (9 mi) by 1.6 km (1 mile) straight stretch of the Gila River between Mogollon Creek at the north and Greenwood Canyon at the south end. The valley floor is excellent farmland, with over 4,000 acres irrigated by a nonpump ditch system today (Lekson 1990:1). The rugged, mountainous terrain of the Mogollon Mountains is found 16.6 km (10 mi) to the east, with elevations over 2,272.7 m (7,500 ft). Gentle, rolling hills characterize the site area and terrain to the west of the site, with a steady increase in elevation east of the river channel towards the Mogollon Mountains. Two major streams are located to the north of the site (Duck Creek and Lobo Creek), converging with the Gila River.

Beyond low-lying grasses, vegetation on the site is sparse. A few small mesquite bushes were found growing in pithouse depressions. Juniper was found on north-facing slopes, with mesquite, oak, and cacti growing on southern facing slopes. Large cottonwood trees rim the Gila River channel. The flat areas of the Gila River Valley are now under cultivation, and indicate potential prehistoric agricultural fields. Construction resources for the prehistoric occupants include readily available adobe, cobbles, and timber.

The site has long been known to local collectors, and the present owner still battles with potential pothunters. In 1965, the surface had been stripped of most artifacts. A Salado period cremation area in the western portion of the site was extensively pothunted, along with some of the Salado period rooms in the adobe roomblocks (Fig. 1). These roomblock potholes did not reach floor levels. By the time of the 1965 archaeological investigation by the Museum of New Mexico, these disturbances were noted as "surprisingly little damage" (Hammack et al. 1966). The alignment for the new highway cut across about 20 percent of the total site area of 16,000 m. Portions of two Salado period mounds and the plaza area between them, and numerous pithouses possibly dating to the late Archaic or Mogollon Early Pithouse phase were located within the proposed right-of-way and were excavated completely (Fig. 2).

Field Methods

The entire 121.9 m (400 ft) by 50 m (165 ft) right-of-way area was investigated. The extramural areas were surface stripped approximately 20 cm down to sterile soils. Rooms in the two mounds included in the right-of-way were excavated down to sterile soils. Numerous pithouses and extramural pits were located by surface stripping. Most of the work was done with hand tools, although a backhoe was used in a portion of the southeastern section of the site. Architectural features were numbered consecutively and excavated as a unit. Excavation units were described as general fill, floor fill, and floor contact in all features. Excavated soil in general was not screened for artifacts.

Records were kept following standards established by the Museum of New Mexico for field procedures. About 1,000 photographs were taken during the excavation. A total of 162

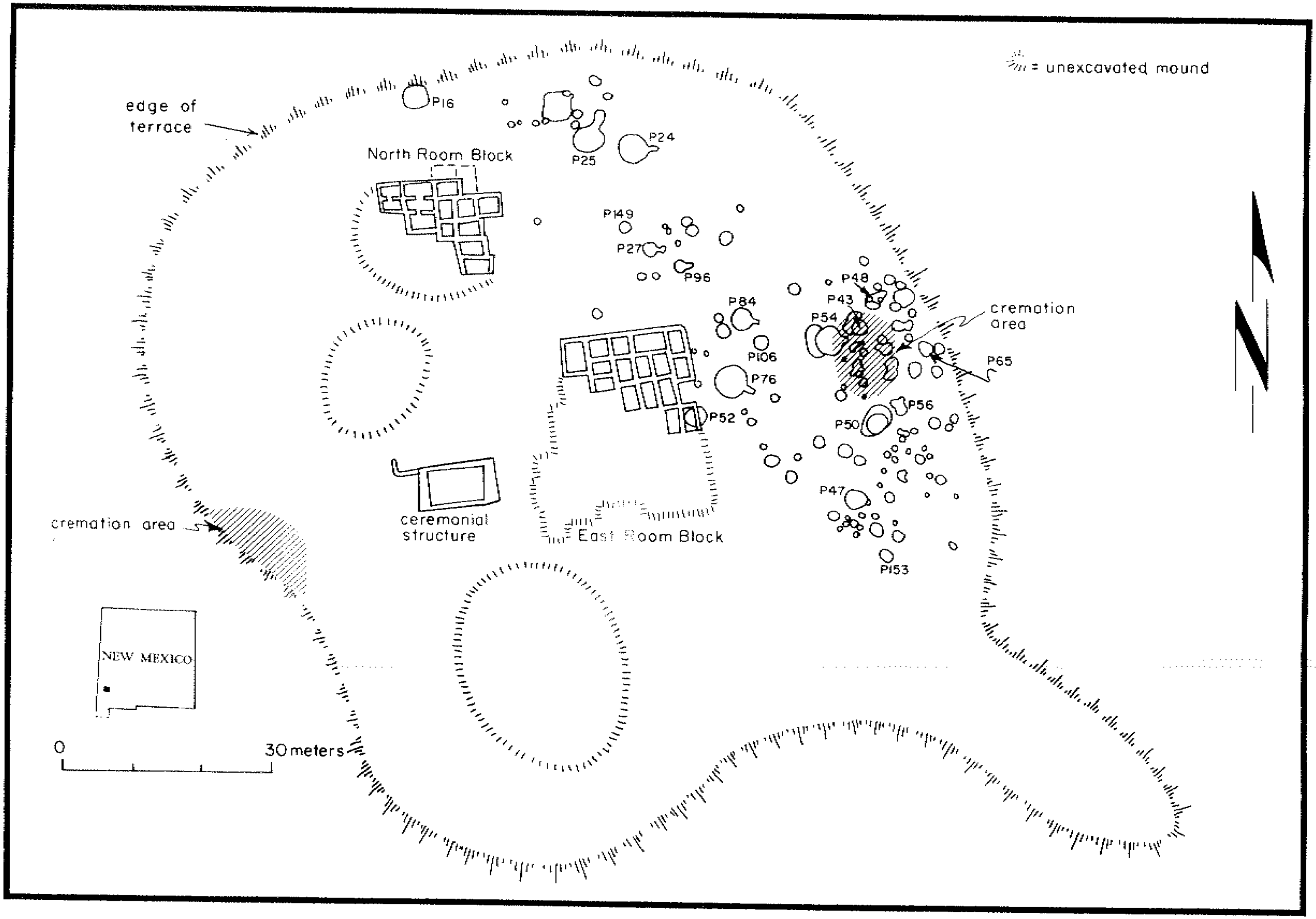

Figure 1. Plan map of the Ormand Village site.

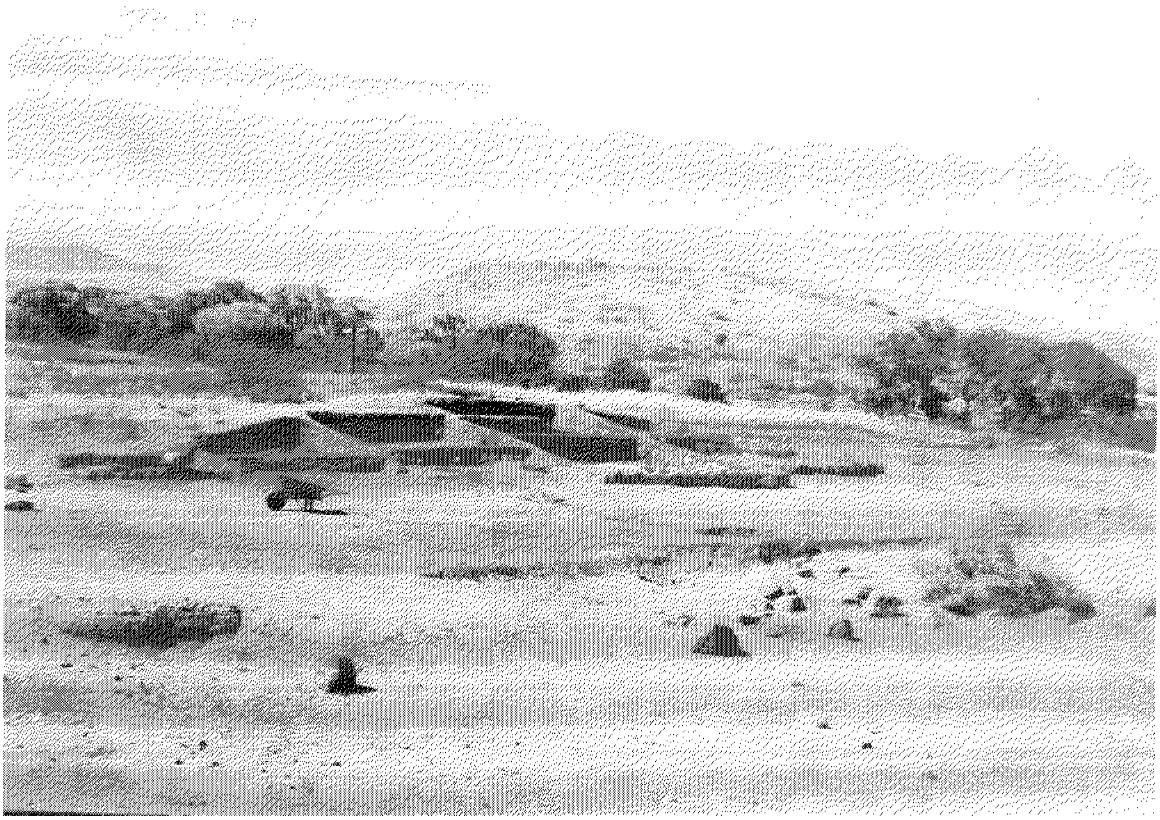

Figure 2. Overview of east roomblock during excavation, looking east.

features were found, including rooms in the mounds, pithouses, and extramural pit features. Three temporal components were suggested from field observations: a late Archaic phase with small pithouses, a Mogollon Late Pithouse phase with larger pithouses and extramural storage pits, and a Salado phase representing most of the architectural and material culture at the site.

After careful evaluation of the material culture and architectural sequencing at the site, these initial interpretations took on important revisions. Dating for all of the pithouses relied solely on architectural comparisons, providing suggested temporal affiliations, not absolute attributions. The smaller pithouses may date to the late Archaic, and possibly to the Mogollon Early Pithouse period. The larger pithouses are architecturally similar to Early Pithouse period structures and possibly to the Georgetown phase of the Mogollon Late Pithouse period, circa A.D. 500-700. Some of the larger pithouses contained Maverick Mountain Polychrome and Tucson Polychrome, and Gila Polychrome sherds in floor and fill proveniences. These structures were tentatively called "Mogollon," but may represent dwellings associated with the initial Salado occupation, or structures reoccupied during the Salado period. One of the larger pithouses, the early surface room construction, and the ceremonial structure are clearly associated with the earliest Salado occupation, perhaps as early as A.D. 1300. Locally made Maverick Mountain Polychrome and Tucson Polychrome sherds were found in relatively high percentages of decorated pottery types at these proveniences. Pinto Polychrome pottery, however, was not found at Ormand, indicating that the Salado occupation was not earlier than A.D. 1300. Construction of the east roomblock, built after portions of the north roomblock and possibly the ceremonial structure, dates to the mid-1300s. The one dateable tree-ring specimen collected on site came from Room 41 in the east roomblock; it was cut for roofing material sometime after A.D. 1342. Later remodeling and pottery, including Gila and Tonto polychromes, indicate a Salado occupation that extended perhaps as late as A.D. 1450.

PITHOUSES

Two sets of distinct pithouse sizes were found along the east edge of the site, on the first terrace above the river. Both of these pithouse types were clearly circular in plan view, and this architectural signifier structured temporal affiliations. Unfortunately, no absolute dates were available from past documentation or obtainable from what had been collected from these structures. Architectural signifiers offer weak temporal measurements, but in this case provided the sole means of interpreting these structures. Temporal divisions presented here, based mainly on structure size and feature differentials, should be considered tenuous at best.

Circular, prerectangular pithouse forms are interpreted as representing a relatively mobile subsistence strategy from the late Archaic and Mogollon Early Pithouse periods. These round pithouses probably had domed or pointed roofs (Anyon and LeBlanc 1984:267-268). At Ormand, the smaller pithouses averaged 3.3 m in diameter, and had a central posthole and basin-shaped hearth. It was unclear if these structures were aceramic: many of the artifacts collected could not be found in the state repository for final analysis.

The late Archaic is associated with pre-agricultural, small, highly mobile groups, with a flexible and easily fragmented pattern of population dispersal and aggregation. All of the known habitation sites from the Archaic period are probably from the late Archaic, or San Pedro phase, dating from 1500 B.C. to A.D. 200 (Minnis and Nelson 1980:85; Schutt et al. 1994:14). Population density was very low in southwestern New Mexico, perhaps 300 households, with 4.5 persons calculated per household unit. The traditional interpretation of the Archaic lifeway hypothesizes that subsistence followed a seasonal migration to areas with available plant and water resources. Following this interpretation, the structures at Ormand possibly represent a "base camp" strategy, where a large number of activities were performed (Minnis and Nelson 1980:64-102). More recent research on the late Archaic in southern Arizona has documented evidence of agricultural villages with corn stored in pits along major waterways (Roth 1993), challenging the hegemony of the traditional interpretation of the Archaic period as a mobile, culturally homogeneous adaptation (Roth 1993:123-137). Corn storage was not found for any of the occupations at Ormand, and this transitional development to settled agricultural life is not confirmed at other Archaic sites in southwestern New Mexico (Lekson 1992a:9).

The Mogollon Early Pithouse period is interpreted as the first evidence of permanent residence. Structures are round and pottery tends to be plain with small amounts of red ware (Gilman 1980). This red ware is not the characteristic San Francisco Red found in later periods, but a local variant (LeBlanc 1980a:119). These Early Pithouse period sites are thought to occur in high areas associated with defense (LeBlanc 1980a:128-132), although this generalization does not hold true for the Ormand Village site, for Early Pithouse sites in the Cuchillo Negro area to the north and east (Schutt et al. 1994:15), or for the Mogollon Highlands (Y. Oakes, pers. comm. 1997).

Possible Late Archaic Pithouses

Eleven smaller pithouses appear, through architectural associations, to date to the late Archaic. These include Pithouses 27, 43, 47, 52, 56, 65, 96, 98, 106, 149, and 153. Field notes and the preliminary report describe no pottery found on the floor of these structures (Hammack et al. 1966:36). Trash deposits from floor fill just 5 to 10 cm above floor level included Gila Polychrome sherds from the Salado occupation (see Pithouse 52 description). It is unclear what this means, and the extent to which bioturbation by rodents may have aided in mixing deposition. Architecturally, these structures are identical to at least one other late Archaic pithouse found on the first terrace above the Gila River, dating to 383 B.C. (Lekson 1992a:64-65). The small size of these Ormand structures suggests that they were inhabited by small nuclear families, and used for shelter and limited daily activities (Minnis and Nelson 1980:89). Archaic base camps tend to be in locations where a large range of activities can be performed (Minnis and Nelson 1980:77). Archaic structures are found along the Upper Gila River and the Rio Grande, and possibly in the Mimbres River drainage (Lekson 1992a:65).

Possible Archaic pithouses at Ormand were generally simple structures with walls and floors made of packed earth. No roofing material was mentioned or collected. Floor features included a central post with small basin-shaped hearths set off-center. Artifacts were examined for all material categories from selected pithouses with the most remains (Pithouses 27, 56, 96, 106, and 153), but few artifacts were recovered overall. Although the size of these dwellings was similar to several extramural pit features, interior features suggested use as domestic habitation. The pithouses did not overlap physically, and are possibly contemporaneous. Unfortunately, no diagnostic chipped stone was recovered. Detailed stratigraphic information could not be established for these structures, since fill above "floor fill" was generally collected as a whole unit called "general fill." Each pithouse is discussed below.

Pithouse 27

Located due north of the east roomblock by 14 m, this circular pithouse measured 3.2 m in diameter (Figs. 3, 4). The depth of the structure was 55 cm, dug into sterile clay. A ramp entrance extended due east, measuring 85 cm in length and 50 cm wide. The ramp extended down onto the floor level of the main structure. Post-abandonment fill consisted of loose, black soil with many cobbles, apparently part of the "leveling" process of the area by the later Salado occupation. The floor was packed clay and unplastered, as were the walls. Floor features included a shallow basin hearth 50 cm west of the entrance. This feature measured 30 by 40 cm, with an unspecified depth. No fill was found in the hearth. What remained of the west hearth edge was burned adobe, indicating that the feature was adobe-lined. A possible center posthole, described as "very shallow" with a poor outline, measured 20 by 40 cm. The floor was a few centimeters above sterile yellow gravel, and was heavily impacted by rodents. No pottery or other artifacts were found on the floor. Artifacts were recovered from floor fill (approximately 10 cm above the floor), including one plain smudged interior sherd.

Pithouse 43

This pithouse was located northeast of a larger, possible Mogollon pithouse (Pithouse 54) by 1.5 m. It measured 3.22 m in diameter, and 0.90 m deep (Fig. 5). The walls were cut into sterile yellow gravels. Post-abandonment fill consisted of black soil and cobbles, with very little cultural debris. The floor appeared to be plastered, and contained two features. An oblong-shaped, adobe-lined hearth was found in the southeastern portion of the structure. The hearth was ash-filled, and measured 22 by 18 by 15 cm deep. The sides of the feature were burned. In the center of the structure was a posthole measuring 43 cm in diameter and 22 cm deep. No plan map of this feature was prepared in the field. No artifacts were found in the state repository for this structure, although collected artifacts were mentioned in field records (Fig. 6).

Pithouse 47

Located at the southern end of the excavated area of the site, this pithouse was about 15 m east of the east roomblock. The structure measured 3.55 m north-south and 3.45 m east-west. The depth was 45 cm at the north wall and 35 cm at the south wall (Fig. 7). There was no sign of an entrance ramp. Walls were vertically cut into sterile yellow gravel, and did not appear to be plastered. Post-abandonment fill consisted of black soil with very few cobbles. In the upper portion of post-abandonment fill were numerous sherds, while the lower portion had very few sherds. No plan map of this structure was prepared in the field.

The floor was flat, suggesting possible plastering, but no obvious plaster was found. Floor features included a central posthole (no measurements given), a hearth "area" consisting of an irregular concave patch of burned adobe about 65 cm east of center, measuring 25 by 25 cm, and a subfloor pit in the southwest wall of the pithouse. The subfloor pit walls were vertical and curved in slightly at the base. The pit floor was irregular due to gravels and cobbles projecting up from the sterile surface below. Pit fill consisted of black soil and some cobbles with no cultural remains.

Although an upper and lower post-abandonment fill were described in field records, artifacts were collected as a whole unit called "general fill." Field documentation mentions a Ramos Polychrome sherd found in the floor fill, but it was not found for this analysis. Four sherds from general fill proveniences present an intriguing mix of Mogollon and Salado pottery. These sherds included two indeterminate Gila or Tonto Polychrome sherds, one Tucson Polychrome sherd, and one Mangus Black-on-white sherd.

Pithouse 52

Located below the east wall of Room 41 in the east roomblock, this pithouse measured 4.0 m in diameter, with a depth of 1.0 m on the west side and .80 m on the east side (Fig. 8). The floor of the west side of the pithouse was 1.0 m below the floor in Room 41. The walls were dug into sterile bench gravels. The post-abandonment fill consisted of a blackish, loose, gravelly soil with a large number of artifacts. Ash was noted in the lower levels.

The pithouse floor was in poor condition, and only a few features were found. Along the southeast edge of the structure was a small, sand-filled shallow pit. Just northwest of center was a puddled adobe basin. Beneath this basin were two subfloor pits, one on top of each other. The subfloor pit just beneath the pithouse floor was the largest, measuring 1.4 m in diameter, and 1.25 m deep (Figs. 9, 10). Fill in this pit was a light yellowish tan soil, mixed with sand and gravel-sized rocks. A large amount of charcoal was noted in the lower portion of the fill. Very few artifacts were found, but an obsidian uniface was recovered.

The lower subfloor pit was also circular and symmetrical, but with a constricted opening. The top of the feature measured 57 cm in diameter, and the bottom measured 1.1 m in diameter. The depth was 1.15 m. The fill consisted of a light yellowish tan soil mixed with sand. Many small pieces of charcoal were noted throughout the fill. Small pieces of animal bone were the only cultural debris noted during excavation.

The difference in fill types between the subfloor pit and the pithouse suggests that these subfloor pits were "decommissioned" during the possible late Archaic occupation of the pithouse. Artifacts were recovered from the upper subfloor pit and included a large shell disc bead, a stone bowl shaped from a cobble of indeterminate material, and an obsidian uniface. No pottery was found.

No artifacts were recovered from the floor proveniences. Artifacts recovered from post-abandonment pithouse fill suggests that most of it was associated with a trash deposit used to level the area for the Salado occupation. Floor fill (roughly 10 cm above the floor) included three Gila Polychrome sherds. Most of the post-abandonment fill was collected as a whole unit called "general fill," including sherds and a few chipped stone and ground stone objects. Gila Polychrome sherds and one Mimbres Black-on-white sherd were recovered from this trash deposit, as well as chipped stone debitage and formal tools (one chert drill, one triangular obsidian projectile point), and a fragment of grooved serpentine.

Pithouse 56

This small pithouse was located northeast of a larger pithouse in the east portion of the site. The plan view was nearly circular, measuring 2.88 m north-south and 2.83 m east-west. The depth was 50 to 55 cm (Fig. 11). Walls were dug vertically into sterile yellow gravels and were unplastered. Post-abandonment fill consisted of black soil and cobbles with very little cultural debris.

The floor was well plastered and in good condition. A center posthole measured 15 cm in diameter and 35 cm deep. To the southeast of the posthole was an irregular, shallow, basin-shaped hearth with burned hearth walls. Hearth fill consisted of soil and solidified ash. Adjacent to the northwest exterior of the pithouse was a large, shallow, basin-shaped pit, measuring 95 cm in diameter and 40 cm deep. This pit was interpreted in field records as unassociated with the pithouse and is assumed here to post-date the structure. No cultural material was found in this pit feature. No artifacts associated with the pithouse were located or analyzed by this project. Field records noted three bags of sherds and chipped stone, a metate fragment, and a deer antler, all from floor fill or "general fill," probably all from post-abandonment trash deposits. The total count of artifacts from this structure is unknown, but probably low in frequency. No artifacts were recovered from floor proveniences.

Pithouse 65

This pithouse was located in the east-center of the site. The structure was 2.85 m in diameter, and 80 cm deep. The walls were vertically cut into sterile yellow gravels, with no trace of wall plaster. Post-abandonment fill consisted of black soil and cobbles, with few cultural remains. The floor was in poor condition, with a few patches of plaster left. A shallow depression in the center, measuring 20 by 28 cm and 15 cm deep, probably represented a center posthole. A shallow, basin-shaped hearth was found 38 cm southeast of the center posthole. It was adobe-lined on the east and west sides.

Two extramural pits nearly equal in size appeared to be associated with this pithouse. Feature 65A was located to the northwest of the pithouse, and Feature 67 was located to the southwest. Both of these pits were approximately 2.0 m in diameter, and a meter deep. Low built-up ridges connected these pits to the pithouse. The ridge between Feature 65A and the pithouse was about 80 cm wide and 30-40 cm high, and the ridge between Feature 67 and the pithouse was 1.5 m wide and 20 to 40 cm high. The function of these two pits was unclear.

No artifacts from the pithouse or associated extramural pits were analyzed by this project because they were not located in the state repository. No artifacts were noted for the floor provenience in field records. Sherds, a few ground stone items, and some chipped stone artifacts were noted from post-abandonment floor fill and general fill proveniences. No plan map or profiles were recorded for this feature.

Pithouse 96

Located a few meters southeast of another small pithouse (Pithouse 27), this pithouse was about 8 m north of the Salado period east roomblock. The structure was slightly ovoid in plan view, measuring 2.78 m north-south and 2.3 m east-west, and 40 cm deep (Figs. 12, 13). Walls were vertically cut into sterile yellow gravels. Cobbles protruded through the walls in places, and no signs of wall plaster were found. Post-abandonment fill consisted of a black soil with a fair number of cobbles and a few sherds. The floor was in good condition, and appeared to be unplastered. A large center posthole measured 25 cm in diameter, and was 50 cm deep. To the southeast of the posthole was an adobe-lined, basin-shaped hearth with a raised adobe rim. The base of the hearth was at floor level or just slightly below. A pit post-dating the structure cut into the east edge of the pithouse, obscuring the location of a possible ramp entrance to the house. No artifacts were analyzed by this project or located in the state repository, although one bag of sherds was collected from post-abandonment "general fill" during excavation. No artifacts were noted on floor proveniences.

Pithouse 98

Located near the east terrace edge in the east-center of the site, this pithouse measured 2.9 m in diameter, and was 45 cm deep (Figs. 14, 15). Walls were dug into sterile yellow gravel and cobbles, and no wall plaster was noted. Post-abandonment fill was black soil with very little cultural material present. The floor was in good condition in the south and west portions, with no evidence of plastering. A rectangular, raised adobe-walled hearth was located in the center, oriented northwest-southeast. It appeared to be built on the floor level, with the walls measuring 10 cm in height. A possible posthole was noted near the southwest wall, measuring 20 cm in diameter and 15 cm deep. A large subfloor pit (Pit 98A) predating the pithouse was found in the northwest portion of the floor. The pithouse floor and hearth clearly extended over the south wall of this subfloor pit. Two other pits were found to the north of the pithouse, seemingly connected to subfloor Pit 98A and predating the pithouse.

No artifacts were analyzed by this project or located in the state repository. Field records indicate sherds, a "floor polisher," and a projectile point were collected from "general fill," representing post-abandonment deposits. No artifacts were found in floor proveniences.

Pithouse 106

This pithouse was located about 8 m east of the northeast corner of the Salado period east roomblock, between two larger pithouse structures. The ovoid structure measured 2.85 m north-south and 2.65 m east-west, and was 60 cm deep (Figs. 16, 17). Walls were dug vertically into sterile yellow gravel. Post-abandonment fill consisted of black soil with many cobbles, with sherds found mainly in the upper half. The floor was in fair condition, with a small patch of remaining plaster. A large center posthole measured 25 by 30 cm and was 30 cm deep. Two other smaller postholes were described on the plan map, and appear to have been around 15 cm in diameter. No hearth was noted, although an area containing ash and soil was found 55 cm to the southeast of the center posthole. A subfloor pit measuring 97 by 76 cm by 15 cm deep was found in the northwest portion of the pithouse, extending 20 cm into the wall. It had a flat bottom and contained no cultural debris. It is unclear how this pit associates with the pithouse, whether it predates, or is contemporaneous with the structure. No artifacts were analyzed by this project or located in the state repository. Field records indicate sherds and bone collected from "general fill," from post-abandonment deposits. No artifacts were associated with the floor provenience.

Pithouse 149

Located towards the north end of the site, about 25 m east of the Salado period north roomblock, this pithouse measured 2.7 m north-south and 2.4 m east-west, and was 35 cm deep (Figs. 18, 19). The walls were dug vertically into sterile yellow gravels and clay. No wall plastering was noted. Post-abandonment fill consisted of mixed gravel with black soil. No artifacts were found in the fill or floor proveniences. The floor may have been plastered, but wet working conditions made this determination difficult. An oval, basin-shaped and adobe-lined hearth was found in the east-central floor, and was burned red. Measurements taken from the plan map provide approximate dimensions of 40 by 20 cm, with an unknown depth. No hearth fill was noted. A possible central posthole measured 15 by 25 cm and was 15 cm deep. A possible ramp was noted to the east, where the floor sloped up into sterile soil.

Pithouse 153

This pithouse was the southernmost feature found on site. It measured 3.05 m in diameter, and was 63 cm deep (Figs. 20, 21). The walls were dug into sterile soil, with no wall plaster noted. Post-abandonment fill consisted of black soil and cobbles, and some charcoal. The floor was in fair condition. A center posthole with a raised rim measured 18 cm in diameter and was 30 cm deep. The rim measured 35 cm in diameter. A subrectangular, basin-shaped, adobe-lined hearth was located due east of the center posthole. A shallow pit west of the center posthole was about 75 cm in diameter and 5 cm deep. No artifacts were recovered from floor proveniences. Other sherds and bone collected from post-abandonment "general fill" were not located in the state repository.

Possible Mogollon Early Pithouses

Six large circular pithouses were found at the Ormand site, including Pithouses 24, 25, 50, 54, 76, and 84. These structures averaged 5.1 m in diameter, with a mean depth of 80 cm, and a mean area of 25.8 sq m. Four of these structures had ramp entrances extending out to the east. Several of these pithouses were visible as depressions near the edge of the terrace overlooking the river valley. Other pithouses were found in the area due east of the Salado period roomblocks. Initial field documentation and architectural signifiers suggest a Mogollon affiliation for these structures. Recent examination of field documentation also suggests the potential for initial use during the Mogollon period and reuse during the later Salado occupation for some of the structures.

A circular plan is quite distinctive for early pithouse forms in the Mogollon region, particularly in the Mimbres area (Bullard 1962:115). From shape alone these structures suggest occupation from the Mogollon Early Pithouse period, circa A.D. 200-500, and possibly into the Georgetown phase of the Late Pithouse period, from A.D. 500 to 700. The list of traits associated with Early Pithouse period sites includes round pithouses, plain pottery, and small amounts of red ware pottery (Gilman 1980). Early Pithouse structures are also "typically" found in isolated or inaccessible locations, with a few sites located on lower elevations along water courses, as seen in the Upper Gila and Redrock areas along the Gila River. The isolated nature of Early Pithouse structures is argued to be a defensive posture (LeBlanc 1980a:120-132). The structures at Ormand Village do not support this ideal settlement pattern, and other Early Pithouse sites excavated by the Cuchillo Negro Project near Truth or Consequences also challenge what has been described as "typical" (Schutt et al. 1994:15). Georgetown phase structures are circular and found on river terraces, but are noted by the presence of plain brown ware and San Francisco Red pottery (LeBlanc 1980a:119)—a ceramic presence not found at the Ormand pithouses. Field documentation was incomplete for most of these structures. Surviving records for each pithouse are described in detail below.

Pithouse 24

Pithouse 24 was approximately 20 m northeast of the north roomblock. The floor plan was circular with a 60 cm wide by 3.0 m long entrance ramp extending out from the east-southeast side (Fig. 22). The dimensions of the central room were 4.8 m in diameter, with a depth of 50-60 cm. The walls appeared unplastered, and cut into sterile, yellow, gravelly soil. Post-abandonment fill consisted of black soil with cobbles. The floor was plastered and in fairly good condition over most of the room. The ramp entrance was raised 30 cm above the floor level, with a subtle incline to the east. Floor features included a hearth, numerous postholes, and a double horseshoe-shaped trench in the west half of the structure. The hearth was adobe-lined and basin-shaped, measuring 50 by 50 by 15 cm. This feature was located in the east-center, and contained a "soil" fill. The adobe lining was burned. Thirteen postholes rimmed the floor edge in an irregular pattern, with one large posthole in the center. Ten of these postholes measured about 25 cm in diameter, with the remaining four postholes, including the center posthole, measuring 30 by 50 cm. The center posthole was 40 cm deep (all other posthole depths are unknown). The double horseshoe-shaped trench fluctuated in width from 60 cm to 1.0 m, but was 25 cm deep throughout. This trench was symmetrical in plan view, cut out of the sterile, yellow, gravelly soil substrata.

Ceramic and chipped stone artifacts were recovered from subfloor, floor, floor fill, and general fill proveniences. A few sherds were found in the subfloor provenience. These included 5 plain unpolished sherds, 1 plain smudged interior sherd, and 1 red slipped plain unpolished sherd. Floor proveniences contained 59 plain unpolished sherds, 3 Gila Polychrome sherds, and 2 unutilized igneous core flakes. Floor fill artifacts were the highest in frequency, and consisted mostly of pottery, including 107 plain unpolished sherds, 9 plain smudged interior sherds, 1 red slipped plain unpolished sherd, and 2 indeterminate Gila or Tonto Polychrome sherds. General fill artifacts included 5 indeterminate Gila or Tonto Polychrome sherds, 1 Gila Polychrome sherd, 2 Tucson Polychrome sherds, chipped stone debitage, and 1 triangular obsidian projectile point. Subfloor and floor pottery suggests that this structure was originally a Mogollon pithouse circa A.D. 200-700, which was perhaps later occupied by Salado migrants.

Pithouse 25

No maps or field documentation were kept for this pithouse, but a general description can be made from the overall site map and photograph (Fig. 23). Located in the north portion of the site, approximately 20 m to the northeast of the Salado period north roomblock, the structure measured about 5 m in diameter, with a ramp or antechamber extending out from the north-northeast edge. No record was kept of possible interior features. Post-abandonment "general fill" contained one plain smudged interior sherd, chipped stone debitage and a few chipped stone tools (all nondiagnostic), and one burned serpentine shaft straightener. No conclusive temporal determinations can be drawn from the artifactual data. The shape and size of the structure indicates a general affinity to Mogollon pithouses circa A.D. 200-700.

Pithouse 50

One profile was found for field documentation of this structure (Figs. 24, 25). From the overall site map, this feature was located in the east portion of the site, about 25 m east of Room 41 in the Salado period east roomblock. The pithouse is about 5.9 m in diameter, with no apparent ramp entrance. The maximum depth of the structure was 1.2 m, at the east edge. A burial was found 1.1 m below ground surface (Burial 5), near the center of the structure. It is unclear if this burial dates to the time of abandonment of the structure, perhaps as early as A.D. 200-700, or to the Salado occupation. The burial was placed in a pit dug down below the floor of the structure. The individual was in poor condition; the skull was in fragments and most of the other bones were in a state of rapid disintegration. The east walls and floor, and particularly the southeast portion of the structure had a good plastered floor and sloping walls. Post-abandonment fill was described as "black." A few sherds were found in post-abandonment "general fill" proveniences, including two Gila Polychrome sherds, one white-on-red smudged interior sherd, and one Chupadero Black-on-white sherd. No conclusive temporal determinations can be drawn from the artifactual data. The shape and size of the structure indicates a general affinity to Mogollon pithouses circa A.D. 200-700.

Pithouse 54

Located approximately 22 m due east of the east roomblock, this pithouse was roughly circular, measuring 5.45 m north-south and 5.10 m east-west, and was 1.0 m deep (Figs. 26, 27). No ramp was found. The structure was filled with black soil and cobbles with a variety of artifacts, all from post-abandonment deposits. The walls were unplastered, vertically cut into the sterile, yellow, gravelly soil. The floor was in poor condition, heavily impacted by rodent activity, and did not appear to be plastered. A total of 27 postholes were found on the floor, most in rough concentric rings. Five larger postholes were located near the center of the structure. Postholes ranged in size from a minimum of 5 cm in diameter and 6 cm in depth to a maximum of 65 cm in diameter and

50 cm in depth. On average, postholes measured 22.3 cm in diameter with a 22.8 cm depth. Presumably the concentric posthole arrangements represent several expansion and remodeling episodes to the structure. No other features were found associated with the floor. A later Saladoan pit was placed on the east edge of the pithouse and contained three secondary cremations (C12, C14, and C19). Ceramic artifacts were mentioned but not located in the state repository, but a one-hand mano made of quartzitic sandstone was analyzed from general fill proveniences, probably of Salado origin. Architectural signifiers suggest an Mogollon Early Pithouse phase occupation.

Pithouse 76

Pithouse 76 was located east of the east roomblock by just 5 m, and contained large amounts of cultural remains. The circular structure measured 5.4 m in diameter, and was 1.0 m deep with slightly insloping walls (Figs. 28, 29). A ramp entrance extended out to the east, measuring 2.2 m long and 60 cm wide. The ramp was 35 cm higher than the floor. Post-abandonment fill for the structure was stratified, although not clearly delineated. All of the artifacts were collected as one unit, however, labeled "general fill." The upper part of the fill had numerous cobbles in dark soil with much cultural debris (Figs. 30, 31). Most of the cultural material was found near the center of the structure. The lower fill extending down to the floor contained fewer cobbles and very little cultural debris. Some brown ware sherds were noted on floor contact along the north wall.

Two floors were found: an upper floor in poor condition that appeared to have been a simple replastered layer with no features, and a lower floor with features in good condition. Lower floor features included two hearths and 36 postholes mostly ringing the floor perimeter. One hearth near the center was unlined and basin-shaped, measuring 50 by 60 cm by 20 cm deep. Another hearth was near the north wall. It was rectangular, partially adobe-lined with a raised adobe collar, and measured 35 by 45 cm with a depth of 20 cm (Fig. 32). A shallow trough about 20 to 30 cm wide was found along the base of the wall in the northwest part of the structure. A series of postholes were set into this trough.

Artifacts were found in floor, floor fill, posthole, and upper fill proveniences. Floor artifacts included nine plain unpolished sherds and a large, grooved, coarse sandstone object (Fig. 34). One of the postholes had a chalcedony preform in its fill. Floor fill artifacts included ten plain unpolished sherds, one brown corrugated sherd, two red slipped plain unpolished sherds, chipped stone debitage, one obsidian side-notched projectile point, one nonvesicular basalt palette, and one quartz crystal. Floor and floor fill artifacts strongly suggest that this structure dates to the Mogollon Early Pithouse period, circa A.D. 200-700.

Although the structure was just 1.0 m deep, numerous Saladoan pottery and other Salado-related trash was recovered. Upper fill contained a high frequency of artifacts, totaling 1,832 sherds, 211 chipped stone items, and 7 ground stone objects. Pottery included 772 plain unpolished, 416 plain smudged interior, 156 brown corrugated, 175 red slipped plain unpolished, 55 red slipped smudged interior, 4 red textured, 4 red corrugated, 40 indeterminate Gila or Tonto Polychrome, 121 Gila Polychrome, 5 Tonto Polychrome, 46 Tucson Polychrome, 30 White-on-red, 4 Mimbres decorated, 3 Tsegi Orange, and 1 indeterminate sherd.

Pithouse 84

This pithouse was located in the east-center of the site, about 12 m east of the northeast corner of the Salado period east roomblock. The plan was oval, measuring 4.0 m north-south and 3.5 m east-west. The depth was 50 to 60 cm (Figs. 34, 35). A ramp entrance extended out from the east wall, measuring 50 cm wide and 2.3 m long, with vertical sides. The ramp led directly down to the floor level with no step down to the floor. Walls were cut vertically into sterile, yellow gravels. Plaster was noted in patches on the walls. The post-abandonment fill was stratified, but artifacts were collected as a whole unit called "general fill." Two distinct fill layers were noted. An upper layer, from the surface down to about 30 to 40 cm, contained a loose, gray soil with abundant cobbles and artifacts. The lower fill level was the final 20 to 30 cm down to the floor level, containing a black soil with few cobbles and artifacts. Numerous plain unpolished sherds were noted in the east-central portion of the floor. The floor was noticeably concave from the edges to the center, and was in good condition. No plaster was noted. A center posthole measured 20 cm in diameter by 40 cm deep. An adobe-lined, basin-shaped hearth was found east of the center posthole, measuring 45-50 cm in diameter, depth unknown (but called "deep"). The adobe lining was burned on the edges.

Floor-associated pottery included 25 plain unpolished sherds, and 1 indeterminate Gila or Tonto Polychrome sherd. A two-hand mano and one fragmentary obsidian projectile point were also associated with the floor provenience. The presence of the one Salado polychrome sherd on the floor tentatively suggests that this structure was re-occupied by later Salado peoples.

Extramural Features

The 80 extramural pits found on the site could not be associated with a particular occupation, and potentially date from the late Archaic to the Salado period. Some of these features were as large as the smaller pithouses and may be pithouses with no interior features. Of the 79 pit features with known measurements, the mean area was 2.8 sq m. These features ranged in diameter from just under 1 m up to 4 m. Recorded depths were typically around 1.0 m. When noted, cultural remains were found in the upper portion of fill, which appeared to contain Saladoan cultural material.

Pits are most common at Archaic sites and show a range of formal characteristics. Many Archaic pits contain fire-cracked rock, suggesting use as baking pits (Minnis and Nelson 1980:88-89). There is no record of fire-cracked rock from Ormand, although it is possible that it was not recognized or collected. Lack of elevation readings during excavation left few clues tying these pits to other on-site structures, but comparisons to other pithouse settlement patterns, and the clustering of these pit features near the pithouses, suggests a temporal affiliation with either pithouse occupation.

Very few of these pit features overlapped one another. Cremation pits were the main exception to this pattern and were obviously dug during the Salado occupation as shallow interment areas for secondary cremations (cremations within containers, typically ceramic vessels). Several Salado period cremation pits were dug in a particular area in the east portion of the site.

Summary of Pithouse Occupations

Possible Late Archaic Occupation

Eleven circular pithouses near the east edge of the terrace overlooking the Gila River appear to date to the late Archaic, circa 1500 B.C. to A.D. 200 (Minnis and Nelson 1980:70). All of the pithouses were simple structures with walls and floors of packed earth. These pithouses did not physically overlap one another, and are possibly contemporaneous. Floor features included a central post and a small basin-shaped hearth set off-center. The mean diameter of these structures was 3.3 m, with a mean depth of 70 cm, and a mean area of 10.6 sq m. These structures included Pithouses 27, 43, 52, 56, 65, 96, 98, 106, 149, and 153. The size of these structures suggests that they were inhabited by small nuclear families, and used for shelter and limited daily activities (Minnis and Nelson 1980:89).

The temporal interpretation of these structures is tenuous, based on architectural comparison and the apparent lack of pottery from floor proveniences. Very few chipped stone items were recovered, none of them diagnostic. Expected diagnostic projectile points are large in size, in accordance with a hunting technology focused on spear and atlatl use. Other diagnostic remains for this period include manos that are either "strikingly" rectangular or rounded in shape, used with an unshaped flat slab or a shallow basin metate (Minnis and Nelson 1980:98-99).

Detailed depositional histories could not be established for any of these smaller structures at Ormand, although field documentation stressed the presence of a relatively sterile lower fill. Saladoan trash was found in the upper fill, suggesting that the structures predated the Saladoan occupation. Numerous extramural pits may also be storage pits, large baking pits, or other Archaic pithouses with no interior features. In the Upper Gila and Rio Grande valleys, Archaic pithouses are found on the first terrace above drainages (Lekson 1992a:64-66). The smaller, possibly late Archaic pithouses at Ormand are deeper than the acknowledged "norm" of very shallow depressions, and may be a specific environmental adaptation to this locality.

Aceramic pithouse sites have been located through survey in the Upper Gila Valley; most are located along minor tributaries. These sites contain from 1 to 12 pithouses. The true chronology of each site is unknown, and it is possible that these sites are aceramic Mogollon Early Pithouse phase occupations. No superimposed depressions were found, as noted at other Mogollon Early Pithouse phase sites. It is unclear if these structures were contemporaneous (Chapman et al. 1985:353-354).

Possible Mogollon Early Pithouse Occupation

Other larger circular pithouses, some with ramps, were also found along the east edge of the terrace. The mean area of these structures was 25.8 sq m, with a mean diameter of 5.1 m and a mean depth of 80 cm. Six of these larger structures were found at Ormand, including Pithouses 24, 25, 50, 54, 76, and 84. Architectural comparisons again play a major role in interpreting temporal affiliations for these structures. Circular plans are quite distinctive in the Mogollon region, and signify Early Pithouse period structures (Bullard 1962:115), dating A.D. 200-500. This shape can also be seen in the first phase of the Late Pithouse period, called the Georgetown phase, dating from A.D. 500 to 700. What places these structures more closely to the Early Pithouse phase is the lack of San Francisco Red pottery, which is the clearest indicator of the Georgetown phase. To some archaeologists, the presence of plain brown ware and the absence of all other ceramic types is the most important signifier for the Early Pithouse period (Chapman et al. 1985:354).

Previous descriptions of Mogollon Early Pithouse structures and locations list a series of "typical" traits, including round structures, plain pottery, the presence in some instances of a red ware pottery that is a local variant of San Francisco Red, and a location in high areas interpreted as a defensible strategy (Gilman 1980; LeBlanc 1980a). This trait list has been challenged by recent research in southwestern New Mexico, particularly concerning the location of sites. The Ormand Village location and the work by the Cuchillo Negro Project near Truth or Consequences (Schutt et al. 1994) are two examples contradicting the "typical" pattern. Pithouses described as Mogollon Early Pithouse-Georgetown structures for the Cuchillo Negro Project had architectural and locational similarities to the Ormand pithouses, but dated before A.D. 550 through absolute dating methods and the presence of San Francisco Red pottery (Schutt et al. 1994). Clearly, there is a variety of architectural styles and locations for the Early Pithouse period in southwestern New Mexico, proving the limited applicability of any "typical" pattern (Schutt et al.1994:15).

Recent survey efforts have also located Mogollon Early Pithouse period sites along the edges of terraces overlooking drainages and floodplains. In the Upper Gila, these sites are nearly always found on the west side of the Gila River, a pattern not seen in surrounding valleys such as the upper San Francisco and Mimbres valleys (Chapman et al. 1985:355).

Artifacts from the fill of the larger Ormand pithouses presented a dynamic picture of use and reuse by later occupations. Pottery recovered from floor proveniences at Pithouse 24 and 84 present an intriguing mix of plain brown wares and Gila Polychrome pottery, and may indicate an occupation affiliated solely with the Salado occupation, or a Mogollon pithouse reoccupied by Salado migrants. At the Point of Pines Pueblo, pithouses that looked remarkably like Mogollon structures with Kayenta-Tusayan interior features were associated with an influx of people producing Maverick Mountain Polychrome pottery (Lindsay 1987:193). The Point of Pines pithouses were rectangular with rounded edges, semisubterranean (from 25 to 60 cm in depth), with shallow rectangular or oval hearth pits in the center, and a few mealing bins. Posthole patterns suggested some Mogollon and Hohokam similarities (Wendorf 1950:92-114). These Point of Pines pithouses resemble a squarish pithouse at the extreme north end of the site clearly associated with the initial Salado occupation at Ormand, with Maverick Mountain polychrome and Gila Polychrome in floor contexts.

Pithouse 76, due east of the east roomblock, was used for trash disposal during the Saladoan occupation. Floor proveniences provided brown ware pottery exclusively, suggesting occupation during the Mogollon period. The three remaining larger pithouses are temporally enigmatic, with only architectural comparisons suggesting a Mogollon Early Pithouse affiliation.

Extramural Pits

Many extramural pits dotted the terrace edge. All of these features were oval to circular, with a mean area of 2.8 sq m. These may be storage pits, featureless Archaic pithouses, or possible baking pits. Very little was recorded in field documentation for these features, and temporal interpretations remain conjectural. A few pits were clearly Salado period cremation areas, dug into older pit features or pithouses, used to shallowly bury cremation urns.

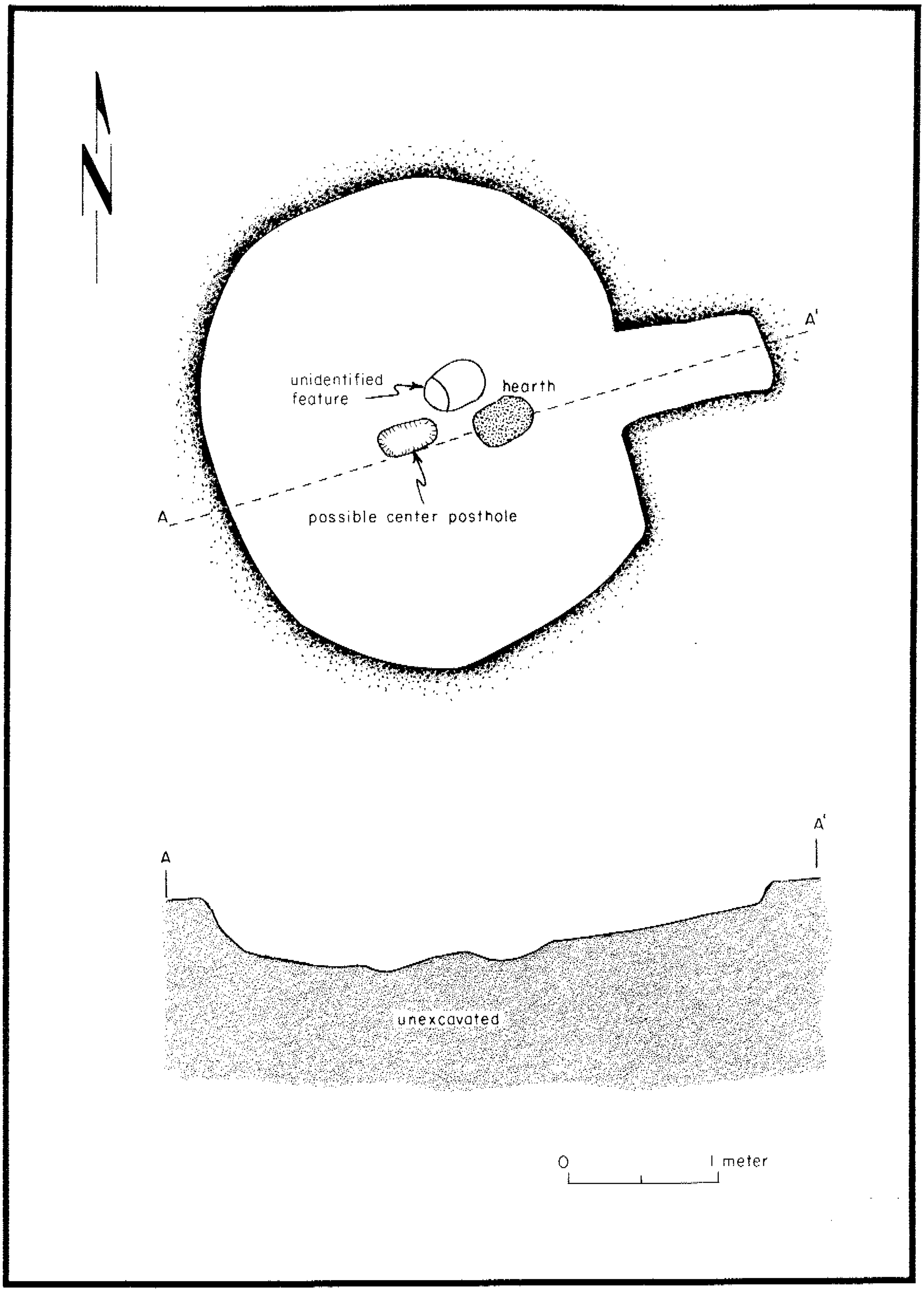

Figure 3. Plan map and profile of Pithouse 27.

Figure 4. Pithouse 27, subfloor.

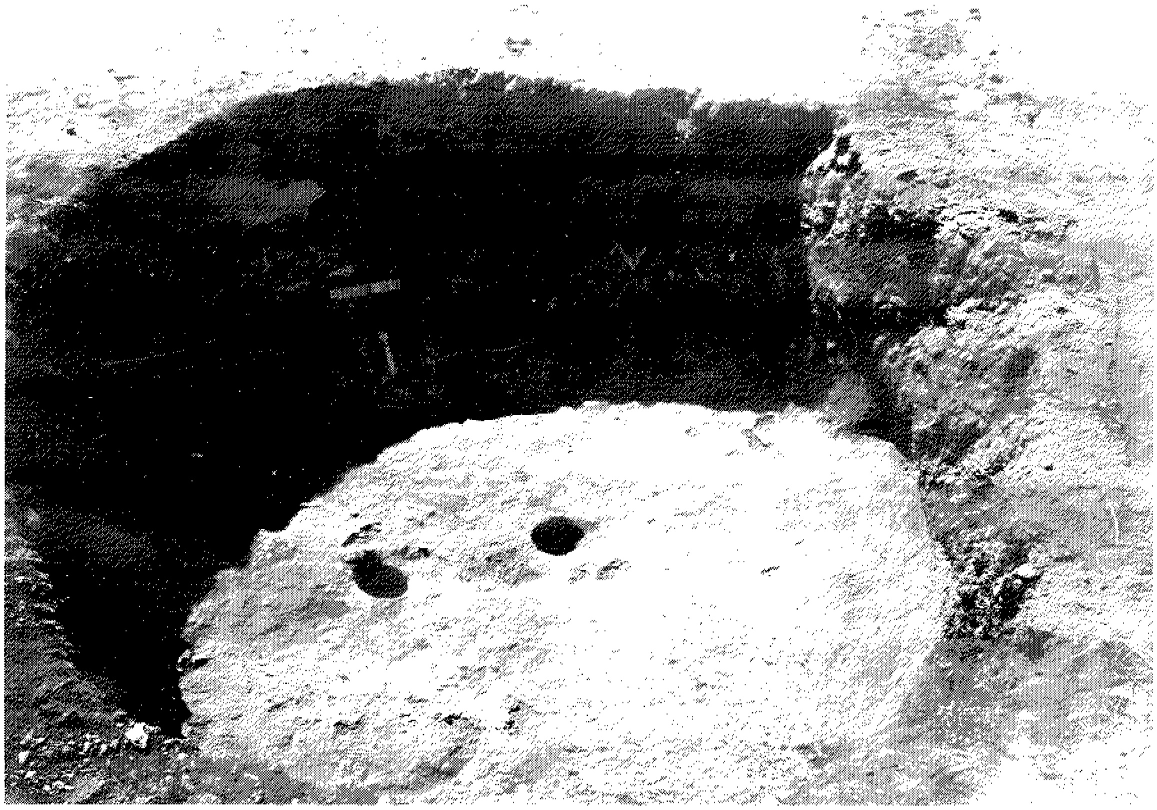

Figure 5. Pithouse 43, floor, looking south.

Figure 6. Pithouse 43, broken vessels on floor.

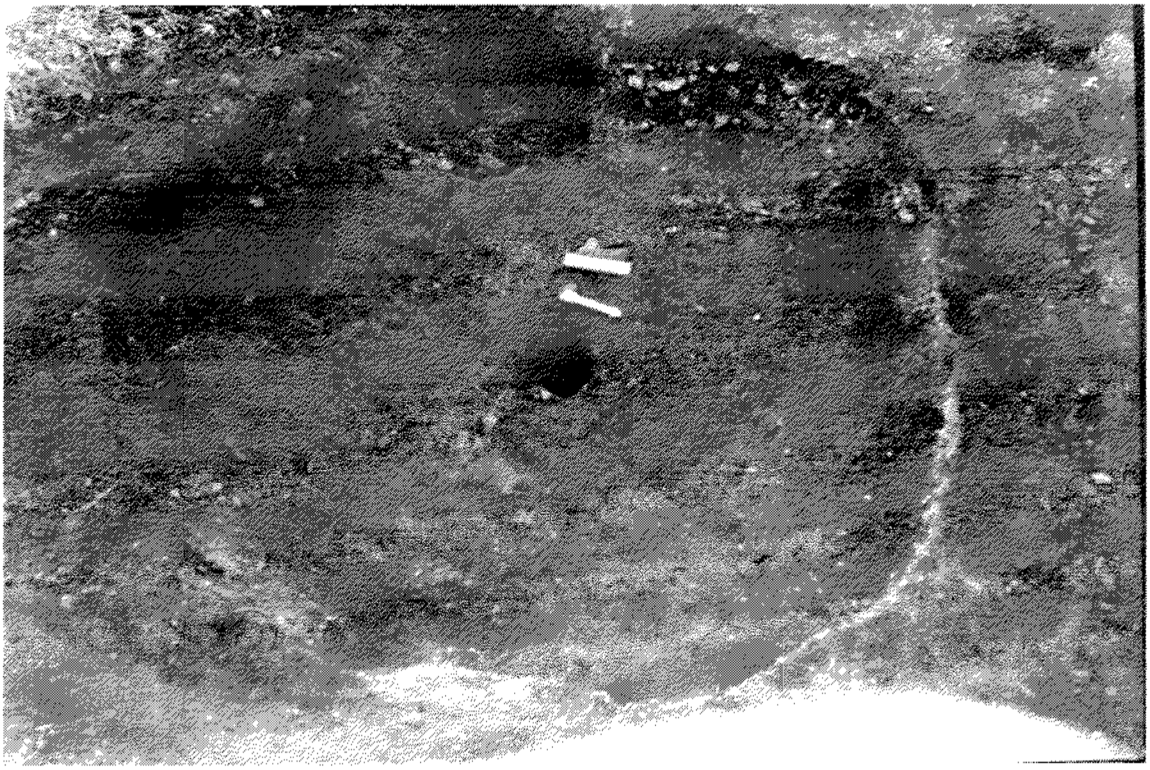
Figure 7. Pithouse 47, floor, looking west.

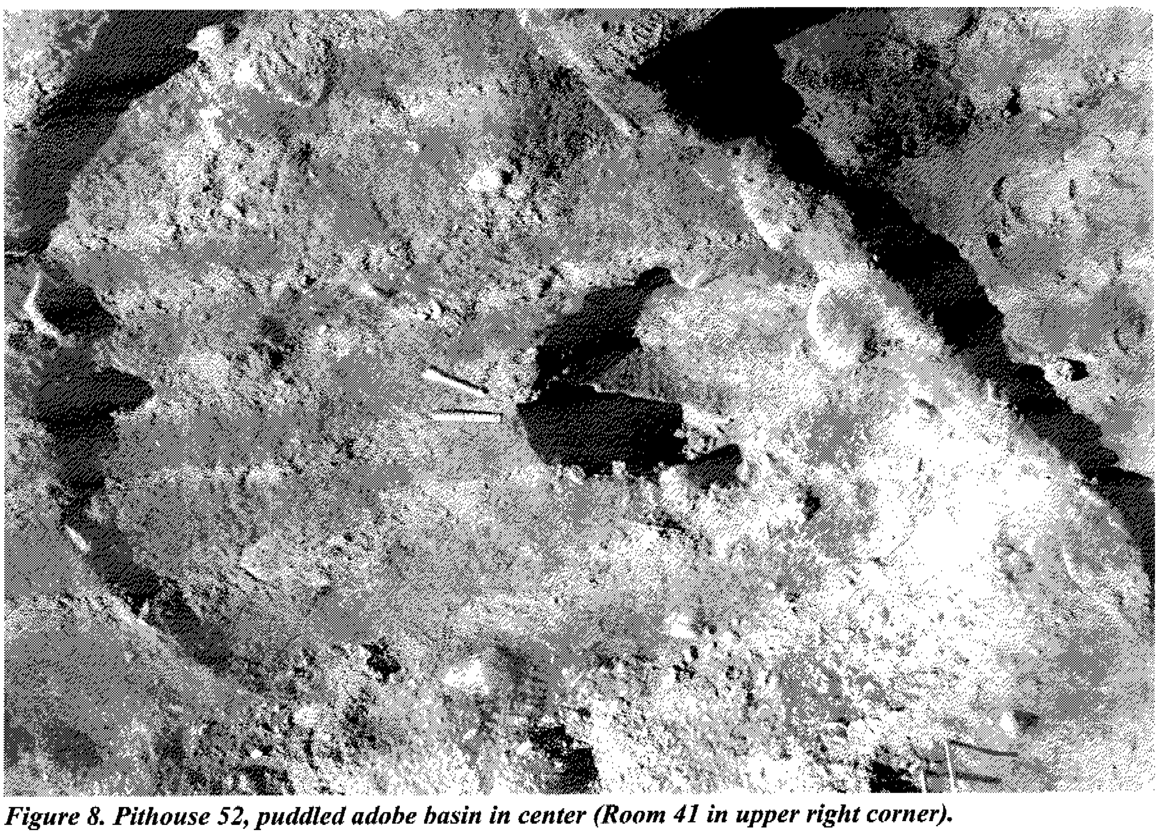
Figure 8. Pithouse 52, puddled adobe basin in center (Room 41 in upper right corner).

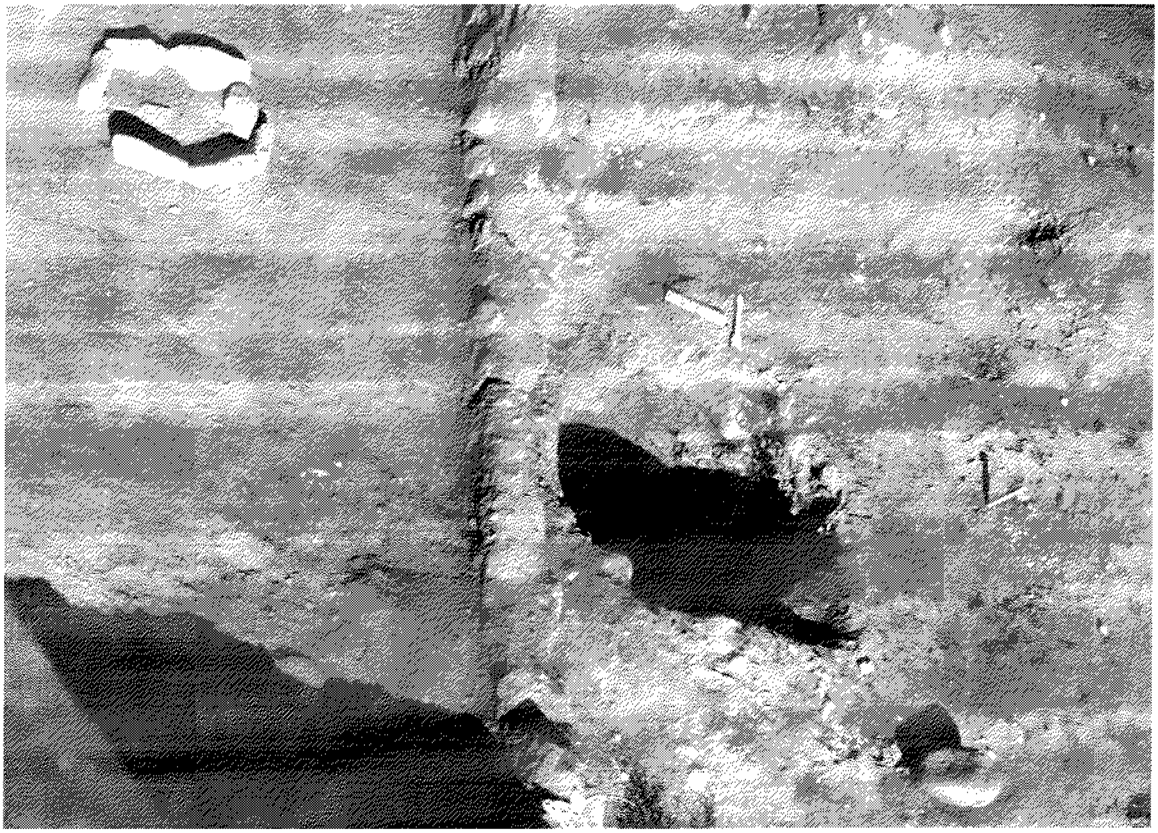

Figure 9. Pithouse 52 showing undercut pits and position of east wall of Feature 41, looking northeast.

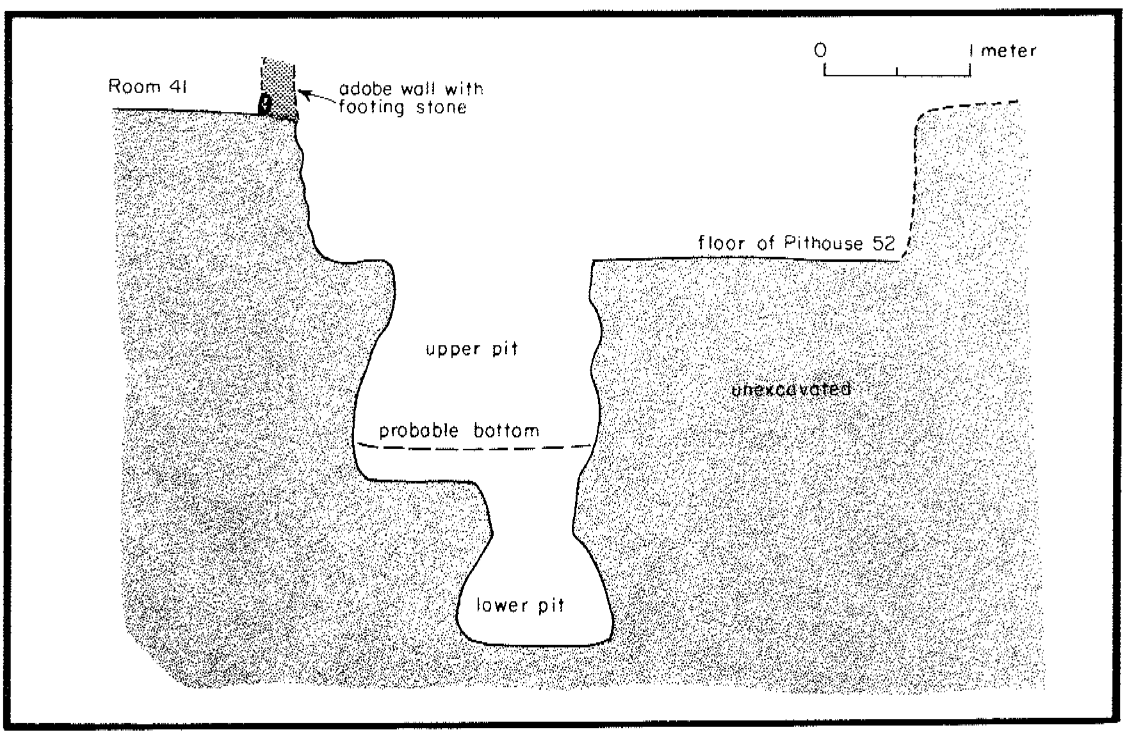

Figure 10. Profile of Pithouse 52 and subfloor pits, below Room 41, east roomblock.

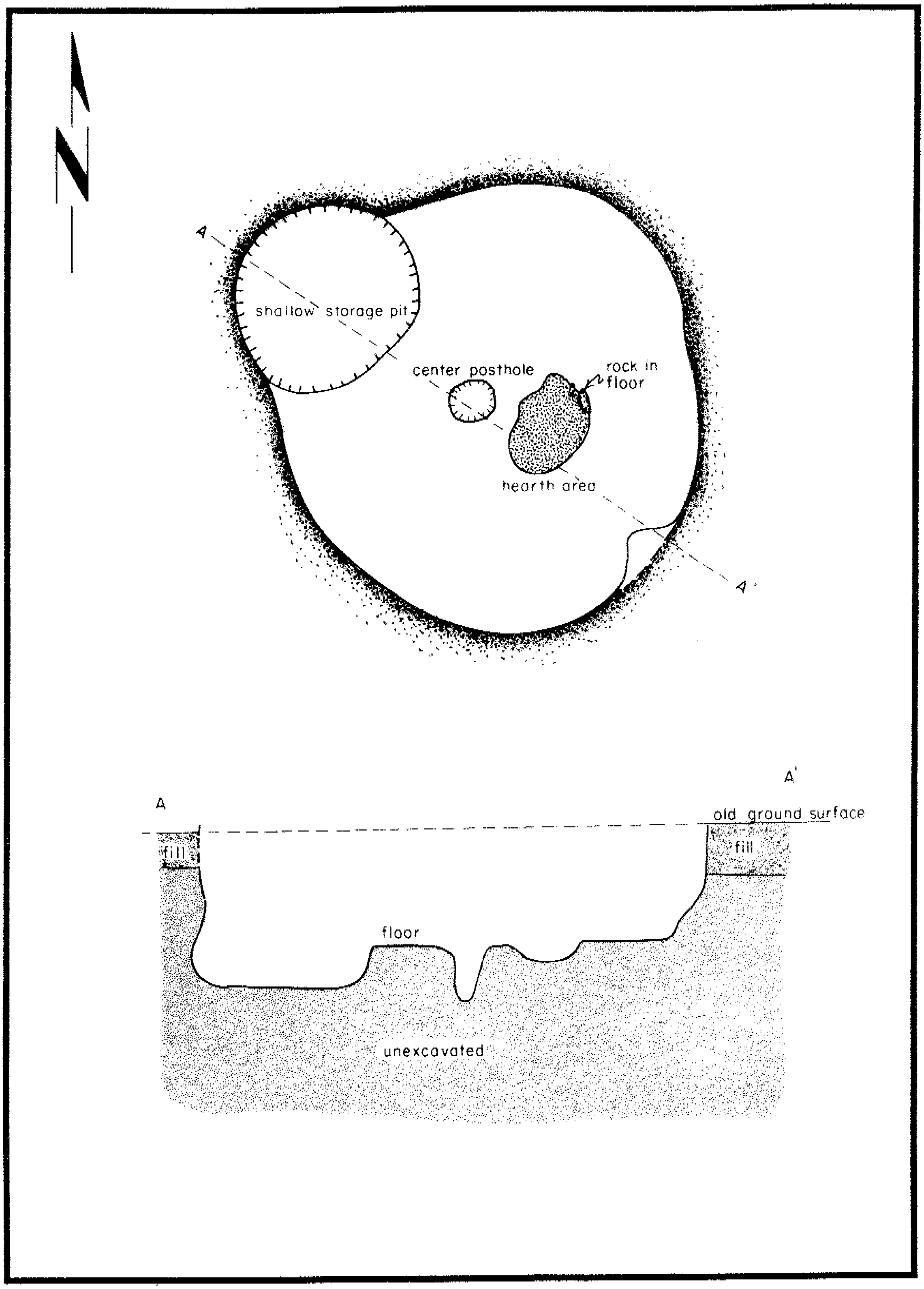

Figure 11. Plan map and profile of Pithouse 56.

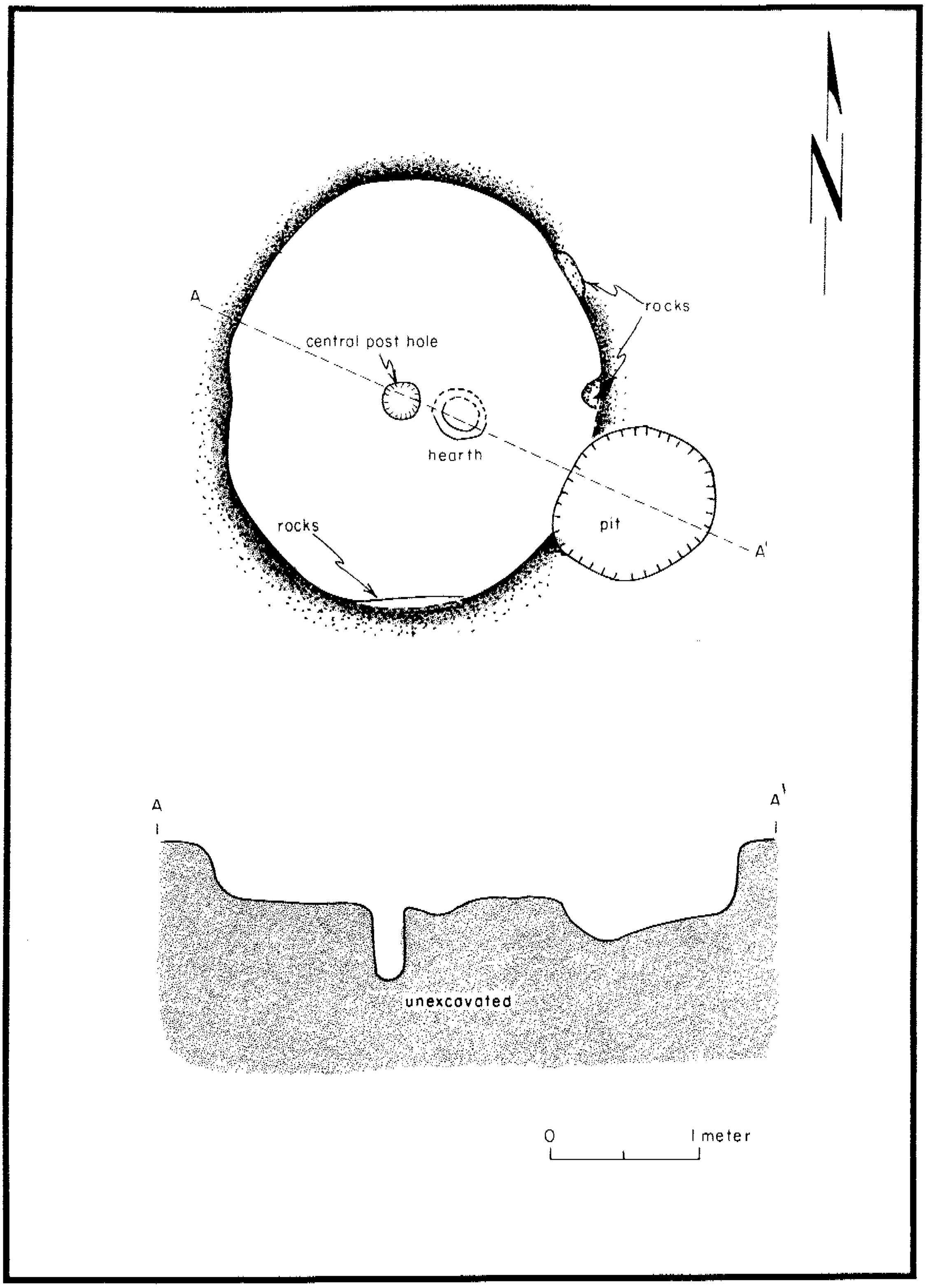

Figure 12. Plan map and profile of Pithouse 96.

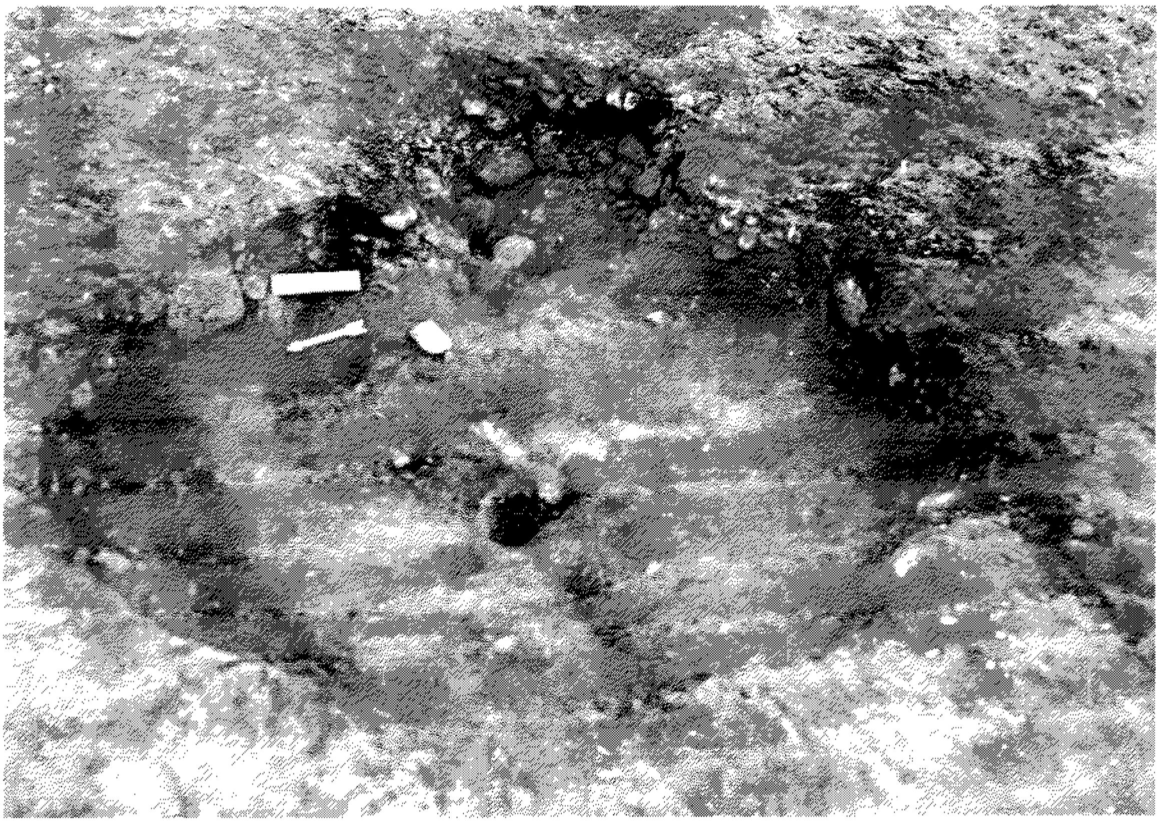

Figure 13. Pithouse 96, floor; post-occupational pit at top, perhaps obscuring a ramp location.

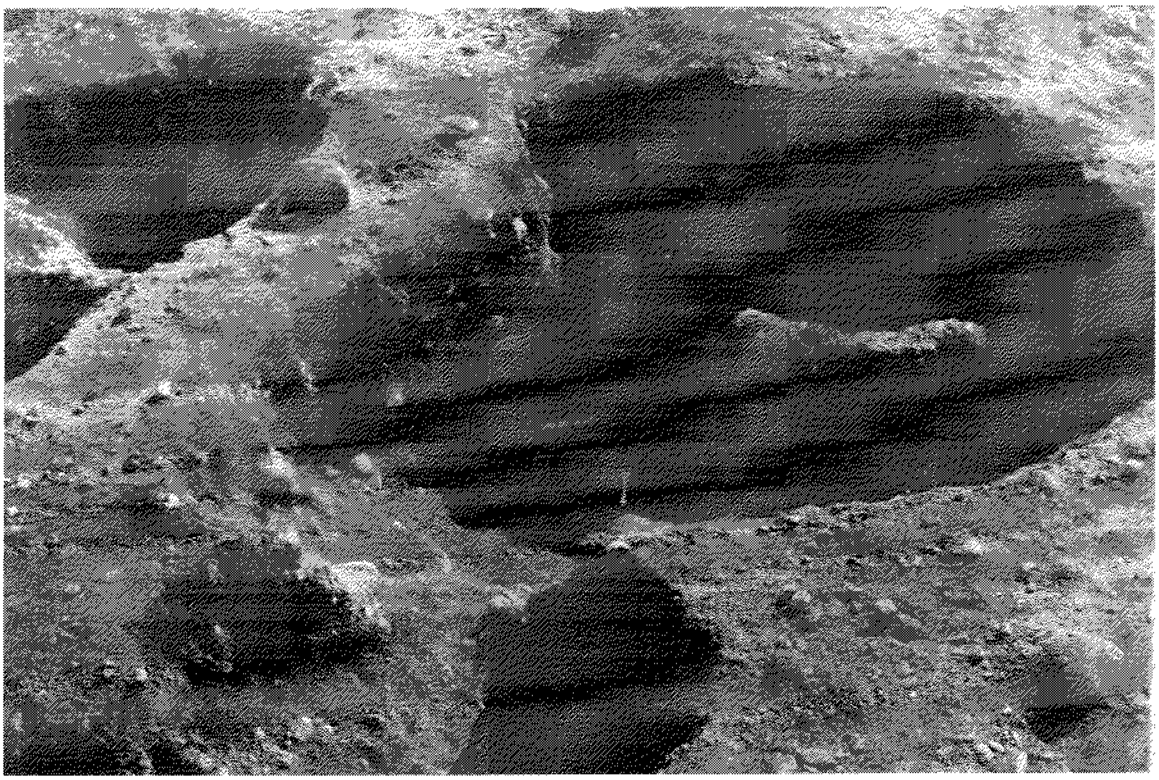

Figure 14. Pithouse 98, during excavation.

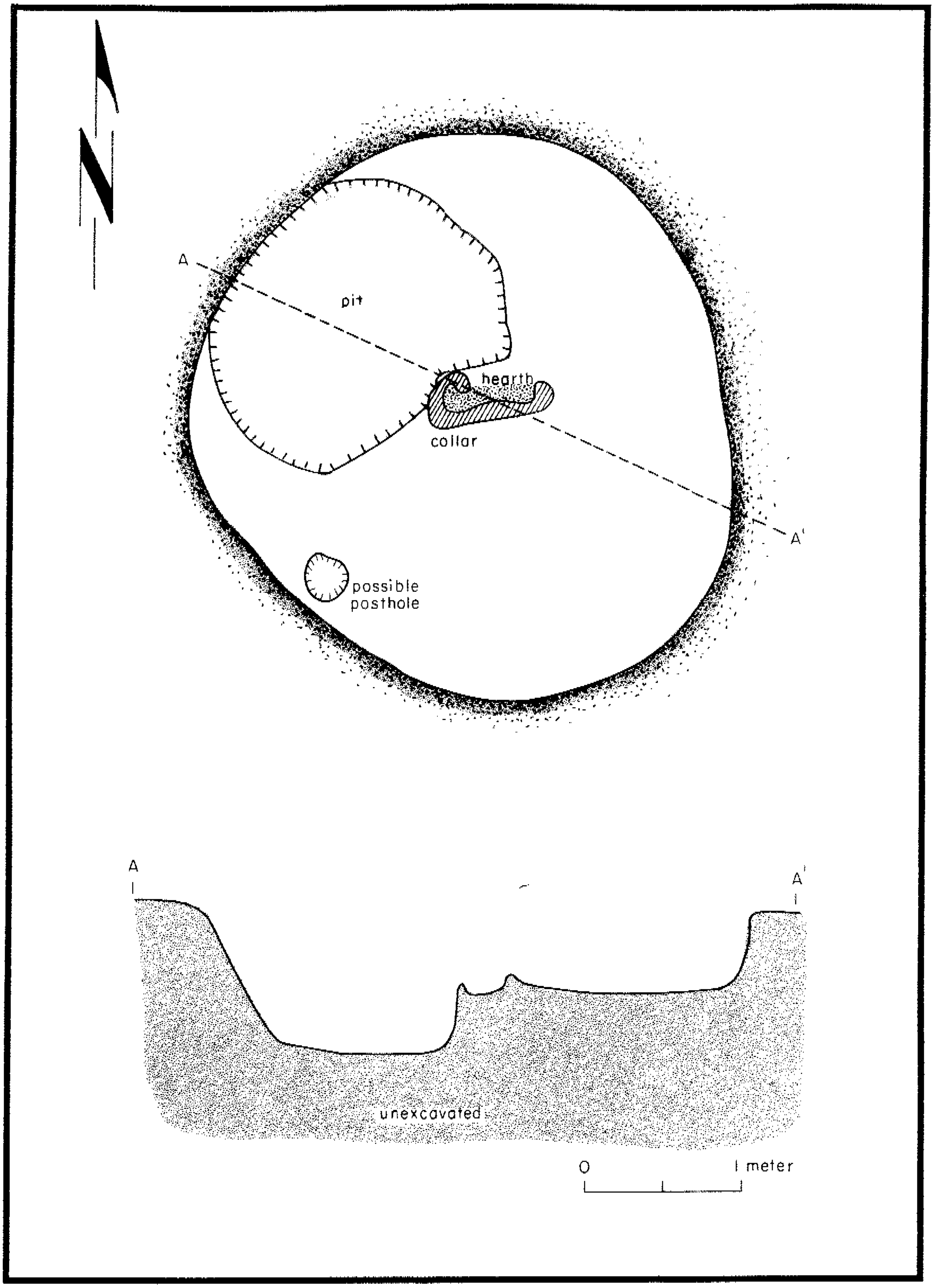

Figure 15. Plan map and profile of Pithouse 98.

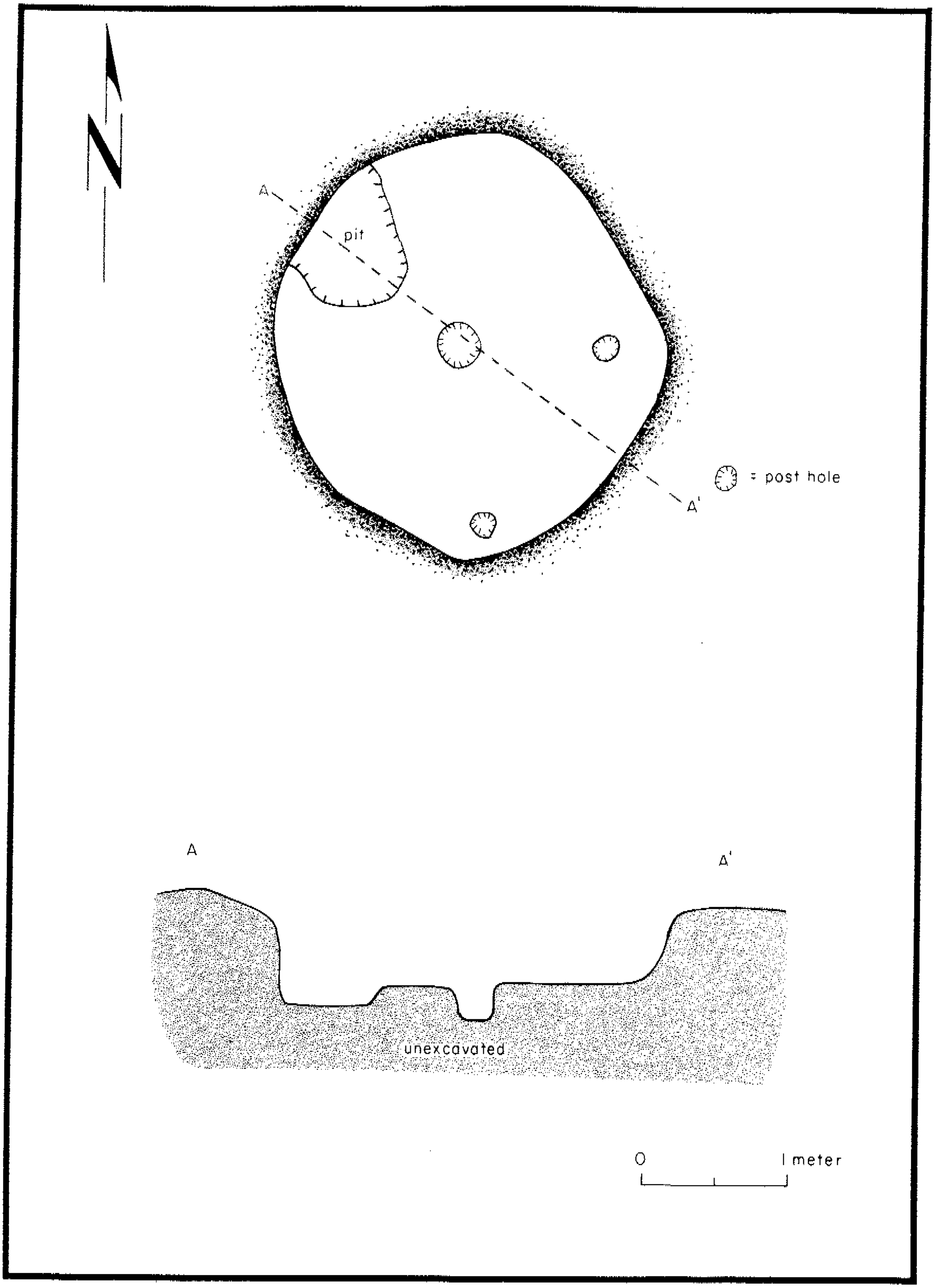

Figure 16. Plan map and profile of Pithouse 106.

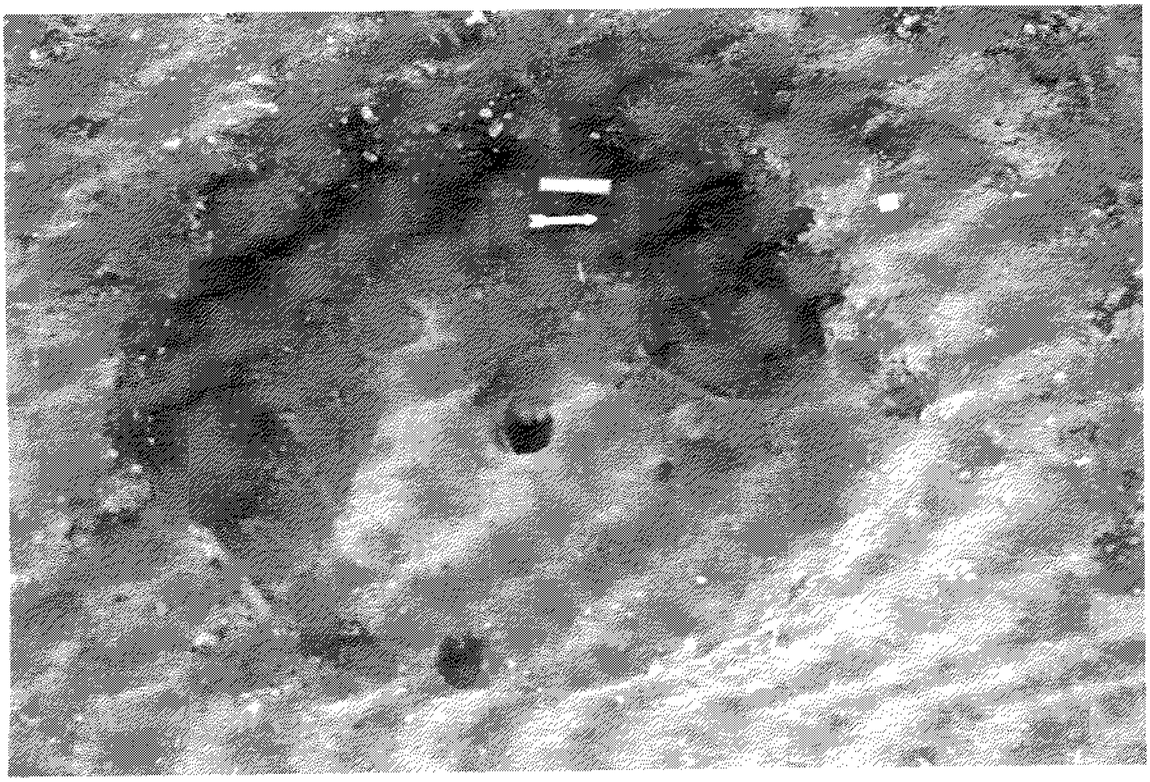
Figure 17. Pithouse 106, floor, looking west.

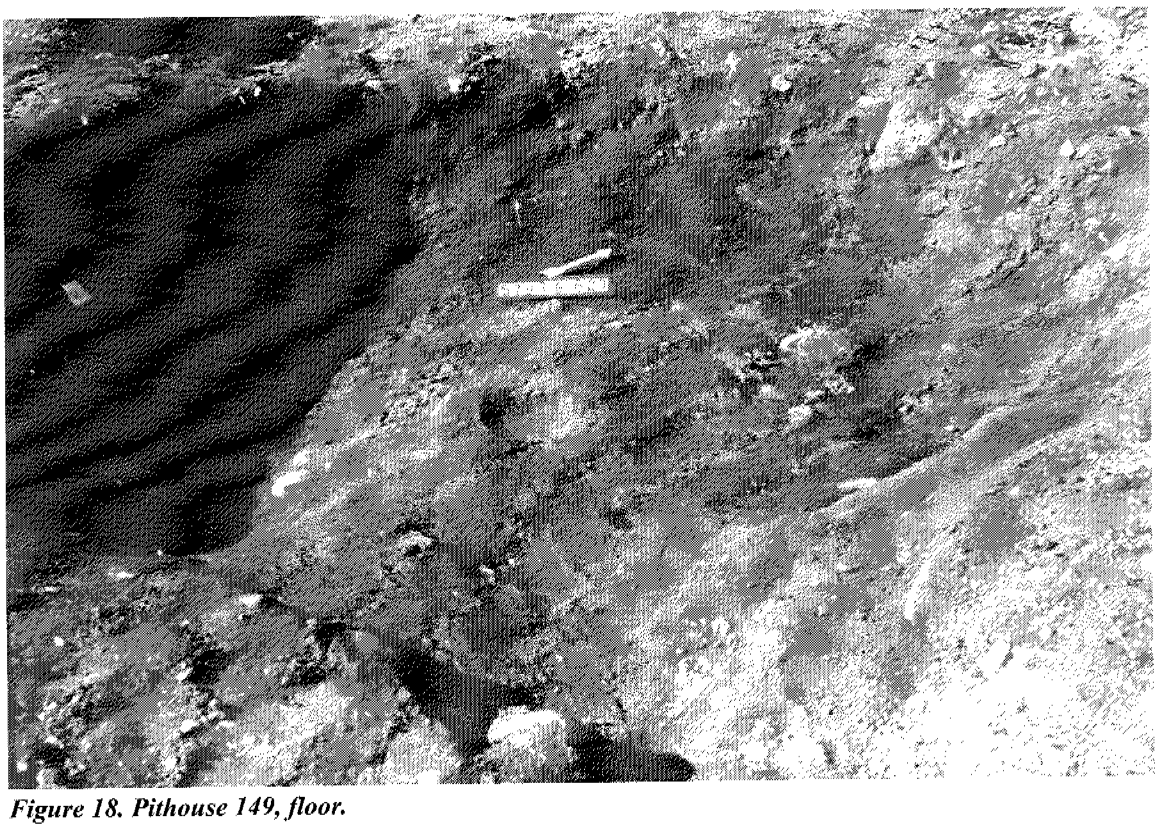
Figure 18. Pithouse 149, floor.

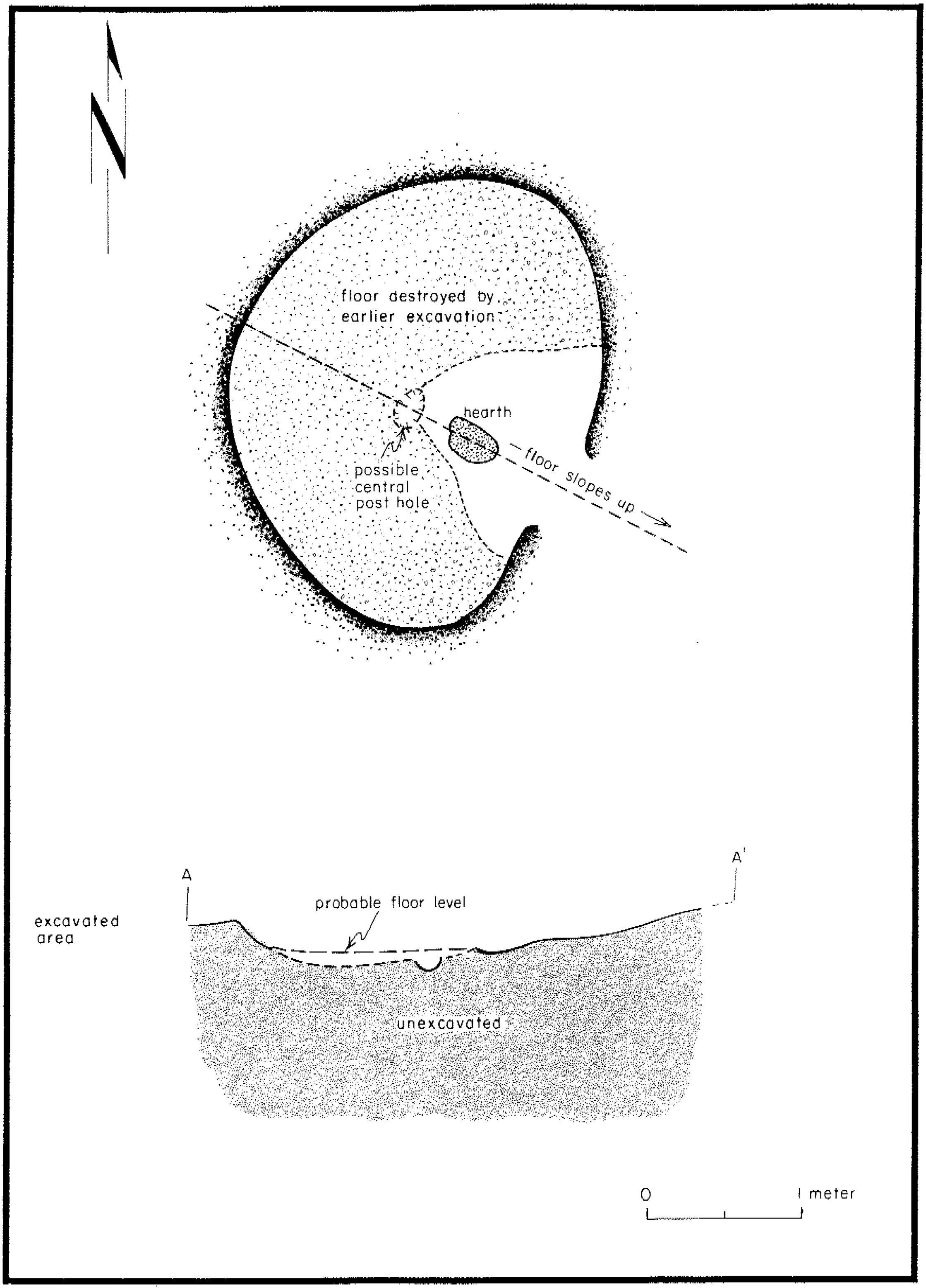

Figure 19. Plan map and profile of Pithouse 149.

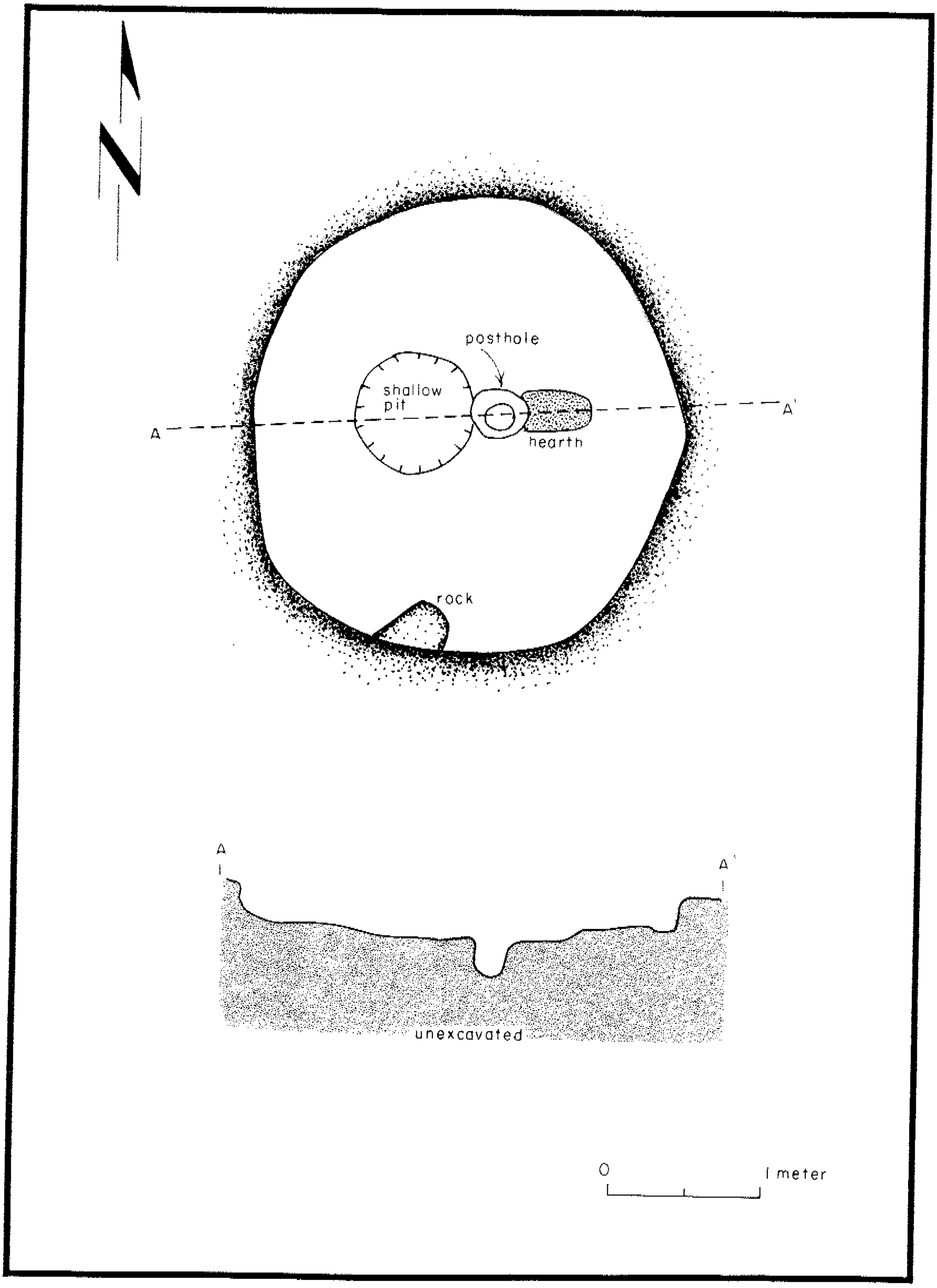

Figure 20. Plan map and profile of Pithouse 153.

Figure 21. Pithouse 153, floor.

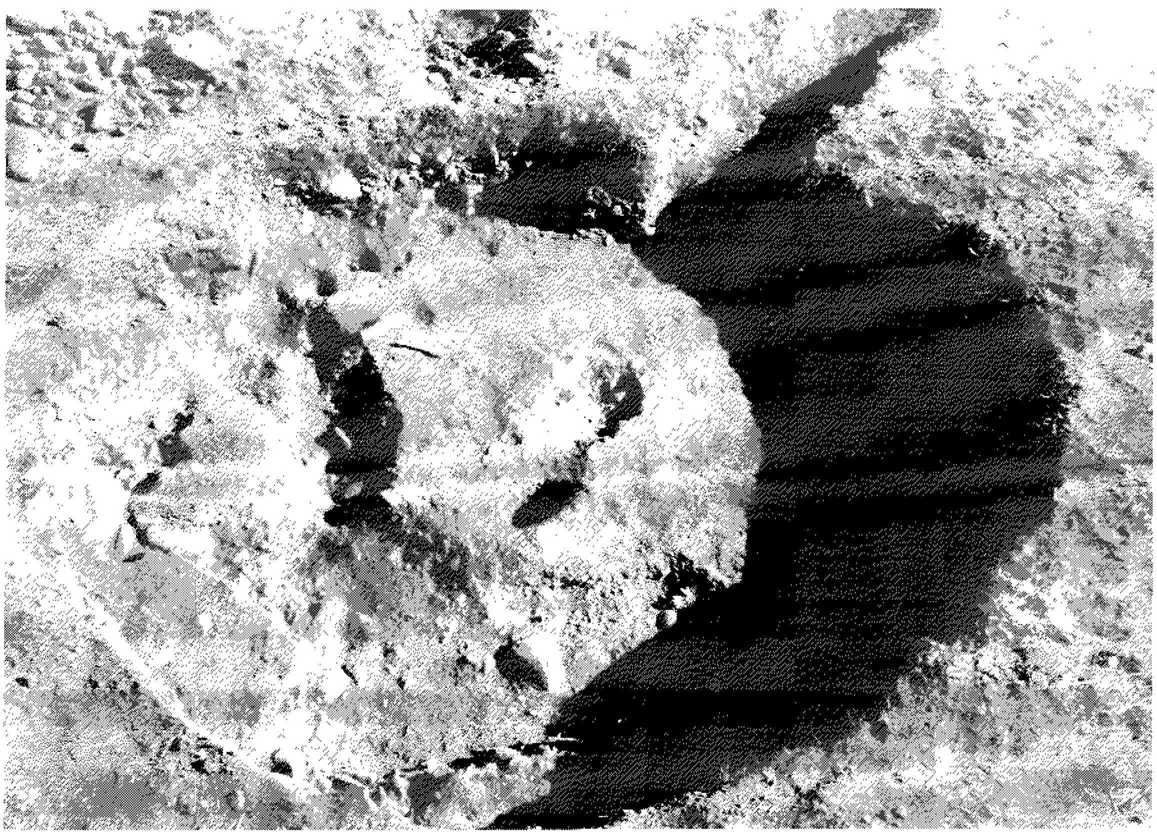

Figure 22. Pithouse 24, floor and depressed "horseshoe" trough, looking northeast.

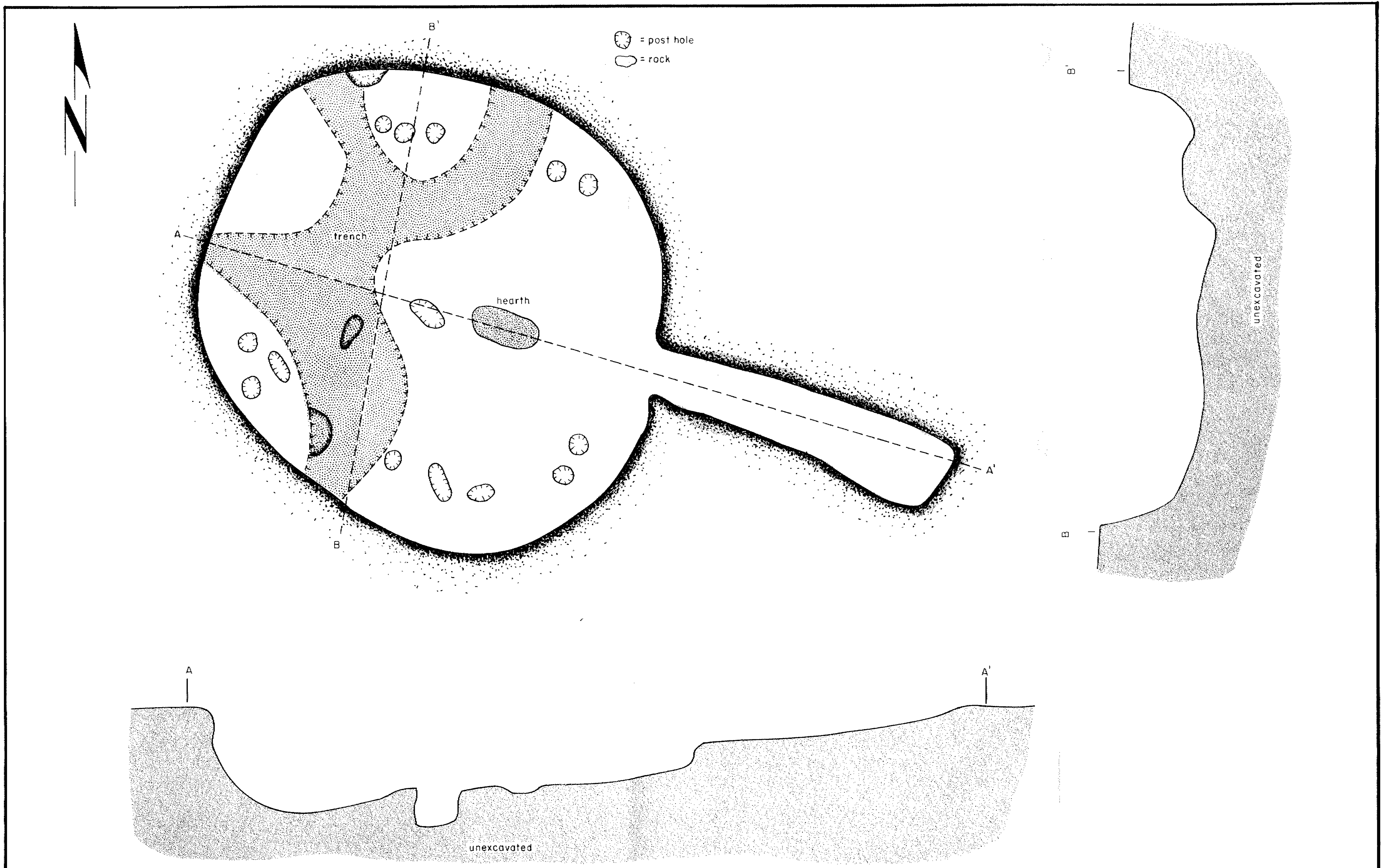

Figure 23. Plan view and profile of Pithouse 50.

Figure 24. Pithouse 25. floor.

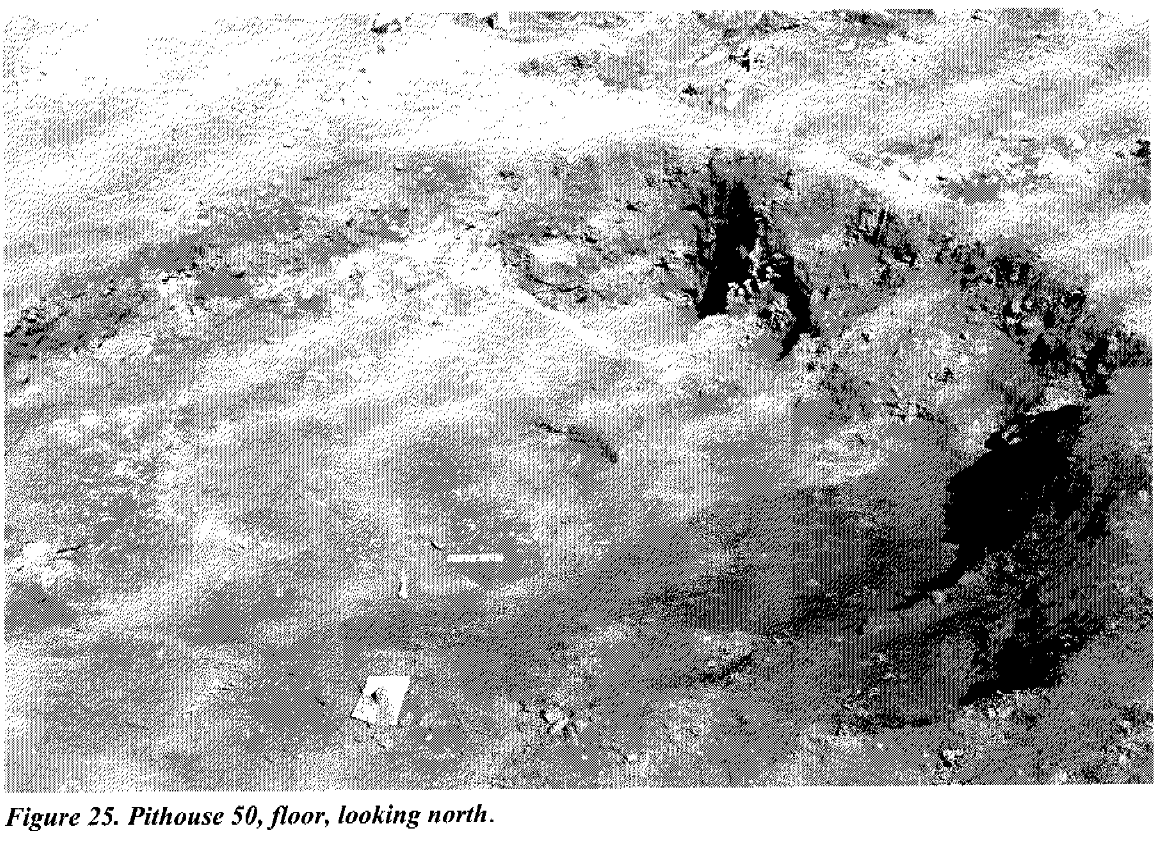

Figure 25. Pithouse 50, floor, looking north.

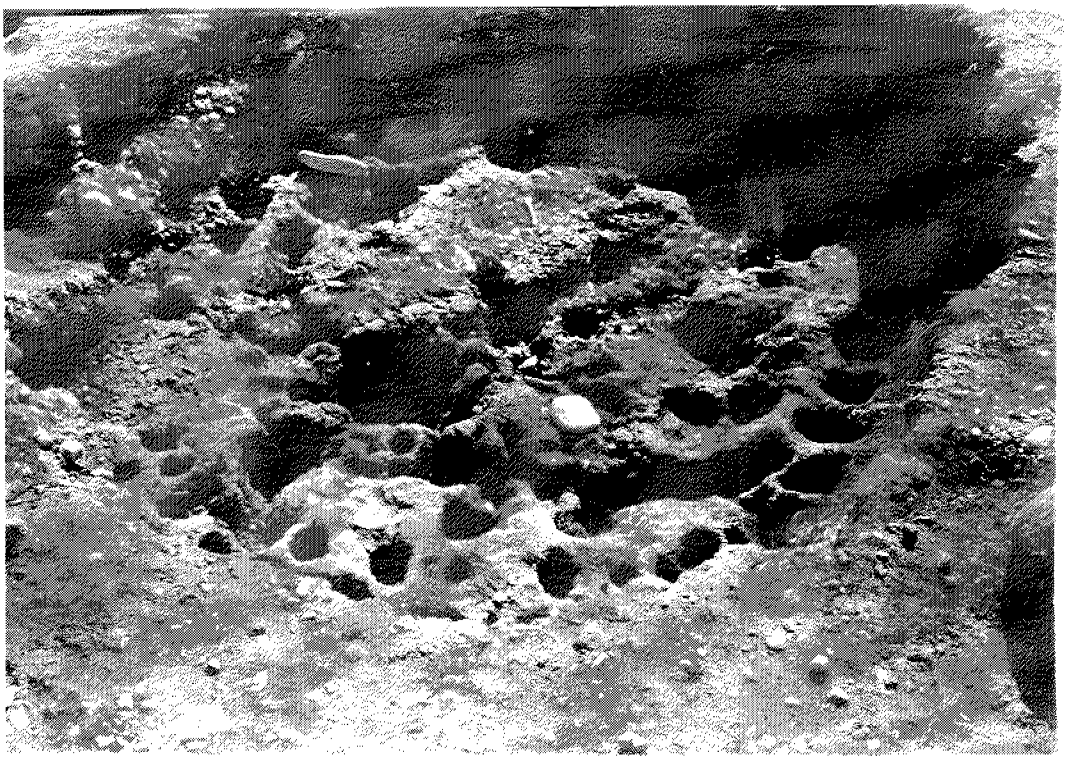

Figure 26, Pithouse 54, with concentric rows of postholes.

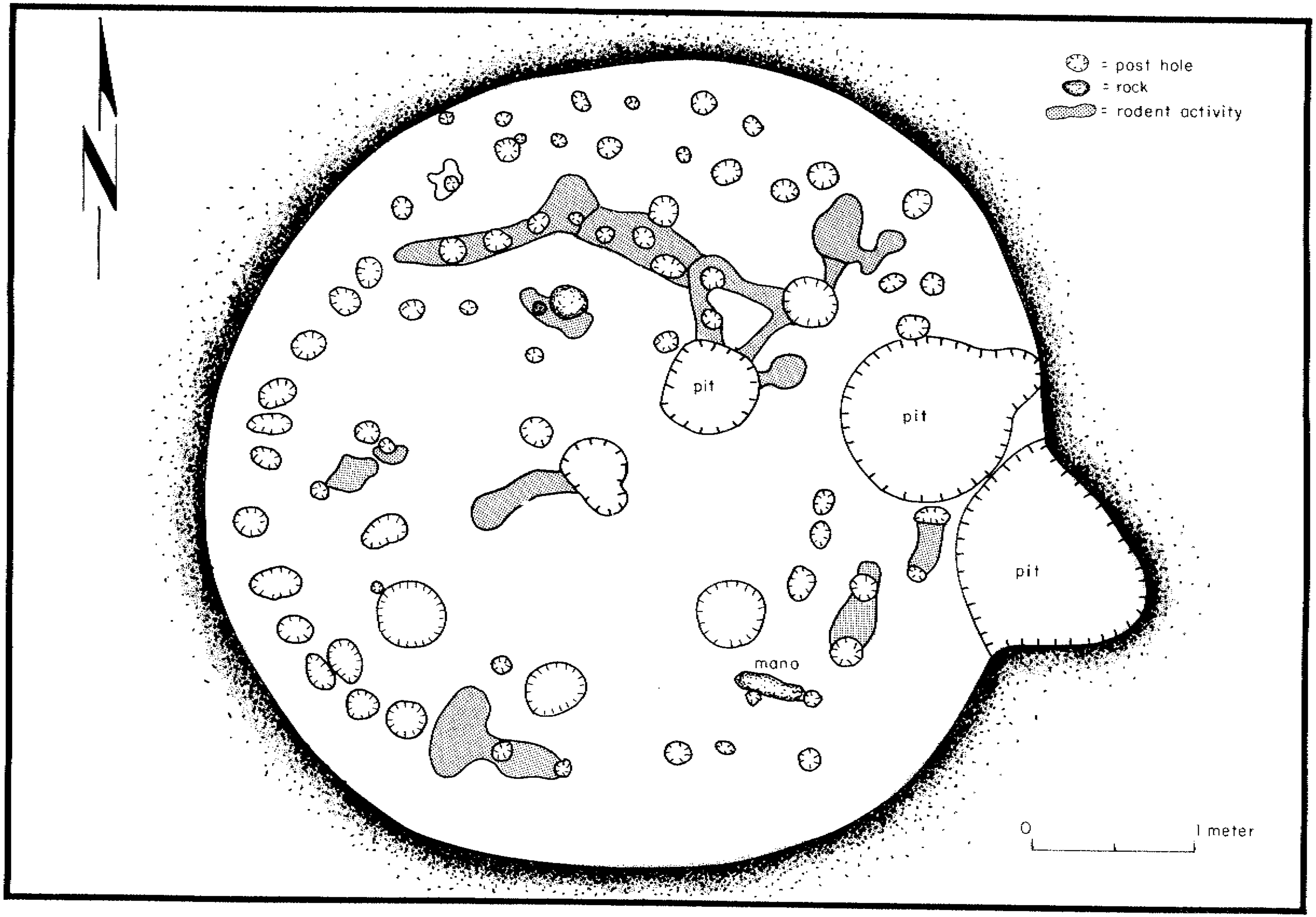

Figure 27. Plan map and profile of Pithouse 54.

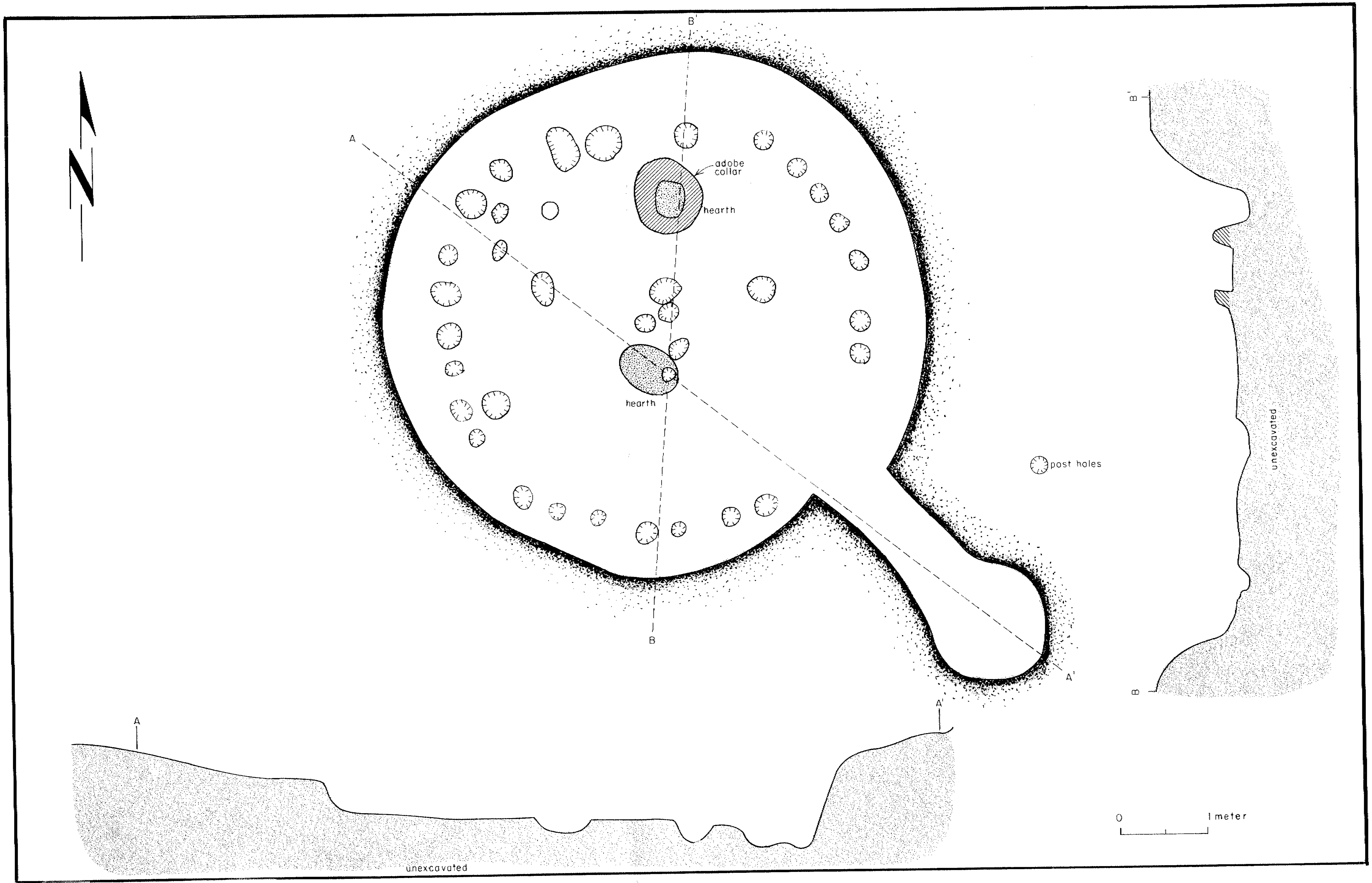

Figure 28. Plan view and profiles of Pithouse 76.

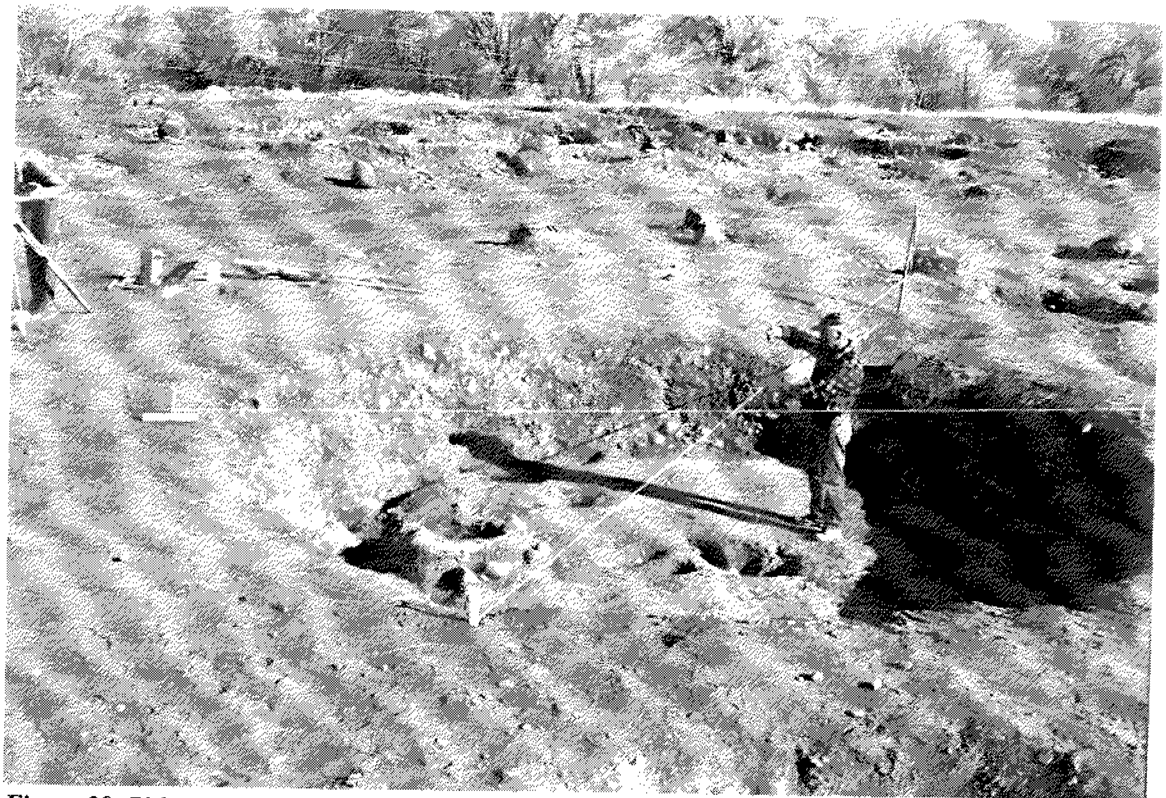

Figure 29. Pithouse 76 being mapped, looking east.

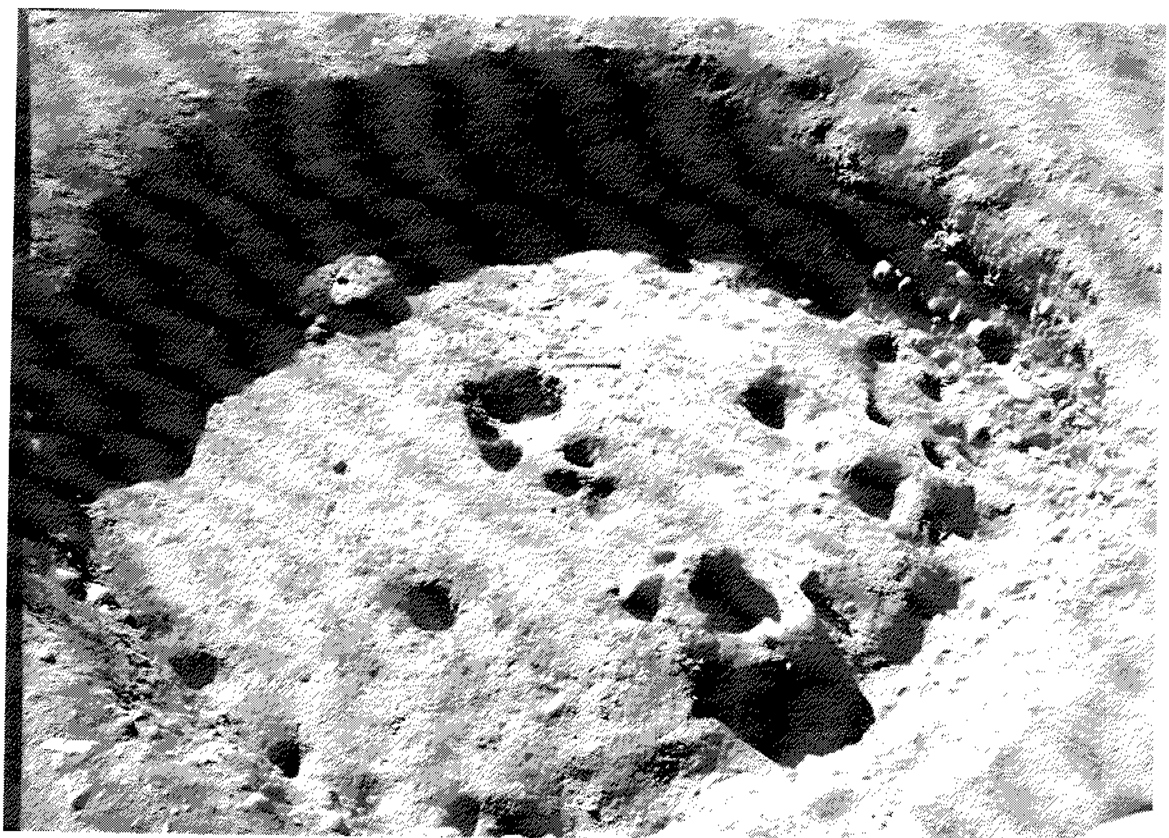

Figure 30. Pithouse 76, floor, looking southwest.

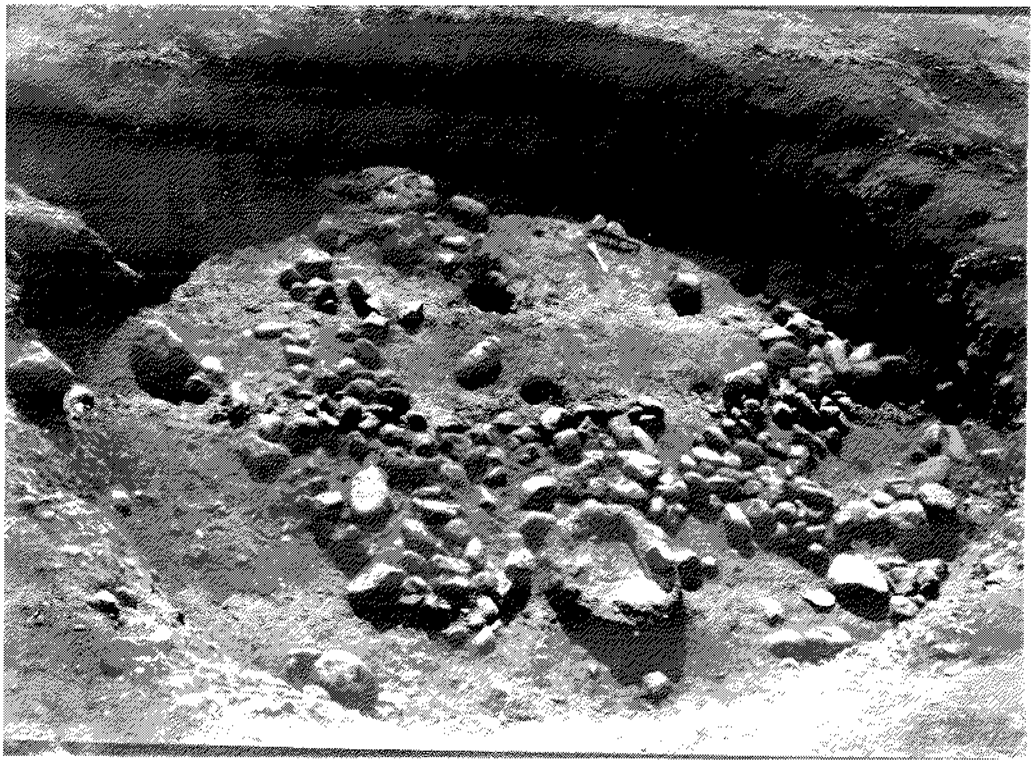

Figure 31. Pithouse 76 showing cobbles on floor, looking southeast. Note grooved object in center of floor.

Figure 32. Pithouse 76, adobe-collared hearth near west wall.

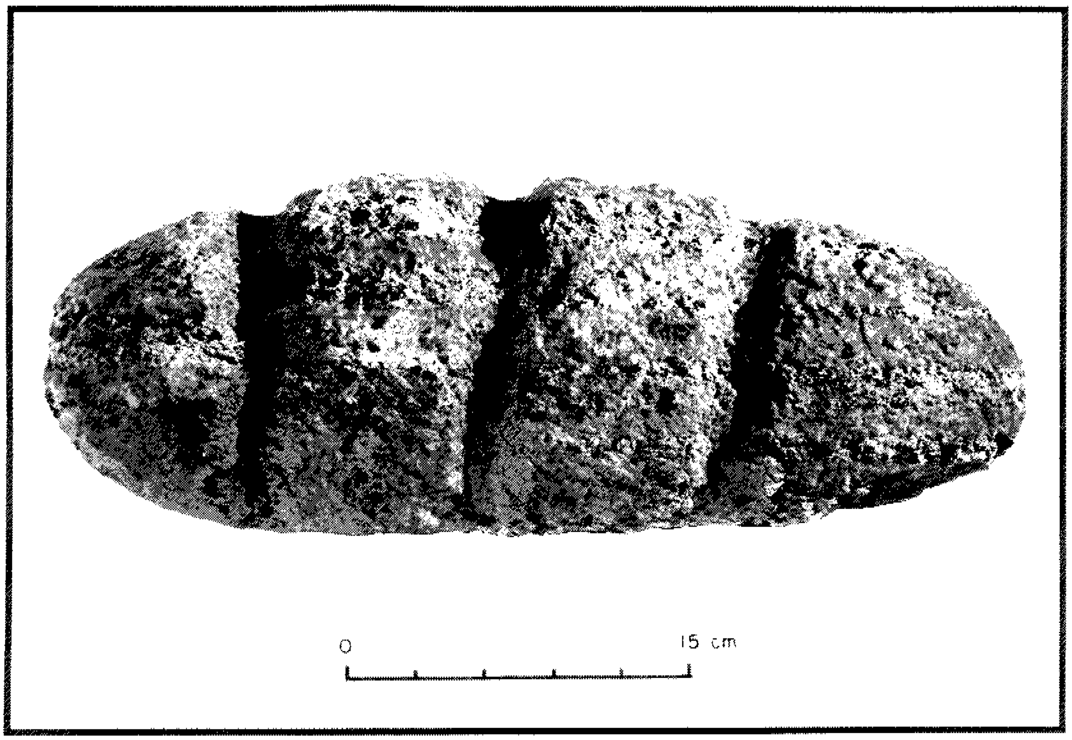

Figure 33. Large "grooved" object from Pithouse 76, floor.

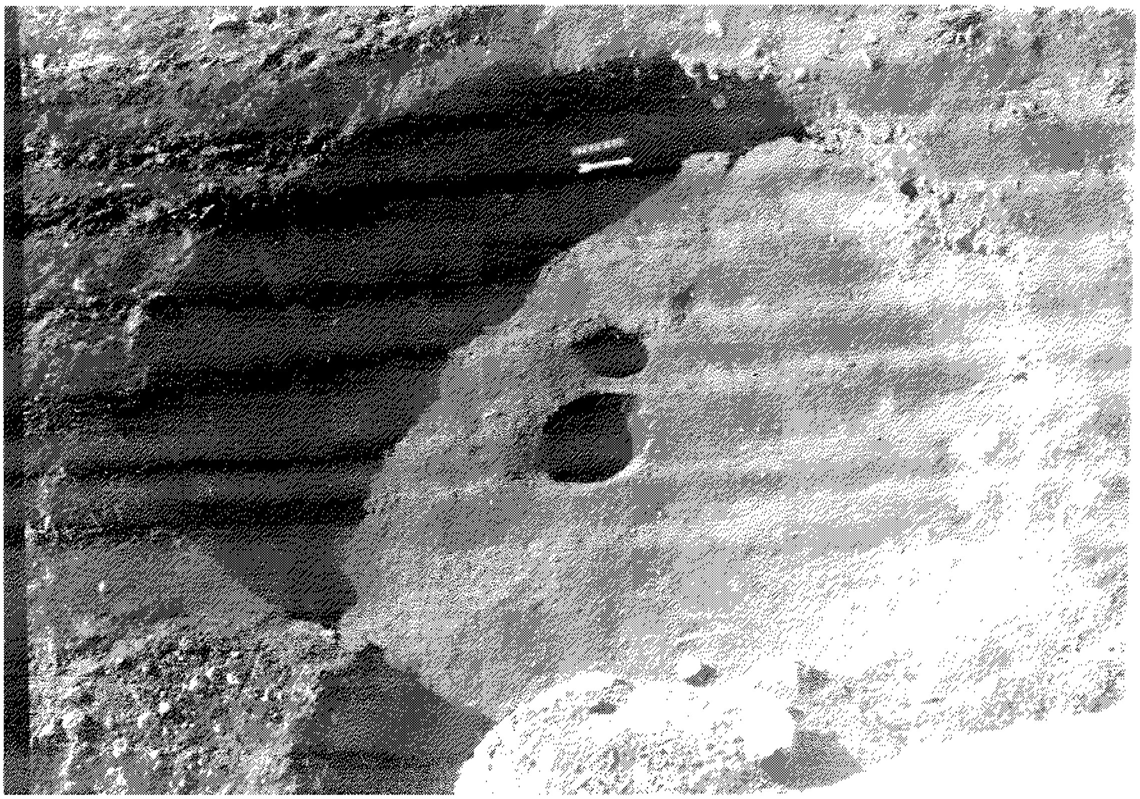

Figure 34. Pithouse 84, floor.

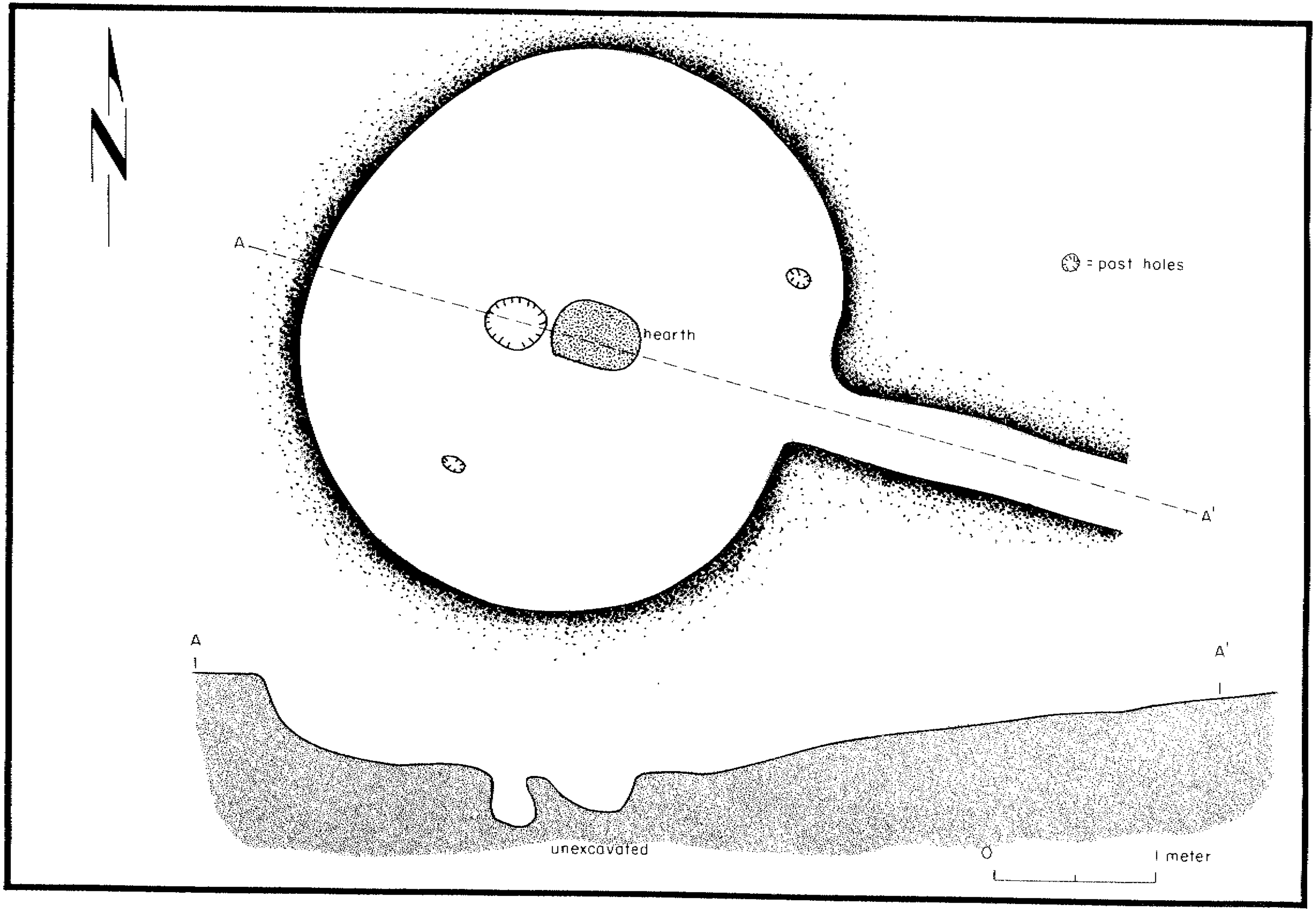

Figure 35. Plan map and profile of Pithouse 84.

SALADO PERIOD: NORTH ROOMBLOCK

One of the distinctive hallmarks of Salado period architecture is large, aggregated, adobe-constructed roomblocks placed around a plaza area (LeBlanc 1989:196; LeBlanc and Whalen 1980:301). At Ormand, four adobe-constructed roomblocks were built at rough cardinal points around a central plaza. Portions of the north and east roomblock mounds were located within the proposed highway right-of-way, and were therefore excavated. Mound descriptions in this report followed cardinal placement as it offered the best mnemonic device for contributors to this report.

Roughly one-third of the north roomblock was excavated, exposing 13 standing rooms and 2 rooms that had been razed during remodeling. Post-abandonment fill was noted as a light brown soil, very different from the post-abandonment fill found at the east roomblock. Rooms were rectangular with variable lengths between 5.0 and 5.45 m long by 2.85 and 4.25 m wide. The average square footage of rooms measured 16.88 sq m. Extant walls for interior rooms stood as tall as 1 to 1.6 m; exterior room walls eroded down to around 30 cm. These outer room walls were typically noted as remnant foundations with upright basal cobbles.

Both north and east roomblocks were initially thought to have been multistoried, although careful examination of field notes and records does not support this. Walls were typically 20 to 40 cm thick. The amount of wall fall accounted for just a single story, and just one layer of roof fall was recorded. Several hearths were found in roof fall and thought to be from second story rooms. These most likely represent hearths on the roof. Other artifacts like metates, bone tools, and many of the large vessels were found on top of the roof fall, indicating extensive use of the roof surface. Nearly every room floor in both roomblocks had hearths, suggesting domestic use. Habitation units on ground level are typically found in single-story structures; multiple-story structures usually have storage rooms on the ground level and living rooms on the second story (Adams 1983:52).

Rectangular, slab-lined hearths comprised 69.2 percent of all hearth types; remaining hearths were basin-shaped adobe-lined firepits. Mealing bins were found in 7 out of the 13 rooms with standing walls. These corn processing stations consisted of one to three bowls or bowl fragments set into the floor with associated metate rests. No metates were found in situ, although a few bowls were recovered from the mealing bins.

Remodeling Sequences

At least two building stages were noted in the north roomblock (Fig. 36). Two earlier rooms (Rooms 6 and 7) had been abandoned, razed, leveled with trash, and then built over with newer rooms (Rooms 8 and 19). Rooms 6 and 7 could have been attached to the initial adobe roomblock construction, prior to the major remodeling episodes. Only the wall bases and floor surfaces were extant at excavation, although this was enough to determine a rectangular shape and size for rooms. Wall foundations consisted of smaller cobbles (approximately 20 cm in length) set upright with a wall thickness of around 20-30 cm. A small portion of the southwest wall corner of Room 7 had survived the remodeling efforts, to a height of 15 cm, and was incorporated into the later remodeled room addition. Loose trashy fill just a few centimeters deep covered a sterile level in both rooms. Two small pits were found in Room 7.

Rooms 15, 17, 18, 57, 58, and 63 constitute a core of initial roomblock construction. Rooms 6 and 7 could have been part of this room group. These rooms were built as a contiguous unit with a compacted, reddish brown adobe with smaller base cobbles (approximately 20 cm in length) set upright, and thinner walls (20-30 cm) than later room additions. These initial interior block of rooms, as noted at the time of abandonment and subsequent excavation, were located in the center of the roomblock.

An outer tier of rooms was later added to the north and east, with easily recognized abutted walls onto the original roomblock. These rooms were constructed from a blackish adobe of a much poorer, less cohesive quality. This cruder adobe material required the use of larger base cobbles (approximately 40-60 cm in length) set upright, and thicker walls (40 cm). Other later remodeling efforts, such as filling in doorways, also utilized this blackish adobe. The three later rooms to the north (Rooms 8, 10, and 22) were generally smaller in size, with numerous storage vessels found on the floor from roof collapse. While smaller size tends to suggest use as storage rooms, only one of these rooms was featureless, and most of the vessels on the floor appeared to have originated from roof storage. The four rooms added to the east (Rooms 19, 20, 21, and 23) were larger, nearly square rooms with floor features like hearths and vessels set into the floor as mealing receptacles.

Wall and Floor Construction

Two distinct types of adobe were noted in the construction of the north roomblock. A compacted, reddish brown adobe with lesser amounts of gravel was seen in the rooms constructed first in the roomblock. These rooms included 6, 7, 15, 17, 18, 57, 58, and 63. The rooms were built with smaller cobbles (about 20-30 cm in length) set upright into a footing trench (Figs. 37, 38). Walls averaged 20 cm in width, with cobbles set on both sides of the trench and gravelly fill placed between. Adobe was then poured or beaten into horizontal layers that were built up layer by layer to create the wall. Each layer ranged from 20-30 cm in height. One historical account refers to a process of beating and pressing adobe in place, resulting in a "hard as rock" adobe (Bannon 1955:47), and perhaps the prehistoric Saladoans used this process. One of the original excavators, Dr. John Wilson, noted a uniform thickness to the walls suggesting use of wall forms (pers. comm. 1996). In contrast to known cast walls at the site of Casas Grandes, walls at Ormand do not have cast marks on wall cores, remains of cast brace holes, evidence of cast doors, or color variation between courses (DiPeso 1974:684).

Later rooms were made with a poorly compacted, blackish and very gravelly adobe. Wall construction proceeded with the same constructional techniques used with the reddish brown adobe. Walls constructed with this blackish adobe were more thick and massive, and did not have the same strength and endurance as the reddish brown adobe. Blackish adobe was also used for patching and remodeling walls and wall features throughout the roomblock. Cobbles used for later room additions were larger (about 40-60 cm in length), and the walls tended to be much thicker (about 40 cm).

Wall interiors were plastered with a layer of brown clay over the adobe. This plaster covered the base cobbles at the bottom of the wall and extended to the floor. There was no evidence of any painting on the walls. Floors were made of adobe with a plaster layer. Typically, floors sloped up to articulate with walls.

Doors, Vents, and Ladder Holes

Doors were found between fourteen rooms (Rooms 8, 10, 15, 17, 18, 20, 21, 22, 23, 63, and two unexcavated rooms to the west of Rooms 21 and 23). At the time of abandonment, five doors were left open linking nine rooms (Figs. 39-41); all other doors were sealed with the black adobe. Doorways tended to be rectangular and located in the interior of the roomblock. Since the walls on the outer edges of the roomblock were considerably eroded, it is possible that exterior doorways did exist. One possible exterior door was noted in the north wall of Room 22.

Ventilation or communication holes were found linking six rooms (Rooms 15, 17, 19, 20, 57, and an unexcavated room west of Room 57). Each of these rooms had a hearth found roughly in the center of the room (Figs. 42-44). The ventilation holes seemed to be related to hearths, and were typically located in a wall at a point directly out from the center of each hearth. Each ventilation hole was a small circular opening about 25 cm in diameter. The height of ventilation holes varied greatly, averaging around 40-50 cm above the floor surface.

Ladder holes, and by implication roof hatch entrances, were found in two and possibly three rooms. Obvious ladder holes were noted in Rooms 20 and 63. Room 22 had two postholes that may actually have been ladder holes; otherwise entry to this room would have been from a door, sealed at the time of abandonment, connecting Rooms 63 and 22. Other roof entrances or exterior doors must have existed for access into the roomblock.

Roofing Material

Burned roof beams were collected from two rooms (Rooms 15 and 63) and from an area due north of Room 10, just outside of the roomblock. Numerous timber specimens were preserved in Room 15 due to the extensive burning of the roof. All of the specimens were sent to the Laboratory of Tree-Ring Research at the University of Arizona in 1967 (Jeffrey Dean, pers. comm. 1996). Several of the specimens thought to be from one tree actually represented fragments from several trees. Nine piñon *(Pinus edulis)* and six juniper *(Juniperus)* fragments were recovered from Room 15, along with two oak *(Quercus)* fragments. Two cottonwood *(Populus)* fragments and one juniper *(Juniperus)* specimen were found in Room 63. Immediately exterior to the north of Room 10, two juniper *(Juniperus)* fragments were found. None of the specimens from this roomblock could be dated.

Loose reeds and reed matting were found in Room 10. These were found on top of floor artifacts and covered with white ash, suggesting use as roof closing material. These items were collected in 1965, but not found and analyzed by a botanist for this project. The field records describe the reeds as flat and hollow, possibly indicating common reeds *(Fragmites)*. Very distinct impressions of reeds in adobe roofing material were collected from Room 34 in the east roomblock. Mollie Toll sees the closest correspondence with horsetail (*Equisetum,* rush), and this may be what was used in Room 10 in the north roomblock as well. The reed matting was drawn in the records as having a twill plaiting pattern (Eric Blinman, pers. comm. 1996).

This evidence suggests that larger support beams were shaped from cottonwood and smaller cross-beams made from juniper and piñon. These species are available in the near environment.

Reeds or reed matting used as closing material above the smaller cross-beams were probably collected along the Gila River. A final layer of adobe was then plastered over the top (see Fig. 37).

Household Units

At the time of abandonment, five distinct household units were noted through door and vent connections (see Fig. 36). Some rooms appeared to be "decommissioned" in later remodeling phases, but no room was identified as being trash-filled. A rudimentary sense of social organization could be determined through architectural connections. Households are discussed below moving from west to east across the roomblock, and are numbered for the sake of clarity in this report.

Household 1: Rooms 22 and 63

This household unit was in the northwest corner of the roomblock. Two rooms were connected by a sealed door at the time of abandonment. Room 63 was accessed by a roof hatch, indicated by ladder holes on the floor. Room 22 might have been accessed through the roof. Two small "postholes" were noted on the floor, which look suspiciously like ladder holes. All vessel descriptions are included in Table 19 (C. Dean Wilson, this volume).

1. Room 22: Post-abandonment fill consisted of adobe wall and roof fall. The floor was "covered" with crushed vessels, which apparently fell in from roof storage (Fig. 45). Two reconstructed vessels were analyzed by this project: a plain unpolished jar (Vessel 39) and a Gila Polychrome bowl (Vessel 56). A large shallow pit near the center may have been an old hearth. Vessel 56 was found set into the floor as a mealing receptacle. The bottom of the bowl was missing, but the bowl was set into a hard white plaster lining with the bottom filled in with plaster. The north wall had a possible sealed doorway or wall patching. If it was a door, it would have led to an exterior area outside of the roomblock. Wall lengths were 4.7 m for the north wall, 4.6 m for the south wall, 2.7 m for the east wall, and 2.6 m for the west wall. Wall heights were not recorded.

2. Room 63: Room 63 was very close in size and shape to Room 22. Post-abandonment upper fill contained unburned, compacted adobe wall and roof fall. Post-abandonment lower fill, from 30-40 cm above the floor down to the floor, consisted of burned roof timbers and reeds, charcoal, ash, and a loose gravelly soil. The walls in this lower portion of the room were burned. The floor contained a large central posthole, a slab-lined hearth with an adobe floor just to the north of center, two ladder holes just north of the hearth, and two ceramic-lined mealing receptacles (Fig. 46). The receptacle to the west contained broken sherds, with the receptacle to the east containing one large sherd and other small sherds lining the basin. These sherds were not located in the state repository or analyzed by this project. Adobe outlines in the floor to the south of each bin indicated metate rests. Several small, irregular pits were noted due south of the metate rest area, perhaps from toes digging into the ground during prehistoric use of the mealing area.

The floor itself was compact, level, and in good condition. Several polished bone awls and approximately six crushed utility vessels were found within a few centimeters above the floor down to the floor level, from apparent roof fall. None of these vessels could be reconstructed. Suggested roof use includes storage and other activities. Final wall dimensions were 4.97 m for the north wall, 5.04 m for the south wall, 3.09 m for the east wall, and 3.17 m for the west wall. Wall heights were not recorded.

Household 2: Rooms 8, 10, 18, and 58

Rooms 8, 10, 18, and 58 formed a second household unit, all connected by interior doors. At the time of abandonment, Room 8 was sealed off from the rest of the rooms. This room was the sole featureless room in the total roomblock. The other three household rooms contained slab-lined hearths. Room 58 also had two bowls set into the floor as mealing receptacles; associated metate rests were due north. Room 18 had a hearth found in roof fall. While no ladder holes are present in this room, the obvious use surface on the roof suggests a roof hatch entryway. Numerous broken vessels were found in Room 10, appearing to have fallen in from the roof, suggesting extensive roof use by this household unit. No entrance was discovered for this unit; entrance was either through the roof or through an exterior door not observed in the low eroded exterior walls.

1. Room 8: Post-abandonment fill consisted of hard clumps of gravelly, adobe wall fall. Numerous sherds were noted in the fill, suggesting roof storage. The floor, or level where the floor could be expected, was totally churned up by rodents. A series of six small holes were found in the west wall approximately 10 cm above the floor level, which may have been used to support wooden beams. No opposing east wall holes were found. A sealed door was located in the center of this wall, about 30 cm above the floor level, measuring 45 cm in width, with an indeterminate height (see Fig. 39). Wall dimensions for excavated walls were unknown for the north and east walls, 4.90 m for the south wall, and 2.90 m for the west wall. Wall heights ranged from 56 to 95 cm.

2. Room 10: Post-abandonment upper fill consisted of loose soil with abundant cultural materials. Lower fill contained adobe wall fall that was burned orange. Below this adobe layer was a layer of reeds, indicated as cat-tails in the field records. Matting made of reeds and woven in a twill plaiting pattern was found about 5 cm above the floor. White ash surrounded the matting. This matting appeared to be roof closing material, since artifacts were found on the floor below it. Five to eight crushed vessels were found in roof fall. Most of these vessels were large utility vessels, although pieces of a medium-sized Tonto Polychrome jar were also found. Several of the utility vessels were reconstructed, including a plain polished jar (Vessel 64), a plain smudged interior jar (Vessel 24), and a plain unpolished jar (Vessel 60). The Tonto Polychrome sherds had a thick layer of ash deposited on them, suggesting that they once lined an ash pit, or were coated with ash from burned roofing material.

Several artifacts found on the floor represent either floor or roof activities. Near the hearth was a collection of bone tools. A triangular hematite palette was found on an unspecified floor area, along with a number of projectile points. One noticeably well-made, one-hand mano was found on the floor near the north wall. Several functional speculations were described for this mano in field notes, including use as a goal marker in a ball court, a plug to a parrot cage, or a plug or cap to a stone bowl (Crocker field notes, on file at the Archeological Records Management Section, Historic Preservation Division). The suggestions of Casas Grandes influenced activity, such as parrot cages and ball courts, is not supported archaeologically on site, and the thickness of the item does not support use as a bowl cap. Both top and bottom convex surfaces were ground and polished, suggesting a more mundane function such as seed grinding.

The floor was a smoothed adobe molded over sterile gravels below, and was replastered twice. A crudely made rectangular hearth, rock-lined on sides and bottom, was located in the near center of the room. The hearth was anchored into the second plaster floor layer, and was left in place for the final plaster floor coat. A shallow ash-filled basin and posthole were noted in the northeast portion of the floor, adjoining the hearth. A sealed doorway in the east wall once connected this room with Room 8. Another door in the south wall opened into Room 18 at the time of abandonment. Wall dimensions were 5.20 m for the north wall, 5.20 m for the south wall, and unknown lengths for the east and west walls. Wall heights ranged from 0.70 to 1.59 m.

3. Room 18: Post-abandonment upper fill contained adobe wall and roof fall. About 18 to 20 cm above the floor was a layer of roofing adobe and roughly shaped rectangular slabs from a hearth on the roof. Below this to the floor were pockets of burned adobe roofing, white ash, scattered pieces of charcoal, ash, reeds, and a large concentration of polished exterior with smudged interior sherds. This pottery was not located in the state repository or analyzed by this project. The floor contained a slab-lined hearth in the center, a posthole to the southwest of the hearth, and an ashpit in the northeast corner. Doors in the north and south walls provided access to Rooms 10 and 58. Wall dimensions were not recorded.

4. Room 58: This room was nearly square in shape and was near the center of the roomblock. Post-abandonment fill consisted of a light brown soil with many adobe chunks and a few sherds, which became very compacted towards the floor. Above a door in the north wall by approximately 10 cm was a series of nine evenly spaced cobbles set into the wall, extending about 1.5 m along the horizontal axis of the wall. Near the base of the door to the east was another rock alignment of six cobbles, set into the wall along a horizontal axis extending about 50 cm. A similar alignment of unknown length was noted in the south wall. It is unclear what these rock alignments signified—whether this was a structural reinforcement or had some other function. The floor was in good condition and contained a center post, a slab-lined hearth with an adobe floor located south of the center post, a partial vessel set into the northeast area as a mealing bin, and an associated metate depression (Figs. 47, 48). The partial vessel in the mealing bin was not located in the state repository or analyzed by this project (Fig. 49). Copper ore was found in the fill just west of the post. Floor artifacts included a concentration of more than 50 beads found in the southeast corner of the floor. Wall dimensions were not recorded.

Household 3: Rooms 15, 17, 19, 20, 57, and an Unexcavated Room West of 57

Rooms 15, 17, 19, 20, 57, and an unexcavated room west of Room 57 were all connected by doors or ventilation holes. This was the largest household unit in the roomblock. By all accounts, it seemed that these rooms were in use at the time of abandonment, although various sealed features provide an intriguing story of actual "connection." One door was left open, connecting Rooms 20 and 57. Room 20 also had ladder holes indicating a roof hatch entryway. The three rooms to the north had sealed doors but mostly open vents. Sealed doors were found in Room 15, which is a pivotal room connecting the south rooms to the north set of rooms. Ventilation holes were open between Rooms 15 and 17, and Rooms 17 and 20. A sealed ventilation hole was noted between Rooms 17 and 19. Four of these rooms (15, 17, 19, 20) contained slab-lined hearths. Room 57 had a basin hearth. No mealing receptacles were found in any of these rooms, which seems odd for such a large household unit.

1. Room 15: Post-abandonment upper fill consisted of loose, gravelly soil with charcoal. A thin layer of burned roof reeds delineated the lower fill, which contained burned adobe roof fall and small burned logs averaging 5 to 8 cm in diameter. The walls of this room were scorched from the

burning roof from the floor up 20 to 30 cm, and several burned timber specimens were collected, totaling nine piñon *(Pinus edulis)*, six juniper *(Juniperus)*, and two oak *(Quercus)* fragments. A slab-lined hearth with an adobe floor was located in the center of the floor (Figs. 50-51). Three postholes were found, with a post remaining in the posthole found 1.05 m from the west wall (Fig. 52). The other postholes included one near the south wall and a central posthole in the southwest corner of the hearth. The east wall contained a sealed doorway near the southeast corner, and two ventilation holes 25 cm in diameter placed in the center of the wall with a space of 40 cm between them. Wall dimensions for excavated walls were 3.35 m for the north wall, 3.25 m for the south wall, 4.70 m for the east wall, and 5.10 m for the west wall. Wall heights at corners measured 1.19 m at the southwest corner, 0.92 m at the southeast corner, 0.85 m at the northeast corner, and 1.19 m at the northwest corner (Fig. 53). Reconstructed vessels from roof fall or floor proveniences included two plain polished jars (Vessels 27 and 28) and one Gila Polychrome jar (Vessel 29).

2. Room 17: Post-abandonment fill contained homogeneous adobe wall fall down to the floor. This room was somewhat narrower and smaller than the other household rooms. A cobble-lined central hearth with an adobe floor was the only floor feature (Fig. 54). Ventilation holes connected this room to Rooms 15, 19, and 20. Wall lengths were 2.70 m for the north wall, 2.87 m for the south wall, 4.65 m for the east wall, and 4.85 m for the west wall. Wall heights were not recorded.

3. Room 19: Room 19 was built over the south wall of Room 7, with areas of reddish adobe from the south wall of Room 7 incorporated into the black adobe north wall of Room 19 (Fig. 55). Post-abandonment fill consisted of hard adobe chunks, ash, charcoal, and cultural debris (sherds and bone). The floor was in poor condition, but did have several features. A square, slab-lined hearth with an adobe floor was found near the north-center (Fig. 56). Two mealing bins were set into the floor in the northeast corner of the room. One contained a Gila Polychrome bowl (Vessel 55) and the other bin was lined with sherds (six Gila Polychrome, two unpainted Salado, and one white-on-red). A ventilation hole was found sealed with plaster in the center of the west wall, measuring 30 cm in diameter. The floor was constructed over a thin layer of trash on top of the underlying sterile substrate. Final wall lengths measured 5.15 m for the north wall, 5.45 m for the south wall, 5.0 m for the east wall, and 4.25 m for the west wall. Wall heights measured 0.85 m at the southwest corner, 0.75 m at the northwest corner, 0.40 m at the northeast corner, and 0.35 m at the southeast corner.

4. Room 20: Post-abandonment upper fill consisted of a loose, gravelly soil. Lower fill contained hard chunks of adobe and numerous sherds down to the floor. The floor was plastered with a fine adobe, smoother in consistency than the walls. A rectangular, cobble-lined hearth with an adobe floor was found closer to the north wall near the center (Fig. 57). Hearth fill contained compacted ash and charcoal. A mealing receptacle was found in the northeast corner of the room, constructed from two halves of different Gila Polychrome bowls (Vessels 30 and 31). The bowl portions were set into the floor at an angle so that the receptacle as a whole was tipped 45 degrees facing east (Fig. 58). Two ladder holes were found west of the hearth by approximately 20 cm. A ventilator hole was found in the center of the north wall, and a doorway measuring 43 by 43 cm was found in the center of the west wall.

The floor had been remodeled at least once. An earlier rectangular hearth was found subfloor in the southwest corner of the room, aligned northwest-southeast. This room was built over a razed portion of the original reddish brown adobe roomblock. Remnants of an earlier wall were found under the floor indicating a north-south alignment continuous from the east wall of Room 17. Excavated wall lengths for Room 20 measured 4.97 m for the north wall, 5.0 m for the south wall, 4.12 m for the east wall, and 4.23 m for the west wall. Wall heights measured 0.90 m at the southwest corner, 0.50 m at the northeast corner, 0.85 m at the northwest corner, and 0.45 m at the southeast corner. Reconstructed vessels found in floor and floor fill proveniences included a plain indented exterior with smudged interior jar (Vessel 41) and a Gila Polychrome jar (Vessel 22).

5. Room 57: This room was near the center of the roomblock, and had the "highest" surviving walls excavated, although wall dimensions were not recorded (Fig. 59). It was a long, narrow room. Post-abandonment upper fill consisted of a loose, gravelly soil, adobe chunks, and a few sherds. A basin metate was found in lower fill, perhaps from roof storage. Black adobe used in later roomblock construction and remodeling sealed a rectangular doorway in the north wall, leading into Room 15. Another doorway in the west wall opened into Room 20. Floor features included a possible hearth, two postholes, and a subfloor pit with a possible center posthole (Fig. 60). Many artifacts were found in floor and floor fill contexts, including a stone animal effigy, a mano, a "floor polisher," bone awls, a serrated obsidian chip, a polished stone pendant, and many crushed, large, unpainted utility vessels found along the north wall (Fig. 61). Some of these artifacts probably came from roof fall, suggesting a multipurpose roof activity area. The floor was plastered and in somewhat good condition, but its softness suggested construction over trash fill. Wall plaster was found on portions of the cobble wall foundations. Reconstructed vessels from floor proveniences included a Gila Polychrome jar (Vessel 81), a Gila Polychrome bowl (Vessel 16), and a miniature mud ware jar (Vessel 34).

Household 4: Room 23 and an Unexcavated Room

The full extent of this household is unclear, since excavation stopped at the open door in the northwest corner of Room 23 (Fig. 62). At least two rooms can be attributed to this household. Post-abandonment fill consisted of a loose, gravelly soil with many sherds found above the floor. The floor and south and west wall bases had good surviving plastered surfaces. A rectangular, slab-lined hearth with a burned sand base was found in the center nearer to the south wall, filled with a fine-grained, white ash (Fig. 63). The hearth measured 45 by 50 cm by 17 cm deep. A mealing receptacle was found in the northeast corner, lined with a plain polished bowl (Vessel 33). The bowl was set into the floor at an angle. A slab metate and three manos, scattered throughout the room, were found on floor contact. An adobe step in the northwest corner lead to a door in the west wall. This unique feature was not found elsewhere on site. The step was semicircular, 8 cm in height, and 23 cm wide. Wall lengths measured 5.10 m for the south wall, and 3.65 m for the west wall, with unrecorded lengths for the north and east walls. Wall heights measured 78 cm at the northwest corner, 54 cm at the northeast corner, 28 cm at the southeast corner, and 67 cm at the southwest corner.

Household 5: Room 21 and an Unexcavated Room

The full extent of this household is also unknown. An open door in the northwest corner led to an unexcavated room; at least two rooms can be attributed to this unit. Room 21 was the southernmost room excavated along the eastern edge of the roomblock. Post-abandonment fill was loose, gravelly soil with adobe chunks and sherds. The floor was in fair condition, with several features found. In the northwest-central area was a rectangular, cobble-lined hearth with an adobe floor. In the east-center was a large posthole. Another possible posthole with rock footings was located 10 cm due west of the hearth. In the southeast corner was a complete plain utility bowl set into the floor as a mealing receptacle (Fig. 64). A mano and a polishing stone were found on the floor to the northwest of the hearth by about a meter. One reconstructed vessel, a red slipped smudged interior bowl (Vessel 86), was recovered from the floor.

Below the hearth in the floor of the room was a bell-shaped pit predating the roomblock. The pit measured roughly 1.0 m in diameter at the top, 1.55 m in diameter at the bottom, and had a depth of 1.25 m. There were no signs of prepared walls or floor, and the pit was cut into sterile yellow gravel. Pit fill consisted of an adobe-colored soil with many cobbles, ash pockets, and small pieces of charcoal. This fill was the same fill used to level the floor, and probably was part of the Saladoan effort to prepare the surface for the roomblock construction. Wall dimensions were 5.10 m for the north wall, 5.10 m for the south wall, 3.10 m for the east wall, and 2.95 m for the west wall. Wall heights measured 70 cm at the northwest corner, 55 cm at the southwest corner, 30 cm at the southeast corner, and 35 cm at the northeast corner.

North Roomblock Discussion

Roughly one-third of the north roomblock was excavated, exposing 13 extant rooms and 2 rooms that had been razed and built over. Room size averaged 16.88 sq m. Walls were constructed by digging a footing trench and placing cobbles upright on end within the trench. Adobe was then poured or beaten into horizontal layers about 20 to 30 cm in height. Walls were built up layer by layer to achieve the final wall height. Roof construction appeared to use cottonwood for larger beams, and piñon and juniper for small cross-beams. Reeds and reed matting were used for closing material, with an adobe layer capping the exterior of the roof (see Fig. 37). These construction techniques were used for at least two remodeling episodes for the roomblock. An initial core of rooms (Rooms 15, 17, 18, 57, 58, and 63) was built from a reddish brown adobe with good cohesive qualities. These rooms had walls with a 20 cm thickness. Two earlier rooms that had been razed and built over by later additions (Rooms 6 and 7) may have been a part of the initial core of rooms. An outer tier of rooms along the north and east edges of the initial room construction was added at a later date. These rooms were made from a "black" adobe with poorer cohesion, producing a thicker 40-cm wall. Other remodeling efforts, including sealing doors and ventilators, used this "black" adobe. No exterior doors were noted for this roomblock, although exterior walls had eroded considerably, and doors may have existed in exterior walls. Just two, and possibly three rooms had ladder holes indicating entrance through roof hatches. Either more roof entrances existed, or more exterior doors; entrance to much of this roomblock remains conjectural.

The roomblock was a single-storied building, with walls typically 20 cm thick for early construction, and 40 cm thick for later construction. Just one layer of roof fall was noted, and wall fall accounted for just one story. Several rooms had hearths found in roof fall, along with other artifacts and large storage vessels, indicating extensive use of roof surfaces for a variety of activities. Roof use may have been similar to ethnohistoric documentation of Western Pueblos, with roof surfaces used extensively for processing food, as work activity areas, and the like (Dohm 1992; Fleming and Luskey 1986; Fowler 1989; Gaede 1986; Holmes 1905; Judd 1925).

Hearths were found in nearly every room; most were slab-lined (69.2 percent) and the remainder were simple basin-shaped, adobe-lined firepits. Mealing bins were found in just over half of the rooms, and consisted of from one to three bowls or bowl fragments set into the floor with associated metate rests. Interior doors and ventilators indicated a number of household units within the roomblock. Household units ranged from two to six rooms in size. Households could have been much larger, since the whole of the roomblock was not excavated. The size and grouping of household units has been interpreted as aggregates (or "piles") of social groups. The social structure of large, aggregated pueblos is actually structured by small household units (Johnson 1989:381). There is a striking lack of overt storage space for interior household space. Dried food stuffs could have been stored in living spaces, perhaps similar to ethnohistoric documentation of Western Pueblos (Dohm 1992; Judd 1925). Room function would have been aided by pollen, flotation, and macrobotanical sampling. Unfortunately, the biggest gap in our knowledge of Ormand concerns the loss of the few botanical samples collected and our historic misfortune of excavation prior to ethnobotanical flotation sampling.

Most of the rooms appeared to be contemporaneously occupied at the time of abandonment, with the exception of Rooms 6 and 7, which were earlier rooms leveled for remodeling. None of the rooms appeared to be trash-filled. Room fill tended to be either sterile melted wall fall and layers of roof fall, with fallen roof hearths, metates, bone tools, and large storage vessels indicating extensive use of the roof. Usable objects, with the exception of storage vessels, were removed at the time of prehistoric abandonment. Few whole metates were found, and no metates were recovered in situ. Some rooms had been burned, including two rooms from the initial core of rooms in the roomblock (Rooms 15 and 63), and a later room addition (Room 10). Two household units are represented by these rooms, located in the northwest portion of the roomblock. This burning did not seem to signify a hostile act, but appeared to be part of a planned abandonment, stemming from any number of social, ritual, or environmental factors (Cameron 1990:28).

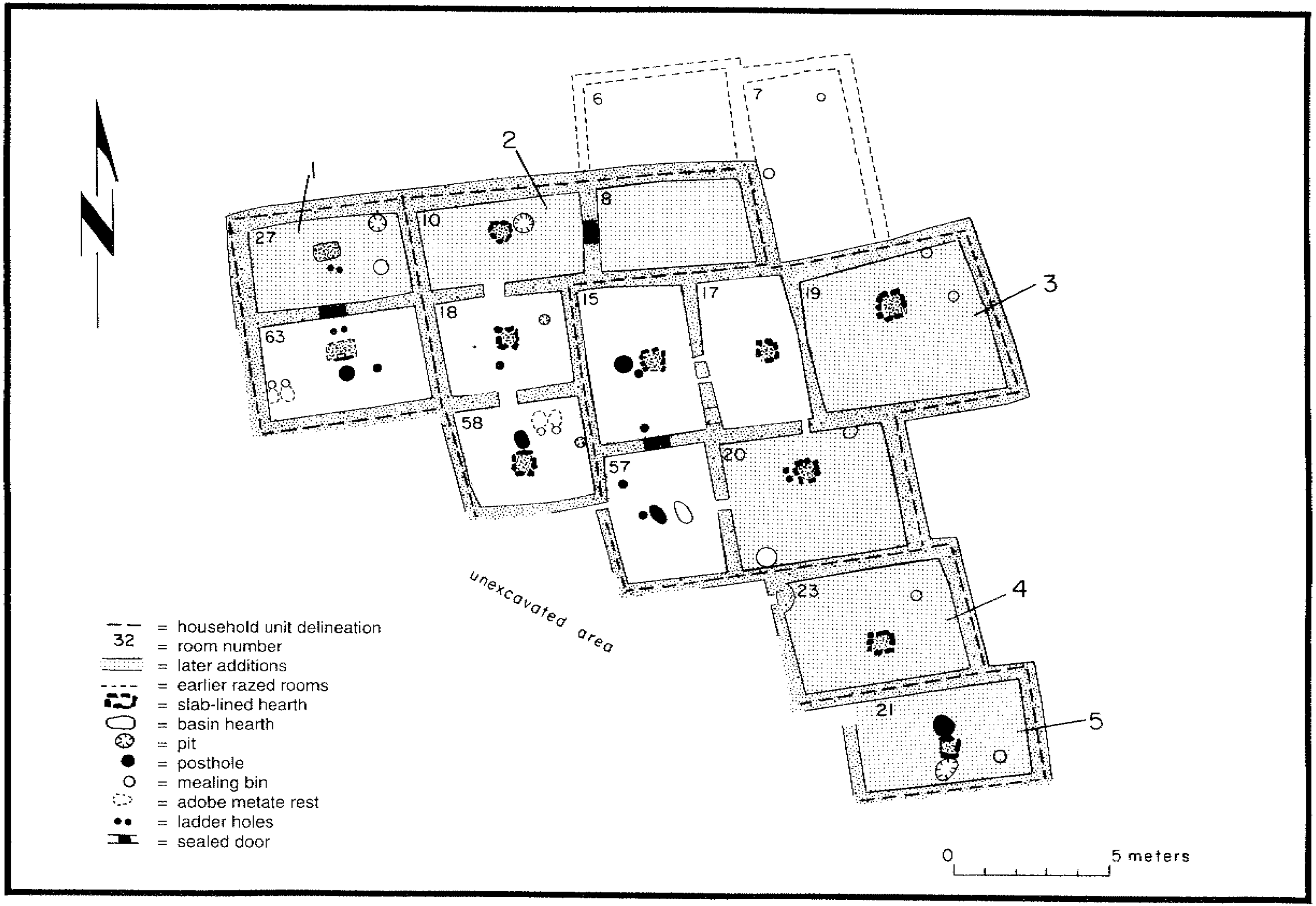

Figure 36. Remodeling sequence and household units, north roomblock.

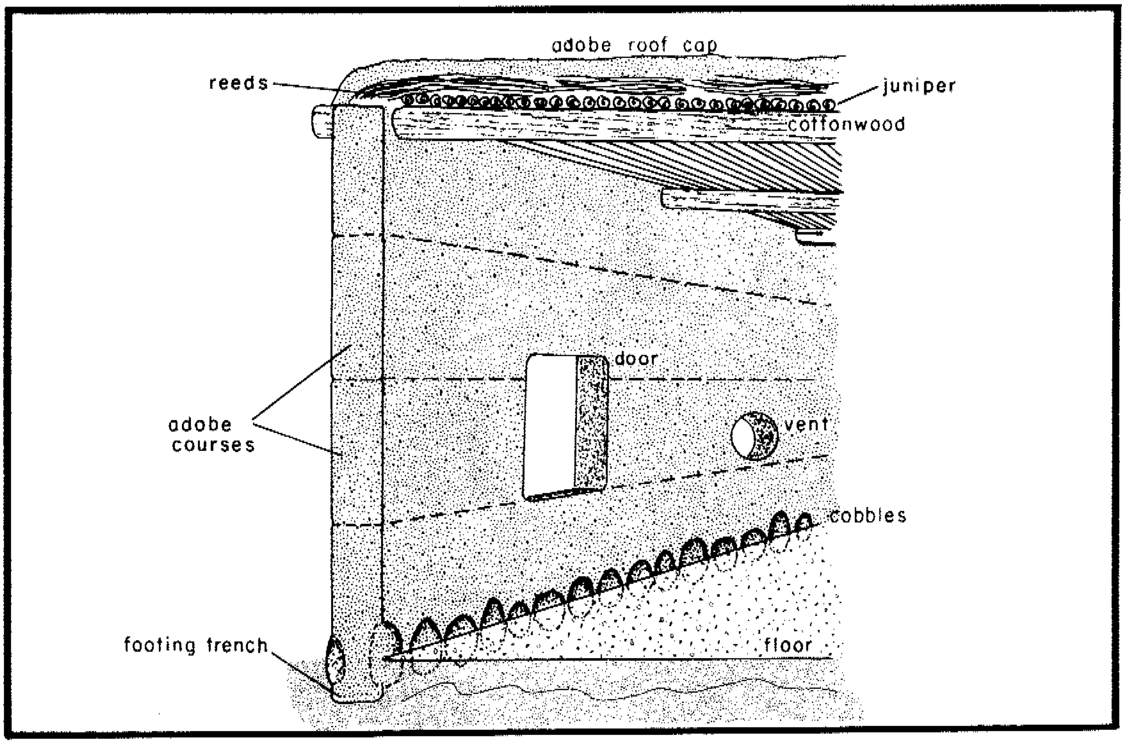

Figure 37. Salado wall and roof construction.

Figure 38. Room 8, wall detail.

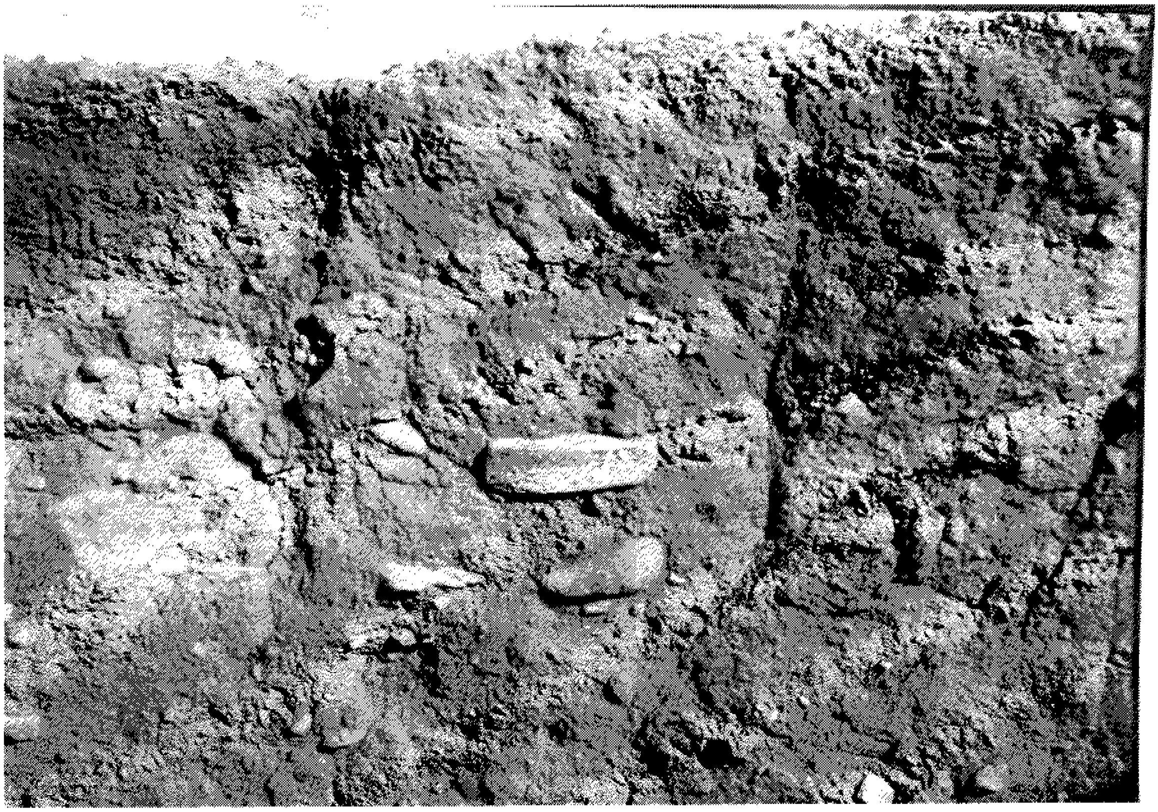

Figure 39. Detail of blocked doorway between Room 10 and Room 8.

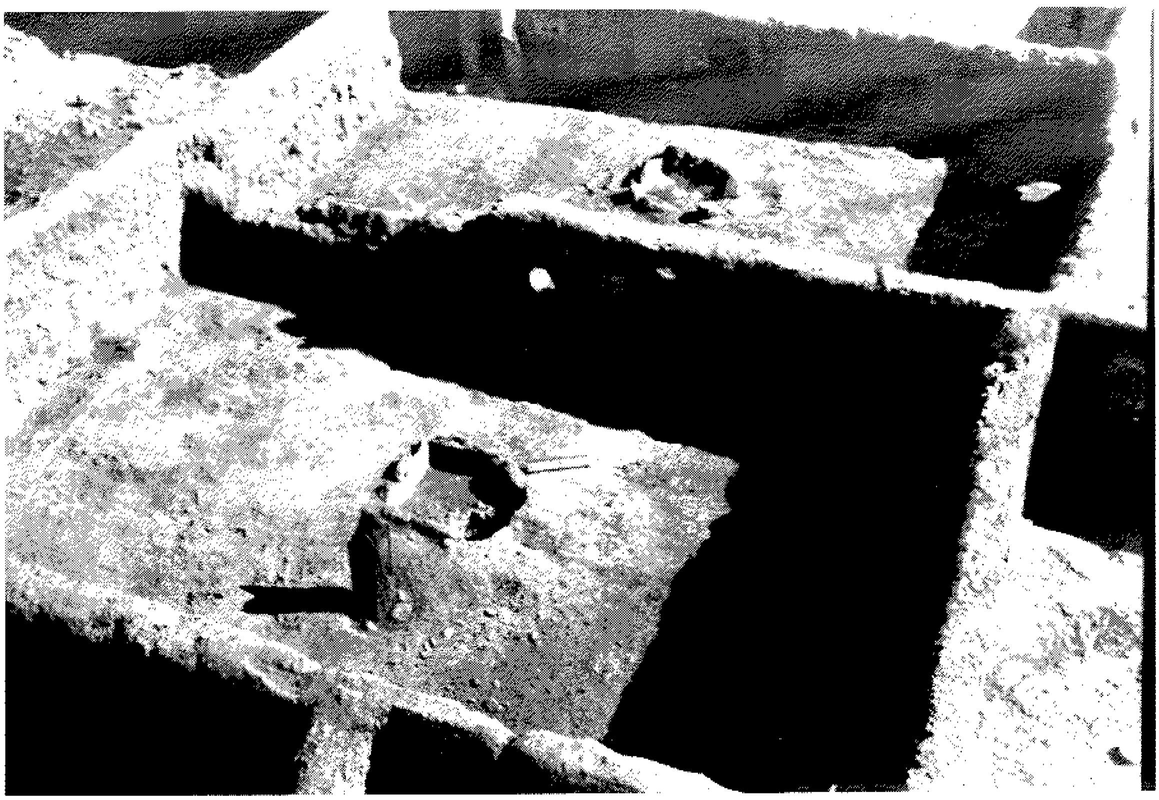

Figure 40. Vent holes between Room 15 and Room 17, looking east.

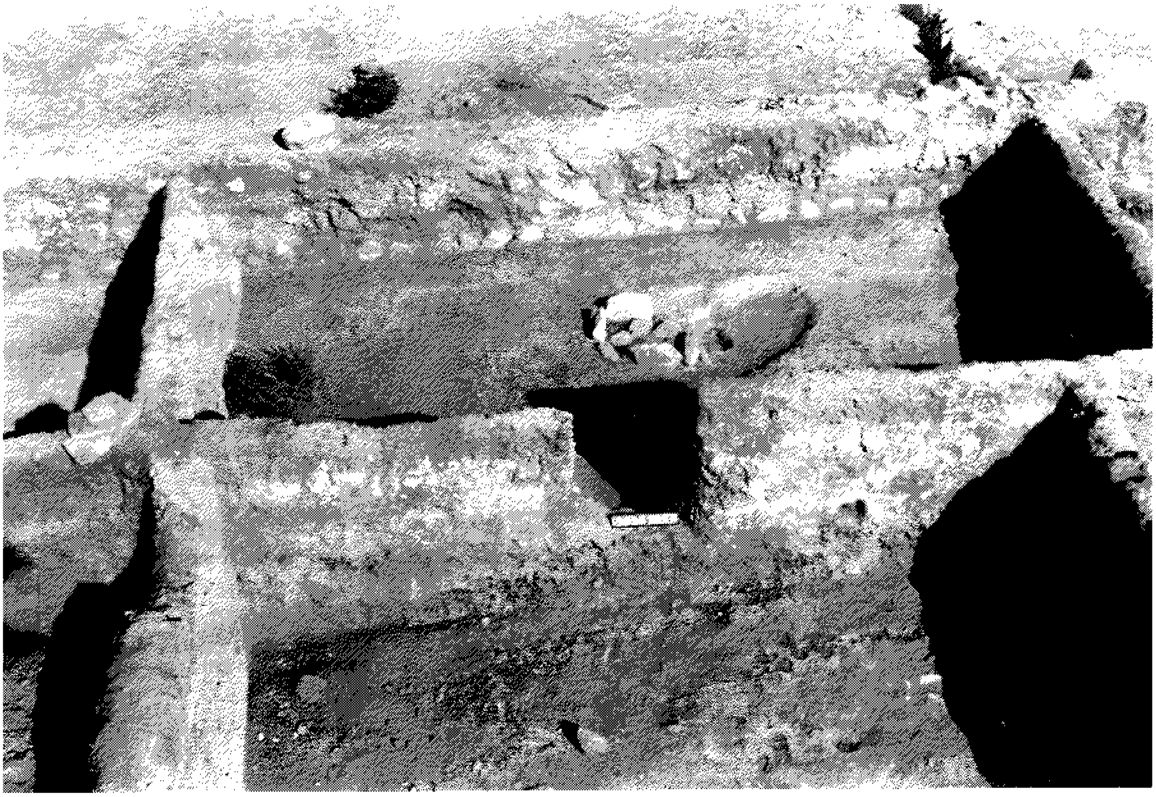

Figure 41. Detail of doorway between Rooms 18 and 10, looking north.

Figure 42. Rooms 57 (right) and 58 (left) in foreground, looking northwest.

Figure 43. Room 58, detail of north wall vent hole, looking north.

Figure 44. Room 17 vent hole, looking into Room 15.

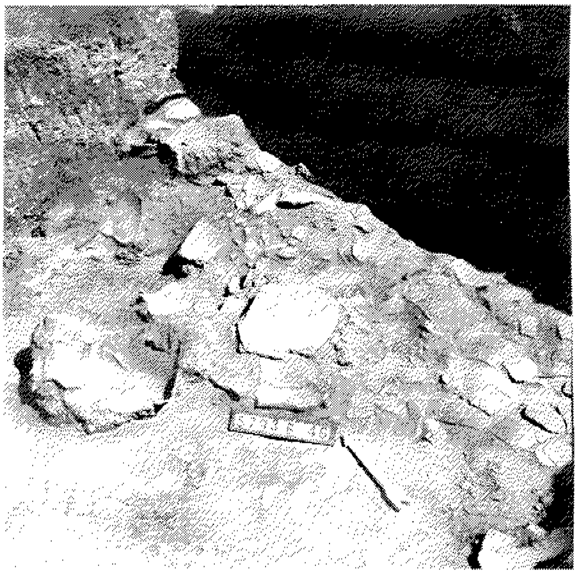

Figure 45. Room 22, detail of pottery.

Figure 46. Hearth and floor artifacts, northeast corner of Room 63.

Figure 47. Room 58, hearth with fire dogs, looking east.

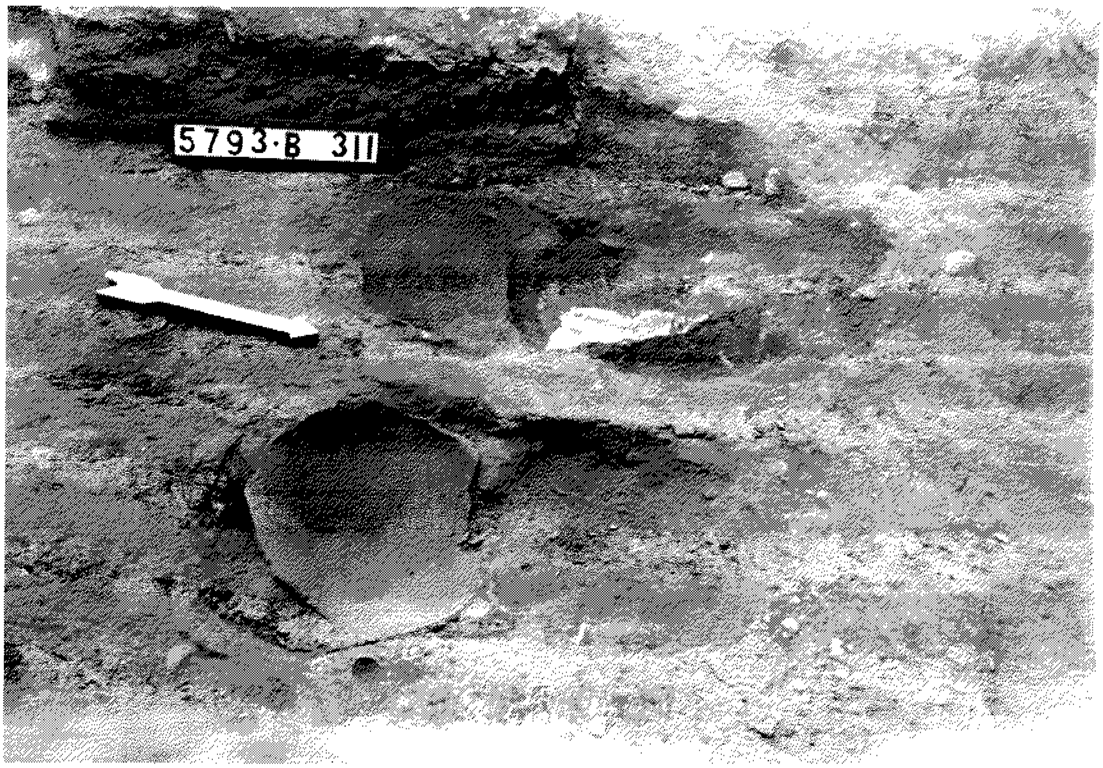

Figure 48. Room 58, mealing bins.

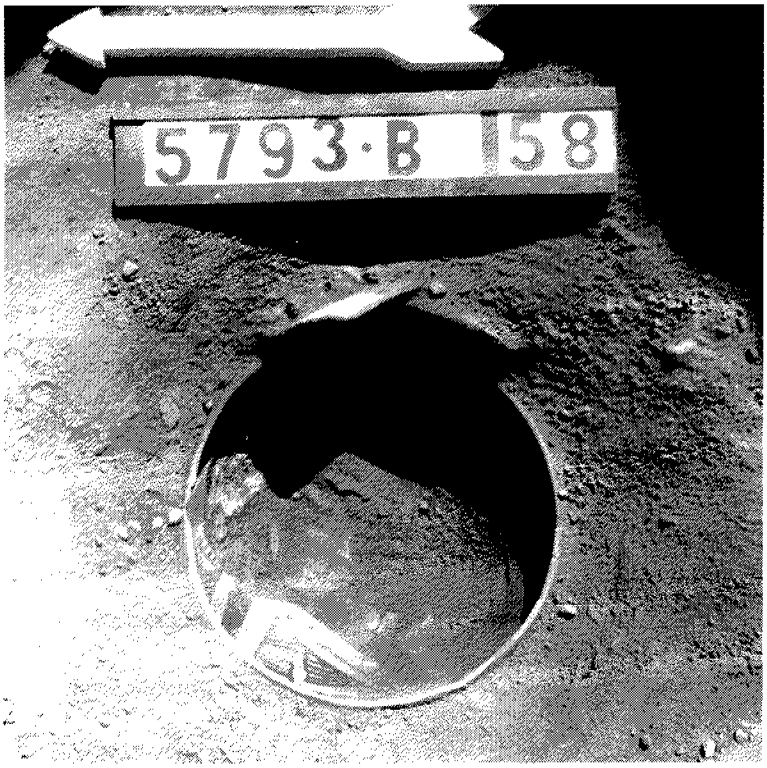

Figure 49. Room 58, vessel embedded in floor.


Figure 50. Room 15, excavation of fire pit.

Figure 51. Room 15, firepit.

Figure 52. Room 15, close up of roof support and broken olla.

Figure 53. Room 15, floor.

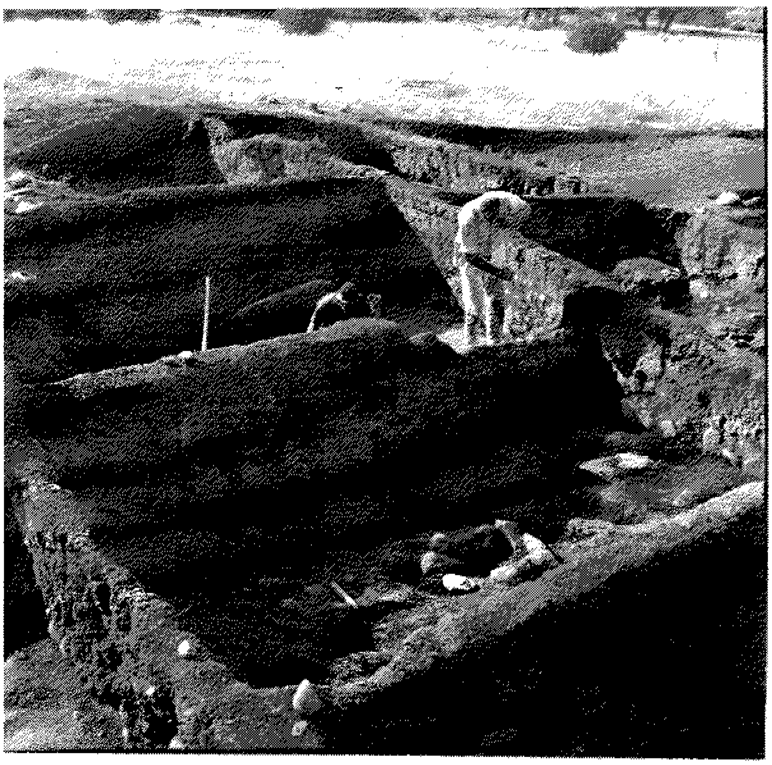

Figure 54. General view, Room 17 in foreground.

Figure 55. Room 19, unexcavated balk at left.

Figure 56. Room 19, firepit.

Figure 57. Room 20, partially excavated.

Figure 58. Room 20, detail of floor artifacts: embedded vessels 30 and 31 forming mealing bin, manos, and sherds.

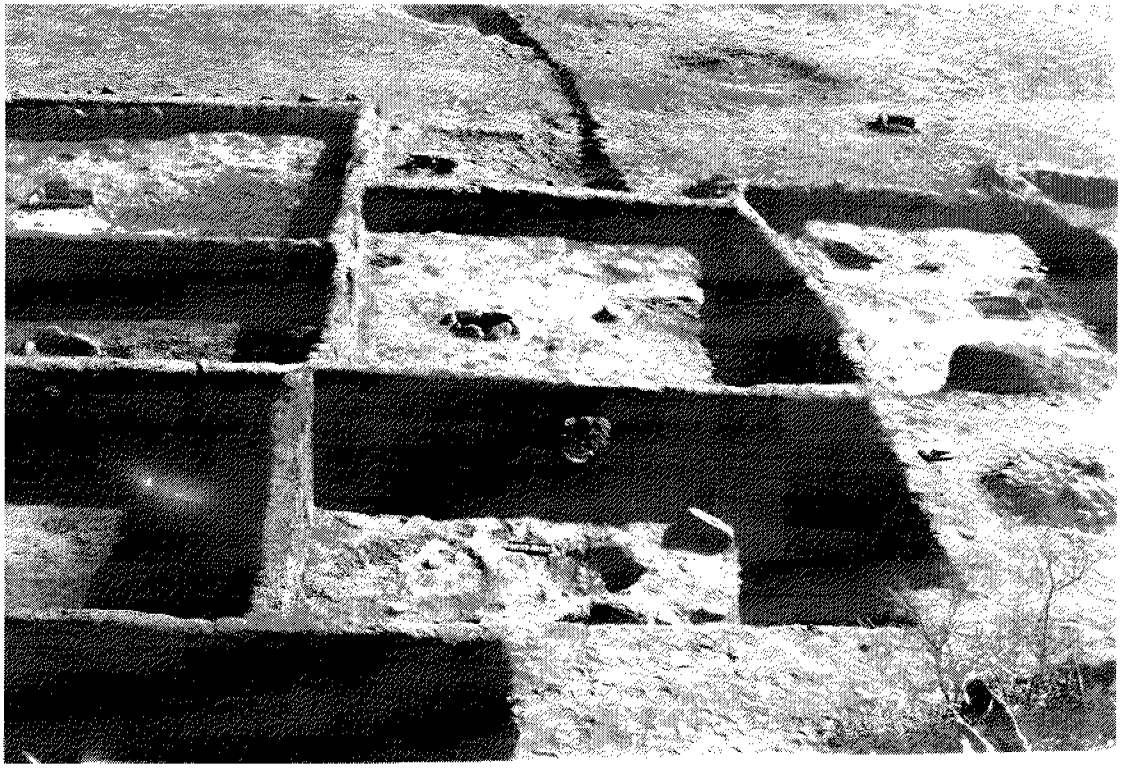

Figure 59. Room 57 and other rooms in north roomblock.

Figure 60. Room 57, south half of structure.

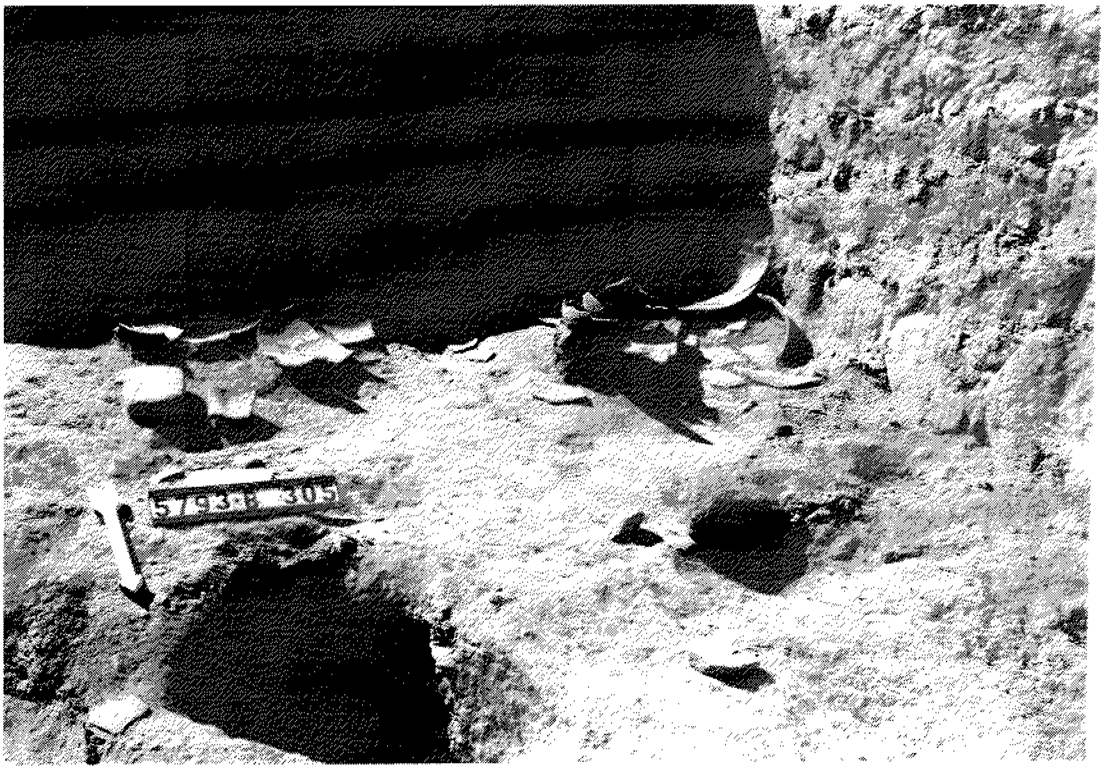

Figure 61. Room 57, pots in southwest corner.

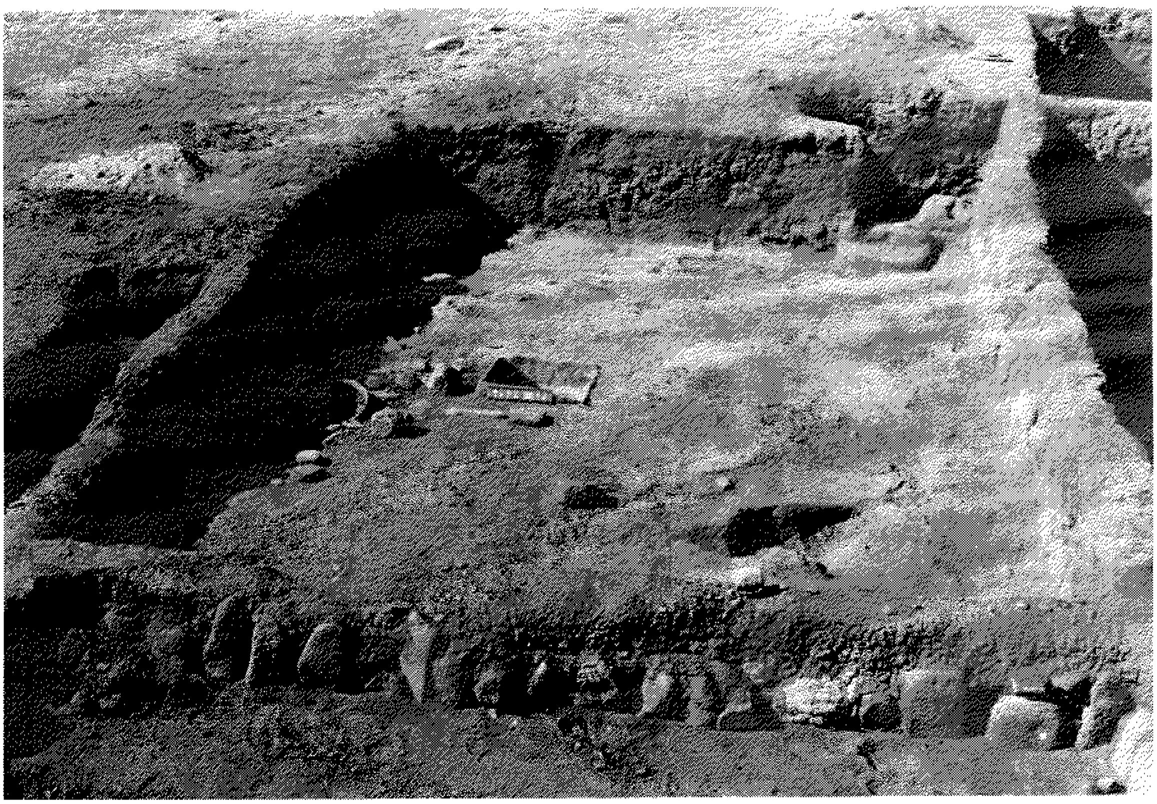

Figure 62. Room 23, floor.

Figure 63. Room 23, close-up of firebox.

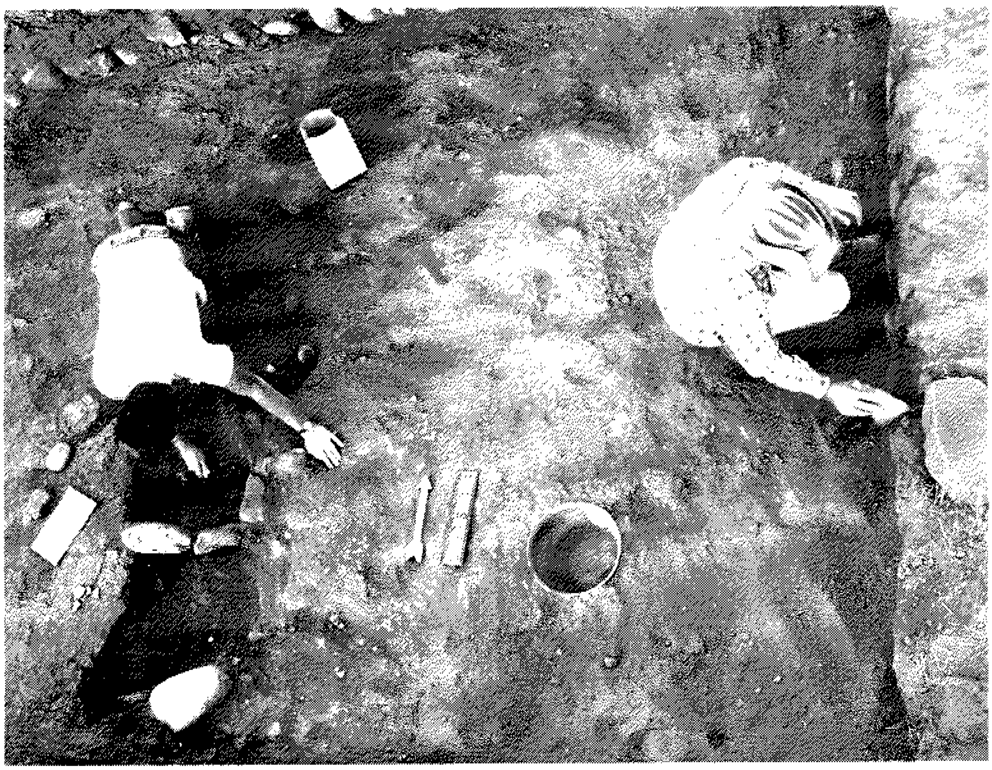

Figure 64. Room 21; plain utility bowl set into floor for mealing bin.

SALADO PERIOD: EAST ROOMBLOCK

In the east-center of the site was the largest adobe roomblock attributed to the Salado occupation. The north and northeast portion of the roomblock was excavated revealing 16 rooms. Beyond the two later rooms added onto the northeast corner, no obvious constructional sequence for the roomblock was noted in field records. Rooms averaged 15.38 sq m in size.

Several rooms across the north edge of the roomblock were built over a layer of trash, measuring 28 cm under Room 29. This trash contained Maverick Mountain Polychrome and Tucson Polychrome pottery. Below this trash level was a surface interpreted as a older plaza level contemporaneous with the early occupation of the north roomblock, perhaps circa A.D. 1300. This trash level was also noted under Room 41, along the east edge of the roomblock, but was not noted for the most interior set of rooms in the roomblock. The east roomblock appeared to have been built at some time later than the north roomblock, although the same use of reddish brown adobe for initial construction, and blackish adobe for later additions, was used.

Hearths were found in nearly every room. Rectangular slab-lined hearths were noted in 56.3 percent of hearth types; the remaining hearths were basin-shaped, adobe-lined firepits. Mealing bins were found in 7 out of the 16 rooms excavated in this roomblock. These corn processing stations consisted of one to three ceramic bowls or bowl fragments set into the floor with associated metate rests. No metates were found in situ, although several bowls were recovered from the mealing bins.

Some rooms were initially interpreted in the field as containing second stories, stemming from the presence of fallen hearths in the fill. Fill descriptions included the presence of only one roof layer, and the amount of fill necessary for a second story was not present. Wall thickness ranged from 20 cm for earlier construction to 40 cm for later construction. Multiple-story structures usually have storage rooms on the ground level, with living spaces on a second story (Adams 1983:52). The evidence for the east roomblock suggests that this structure was also a single-story structure similar to the north roomblock. The number of storage vessels and hearths found in roof fall of several rooms indicates intensive use of the roof for storage and activity areas during the Salado occupation.

Remodeling Sequence

The same use of reddish brown adobe for initial construction, and blackish adobe for later construction and remodeling, was noted in this roomblock, similar to the north roomblock. Two rooms were added on with the blackish adobe, and had clear abutment attachments onto the roomblock (Rooms 35 and 36, Fig. 65). The initial construction of the roomblock appeared to have been built as a contiguous whole. Although the use of similar adobe types for construction suggests some contemporaneity between the two roomblocks, the presence of early phase, north roomblock associated trash underneath the northwest portion of the east roomblock indicates a later construction date for the east roomblock (Fig. 66). East roomblock construction must have occurred after the initial construction for the north roomblock, but perhaps before the later use of blackish adobe room additions for both roomblocks.

Wall and Floor Construction

Construction methods were identical to those found at the north roomblock: footing trenches were dug with cobbles set upright on end as support for coursed adobe walls. Walls were then built up through layered courses, which were either poured or beaten into a uniform wall thickness of 20 to 30 cm. Each course was probably 20 to 30 cm in height, similar to the wall construction in the north roomblock. Wall plaster was consistently found to be a brown clay applied over the poured adobe and cobble bases. Floors were also covered with this brown clay plaster, with the exception of one room with a central "trough" or depression, which was not plastered.

Doors, Vents, and Ladder Holes

Interior and exterior doors were found in this roomblock. Two exterior doors connected the east exterior area through an "alcove" (see Fig. 65). One of these doors was open at the time of abandonment connecting Room 44 to the outside "alcove." This door appeared (from slides taken during excavation [Dr. John P. Wilson, personal collection]) to have been rectangular with a bottom sill flush with the plaza level—quite unique from all of the other doors associated with the Salado occupation. The other exterior door was sealed at the time of abandonment, connecting what was probably a storage room (Room 36) to the same "alcove." Interior doors connected seven rooms (83, 89, 37, 38, 36, 48, 44). These doors were typically subrectangular, with one roughly circular opening noted (Figs. 67-70). All of these interior doors were open at the time of abandonment. Unlike the north roomblock, no ventilation or communication holes were found.

Ladder holes implying roof hatch entrances were noted in three rooms (Fig. 71). One roof entrance led to an extended household unit of four rooms connected by interior doors. Two of these roof entrances led to enclosed rooms, each with unique floor features. One room was thought to have been a ceremonial room and the other a possible storage room.

Roofing Material

Burned roofing timber was collected from two rooms and sent to the Laboratory of Tree-Ring Research at the University of Arizona in 1967. One cottonwood *(Populus)* specimen and one juniper *(Juniperus)* specimen were collected in Room 37 in the center of the roomblock. The sole datable dendrochronological specimen for the entire Salado occupation was collected from Room 31, at the north end of the roomblock. This specimen was identified as a piñon *(Pinus edulis)* beam cut for roofing at some time after A.D. 1342.

Burned and unburned reeds were noted in Room 37, and reed matting was noted in Room 41, indicating similar roof construction techniques used in the north roomblock. Following this analogy, cottonwood was probably used for the larger support beams with juniper and piñon used for smaller cross-beams. Loose reeds or reed matting were used as closing material before applying an adobe roof cap (see Fig. 37).

Household Units

Interior door connections indicated three household units (see Fig. 65). Interior doors were typically 40 cm above the floor level, and roughly 40 cm wide, with unknown heights for the most part. No ventilator holes were found in this roomblock. Two of these household units contained two rooms, both consisting of a room with a slab-lined hearth connected to a second room with a basin hearth (Households 1 and 3). Room 44 in Household 3 had an exterior door, which was open at the time of abandonment. This household is the only example of an open exterior entrance for the whole of the excavated site. Household units are discussed in detail below and numbered consecutively from west to east for clarity. Whole vessel descriptions are included in Table 19 (C. Dean Wilson, this volume).

Household 1: Rooms 83 and 89

This household was located towards the northwest portion and interior of the roomblock. Just two rooms were associated with this household.

1. Room 83: Post-abandonment fill consisted of a loose brown soil with charcoal and sherds. The south wall contained an open door leading south into Room 89. The door was 48 cm up from the floor and 38 cm wide. A concentration of crushed sherds was found in the northwest corner, but did not form a reconstructed vessel. The floor was plastered and in good condition, and built over a layer of trash associated with the north roomblock initial occupation. A stone-lined hearth was located in the center-north, filled with white ash. Three postholes were found: one at the east wall in the center, and two near the southeast corner of the south wall. Excessive moisture at the time of excavation made it difficult to see any of these features clearly. A hearth fallen from the roof was found in the roof fall several centimeters above the floor, in the south-center of the room. This roof hearth consisted of a large, flat, quadrangular boulder with two flat slabs surrounded by white ash. Room wall lengths measured 4.20 m for the north wall, 4.20 m for the south wall, 3.00 m for the east wall, and 3.00 m for the west wall. Wall heights averaged 1.10 m.

2. Room 89: Post-abandonment fill consisted of a loose, dark brown soil with charcoal and sherds. The frequency of sherds increased in the lower depths of the fill. A large number of crushed utility sherds were found on the floor, possibly from roof storage. Two vessels were reconstructed from this concentration: a plain smudged interior jar (Vessel 45) and a plain polished bowl (Vessel 47). An irregular-shaped hearth was located in the center of the floor. This hearth was unlined, and filled with white ash (Figs. 72-73). Due south by approximately 10 cm was a large posthole with a rock base, about 35 cm in diameter. Approximately 15 cm southeast of this large posthole was a small posthole about 10 cm in diameter. Near the north wall and the northwest corner were 10 Gila Polychrome sherds set into the floor as a mealing receptacle. The receptacle measured 28 cm in diameter and was 18 cm deep, cut into sterile soils. The room was not built over trash. A doorway 38 cm wide was located in the center of the north wall, 62 cm above the floor surface. The floor of this room was 14 cm lower than the floor in Room 83. Known wall lengths measured 2.85 m for the north wall, 4.25 m for the east wall. West and south wall lengths were not recorded. Wall heights averaged 1.25 m.

Household 2: Rooms 33, 36, 37, 38

Household 2 included four rooms, making it the largest known household in the east roomblock. The household was accessed through the roof into Room 37. Interior doors connected household rooms to the east (Rooms 38 and 36). A sealed door was noted between Room 37 and Room 33 to the north. Room 36, at the extreme east of the household, had a sealed exterior door. This room had no features, suggesting use as storage.

1. Room 33: This was a very large rectangular room at the north edge of the roomblock. Post-abandonment fill was a loose, gravelly soil with adobe chunks and artifacts. A roof hearth was found in burned roof fall in the south-central portion of the room, including slabs and white ash. Floor fill contained roof fall, with charred beams, charred reeds, and a layer of ash. The floor was in fair condition with several features. A slab-lined hearth was found in the floor near the center of the north wall. Only one vertical slab was found, defining the north wall of the feature. The rest of the feature was a basin-shaped depression that rounded up to the floor level, and faded into a posthole to the south. Two central postholes measured approximately 40 to 50 cm in diameter. Another earlier hearth was noted to the southeast of the east posthole. This hearth was a wide, shallow basin of burned adobe. Nine other postholes dotted the floor, with four along the north wall. These postholes ranged from 20 to 30 cm in diameter. A mealing bin was located in the northwest quadrant, lined with portions of a Gila Polychrome with smudged interior bowl (Vessel 51) and a plain smudged interior bowl (Vessel 90), set into an ash lining. Another Gila Polychrome bowl (Vessel 19) was reconstructed from floor proveniences. One sealed door was noted in the western portion of the south wall, connecting into Room 37. Wall lengths measured 5.90 m for the north wall, 6.00 m for the south wall, 3.30 m for the east wall, and 3.50 m for the west wall. Wall heights ranged from 57 to 88 cm.

2. Room 36: Post-abandonment fill was loose, gravelly soil with minute charcoal pieces and adobe chunks. The floor was in poor condition. A possible hearth was in the center of the room consisting of an ash deposit with no definite edges. An open door in the west wall near the northwest corner led to Room 38. The bottom of the door was approximately 45 cm above the floor surface, with the aperture measuring 46 cm at the bottom and 56 cm at the top. A sealed door was found in the south wall leading outside of the roomblock. This door was 45 cm above the interior floor surface (Fig. 74). The south wall had an extra reinforced "buttress" along the base of the exterior part of the wall, adding an additional thickness of 40 cm of adobe. Floor artifacts included a concentration of Gila Polychrome sherds in the southeast quadrant, which did not reconstruct into a vessel. Vessels from the floor and floor fill included a plain unpolished jar (Vessel 40), a plain polished bowl (Vessel 10), a plain smudged interior bowl (Vessel 9), and a Tonto Polychrome jar (Vessel 59). A mano was also found in this artifact concentration. In the northwest corner was a sherd disc, along with a ground stone slab. One large subfloor pit was discovered in the center of the room, plastered over and probably predating room use. Wall lengths measured 2.95 m for the north wall, 3.00 m for the south wall, 4.60 m for the east wall, and 4.58 m for the west wall. Wall heights ranged from 54 to 84 cm.

3. Room 37: This room had burned, leaving several burned roofing timbers on the floor and burned patches of wall plaster on the lower portion of the walls. Post-abandonment fill consisted of loose, gravelly soil with abundant adobe wall fall and cultural material. Roof fall was noted 24 cm above the floor down to the floor, including burned and unburned wood and a layer of reeds 4 cm thick above the wood. Chunks of adobe with reed imprints were found above the reeds. Wood specimens were collected and sent to the Tree-Ring Laboratory at the University of Arizona in 1966, but none

of the specimens could be dated. These specimens were identified as one cottonwood (*Populus)* fragment and one juniper *(Juniperus)* fragment (Jeffrey Dean, pers. comm. 1996).

The floor was in very good condition. A rectangular, cobble-lined hearth with an adobe base was located in the west-center of the room. Due east approximately 25 cm was a center posthole 35 cm in diameter, with a post left in place (Fig. 75). To the west of the hearth about 30 cm was a pair of ladder holes. The southern third of the room was raised 4-5 cm above the rest of the room, perhaps indicating a storage area. Reconstructed vessels from floor and floor fill proveniences included two plain polished jars (Vessels 1 and 7), a plain unpolished jar (Vessel 5), and a red slipped smudged interior bowl (Vessel 3). Vessels 1 and 3 were found on this raised level, and appeared to be on floor contact and not fallen in from the roof (Fig. 76). Wall lengths measured 3.10 m for the north wall, 3.10 m for the south wall, 4.53 m for the east wall, and 4.70 m for the west wall. Wall heights ranged from 94 cm to 1.80 m.

4. Room 38: This room had one doorway each in the east and west walls. It was a middle room between Room 37 to the west and Room 36 to the east. Post-abandonment fill consisted of loose, gravelly soil with abundant hard adobe in the last 30 cm down to the floor. The walls were in very good shape. The floor was in fair condition. A rectangular, cobble-lined hearth with an adobe bottom was found in the east-center of the room. Due west of the hearth was a posthole about 25 cm in diameter. A mealing receptacle lined with ceramic fragments was found in the northwest corner of the room. These ceramic fragments included 32 plain smudged interior sherds, 1 smeared corrugated sherd, and 1 plain polished sherd. Floor artifacts included five thin, flat, ground slabs found throughout the floor, three manos found scattered near the hearth, red pigment on the floor south of the hearth, and bone tools to the east of the hearth. Floor fill contained possible evidence for an ornament production area, perhaps on the south half of the roof. Several small, ground, flat slabs were noted, along with pieces of turquoise, and small, flat cobbles. Two manos were also recovered as roof fall.

The door in the west wall was located near the southwest corner. It was 32 cm above the floor surface, and measured 44 cm in width. The door base edge was plastered into a flat surface. The door in the east wall was in the center of the wall, just about due east of the hearth. This door was 38 cm above the floor surface. Wall lengths measured 2.90 m for the north wall, 2.88 m for the south wall, 4.63 m for the east wall, and 4.53 m for the west wall. Wall heights ranged from 0.80 to 1.20 m.

Household 3: Rooms 44, 48

This household had, at the time of abandonment, an open exterior door leading from an "alcove" area east of the roomblock. The interior door connecting the rooms aligned exactly east-west with the exterior door.

1. Room 44: In the east wall of this room was the one open exterior door found in this partial excavation of the Salado roomblocks. The door connected the exterior plaza level into a sunken floor interior, 25 cm below the exterior plaza level. This exterior door was larger than interior doors, measuring 60 cm at the base. From a 1966 slide taken of the feature, it appeared that the door base was level with the plaza surface. The elevational differences between exterior surfaces and interior floor areas were not seen in the north roomblock, and no exterior doors were noted either. This construction style was most similar to door entrances for southeastern Arizona Salado

sites (DiPeso 1958; Franklin 1980).

Post-abandonment fill for Room 44 was loose, gravelly soil with ash, charcoal, burned roof fall, and some sherds. Two shaped, flat slabs were found in the fill about 20 cm above the floor surface, and most likely fell in from the roof. The floor was in poor condition and had just one feature. An unlined, circular basin hearth was found in the center of the room. It measured 85-90 cm in diameter, and was 12 cm deep. In the west wall was an interior door leading into Room 48 (Fig. 77). This door was 22 cm above the floor and averaged 45 cm wide. Room wall lengths measured 2.85 m for the north wall, 2.88 m for the south wall, 5.35 m for the east wall, and 5.50 m for the west wall. Wall heights were not recorded.

2. Room 48: Post-abandonment fill was not described. Several crushed utility vessels, intermixed with stone slabs, were noted in the floor fill and floor area north of the center posthole. Three Plain Smudged Interior jars were reconstructed (Vessels 50, 51, and 52). The pattern of breakage for the vessels suggested roof storage, and the slabs may indicate a roof hearth. Two floor features were found, including a slab-lined, square hearth in the east-center, and a center post in the west-center (Figs. 78, 79). A serpentine "shaft straightener" was found on or just above the floor about 20 cm south of the center post. In the southeast corner of the south wall, a long, narrow slab measuring about 1 m long, 20 cm wide, and 10 cm thick, was set vertically into the wall face. Above this was another slab set horizontally into the wall. Field excavators suspected a niche behind the vertical slab, but only wall fill was found behind the slab. Wall heights ranged from 0.66 to 0.96 m. Wall lengths measured 3.20 m for the north wall and 5.50 m for the east wall. The wall lengths for the south and west walls were not recorded.

Other Rooms

Many rooms in the east roomblock had no evidence of entry through doors or roof hatches, and appear enigmatically unassociated with one another. Several of these rooms contained mealing receptacles and may have been single room household units. These rooms appeared to have been inhabited at the time of abandonment, although access remains conjectural (see Fig. 65). These rooms are discussed below in numerical order.

Room 29

Located in the northwest corner of the roomblock, this large, rectangular room (Fig. 80) contained post-abandonment fill of brownish soil, adobe, cobbles, and many potsherds. Burned roof fall was found 5 to 10 cm above the floor, including charred reeds. Floor features included a slab-lined, rectangular hearth located in the central-west portion of the room (Fig. 81). The slabs forming the east and west walls were thin; no more than 1 cm thick. The slabs forming the north and south walls were about 2 to 4 cm thick (Fig. 82). Three bowl-shaped mealing receptacles were found near the southwest corner of the room, aligned east-west in a straight line. The bowls had been removed, leaving a solidified white ash lining. No metate rests were noted. A mano was found 1.2 m to the east of the receptacles. Other mano fragments and ground stone slab fragments were found scattered throughout the floor. The floor was "much higher" than the floor in Room 30 (how much higher is unrecorded). Many sherds were found on the floor and in the floor fill, possibly representing vessels from roof storage. No vessels, however, could be reconstructed. Excavated wall lengths measured 6.0 m for the north wall, 6.03 m for the south wall, 3.87 m for the east wall, and 4.15 m for the west wall. Wall heights ranged from 35 to 76 cm.

Below the floor were two layers of trashy fill totaling about 28 cm in depth. This fill contained Tucson Polychrome and Maverick Mountain Polychrome sherds. Below the trashy fill layer was an adobe surface interpreted as a plaza level contemporaneous with the early rooms in the north roomblock. Below the plaza level was a large, subfloor, bell-shaped pit in the north end of the room, predating the roomblock. The pit measured 1.3 m in diameter. It was filled with two distinct layers: an upper layer of adobe and cobbles that was approximately 20 to 40 cm deep, and a lower layer of cobbles and loose soil approximately 55 to 80 cm deep.

Room 30

This room was nearly square and was located along the north edge of the roomblock, due east of Room 29. Post-abandonment fill consisted of gravelly soil with some ash, charcoal, and potsherds. The floor was in poor condition, but no mention of construction over a trash layer was noted in field records. Floor features included three mealing bins (Fig. 83). The alignment and location of these features paralleled Room 29: a southwest corner location and an east-west alignment. The bin basin nearest the west wall was lined with white ash, a Tucson Polychrome sherd was placed in the basin, and the feature was partially covered with floor plaster. A ground and faceted red paint stone was found in the ash lining below the sherd. The center bin contained five large fragments of two separate Gila Polychrome bowls. The easternmost bowl was lined with a Gila Polychrome bowl (Vessel 21) that had an interior rim decoration. All of these bowls were set into the floor at an angle, rotated 17 degrees from the horizontal, and tipped towards the south wall. To the south of the receptacles were adobe metate rests. A ground stone "floor polisher" was located due northwest of the easternmost bowl by 15 cm. Wall plaster was noted on the east and south walls. Wall lengths measured 4.18 m for the north wall, 4.08 m for the south wall, 3.60 m for the east wall, and 3.95 m for the west wall. Wall heights were not recorded.

Room 31

Room 31 was due east of Room 30, located along the north edge of the roomblock. Burned roof fall recovered from this room provided the only datable tree-ring specimen for the entire Salado occupation at Ormand Village, cut for roofing at some time after A.D. 1342. The specimen was identified as a piñon (*Pinus edulis)* beam, found in the southeast quadrant, oriented northwest-southeast. Post-abandonment fill consisted of a loose, gravelly soil with ash, charcoal, and sherds. The floor was in poor condition and was built over a trash layer associated with the initial north roomblock occupation. Two large pits were found in the center of the room (Fig. 84). The pit to the west was basin-shaped with a posthole at the southern end, measuring 77 by 58 cm by 24 cm deep. The pit to the east was also basin-shaped and filled with cobbles and potsherds. It measured 53 cm in diameter by 29 cm deep. Nine postholes rimmed the walls of the room in a random pattern; three postholes clustered in the northwest corner and the other postholes were spread out around wall perimeters. Posthole size ranged from 20 to 40 cm in diameter. Two mealing bins were located in separate locations. One bin was located in the northwest quadrant between the large west pit and the cluster of postholes in the northwest corner, and contained four Gila Polychrome sherds, a plain polished brown sherd, and a Tonto Polychrome sherd. The other mealing bin contained a "partial bowl," and was located in the southwest quadrant, near the south wall. The sherds from this bin were not located in the state repository nor analyzed by this project, and may have consisted of sherds like the other bin linings. Wall lengths measured 3.30 m for the north wall, 3.40 m for the south wall, 3.50 m for the east wall, and 3.85 m for the west wall. Wall heights ranged from 62 to 79 cm.

Room 35

Room 35 was located in the northeast corner of the roomblock. Post-abandonment fill consisted of a loose, gravelly soil with adobe chunks and sherds. The floor was in poor condition, probably because it was built on a trash layer associated with the north roomblock occupation (Fig. 85). A possible posthole was noted near the west wall in the center. Mano fragments were found in the center of the room and in the southwest corner. The lack of floor features suggests use as storage, although evidence suggests that vessels were stored on the roof, not on the floor. A concentration of broken vessels was found in post-abandonment fill in the southeast corner of the room, and scattered over the northern half of the floor. No vessels could be reconstructed from these sherds. Wall lengths measured 2.98 m for the north wall, 2.95 m for the south wall, 4.40 m for the east wall, and 4.65 m for the west wall. Wall heights ranged from 38 to 78 cm.

Room 41

This room was located along the east edge of the roomblock, in the exact center. Post-abandonment fill consisted of loose, gravelly soil with some sherds. Fragments of burned roof reed matting were found in the north half of the room, about 5 cm above the floor. Plaiting techniques were not discussed in field notes. The floor was in poor shape, probably because it was built over a trash layer (Fig. 86). It is unclear if this trash layer is the same trash noted along the north edge of rooms for the roomblock, associated with the initial occupation at the north roomblock. A rectangular, cobble-lined hearth with an adobe bottom was located in the east-center of the room. To the northeast of the hearth by about 1.0 m were two mealing receptacles set into the floor (Fig. 87). One receptacle was lined with 2 plain smudged interior sherds, 1 polished red sherd, 11 unpainted Salado sherds, and 9 Gila Polychrome sherds. The other bin was lined with either sherds or a bowl, none of which were located in the state repository. A mano fragment was found on the floor due north about 15 cm of the receptacles nearest the east wall. Another mealing receptacle was located in the northwest quadrant of the room. It also had a mano broken in two set along the west edge of the feature. No bowl or sherd lining was mentioned, located, or analyzed for this bin. Most of the north wall had a 30 to 40 cm thick "buttress" lining the interior wall base. This enigmatic feature suggests any number of interpretations, from wall slump to a possible interior bench; its function remains unclear. Wall lengths measured 3.40 m for the north wall and 5.15 m for the east wall. Wall lengths were not recorded for the south and west walls. Wall heights ranged from 40 to 70 cm. The room had been built over trash fill and two features predating the roomblock, including the west half of Pithouse 52, described in the pithouse section under "Possible Late Archaic Pithouses" in this report (Fig. 88). The subfloor pits were not described in field records.

Room 68

This room was located due west of Room 41. Post-abandonment fill was not described for this room. Several floor features were found, but no dimensions were recorded. A slab-lined hearth was located in the northeast-central part of the room. Only the southeast and south walls contained upright slabs; the hearth appeared to be rectangular when whole (Figs. 89-90). A pit was found in the northwest corner, and in the southwest-center was a basin. Three manos were found in a random pattern across the floor. Wall lengths measured 2.80 m for the north wall, 2.70 m for the south wall, 5.10 m for the east wall, and 5.18 m for the west wall. Wall heights were not recorded.

Possible Ceremonial Room

Location in the interior of the roomblock, recovered material culture, and restricted access prompted a ceremonial function for Room 79 in field records. One aspect to keep in mind in reconstructing room function is that many activities can take place within a given space. In contemporary Zuni Pueblo, some rooms are used as a residence during the day and for clan or religious meetings at night (Ferguson 1993:7). This is not to say that specialized architectural space did not exist, but merely to point out the complexities in reconstructing space-specific behavior.

Ladder holes were noted on the floor of Room 79 west of a central hearth, indicating a roof hatch entrance. No other door or vent connection was found to other surrounding rooms. The room was located in the interior of the north half of the roomblock (see Fig. 65). Post-abandonment fill consisted of a loose, dark brown soil containing some charcoal, bone awls, sherds, and mano fragments. Adobe roof fall was found on the floor. Floor artifacts included a red slipped plain polished jar (Vessel 35) and a plain polished jar (Vessel 17) with a pointed bottom. A circular basin hearth measuring 39 cm in diameter by 39 cm deep was located in the center of the floor. One upright slab was set into the west edge, positioned as a deflector. A "groove" was noted in the north-central portion of the floor, running from the west wall, approximately 3 m to the east, stopping at a large post in the northeast-center (Fig. 91). Grooves have been found in Mogollon "Communal Structures" (Anyon and LeBlanc 1980:262), but it remains unclear what this feature signifies in a Salado context. Field notes mention four different ground stone slabs used for paint grinding, and a stone bowl covered with red pigment, all from a floor area to the north and northeast of the hearth. One of the paint-grinding slabs had yellow ocher adhered to it. Two manos were found near the hearth, and a possible mano blank was found between the hearth and the northeast-central post (Fig. 92). An axe, many red pigment stones, yellow pigment stones, and bone tools dotted the floor. Unfortunately, few of these artifacts were relocated for analysis by this project.

Two large postholes were found near the center of the room to the northeast and southeast of the hearth. Six other postholes rimmed the room near north, east, and south walls. Wall lengths measured 5.47 m for the north wall, 5.47 m for the south wall, 3.10 m for the east wall, and 3.10 m for the west wall. Wall heights averaged 1.25 m.

Possible Storage Room

Room 34 was located due north of the possible ceremonial room (see Fig. 65). It also was accessed through a roof entrance, and had unique floor features. Post-abandonment fill for this room was loose, gravelly soil with chunks of adobe. The floor was in excellent condition, plastered except in an unusual central area. A large depression, or "trough" (Figs. 93-95), extended from the west wall to the east wall in the center one-third of this room, averaging 1.2 m in width. All of the floor features were located in the "trough." Nicely prepared, featureless, adobe "platforms" were located to the north and south of the trough, rising 5 cm above the "trough." These platforms were edged with 5-cm-high adobe ridges, delineating the trough depression from the raised platforms. This room looks similar to photographic documentation of turn-of-the-century Hopi storage rooms (Judd 1925), although large bins are noted in the Hopi examples. Storage rooms from Hopi are found in restricted interior rooms only (Dohm 1992:13), since dried harvest was essential, highly valuable, and protected. The limited access to Room 79 suggests a similar protective status.

Features in the floor "trough" included a center posthole containing an upright, unburned post, noted as juniper in the field notes. This post was not collected for future species identification. The post fragment measured 22 cm in diameter and was 89 cm high. To the east approximately 40 cm was a square, cobble-lined hearth measuring 60 by 60 cm. The bottom of this hearth was lined with a grinding slab. A stone bowl manufactured from a natural cobble was found resting on the northeast corner of the hearth. Due east of the hearth by 28 cm was a pair of ladder holes. These ladder holes were 40 cm apart from one another north-south, and 57 cm out from the east wall; depth was unknown (see Fig. 71). A shorter adobe ridge extended out from the east wall ending at the north ladder hole.

On the north floor platform was a concentration of burned adobe and ash, presumably from roof fall. Several floor artifacts were recovered, including a metate fragment and mano in the burned adobe concentration, a "prayer stick" or stone cylinder made of a light green serpentine near the east wall in the center, a red paint stick in the northeast corner of the room, and three other manos and a metate fragment scattered across the "trough." A Gila Polychrome jar (Vessel 18) came from this northeast floor area. Wall lengths measured 3.10 m for the north wall, and 4.70 m for the east wall. The south and west wall lengths were not recorded. Wall heights ranged from 0.89 to 1.0 m.

Beneath the southern floor platform was a large, shallow, subfloor pit. This pit extended from the southern edge of the hearth and center post south by 1.75 m, and was 2.30 m wide east-west. It is unclear if this feature predates room use.

East Roomblock Discussion

As with the north roomblock, very few rooms were featureless, suggesting that few rooms were used exclusively for storage. The two featureless rooms did not contain a large number of storage vessels. Roof fall evidence suggests that roof storage played a major role in spatial use of the building, perhaps similar to historic documentation of roof use at Zuni and Hopi (Dohm 1992; Fleming and Luskey 1986; Fowler 1989; Gaede 1986). Dried food stuffs must have also been stored in living spaces. In an analysis of late nineteenth-century photographs of Zuni Pueblo, storage rooms were connected to an extended household unit and accessed through other interior rooms. Door entries mark their relative privacy and these rooms were off-limits to visitors. Very little food storage was seen in front rooms used to receive visitors. Food stored in these back rooms consisted of dried bulk storage. Historic photographs also show clusters of drying food on rooftops and terraces. These drying harvests are immense and accompany great numbers of ceramic vessels (Dohm 1992:1-15).

East roomblock extended household units were smaller and fewer than in the north roomblock. Many rooms appeared to be single-room habitation units. Correspondingly, no ventilator holes and fewer interior doors were found in this roomblock. Two exterior doors, one open at the time of abandonment, were found connecting rooms to an exterior "alcove" area along the east edge of the roomblock.

Several rooms along the north edge of the roomblock were built over trashy fill containing Tucson Polychrome and Maverick Mountain Polychrome sherds, associated with the initial Salado occupation at the north roomblock. East roomblock construction must have occurred after the initial construction of the north roomblock. Most of the east roomblock appeared to be built as a contiguous whole, with two rooms clearly added to the northeast corner at a later date. Construction techniques were similar to the north roomblock, with a footing trench dug, upright cobbles set into the trench on edge as a foundation, and poured or beaten layers of adobe built up to create walls. Roofing appeared to be cottonwood for large beams, juniper or piñon for smaller cross beams, reeds or reed matting for closing material, and an adobe cap for the roof top (see Fig. 37). Several rooms provided intriguing evidence for specialized use, including ritual (Room 79) and storage (Room 34). Specialized room function was not noted in the few rooms excavated in the north roomblock.

The abandonment process for this roomblock was identical to the north roomblock: rooms were cleared of usable objects, particularly metates, but roof storage vessels were left. Burned roof fall and scorched walls were noted for seven rooms, but did not appear to be associated with a hostile attack of the structure. As with the north roomblock, this seemed to be associated with a planned abandonment of the community, in response to any number of social, ritual, or environmental stresses (Cameron 1990:28).

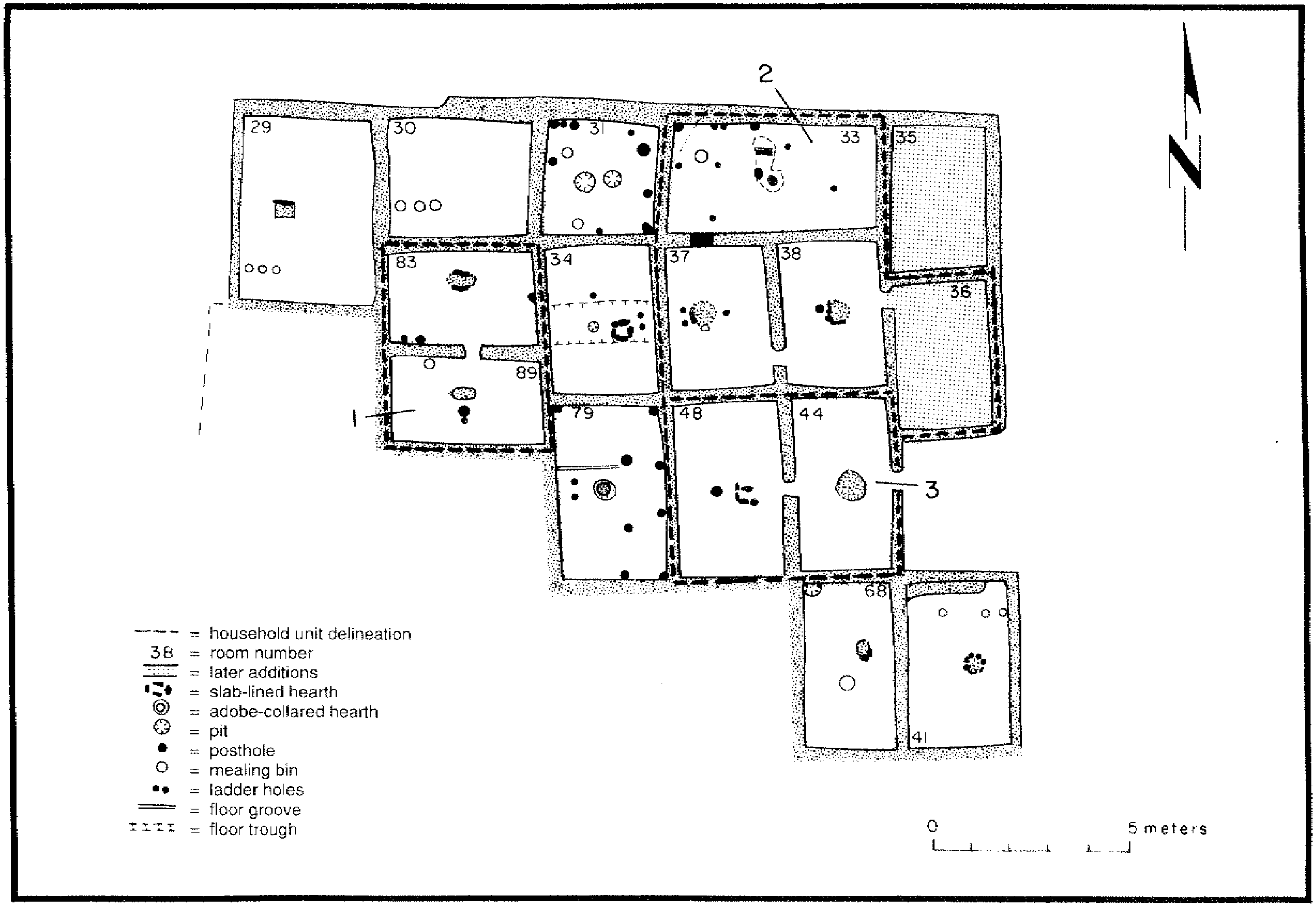

Figure 65. Remodeling sequence and household units, East Roomblock.

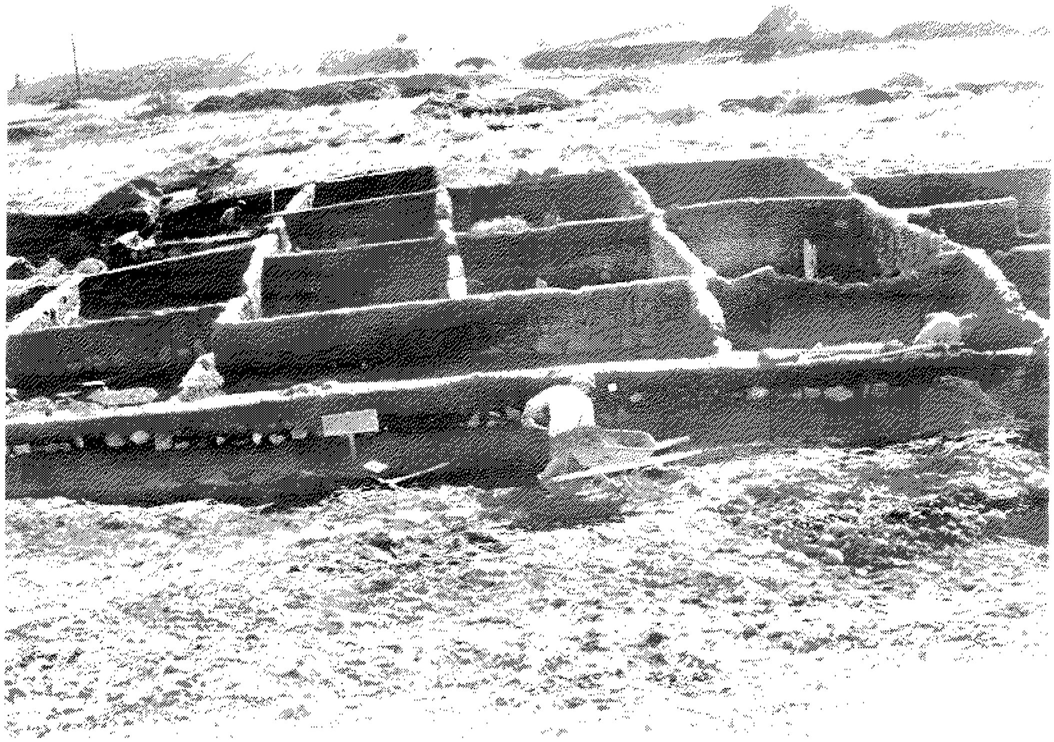
Figure 66. East roomblock during excavation.

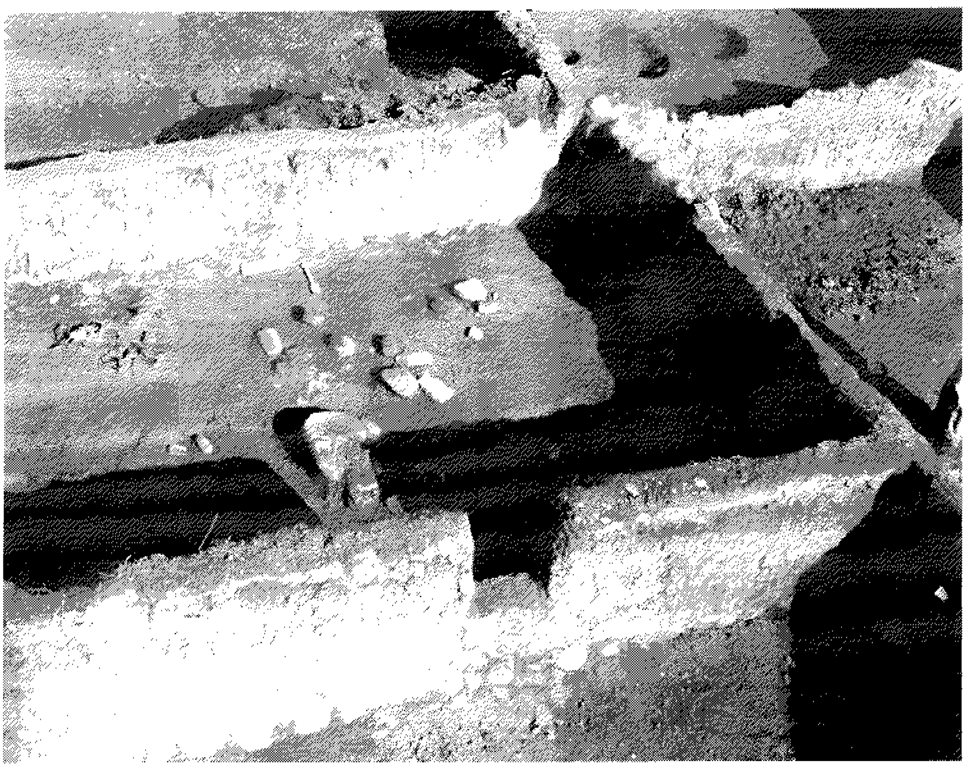
Figure 67. Room 83, floor.

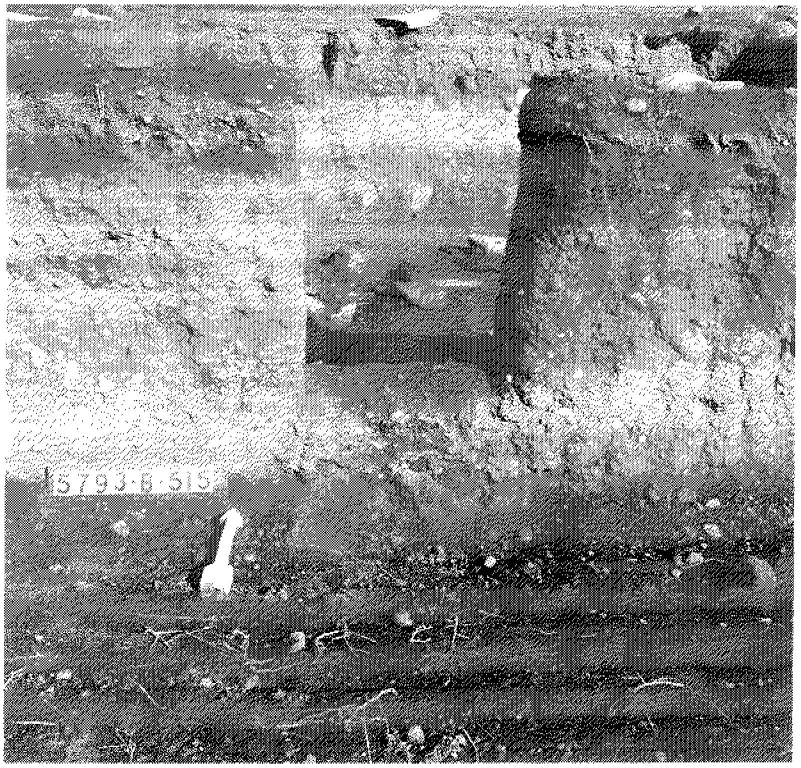

Figure 68. Room 89 doorway, looking into Room 83.

Figure 69. Room 36 doorway from Room 38.

Figure 70. Room 38, doorway into Room 37.

Figure 71. Room 34, detail of hearth and ladder holes.

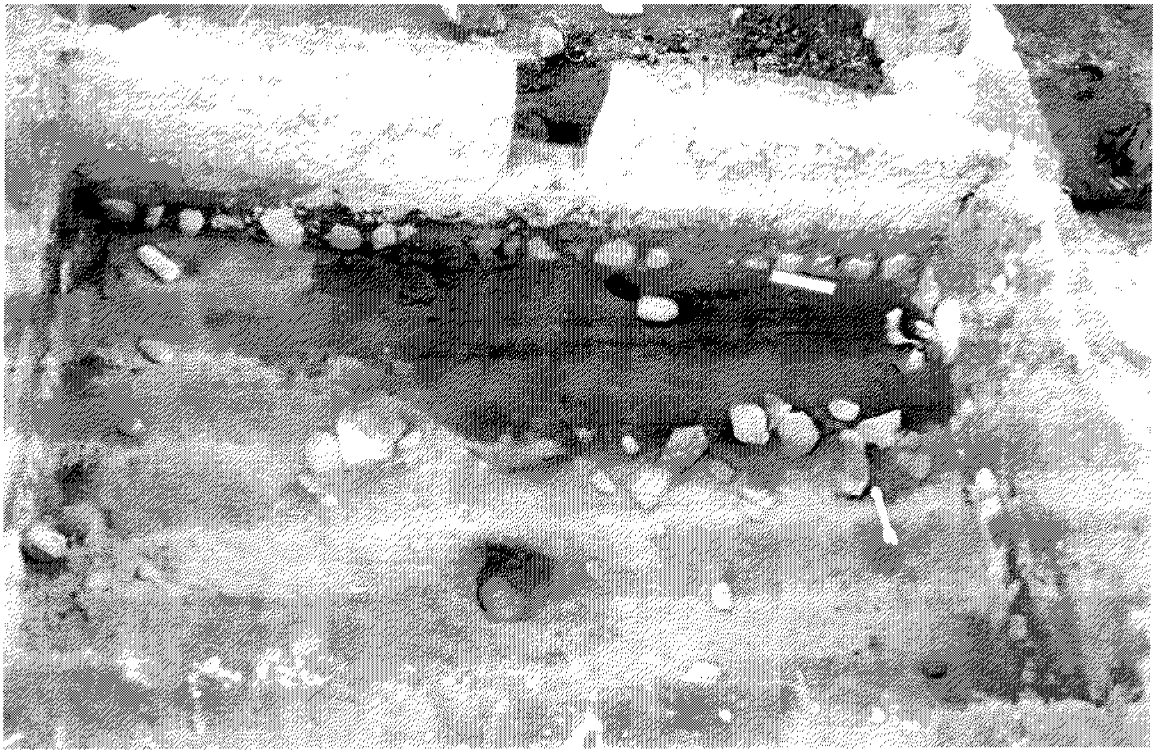

Figure 72. Room 89, overview, looking north.

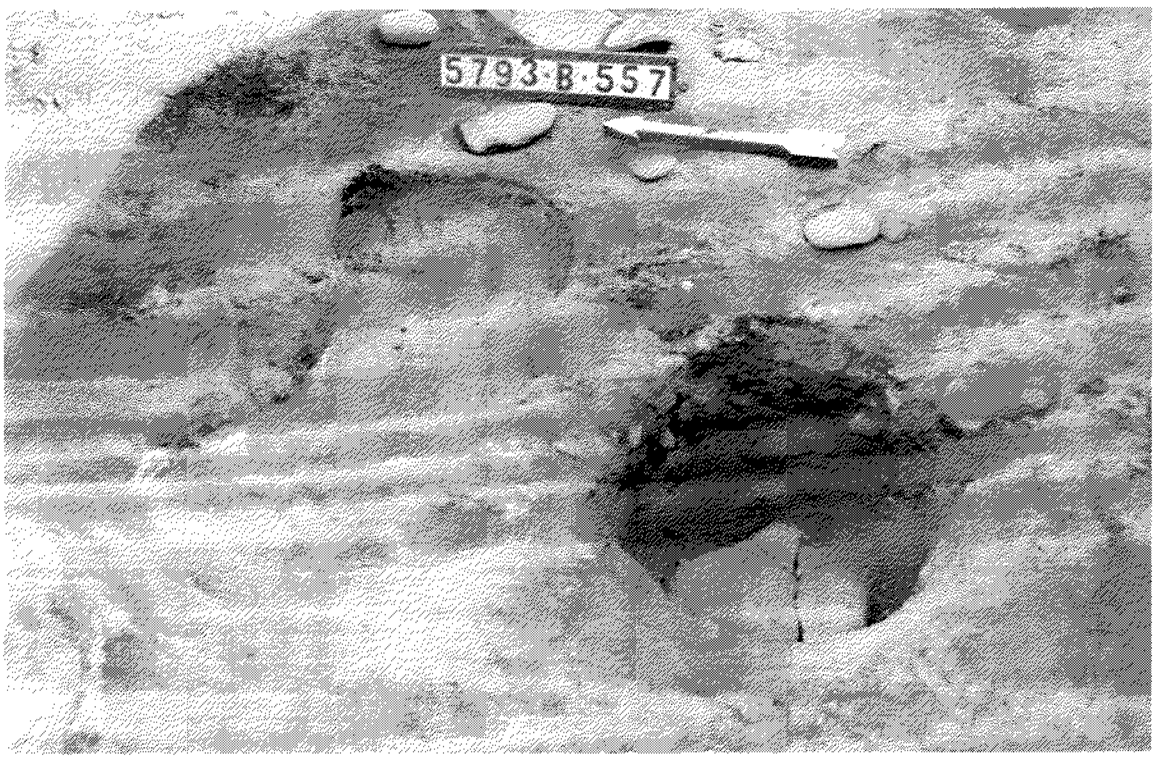

Figure 73. Room 89, hearth (left) and posthole (right) in center of floor, looking east.

Figure 74. Room 36, foreground; note cobble footings, worker is standing in Room 36.

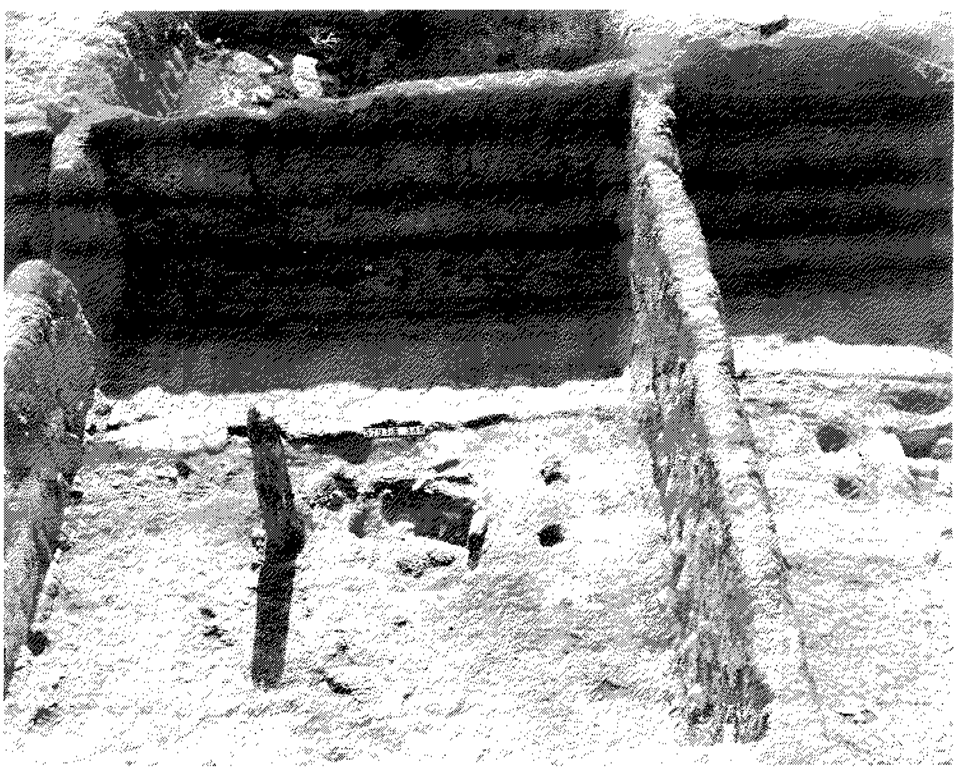

Figure 75. Room 37, after excavation, looking south.

Figure 76. Room 37, vessel near southwest corner of room.

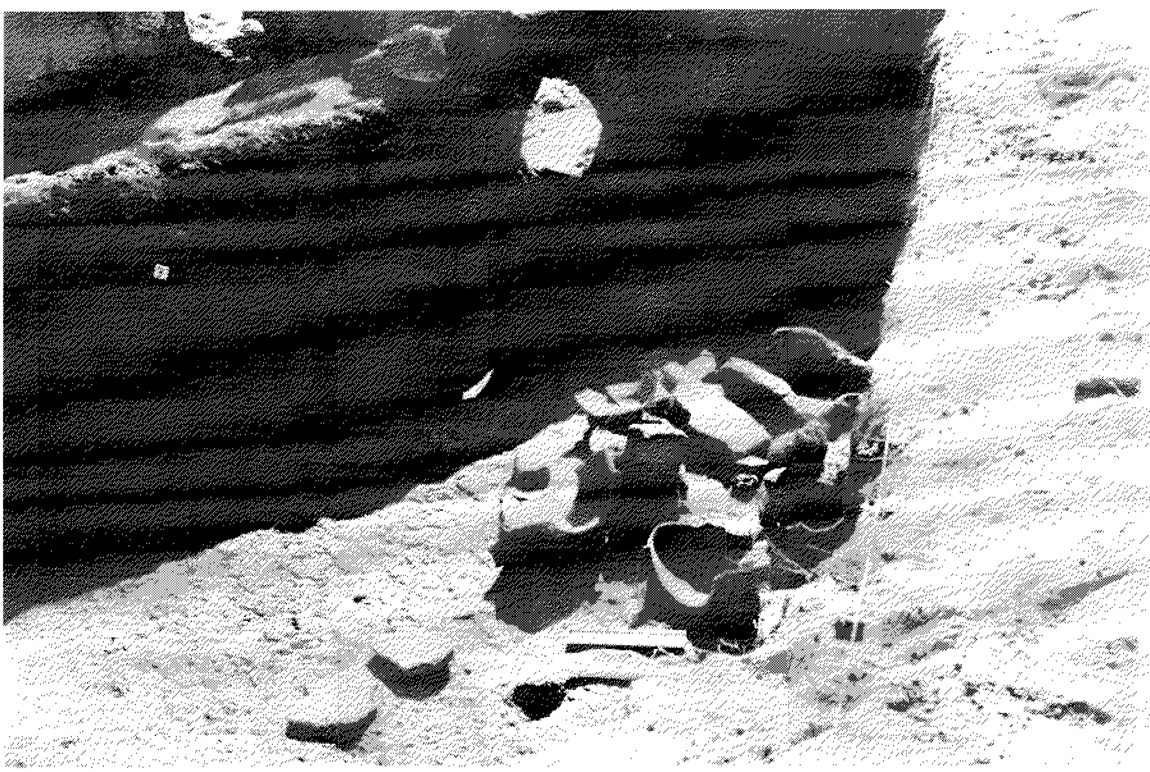

Figure 77. Room 44, hearth and vessels; detail of wall opening, east half of room unexcavated.

Figure 78. Room 48, after excavation, looking east.

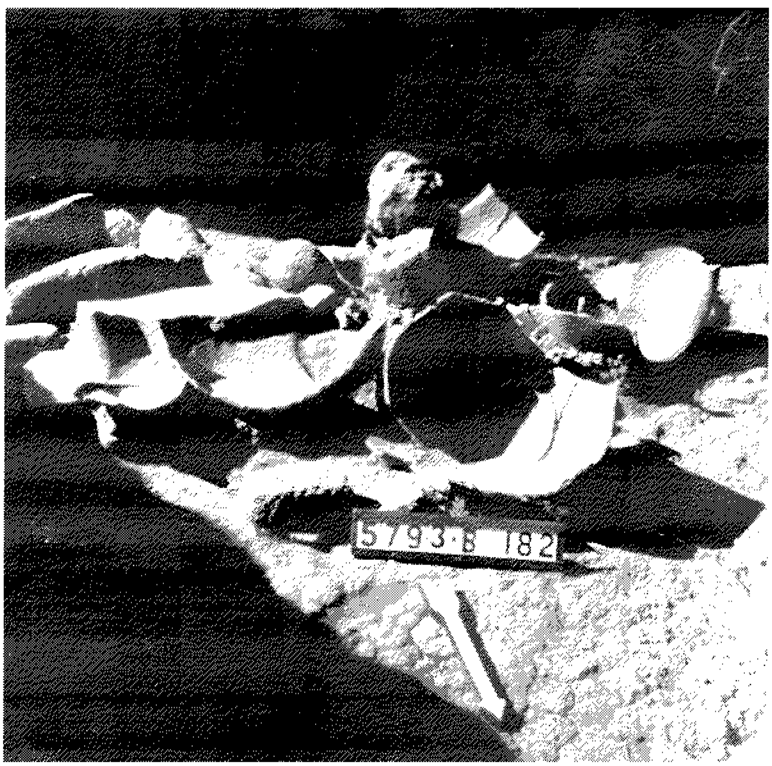

Figure 79. Room 48; broken vessels on floor.

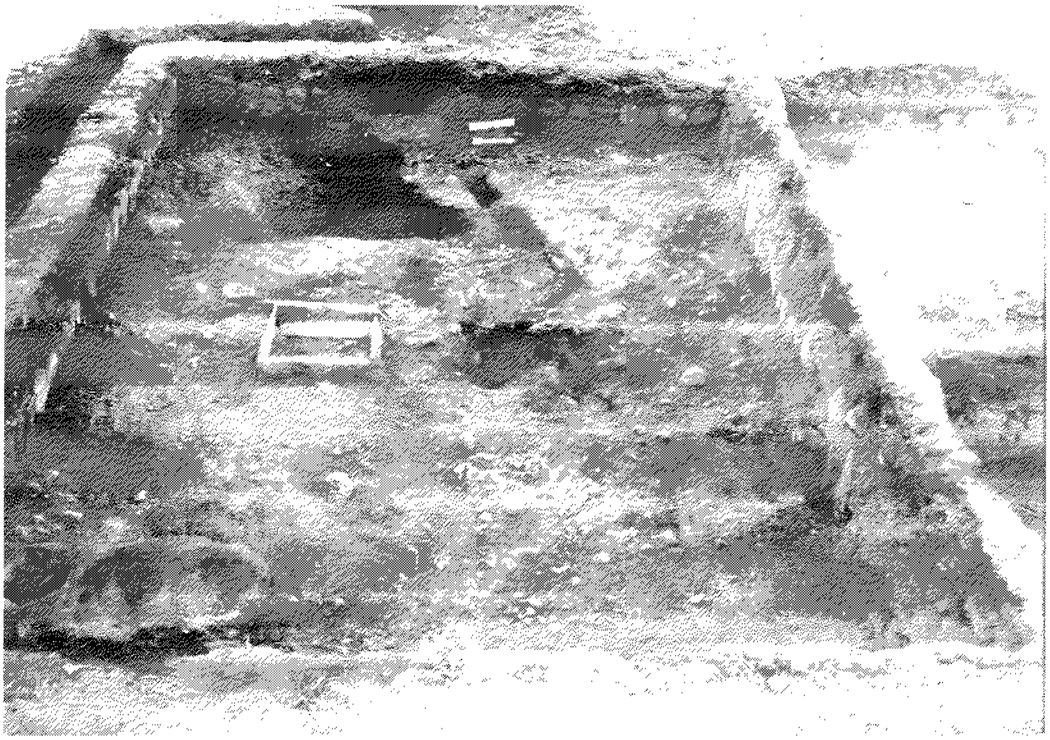

Figure 80. Room 29, excavated to subfloor level (old plaza level?), looking north.

Figure 81. Room 29, close-up view of north half before removal of hearth fill, looking north.

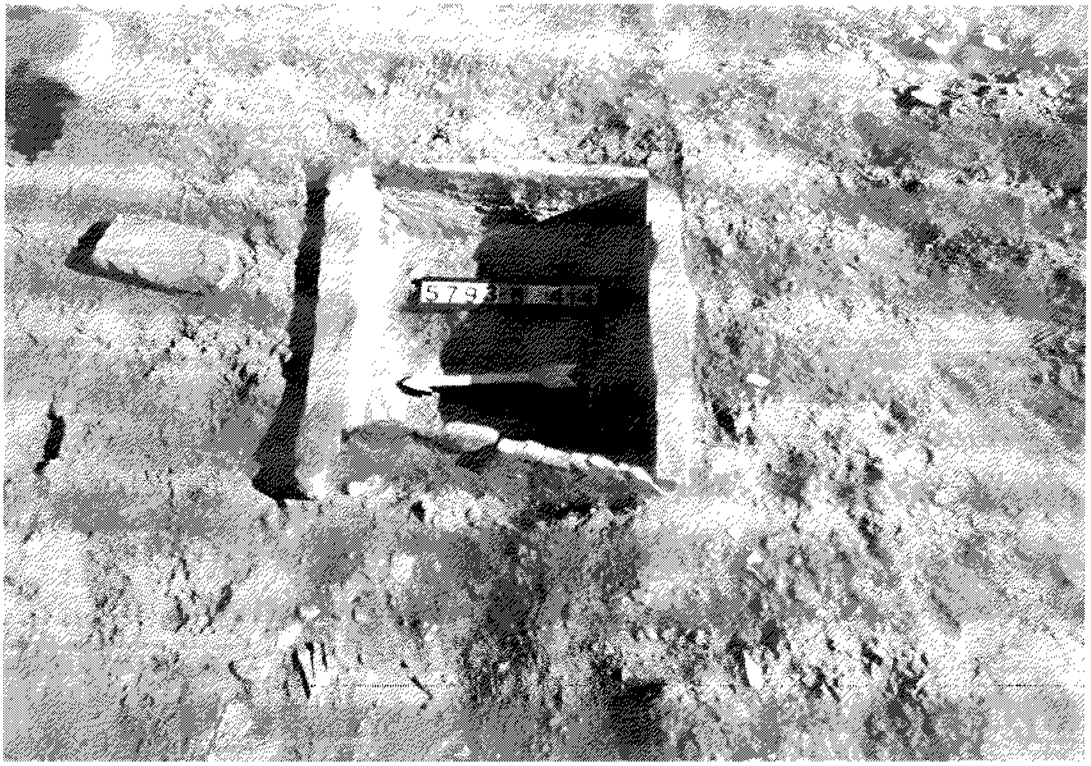

Figure 82. Room 29, detail of hearth with fill removed, looking east.

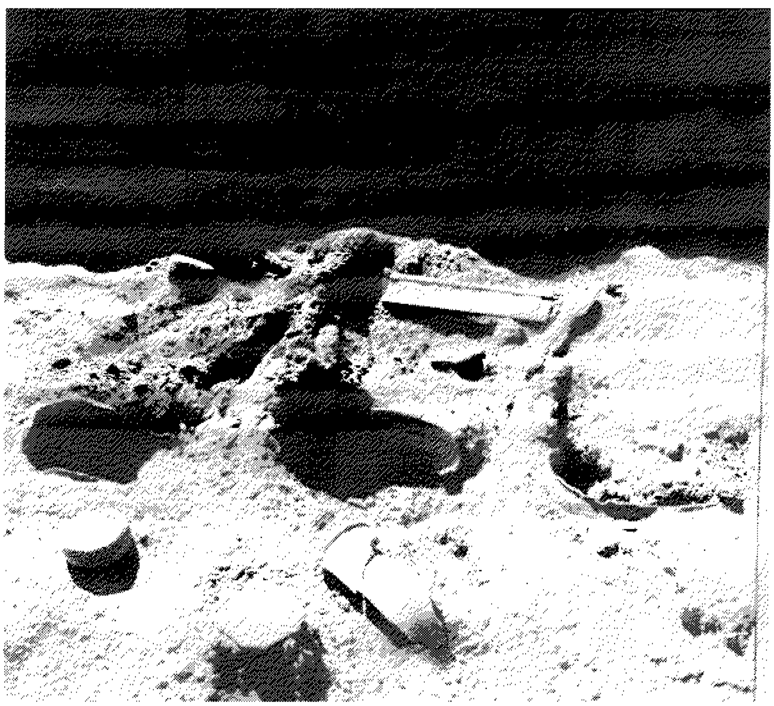

Figure 83. Room 30, mealing area; note remains of adobe rests, ceramic vessels set into floor as mealing receptacles.

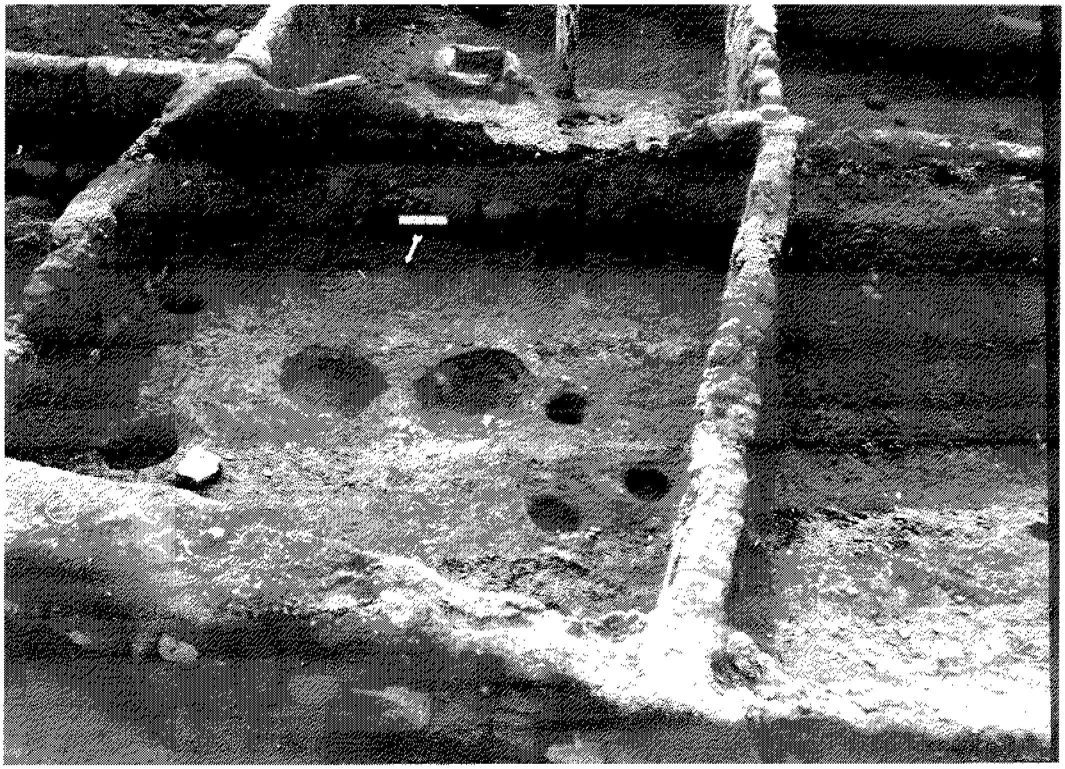

Figure 84. Room 31, after excavation, looking south.

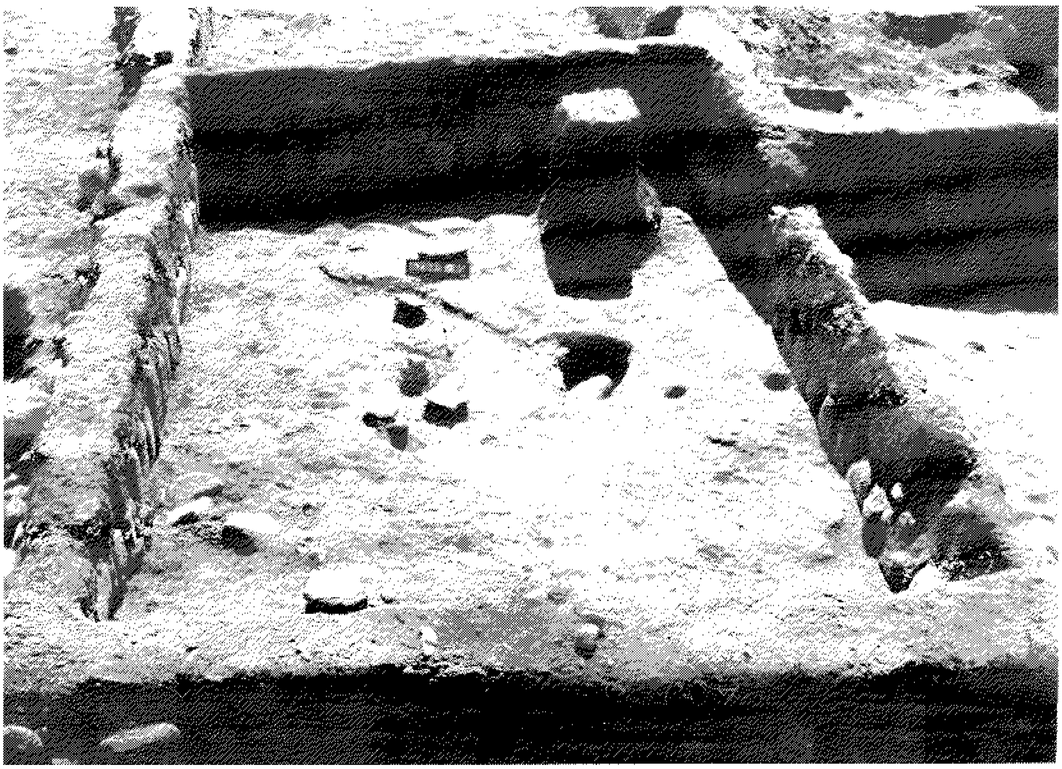

Figure 85. Room 35, after excavation, looking south.

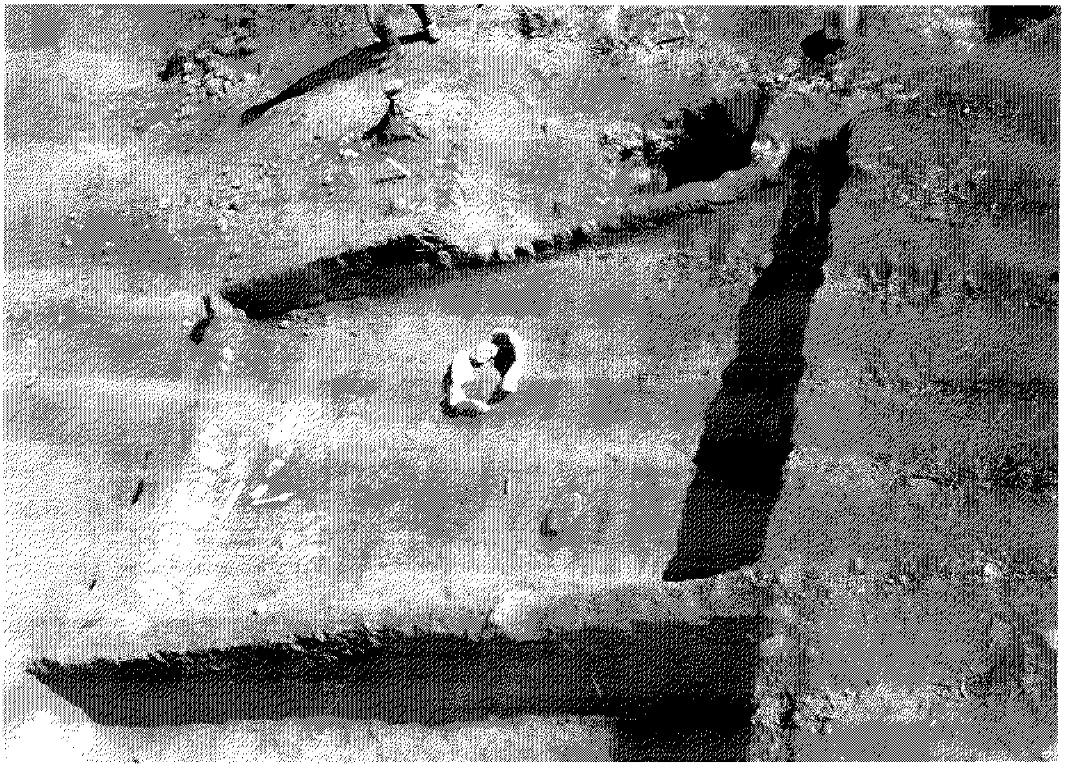

Figure 86. Room 41, looking east.

Figure 87. Room 41; two vessels set in floor, looking south.

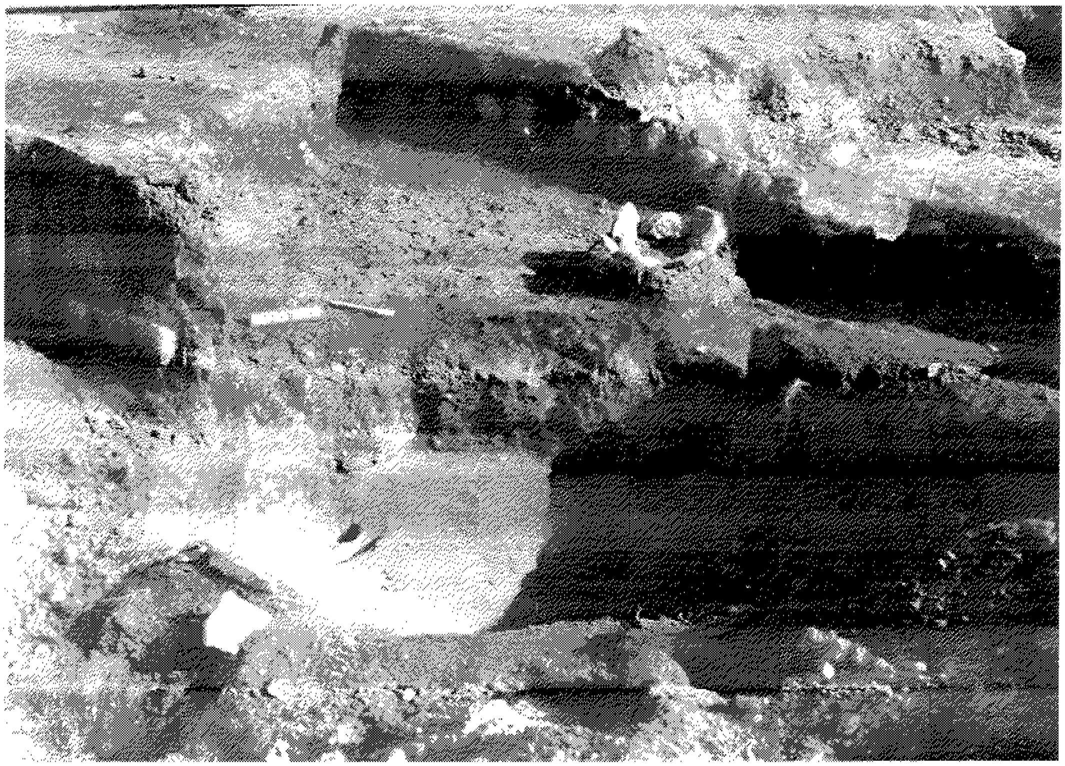

Figure 88. Rooms 41 and 68 during excavation An unnumbered and unrecorded pithouse is in the center.

Figure 89. Room 68, excavation complete. Hearth in center, looking north.

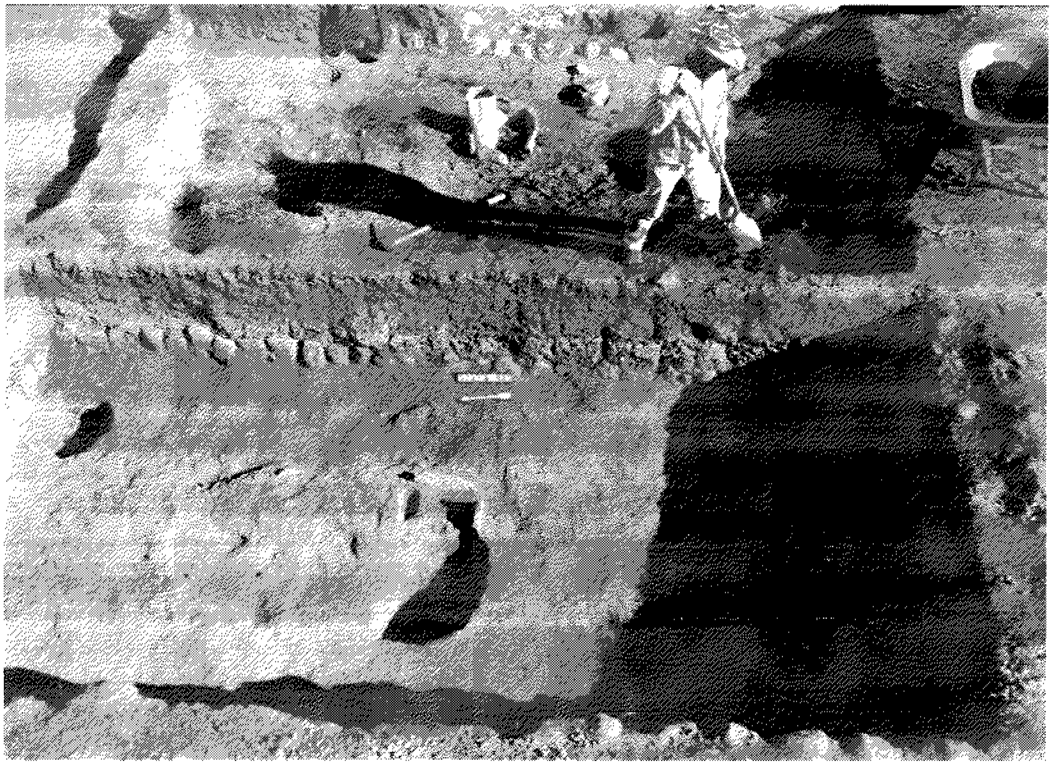
Figure 90. Room 68, excavation complete; looking east.

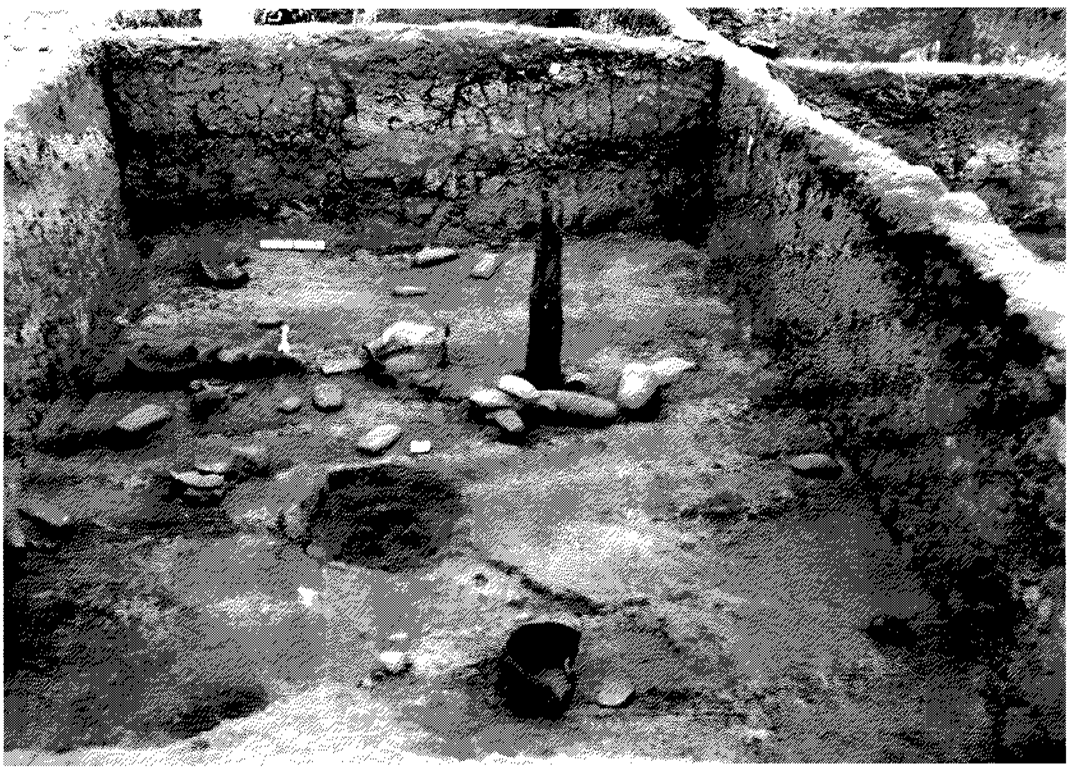
Figure 91. Room 79, floor, possible ceremonial room, looking north.

Figure 92. Room 79, looking north; close-up of possible mortar or stone bowl near post.

Figure 93. Room 34, showing trough area in center of floor, looking south. Raised adobe platforms at top and bottom of photograph.

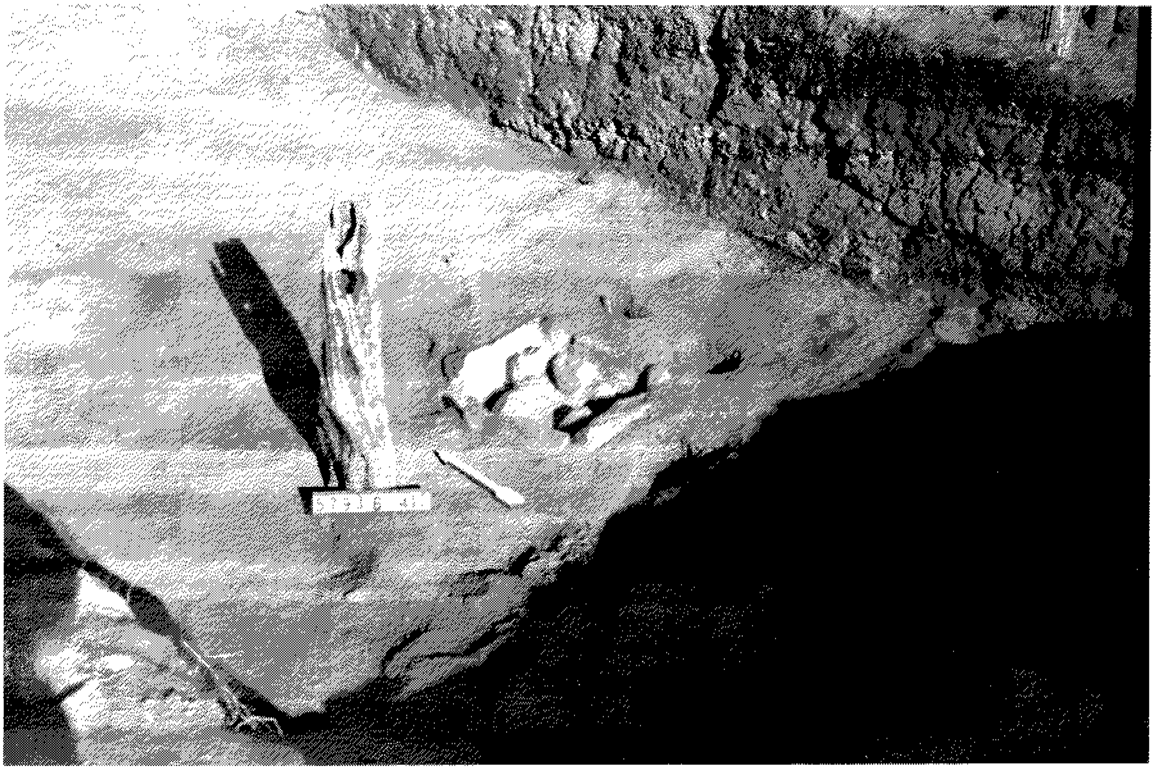

Figure 94. Room 34, detail of floor, looking northeast.

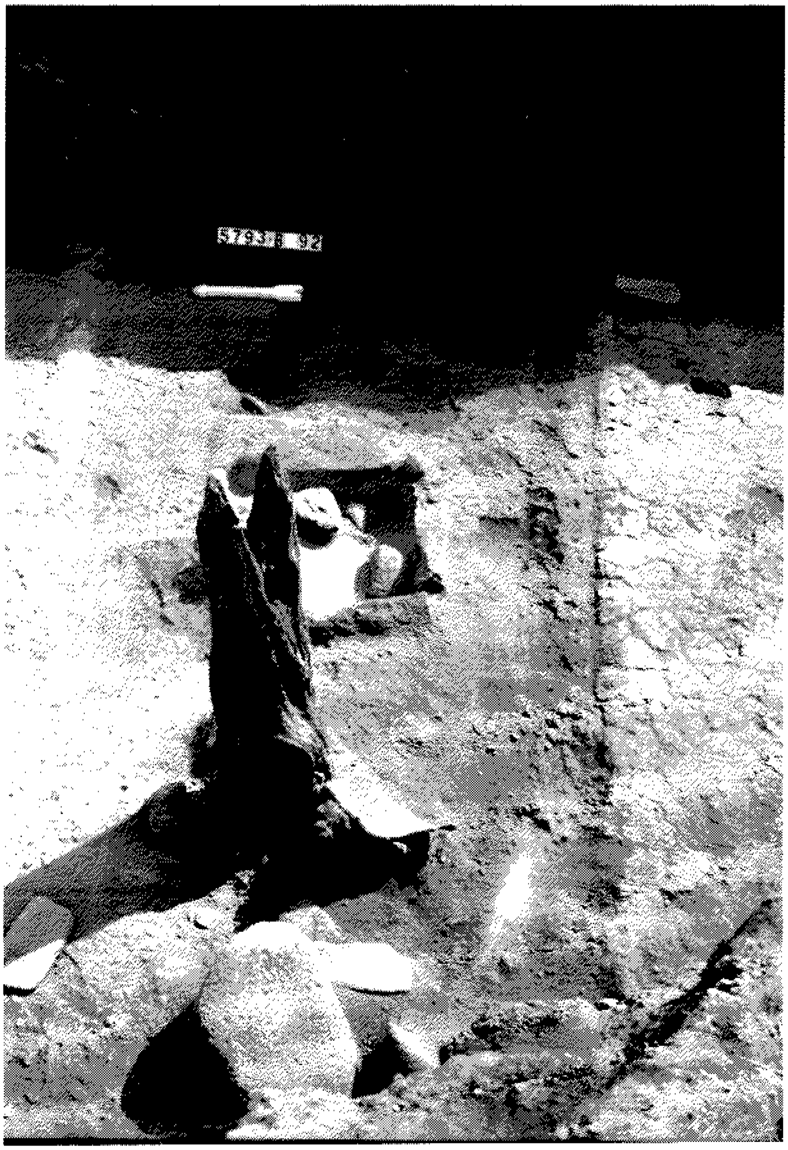

Figure 95. Room 34; detail of center post and fire pit in depressed "trough" area. Raised platform to right and left in photograph; looking east.

OTHER SALADO PERIOD FEATURES

Within the proposed highway right-of-way, other features beyond the two roomblocks were attributed to the Salado occupation on site. The large, rectangular ceremonial structure in the west-center of the site is the only known Salado communal and ritual structure noted in the Upper Gila, and is a rare example from the total known inventory of Salado sites in the Southwest. Two cremation areas were found on the extreme west and east edges of the site. A pithouse associated with the initial Salado occupation was found at the extreme north end of the site, on the terrace edge.

Pithouse 16

Located 7 m north of the north roomblock and just 3 m from the bench edge, was a square pithouse with rounded corners, measuring 3.7 m east-west and north-south and 40 to 50 cm in depth (Figs. 96, 97). Post-abandonment fill consisted of black soil and cobbles, with numerous sherds found in floor fill, all of which were broken down to around 3 to 6 cm in size. Distinctive stratigraphic layers were noted in the east-west profile. Deposited on an incline, the eastern edge was higher than the west. Artifacts from these fill layers were collected as one unit called "general fill."

No prepared surface was detected for the walls, which were dug into sterile yellow gravel and clay. The floor was plastered and well preserved in the center of the structure. Nine postholes ringed the periphery of the floor and contained gravelly fill with some charcoal. No other features were present. Tucson Polychrome and Gila Polychrome sherds were found on the floor of this structure, representing 10.5 percent of all ceramic types found. Tucson Polychrome pottery is associated with the initial Salado occupation at the Ormand site, perhaps dating as early as A.D. 1300. This pithouse was possibly used for habitation while the north roomblock was being built. The lack of a hearth, however, confuses this functional interpretation.

Artifacts were collected from floor, floor fill, and general fill proveniences. Floor artifacts included 42 plain unpolished sherds, 66 plain smudged interior sherds, 2 brown corrugated sherds, 12 Gila Polychrome sherds, 1 Tucson Polychrome sherd, 1 Mimbres Black-on-white sherd, and 1 fragment of unworked *Anodonta californiensis* shell (a freshwater clam). Floor fill contained only pottery, including 5 plain unpolished sherds, 2 plain smudged interior sherds, 1 red slipped plain unpolished sherd, and 1 indeterminate Gila or Tonto Polychrome sherd. General fill contained many artifacts for such a shallow structure (n=1,522). These included 488 plain unpolished sherds, 584 plain smudged interior sherds, 76 brown corrugated sherds, 110 red slipped plain unpolished sherds, 80 red slipped smudged interior sherds, 7 red textured sherds, 3 red corrugated, 93 indeterminate Gila or Tonto Polychrome sherds, 48 Gila Polychrome sherds, 1 Tonto Polychrome sherd, 10 Maverick Mountain sherds, 2 Tucson Polychrome sherds, 10 White-on-red sherds, 1 obsidian biface, 8 core flakes (2 chert, 3 chalcedony, 1 obsidian, 2 igneous), and 1 grooved serpentine object.

Ceremonial Structure

The ceremonial structure, Room 97, was located in the west-center of the site plaza area. Surface appearance projected a low, long mound, covered with cobbles, quite different from the surface appearance of the roomblocks. A National Science Foundation grant supported a full excavation of the structure in the final month of the project.

Wall Construction

A single rectangular room was uncovered, measuring 10.3 by 6.9 m (Fig. 98). This room was four to five times larger than any of the roomblock rooms, totaling 71.07 sq m. No remodeling of the walls was noted. Each wall was constructed differently: the north wall was made of cobbles, the south wall was cobble faced with an adobe core, the east wall was cobble faced on the interior and exterior around a thick rubble core, and the west wall, although damaged by a pothunter's hole, was adobe faced on the interior and exterior over a thick rubble core. The north and south walls were around 70 cm thick, and the east and west walls were just under 2.0 m thick. Walls were no higher than the foundation cobbles, with very little wall fall noted in or outside of the structure. This prompted field speculation that most of the superstructure was made of perishable materials. No postholes were noted on the tops of these walls.

A curious wall foundation was discovered attached to the northwest corner, but was not followed out to its full extent. It extended directly to the west for around 4 m, and then made a right-angle turn to the north, continuing for around 3 m. This wall may be evidence of a compound wall linking this structure to the unexcavated west roomblock.

Post-Abandonment Fill Description

Post-abandonment fill consisted primarily of "windblown" material. Floor fill artifacts included 33 plain unpolished sherds, 27 plain smudged interior sherds, 1 brown corrugated sherd, 9 red slipped plain unpolished sherds, 2 red slipped smudged interior sherds, 2 indeterminate Gila or Tonto Polychrome sherds, 10 Gila Polychrome sherds, 1 Tonto Polychrome sherd, 1 Maverick Mountain Polychrome sherd, 1 Tucson Polychrome sherd, 1 white-on-red sherd, 2 Tsegi Orange sherds, 2 obsidian bifaces, 4 pieces of angular debris (3 chert, 1 chalcedony), 10 core flakes (5 chert, 2 chalcedony, 3 igneous), and 2 multidirectional cores (2 chert). General fill included 14 plain unpolished sherds, 49 plain smudged interior sherds, 19 red slipped plain unpolished sherds, 1 red slipped smudged interior sherd, 3 indeterminate Gila or Tonto Polychrome sherds, 6 Gila Polychrome sherds, 3 Tonto Polychrome sherds, 3 Maverick Mountain Polychrome sherds, 1 indeterminate ground stone item, and 1 chert projectile point fragment.

Floor and Floor Features

The floor consisted of a hard plaster made of a compacted black adobe set over sterile soil. The use of "black" adobe signals a possible remodeling of the floor, since "blackish" adobe was used to construct later room additions to the roomblocks and to remodel interior features. Several features were found along a near-perfect north-south axis down the center of the room (see Figs.

98-99). Nearest the south wall was an adobe and cobble deflector, 75 by 30 by 22 cm high. Four large upright cobbles were placed on the north side of the deflector (Fig. 100). North of the deflector was a large, deep, rectangular, sandstone slab-lined hearth with an adobe floor. The hearth measured 1.0 m by 75 cm and was 29 cm deep. To the north of the hearth was a large oval pit that might have been a foot drum. It measured 1.15 m by 90 cm and was 35 cm deep, and was filled with black soil containing numerous sherds. The feature furthest to the north was an informal hearth, irregular in shape, measuring 90 by 45 cm and was 30 cm deep. No prepared lining was found, although patches of burned adobe were noted on the northwest side. Black soil filled this feature. Numerous postholes were found in a nonrandom pattern throughout the floor, with 15 postholes rimming the interior walls. All of these postholes were small, measuring around 20 to 25 cm in diameter. No large central post was found.

Floor Artifacts

A flat stone, perhaps a lapidary stone, and twelve round stones were found due north of the deflector (Fig. 101). This possible lapidary stone was not located in the state repository for analysis. The twelve round stones were made from shaped and naturally round rock: five stones were shaped through pecking and grinding sandstone, four stones were naturally round white chalcedony, and three stones were naturally rounded, orange-cortexed chert. Worked sherd discs were found on the floor (n=4), with no precise provenience described. These discs were made from plain smudged interior, red slipped plain unpolished, red slipped smudged interior, and indeterminate Gila or Tonto Polychrome pottery. A rhyolite basin metate was found in the southwest corner of the room (see Fig. 98). Other floor artifacts included a piece of unworked turquoise, a fragmentary ground and polished piece of marine shell, and two core flakes (one igneous, one welded tuff). Floor pottery consisted of 18 plain unpolished sherds, 12 plain smudged interior sherds, 3 plain corrugated sherds, 3 red slipped plain unpolished sherds, 1 red slipped smudged interior sherd, 1 indeterminate Gila or Tonto Polychrome sherd, 4 Gila Polychrome sherds, 3 Tucson Polychrome sherds, and 1 white-on-red sherd. The presence of Tucson Polychrome sherds on floor contexts may signal a construction date concurrent with the initial Salado occupation of the site, perhaps dating to A.D. 1300.

Abandonment

At the time of excavation, no roofing or superstructure material was found, and few artifacts were noted on the floor or in the fill. These factors suggested that ". . . the structure had been purposefully dismantled with everything of value taken out" (Hammack et al. 1966:32). This appeared to have been a thorough and planned dismantling. No burning of the structure was noted. It is unclear if this abandonment took place along with the abandonment of the total site, or some time before. The lack of Tonto Polychrome in fill contexts at this structure suggests that abandonment could have happened before the last stages of occupation on the site.

Ceremonial Structure Discussion

This structure was interpreted as ceremonial on the basis of formal architectural attributes, such as large size and type of interior features. This raises the eternal questions "why," "what," or "when is a kiva?" (Adler 1993; Lekson 1988; Smith 1952, respectively). Discussion of ceremonial structures in the prehistoric Southwest typically focuses on the interpretation of Anasazi kivas, and general arguments surrounding this subject are pertinent to the Ormand Salado example. The interpretation of prehistoric kivas began with ethnographic interpretation of Western Pueblo groups and sociopolitics of the nineteenth century. Most interpretations of ritually specific structures follows the "form equals function" argument, where shape, size, and kind of interior features indicate spatial function. This "trait-list" approach does not account for variety in structure forms, temporal transitional developments, and an exact use of ethnographic accounts, which rarely showed strict spatial differentiation between ritual and domestic space (Lekson 1988). Kroeber's 1917 study of Zuni kin and clan significantly points out that kiva societies represented only one of many social groups integrating Zuni society (Ferguson 1989:169). A fundamental problem lies in the methodological reduction of equating kivas as social groups to kivas as structures (Ferguson 1989:171). The inherent complexity of belief and behavior is not addressed, relying instead on a strict dichotomy between the "doing" of ritual and the "thinking" of beliefs. This separation of the whole of ritual activity enables the use of mutually exclusive labels, such as "domestic" and "ritual" space. These terms do have some meaning in a more general sense: ritual space of necessity integrates groups and relies on social context, and domestic space is oriented towards maintaining the basic economic needs of a household. Few architecturally defined spaces, however, exist only as ritual or domestic environments; most are multipurpose (Adler 1993:319-322). At this point, we do not have a methodology that deals with the ". . . intrinsic nature of architecture as a social artifact," regardless of supplementary artifact studies (Ferguson 1989:172).

Specialized ritual architecture is noted in prehistory, however, by the construction of great kivas and formalized plaza areas after A.D. 1250 (Adams 1989; Adler 1993:321; Ferguson 1989:171). This specialized development is tied to the commingling of Anasazi and Mogollon populations along the Mogollon Rim. The "Great Drought" (circa A.D. 1276-1299) is cited as a prime mover of Anasazi populations from the Four Corners, into areas already inhabited by Mogollon populations (Adams 1989:155; Reid 1989:65-97). The role of ritual changed dynamically in response to the great increase in settlement size; a process that accelerated greatly in the late thirteenth and fourteenth centuries. Communities with refugee populations developed into large, aggregated, plaza-oriented villages with rectangular kivas. The development of a rectangular kiva form is distinctly Mogollon in origin (Reid 1989:67), extending into the Mogollon Rim area after A.D. 1275 (Adams 1989). Enclosed plaza areas are first seen around A.D. 1250. Some plazas have kivas containing platforms located in the southern or eastern interior. These formal changes in architecture reflect social changes, as the need to encourage cooperation between multi-ethnic groups became a necessity. The development of enclosed plaza areas seems tied to ritual needs rather than to defense or other needs. The multi-ethnic dimension of this period is underscored by architecture that combines the ritual aspects of an Anasazi past (Great Kivas) with the enclosed village space of southern groups (Adams 1989:155-158; Smiley 1952:20-21). Ceramic evidence at Ormand ties the Ormand Salado presence to this great migration through the Mogollon Rim and further south and east, or reveals the Ormand settlement as a tangential part of the chain of events related to this process. The presence of locally produced Maverick Mountain Polychrome and Tucson Polychrome pottery at the Ormand Village connects the Ormand Salado presence to peoples maintaining ceramic traditions from the Mogollon Rim and southeastern Arizona (C. Dean Wilson, this volume).

The initial field interpretation of the ceremonial structure at the Ormand site did follow a "trait-list" approach. Size, interior feature type, location, and relative difference to other architecture guided interpretation. The structure was four to five times larger than rooms found in the roomblocks. Interior features and their alignment fit known patterns for ritual structures, specifically the tall deflector associated with the hearth and the possible foot drum. Foot drums were found at several rectangular ceremonial structures in the Point of Pines region, circa A.D. 1400 (Smiley 1952:14, 23). The central location of this structure implies communal use and availability, marking it as a potentially "high level" integrative structure (Adler 1989:38). Compared to other known rectangular kivas in the Point of Pines region from A.D. 1400 (Smiley 1952:23-58), which are slightly larger than a room in Ormand roomblocks, the Ormand "kiva" is closer to the size of a "Great Kiva," at 71.07 sq m. If the evidence from the Point of Pines region is indicative of the kind of social organization we see at Ormand, then the ceremonial structure united multi-ethnic groups in ritual, providing village-level social unity (Adams 1989:155-158; Lowell 1988:94).

Portions of the Plaza Area

A large area, lumped together as Feature 32 during excavation, combined surface-stripped portions exterior to the east of the east roomblock with an area between the north and east roomblocks. The full extent of this excavated area, including horizontal and vertical measurements, is unknown. Stripping around the east roomblock extended at least 30 m to the east of the roomblock. This area was surface-stripped to a level equivalent to a "plaza" level, although no prepared surface was noted. No grid system was used, excavated depths were not recorded, and stratigraphy, if any, was not described. While the vast number of collected artifacts from the site are attributed to the plaza area (about 100 boxes of sherds, chipped stone, and ground stone), the lack of detailed records and ability to determine activity areas or concentrated trash excluded this area from intensive analysis. Of note is the fact that a large sheet of trash *did* exist at Ormand, measuring at least 28 cm in thickness near its terminal southern edge (see Room 29 fill description). This is of particular importance for Salado sites in the Upper Gila River Valley, since interpretation of Salado settlements in this area has pointedly referred to the "universal" lack of trash, therefore implying very short-lived or mobile communities (Nelson and Anyon 1996:278-288; Nelson and LeBlanc 1986). While mobility in some form may have played a role in the Salado settlement pattern of the Upper Gila River Valley, trash deposits cannot be used as a pivotal argument supporting this hypothesis.

Cremation Areas and Burials

Strict budgetary constraints and current policies regarding examination of human remains and associated artifacts limited research. Within these constraints, the most comprehensive description of cremation and burial remains was presented, gathered from field records and a recent analysis of the whole cremation vessels stored at the Museum of New Mexico, Museum of Indian Arts and Culture (MIAC). Human remains were moved to the Maxwell Museum at the University of New Mexico, Albuquerque, in 1975. At the time of this analysis and writing, the Ormand site was slated for examination and repatriation of burial remains and associated goods under the Native American Graves Protection and Repatriation Act (NAGPRA) by MIAC. No detailed studies of human remains or associated goods beyond accessioned whole vessels were conducted with respect to this process. This section was completed in the spirit of providing basic preliminary information as a springboard for future research.

Cremations

Two separate cremation areas were noted at the time of excavation. One area was on the extreme west-center edge of the site, and was not examined in the 1965-1966 excavation. It reportedly contained up to 70 vessels (Hammack et al. 1966), which had been removed through pot-hunting efforts. The other area was in the extreme east-center of the site near the terrace edge (see Fig. 1). In this east cremation area, most cremation vessels were placed in pits that possibly dated to the late Archaic or Mogollon Early Pithouse periods. Vessels were typically found 6 to 80 cm below ground surface. Other cremations were found deep in the fill of pithouses. Some of these vessels were found as deep as 1.10 m below ground surface.

A total of 39 individuals were inventoried by the Maxwell Museum in 1975. These individuals included 12 infants, 1 child, 5 adolescents, 4 males, 1 female, and 16 individuals of indeterminate age and sex. Field notes mention that beads were found with 65-75 percent of the cremations, but records account for only four examples (10.25 percent), one of which included other artifacts such as a "geode" and "obsidian chips" (cremation C33, described below). No systematic collection or record was kept of beads, and the examples cited came from a "plain jar," a "red ware jar," a "polished red with fillet rim jar," and a "black ware" jar. These beads did not seem to represent enough beads for a necklace in any instance, and no material types for these beads were described.

No particular pattern was noted for vessel types: plain, red-slipped, and decorated vessels were found interspersed throughout the cemetery (Fig. 102). These separate east and west cremation areas may indicate distinct kinship or sodality groups from the Salado occupation, although this provocative possibility remains conjectural at present. A total of 69 vessels were mentioned in field records, including 25 vessels (mostly jars) with accompanying smaller bowl covers, 1 large jar with 2 cover bowls, 8 jars with no cover bowls, 1 jar with a worked stone cover, 3 cover bowls over cremated remains in a clay pit, 1 cremation that was interred directly with no vessel, and 1 bowl that appeared to be empty. Of the 29 "cover bowls," including 2 that covered pits, 41.4 percent were "plain bowls," presumably unpolished brown ware bowls (n=12). A variety of other ceramic types were used for cover bowls (plain smudged interior bowls, n=4; Gila Polychrome bowls, n=5; plain punched exterior/plain smudged interior bowl, n=1; incised corrugated bowl, n=1; Tonto Polychrome interior/white-on-red exterior bowl, n=1; red slipped plain polished bowl, n=1; "black ware" jar, n=1; and an unidentified vessel). Excavation records mention that several of these bowls had "kill holes," but exact information was not provided. Recent examination noted abrasion on the exterior base, interior, or both for 31 vessels examined, with just 4 vessels exhibiting no use wear. There was quite a range of abrasion variety, since this aspect was described as slight, moderate, or heavy for both the base or interior of a vessel. The vessels with abrasion were evenly divided between those with just basal abrasion, and those with a combination of basal and interior grinding. Just one vessel had evidence of interior abrasion only. The remaining vessels (n=34) mentioned in field records had not been accessioned into the permanent collection at MIAC, or located in the state repository.

The types of vessels used to hold cremations varied greatly, although most were jars (at 77.1 percent). Unpainted types accounted for 64.3 percent, with red-slipped types representing 21.4 percent. Decorated vessels represented 14.3 percent of examined vessels, including 5 Gila Polychrome bowls, 2 Gila Polychrome jars, 1 Tonto Polychrome interior with a white-on-red exterior bowl, 1 Tonto Polychrome jar, and 1 "black-on-orange" jar (n=10). Of the 5 painted bowls used as covers over cremation vessels, 3 Gila Polychrome bowls and the 1 Tonto

Polychrome interior with white-on-red exterior bowl were found covering red-slipped polished jars. The other Gila Polychrome cover bowl was placed over a pit with cremated remains. Just one cremation set included two painted vessels; vessel C57 was a Gila Polychrome bowl covering C50, called a mysterious "black-on orange" jar. The remaining painted cremation vessels were covered with a variety of unpainted bowl types—a "punctate" bowl covered a Gila Polychrome vessel, an unpolished bowl covered a Tonto Polychrome vessel, and a red slipped plain unpolished bowl covered a Tonto Polychrome jar. The painted wares were located throughout the east cremation area, and apart from being decorated do not suggest a higher status than other cremations.

Some differences were noted in ceramic types between what was recorded in the field and what was determined by this analysis. A description of each vessel is provided here, culled from all of the available information at present, including what each vessel was recorded as initially and what description was assigned most recently. Further details may be found in C. Dean Wilson's "Ormand Ceramic Analysis Part II," in this volume. For analytical purposes, type descriptions from the recent ceramic analysis were favored over older field descriptions. Each cremation was located on a map of the east cremation area (see Fig. 102). Cremation vessels were labeled "C" with a consecutive number in the field, and this system was followed in descriptions below, with the number assigned in the recent Wilson study added in parentheses.

Vessels C1-2: Vessel C1 was inverted as a cover over Vessel C2. C1 was described in the field as a "punctate" bowl, but recent examination determined the type as a plain incised exterior with plain smudged interior bowl. Slight basal abrasion was noted (Wilson, Vessel #77). C1 had an everted rim. Vessel C2 was called a Gila Polychrome "bird effigy" jar in the field. Recent examination confirms that it was a Gila Polychrome design, with two broken strap handles, which were perhaps construed as bird wings. Slight basal abrasion was noted (Wilson, Vessel #83). Vessel C2 held cremated remains, which could not be matched to Maxwell Museum records. This set of vessels, along with C3-4, were in a shallow pit, dug down into sterile soil.

Vessels C3-4: Vessel C3 was inverted as a cover over C4. Initially described as a "plain bowl," recent analysis described this vessel as a plain smudged bowl. Slight basal abrasion was noted (Wilson, Vessel #73). The rim of this bowl was slightly everted. Vessel C4 was initially described as a "plain jar." Recent analysis described this vessel as a plain unpolished jar. No basal abrasion was noted (Wilson, Vessel #94). C4 held a cremated adolescent that was possibly female. This set of vessels was located in the same pit as C1-2.

Vessels C5-6: Vessel C5 was initially described as a "plain bowl"; recent analysis typed it as a plain unpolished bowl. No basal abrasion was noted (Wilson, Vessel #92). C5 was inverted over vessel C6. Vessel C6 was described initially as a Tonto Polychrome jar, which was confirmed by recent examination. Moderate abrasion was noted on the exterior base and on the interior (Wilson, Vessel #72). C6 held a cremated child. This set of vessels, along with C7-8, were set into a shallow pit dug into sterile soil. The top of C5 was about 6 cm below the ground surface.

Vessels C7-8: Vessel C7 was not examined by this analysis and was called a "plain bowl" in field records. C7 was inverted over vessel C8. Vessel C8 was initially called a "corrugated jar," but recently described as a red slipped polished over indented corrugations jar. Abrasion was noted on the interior (Wilson, Vessel #67). C8 held a cremated adult of indeterminate sex and possibly an infant. These two vessels were found in the same pit as C5-6, with C7 roughly 6 cm below ground surface.

Vessels C9-10: These two vessels were found in Pit 53, which appeared to be dug prehistorically for the interment of two burials—Burial 4 and 13. These burials were on the floor of the pit and seemed to predate the placement of the cremation urn set. Vessel C9 was inverted over C10. Initially called a "plain bowl" in the field, recent analysis described it as a plain smudged bowl. Heavy abrasion was noted on the exterior base (Wilson, Vessel #70). The rim was everted. C10 was initially called a "red polished jar," confirmed and further described for this analysis as a red slipped plain polished jar. Moderate abrasion was noted on the exterior base, and slight abrasion on the interior (Wilson, Vessel #101). C10 held cremated remains, which could not be matched to Maxwell Museum records.

Vessel C11: This small vessel was described in 1965 as a "plain bowl." It was not examined by this analysis. C11 was a cover bowl set over small, cremated fragments of bone placed on sterile soil. This information suggests that C11 represented a young individual. No match could be made with Maxwell Museum records.

Vessels C12-13: Three sets of cremation vessels (C12-13, C14-15, C19-20) and three more empty vessels (C16-18) were found in a pit extending off of Pithouse 54. This pit appeared to post-date the pithouse. Cremation set C12-13 was placed in the northwest portion of the pit. Vessel C12 was inverted over C13. C12 was initially described as a "punctate bowl"; recent interpretation described it as an incised corrugated exterior/plain polished interior bowl. Slight basal abrasion and very slight interior abrasion were noted (Wilson, Vessel #85). C12 was about 20 cm below ground surface. Vessel C13 was described initially as a "plain jar." Recent analysis describes it as a plain unpolished jar with dimpled exterior. The base was slightly abraded (Wilson, Vessel #80). C13 held a cremated individual of indeterminate age and sex.

Vessels C14-18: In the northeast and east of the pit extending off Pithouse 54 were a number of vessels, interpreted in the field as an associated group, including a "set" (a jar with a cover bowl, C14-15), and three single accompanying vessels (C16-18). Vessel C14 was inverted as a cover over vessel C15. The top of C14 was about 25 cm below ground surface. Initially called a "plain bowl," recent examination described it as a plain smudged interior bowl. Slight basal abrasion was noted (Wilson, Vessel #75). The rim was everted slightly. Vessel C15 was not accessioned into the MIAC collection, and was described in records as a red slipped plain polished jar. C15 held cremated remains which could not be matched to Maxwell Museum records. This cremation set was encircled by three other empty vessels. Vessels C16-18 are considered accompaniments to C14-15. Vessel C16 and C17 were not examined by this analysis. Vessel C16 was described in records as a small red slipped plain polished jar, and Vessel C17 as a small "plain bowl." Vessel C18 was initially described as a small "plain red jar," with recent description calling it a plain polished jar. Slight basal abrasion was noted (Wilson, Vessel #76).

Vessels C19-20: The last set of vessels in this pit was found at the southern edge. Vessel C19 was inverted over C20 and was large enough to totally cover it. This vessel was not examined by this analysis, and was called a "plain bowl" in the records. Vessel C20 was initially called a small "plain red jar," more recently described as a plain polished jar. Slight basal abrasion was noted (Wilson, Vessel #71). C20 held cremated remains of two individuals; an adolescent and an individual of indeterminate age and sex. Underneath C20 was a prepared floor of large sherds (described as "culinary," presumably plain unpolished sherds).

Cremation C21: This cremation did not have an associated vessel. The cremation was placed in a small basin dug into sterile soil approximately 15 to 20 cm below ground surface. No match could be made with Maxwell Museum records.

Vessels C22-23: Vessel C22 was inverted as a cover over C23. Both of these vessels were not examined by this analysis. Records call C22 a "plain bowl," and C23 a "plain jar." Vessel C23 held cremated remains, which could not be matched to Maxwell Museum records. This cremation set was found in a small extension pit off of larger Pit 59. They were placed on sterile soil. Several large cobbles were set into the "wall" of the pit in the northwest edge to prepare the area. Small beads were found in the cremation. The top of C22 was 20 cm below the ground surface.

Vessels C24-25: Vessel C24 was inverted as a cover over C25. C24 was not examined by this analysis. Field records describe this vessel as a "plain bowl." This cremation set was very shallowly placed—the top of C24 was 3 to 5 cm below ground surface. C25 was described in field records as a "plain jar," updated recently to a plain unpolished jar. Slight basal abrasion was noted, along with slight interior abrasion (Wilson, Vessel #79). Vessel C25 held a cremated individual of indeterminate age and sex.

Vessel C26: Vessel C26 was not examined by this analysis. Field records describe this vessel as a partial Gila Polychrome bowl inverted over a prepared clay basin dug into sterile soil. Very few cremated remains were found in this basin, recorded as fragments that were of indeterminate age and sex.

Vessel C27: Vessel C27 was covered with a worked circular stone slab and a one-hand mano. C27 was initially described as a "red polished jar"; recent examination described this vessel as a red slipped plain polished over corrugated jar. Heavy basal abrasion was noted, and the interior was sooted and abraded (Wilson, Vessel #102). The bottom had a "kill hole," which was plugged on the interior with some large sherds from another vessel. Vessel C27 held a cremated individual of indeterminate age and sex.

Vessel C28: This vessel did not have a cover. Recent examination confirmed the initial field description of a red slipped plain polished jar. Interior and exterior surfaces were abraded (Wilson, Vessel #97). The bottom had a small "kill hole." C28 held a cremated juvenile between 10 and 12 years of age and indeterminate sex.

Vessels C29-30: Vessel C29 was a highly decorated bowl with Tonto Polychrome designs on the interior and white-on-red patterns on the exterior, as initially described and confirmed by recent analysis. Heavy abrasion was noted on the vessel base and slight abrasion was noted on the interior (Wilson, Vessel #89). Vessel C29 was inverted over C30. Vessel C30 was initially described as a red slipped plain polished jar, confirmed by recent analysis. Moderate basal abrasion and slight interior abrasion were noted (Wilson, Vessel #98). Two individuals were placed in C30: a child of indeterminate sex and a juvenile that was possibly female. "Several" beads accompanied the cremations. The vessel set was placed in Pit 60 within loose fill. A burial (Burial 9) was found beneath it. The relationship, if any, between the cremated and inhumed remains was unclear.

Vessels C31-32: Vessel C31 was inverted over C32, completely covering it. Recent analysis confirms the initial description of C31 as a Gila Polychrome bowl. Heavy abrasion was noted on the base and interior (Wilson, Vessel #88). The bottom had a "kill hole." Vessel C32 was initially described as a "red polished jar," updated recently to a red slipped plain polished over indented corrugations jar. Slight basal abrasion was noted (Wilson, Vessel #100). C32 held a cremated adolescent of indeterminate sex. The vessel set was placed on sterile soil.

Vessel C33: This vessel was not examined by this analysis. Field records described vessel C33 as a shattered "black ware jar" with a "very sandy temper." No cover bowl was found in association. Several "offerings" accompanied the cremated remains, including a broken geode (material not mentioned), obsidian "chips," and a few beads. The vessel was set on sterile soil. No records match could be made with Maxwell Museum documentation.

Vessels C34-35: This cremation set was found just below the surface, but no specific measurements were provided. Vessel C34 was not examined by this analysis, but was described in field records as a Gila Polychrome bowl. It was inverted over C35. Vessel C35 was initially described as a "red ware jar," recently confirmed as a red slipped plain polished jar. Moderate abrasion was noted on the base, and slight abrasion was noted on the interior (Wilson, Vessel #99). An unknown number of beads accompanied a cremated infant in vessel C35.

Vessels C36-37: The top of vessel C36 was 13 cm below ground surface. C36 was inverted over C37. The initial "plain orange bowl" description was modified under recent examination to a red slipped plain polished bowl. Slight basal abrasion was noted (Wilson, Vessel #74). Vessel C37 was described in field records as a Tonto Polychrome jar, but recently characterized as a Gila Polychrome jar. No abrasion was noted (Wilson, Vessel #84). C37 held a cremated infant. The vessel set was placed in loose fill and at an angle towards the northeast.

Vessels C38-39: Vessel C38 was not examined by this analysis but was described in field records as a "plain bowl" with a "kill hole" in the bottom. It was inverted over vessel C39. Vessel C39 was initially described as a "red ware jar," called a red slipped plain polished jar in this analysis. Moderate abrasion was noted on the base (Wilson, Vessel #65). C39 held two cremated individuals: an adult of indeterminate sex and an individual of indeterminate age and sex. This set was placed on sterile soil.

Bowl between C38-39 and C40-41: A bowl was found between these vessel sets that appeared to be either a disturbed cremation or some kind of "offering," perhaps associated with these sets. This vessel was not numbered, and not located or analyzed for this project. About a half-dozen beads were found in the vessel fill, described as "very tiny." More of these same beads were found directly underneath the bowl, along with a few fragments of cremated bone.

Vessels C40-41: Both of these vessels were not examined by this analysis, and both were described as "black ware." C40 was a bowl, presumably inverted over jar C41. Vessel C40 had a drilled "kill hole" in the bottom. Vessel C41 was also "killed," with no further description. These vessels were placed in fill near Pit 59, a few centimeters above sterile soil (depth below surface unknown). C41 may have held two cremated individuals; Maxwell Museum records are unclear on this point. One adult of indeterminate sex was positively attributed to C41.

Vessels C42-C44: C42 was actually large sherds from a "plain jar" set over C43, which was a "plain bowl" used as a cover over C44, which was another "plain bowl." Vessel C42 and C44 were not examined by this analysis. Vessel C43 was described in the field as a "plain bowl," recently described as plain polished with smudged interior. Heavy abrasion was noted on the base, with slight abrasion on the interior (Wilson, Vessel #93). C44 held a cremated adult of indeterminate sex. These vessels were set into fill between pits 60 and 62, just a few centimeters above sterile soil and about 25 cm below the ground surface.

Vessels C45-46: Vessel C45 was inverted over C46. C45 was not examined by this analysis, but described in field records as a "plain bowl." Vessel C46 was initially described as a red slipped plain polished jar, recently confirmed by this analysis. No abrasion was noted on the interior or exterior of this vessel (Wilson, Vessel #82). C46 held a cremated adult of indeterminate sex. The vessel set was placed in a small pit excavated into sterile soil "surrounded by rocks." Whether this indicates a prepared pit is unclear.

Vessels C47-48: Vessel C47 was not examined by this analysis nor described by type in field records, but was mentioned as inverted over C48. Presumably it is a bowl. It was noted that the bottom was "killed." Vessel C48 was described initially as polished red ware, recently confirmed as a red slipped plain polished jar. Heavy basal abrasion was present, but no interior abrasion was noted (Wilson, Vessel #87). C48 held a cremated adult of indeterminate sex. These vessels were placed in a slight depression in sterile soil.

Vessels C49-50: Vessel C49 was inverted over C50, and completely covered vessel C50. Described in field notes as a "plain utility bowl," C49 was not examined by this analysis. Several large sherds laid on top of C49, which were not collected or described. Vessel C50 was initially described as a "plain orange bowl," recently characterized as a plain polished bowl. Moderate abrasion was present on the exterior base, and no abrasion was noted in the interior (Wilson, Vessel #68). C50 held a cremated infant.

Vessels C51-52: Both of these vessels were not examined by this analysis. Vessel C51 was described as "plain ware," presumably a bowl, since it was inverted over vessel C52. Vessel C52 was described as a "plain jar." These vessels were placed in loose fill, with the top of C51 roughly 40 cm below ground surface. C52 held two cremated individuals: one of indeterminate age and sex, and one infant.

Vessel C53: This vessel was not described in field records or examined by this analysis. The vessel was set upright and placed on sterile soil "a few centimeters below the surface." The contents of the bowl were mainly black soil and one unburned "finger bone." No match could be made with Maxwell Museum records.

Vessel C54: Vessel C54 was described only as a "bowl" in field records. Recent examination has typed this vessel as a plain polished with smudged interior bowl (Wilson, Vessel #91). Light abrasion was noted for the exterior basal surface and the interior. This vessel was found inverted, but did not appear to cover a cremated individual. Black soil, small rocks, and about six sherds were found underneath the vessel.

Vessels C55-56: Vessel C55 was described in field records as a "plain bowl," inverted over vessel C56, with a large rock on top of it. This vessel was not examined by this analysis. Vessel C56 was initially described as a "polished jar," recently confirmed as a red slipped plain polished jar. Moderate abrasion was noted for the exterior base and interior (Wilson, Vessel #95). C56 held a cremated adult of indeterminate sex. These vessels were set into sterile soil.

Vessels C57-58: This set was the only example of two painted vessels used together for a cremation set. Unfortunately, very little field description exists for these vessels, and they are not in the permanent collection at MIAC; hence, we did not examine them for this analysis. Vessel C57 was described on field specimen sheets as a "Gila Polychrome bowl," presumably inverted as a cover over C58. Vessel C58 was described as a "black-on-orange jar" with decorations that "nobody had seen before." C58 held a cremated individual of indeterminate age and sex.

Vessel C59: This vessel was described in the field as a "plain jar," and was not examined by this analysis. Field notes describe this vessel as looking like a "helmet" because the rim everted out widely. Vessel C59 was inverted over a cremated individual of indeterminate age and sex.

Vessel C60: Vessel C60 was initially described as a "plain bowl," recently described as an unpolished bowl. Moderate basal abrasion was present, with slight abrasion noted on the interior (Wilson, Vessel #69). The vessel was set into loose fill within Pit 61 very near to a burial (Burial 7). The excavator felt certain that the cremation predated the burial. This presents an intriguing reversal of the presumed temporal order of burials and cremated remains on site. Obviously, this example offers a note of caution in assuming that all Ormand Village burials predate the Salado occupation. No match could be made with Maxwell Museum records.

Vessel C61-64: These vessels were grouped together in the northeast corner of Pit 64. Only a rudimentary description was provided in field records. C61 was described as a "punctate bowl," C62-64 as "plain bowls." None of these vessels was examined by this analysis. Presumably, they were set upright and contained cremated remains. Only C64 was clearly recorded in Maxwell Museum records as a cremated adult of indeterminate sex.

Vessels C65-66: This vessel set was found in close proximity to another vessel set (C67-78), off the northeast edge of Pithouse 54. Vessel C65 was described in the field as a "plain bowl," and was not examined by this analysis. It was inverted over C66. Vessel C66 was initially described as a "corrugated jar," but recent analysis describes it as a polished red over indented corrugated jar. Heavy basal abrasion was noted, along with slight interior abrasion. The interior was smudged (Wilson, Vessel #103). C66 held a cremated infant.

Vessels C67-68: This vessel set was not examined by this analysis. Field records note that vessel C67 was a "plain bowl," and vessel C68 was a "punctate jar." These vessels were found near vessels C65-66. It is unclear if vessel C68 held cremated remains. No Maxwell Museum records could be matched for this vessel set.

Vessels C69-70: These were found between two small extramural pits (Pits 71 and 72), both vessels were examined by this analysis, but not described in field documentation. Vessel C69 was a Gila Polychrome bowl inverted over C70. Heavy basal abrasion was noted, with no interior abrasion (Wilson, Vessel #78). Vessel C70 was a red slipped plain polished jar. Moderate basal abrasion was present; no interior abrasion was noted (Wilson, Vessel #96). C70 held a cremated individual of indeterminate sex.

Burials

At a public presentation of the Ormand Village site, the question of whether burials might indicate a different Saladoan social or ethnic group from the individuals cremated was raised. This provocative question will unfortunately remain unanswered at present. Several factors mitigate against resolving this question: first, it is difficult to determine the contemporaneity of these burials to the overtly Salado phase cremations, as well as between each burial as a group. This difficulty in interpreting "vertical control" and therefore temporal distinctions was particularly noticeable in the pithouse and extramural pit features on site, where nearly all of the cremations and burials were located. The other obvious problem is that cremated remains leave little to examine, particularly in determining ethnic differences through morphological attributes. A final factor includes the inaccessibility to other associated burial artifacts through the present NAGPRA assessment of the Ormand Village site.

Not all of the information about the burials was found; four burials remain unlocated and without any kind of excavation description, or with inconclusive records (Burials 2, 3, 11, and 12). Information that could be accounted for is presented below, by consecutive number.

Burial 1: This individual was located in Feature 2, described as a burial pit dug into sterile soil to a depth of approximately 1.10 m. The burial pit was located to the east of the north roomblock by about 15 m from the northeast edge. The individual was flexed and oriented towards the northeast. The skeleton appeared to be buried incomplete, with the entire vertebrae, rib cage, and hands missing. It was suggested by the excavators that the individual had been moved in the prehistoric past. Fill immediately surrounding the skull included charcoal. The individual was placed on a layer of yellow sand, within what was very rocky, sterile soil. No associated goods were noted.

Burial 2: Another burial was found very near to Burial 1. Found at the same time as Burial 1, this burial was not numbered. It may be Burial 2, and will be described as such. Only fragmentary remains, including a few skull portions and one leg bone were present at the time of excavation. It appeared that the individual was flexed and facing south. The burial was placed into a pit dug into sterile soil. No associated goods were found. Maxwell Museum records state that Burial 2 contained an adult of indeterminate sex with some "burned bone." It is unclear if this individual was partially cremated.

Burial 3: The location of this burial is inconclusive, and is tentatively associated with Pit 66, to the northeast of the north roomblock, between Pithouse 25 and the terrace edge. The individual appeared to be flexed and facing north. The condition of the skeleton was poor, but evidence of ochre (presumably red ochre) was found on the remains and in the pit.

Burial 4: Located on the west edge of Pit 53, Burial 4 was placed on the floor of the pit. This inhumation was incomplete—essentially the lower portion of the body from the waist down was present. The individual appeared to be flexed. Beads were found in association, but were not described by material, kind of bead, or number present. Another burial was located within this pit (Burial 13), and although these two burials did not appear to be directly related, the excavators thought that the pit feature was dug specifically for these burials. Cremation C9-10 was located in the east portion of the pit, but was clearly a later addition. No Maxwell Museum records could be matched to this burial.

Burial 5: This burial was located in an intrusive pit set into Pithouse 50, roughly in the center of the structure. The depth below ground surface was about 1.10 m, slightly below the floor of Pithouse 50. This burial clearly predated the domestic use of the structure, but remains temporally enigmatic. The skeleton was very fragmentary, presumably from erosion. The individual was possibly flexed, and appeared to be facing south. Some nonhuman remains were noted to the south of the individual by approximately 40 cm, and it was suggested in field notes as evidence of an accompanying dog burial. No associated goods were found. The individual was identified as an adult female in Maxwell Museum records.

Burial 6: Located along the east edge of Pit 61, this individual was placed about 50 cm above the pit floor, and appeared to be flexed and facing west. Red ochre covered the body, and a bone awl was found near the chest area. No Maxwell Museum records could be matched to this burial.

Burial 7: This burial was also found in Pit 61, but on the west edge. The individual was recorded as an infant in Maxwell Museum records. Associated sherds (not described further) were found next to the west wall of Pit 61. The depth from ground surface to the burial was around 60 cm.

Burial 8: Burial 8 was located in the southeast edge of Pit 62, and beyond recording the location, was not described. Maxwell Museum records described an individual of indeterminate sex.

Burial 9: The location of Burial 9 is inconclusive; it was mistakenly located in Pit 53, but one plan map seems to indicate a location west of Burial 7, and another plan map indicates a location due south of Cremation C29-30 within Pit 60. Both maps show fragmentary remains including skull fragments and portions of one arm, possibly of an infant. The position of the individual was indeterminate. No associated artifacts were found. This burial was about 40 cm below the ground surface. Maxwell Museum records confirm that this individual was an infant.

Burial 10: Burial 10 was located between Pits 61 and 64. The position and orientation of the individual was indeterminate. The individual was placed on sterile gravel about 30 cm below the ground surface. The fragmentary nature of the skeleton included skull fragments and ribs. No associated artifacts were found. This individual was recorded as an infant in Maxwell Museum records.

Burials 11 and 12: No records or maps were found describing or locating these burials. Maxwell Museum records state that Burial 11 was an adult male and Burial 12 was an adult of indeterminate sex.

Burial 13: This burial was located in the northwest corner of Pit 53. The position of the individual suggested that the body was flexed facing east. No associated artifacts were found. No Maxwell Museum records could be correlated to this burial.

Burial 14: Burial 14 was found in the very east edge of the site, within the west edge of Pit 90. The individual was described in field records as a small child with an indeterminate position and orientation. A shell gorget was found nearby. The skeleton was fragmentary and included some skull fragments and a few long bones. A one-hand mano was found near the burial and was of unclear association. No Maxwell Museum records could be correlated to this burial.

Burial 15: To the east of Pithouse 43 by about 10.0 m was a small pit (Pit 101) containing Burial 15. The burial seemed to post-date the pit, since the individual was placed in the middle of pit fill, about 50 cm below ground surface. The individual was flexed and facing south. No associated artifacts were found. No Maxwell Museum records could be matched to this burial.

Burial 16: Burial 16 was located in another small pit (Pit 109) to the east of Pithouse 50. The individual was placed in the north side of the pit about 65 cm below ground surface, and appeared to post-date the feature's original function. The skeleton was too fragmentary to determine the position or orientation of the individual; the torso, arms, and head were missing. No associated artifacts were found. Maxwell Museum records document an adult of indeterminate sex.

Burial 17: This burial was in the extreme northeast portion of the site, in Pit 102. The burial was placed in an intrusive burial pit (Pit 124), dug below the floor of Pit 102. The shape of the burial pit was ovoid, 110 cm long and 70 cm wide, with a depth of 38 cm. The top of the feature was 70 cm below ground surface. The individual was flexed and facing west. An associated corrugated jar was found 15 cm due west of the skull, in the west edge of the burial pit. The individual was described as an adult of indeterminate sex in Maxwell Museum records.

Burial 18: The last burial recovered during the 1965-1966 excavation of Ormand Village was located in Pit 62. The individual was flexed facing north. No associated artifacts were found. The burial was placed into a pit dug down into sterile soil, 75 cm below ground surface. The individual was identified as an adult male in Maxwell Museum records.

Discussion

The cremations found at the Ormand Village site follow a pattern seen at other Salado sites in southeastern Arizona (Bronitsky and Merritt 1986). It is unknown if this pattern fits the whole of the Upper Gila Salado settlement. This pattern features secondary cremations in vessels, where an individual(s) was cremated and placed in a vessel, and shallowly buried in areas outside of habitation. In southeastern Arizona, the pattern consists of secondary cremations in plaza areas. Ornaments typically accompany individuals, along with objects of "ceremonial importance." Inhumations are found in separate cremation cemeteries, although the significance of this is unclear (Bronitsky and Merritt 1986:222,225).

There is no one burial practice equated with the Salado horizon. In the Tonto-Globe and Salt-Gila basins, both cremation and extended inhumations are found, although inhumation may be a more common practice. Cremation cemeteries are noted, however, at several sites (Elson 1996:139). Inhumations in southeastern Arizona are typically semiflexed and placed in trash areas. Subfloor inhumations were noted at the Ringo site. Associated burial goods were rare (Bronitsky and Merritt 1986:222, 225).

Most of the Ormand Village burials were assumed to predate the Salado occupation in field records, and this seems plausible if a particular line of reasoning is followed. Burials typically were located in pit features and pithouses assumed to date to the possible late Archaic or possible Mogollon Early Pithouse period occupations. These temporal associations rest on meager chronometric controls for the pithouses, which relied solely on architectural comparisons. Of the pit features with burials, 25 percent were found in pits that may have been dug solely for use as burial pits (n=4 out of 16). The remaining 75 percent of the known burials were found in pits (n=11) or pithouses (n=1) "predating" the Salado occupation. Of the 18 individual inhumations at Ormand, only three clear examples were found placed underneath secondary cremations (Burials 4, 9, and 13). One cremation, however, was actually found underneath an inhumation (C60 under Burial 7). The relationship between inhumations and secondary cremations on site remains unclear, and it is possible that all burial practices originated during the Salado occupation.

Burial patterns from the Mogollon Late Pithouse phase include intramural and extramural interments. Burials can be flexed or semiflexed and lack the presence of inverted bowls placed over the heads, as seen in late Three Circle phase burials (Shafer and Taylor 1986:50). Mortuary patterns at the SU site indicate that Mogollon Early Pithouse phase burials were placed in the eastern portion of the site in two clusters. Each cluster had an area with many postholes originally interpreted as wattle-and-daub surface houses. It is possible that these structures were used as mortuary facilities (Wills 1996:347).

At present, a definitive understanding of the Ormand Village burials eludes interpretation. Meager chronometric controls for pithouses and features work against a clear understanding of how inhumations related to secondary cremations on site, if at all. It is possible that all burial practices on site were associated with the Salado occupation. What was clearly attributable to the Salado occupation at Ormand Village included two distinct secondary cremation cemeteries, located on the extreme west and east edges of the terrace, outside of habitation areas and the central plaza.

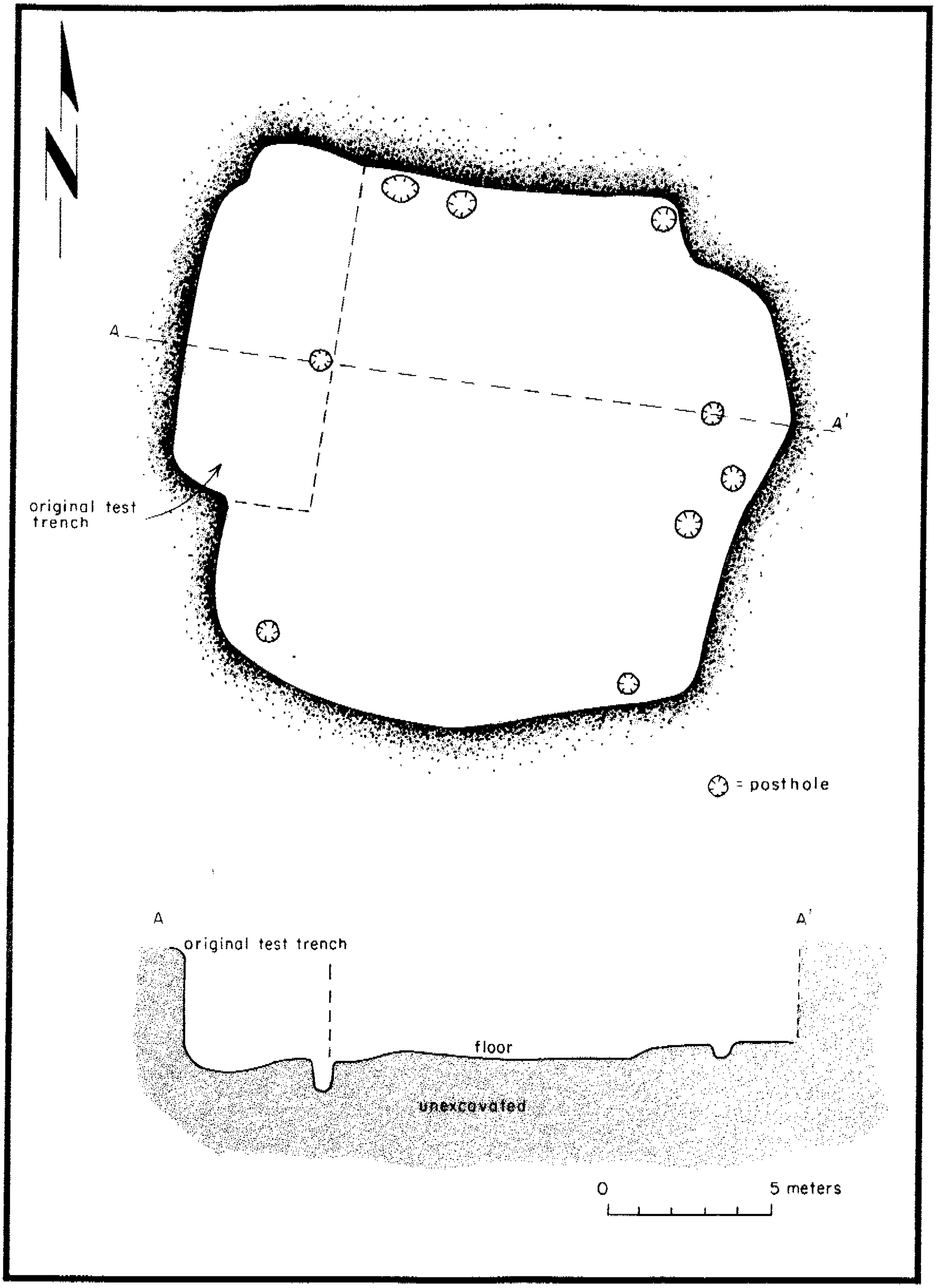

Figure 96. Plan map and profile of Pithouse 16.

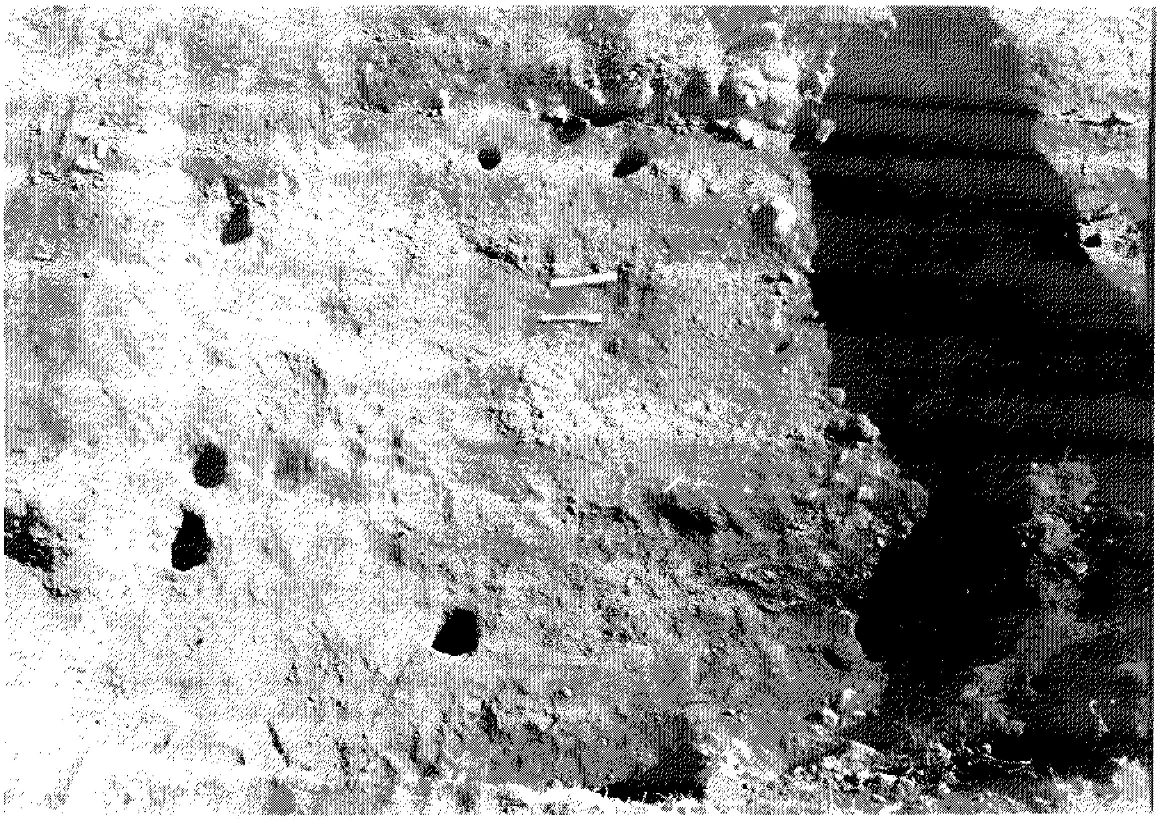

Figure 97. Pithouse 16, floor.

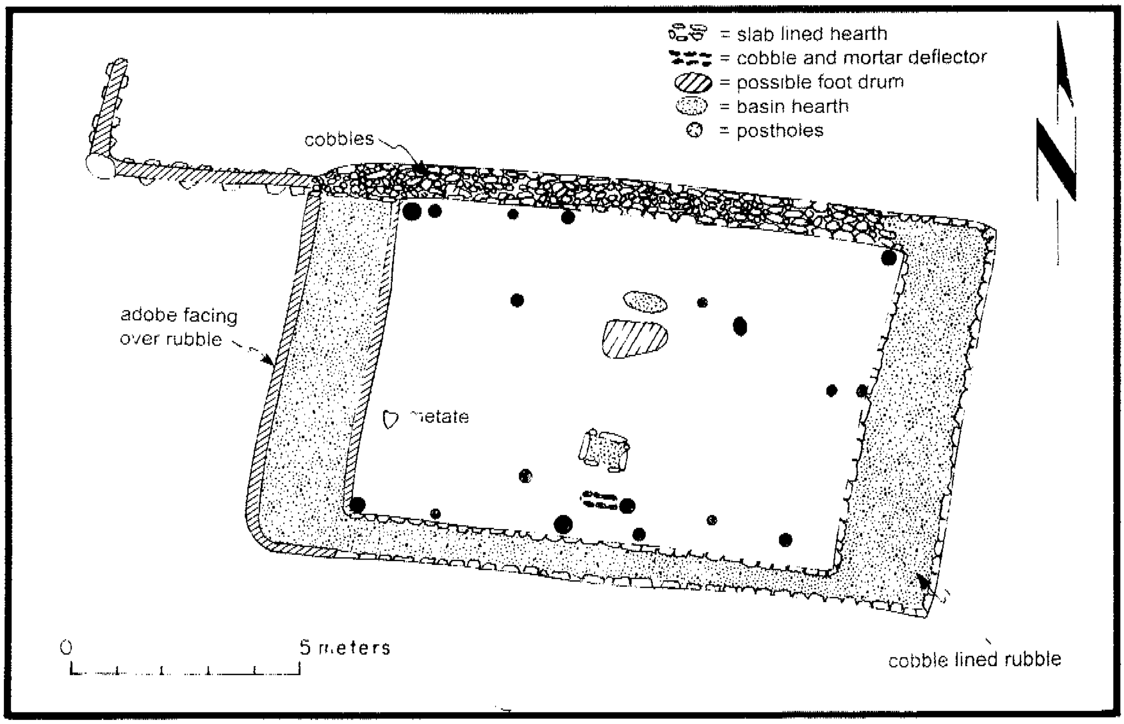

Figure 98. Plan map of the ceremonial structure, Feature 97.

Figure 99. Ceremonial structure (Feature 97), floor, looking east.

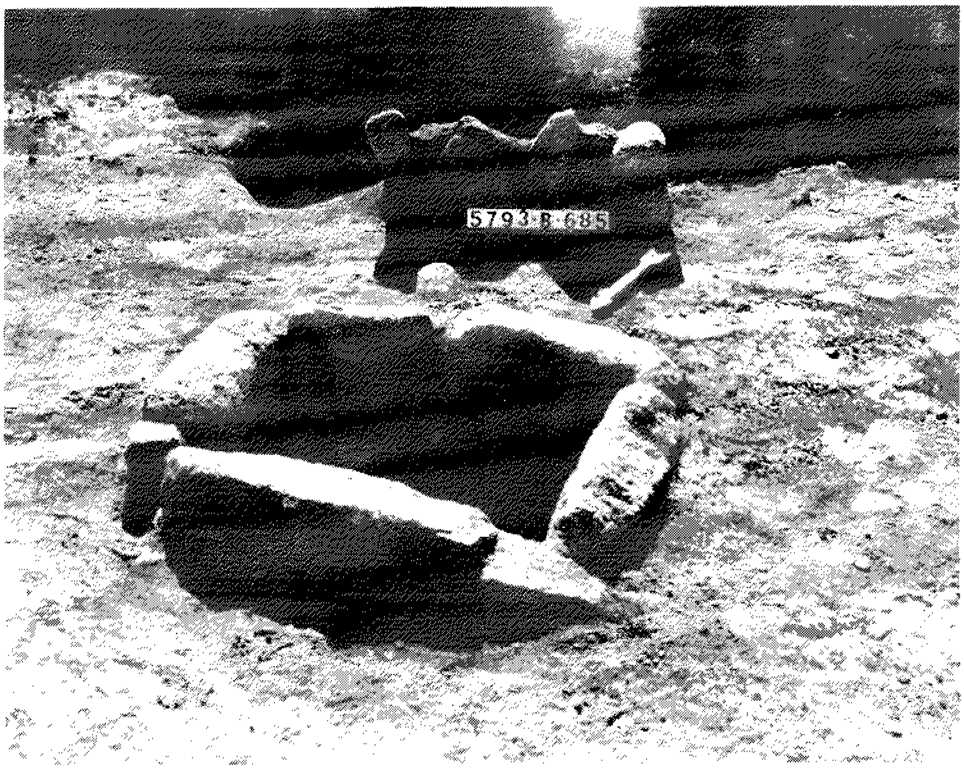

Figure 100. Ceremonial structure (Feature 97), firepit.

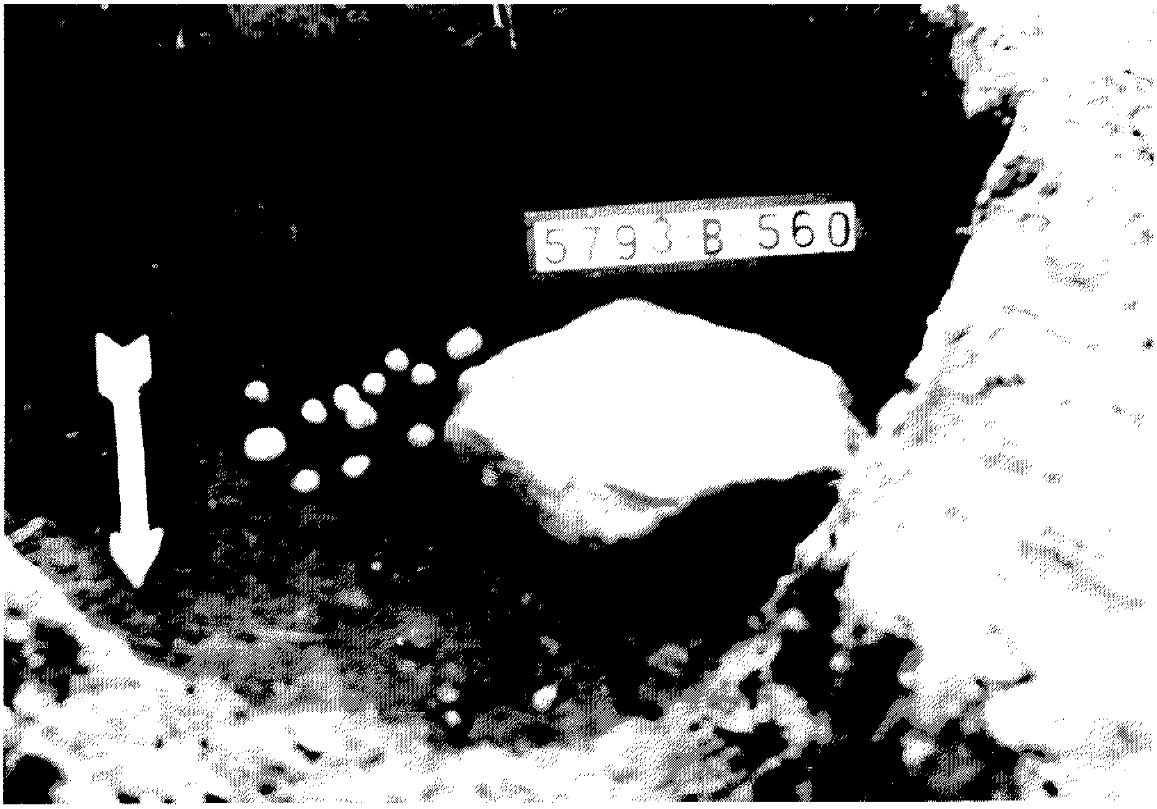

Figure 101. Ceremonial structure (Feature 97), lapidary stone and stone balls.

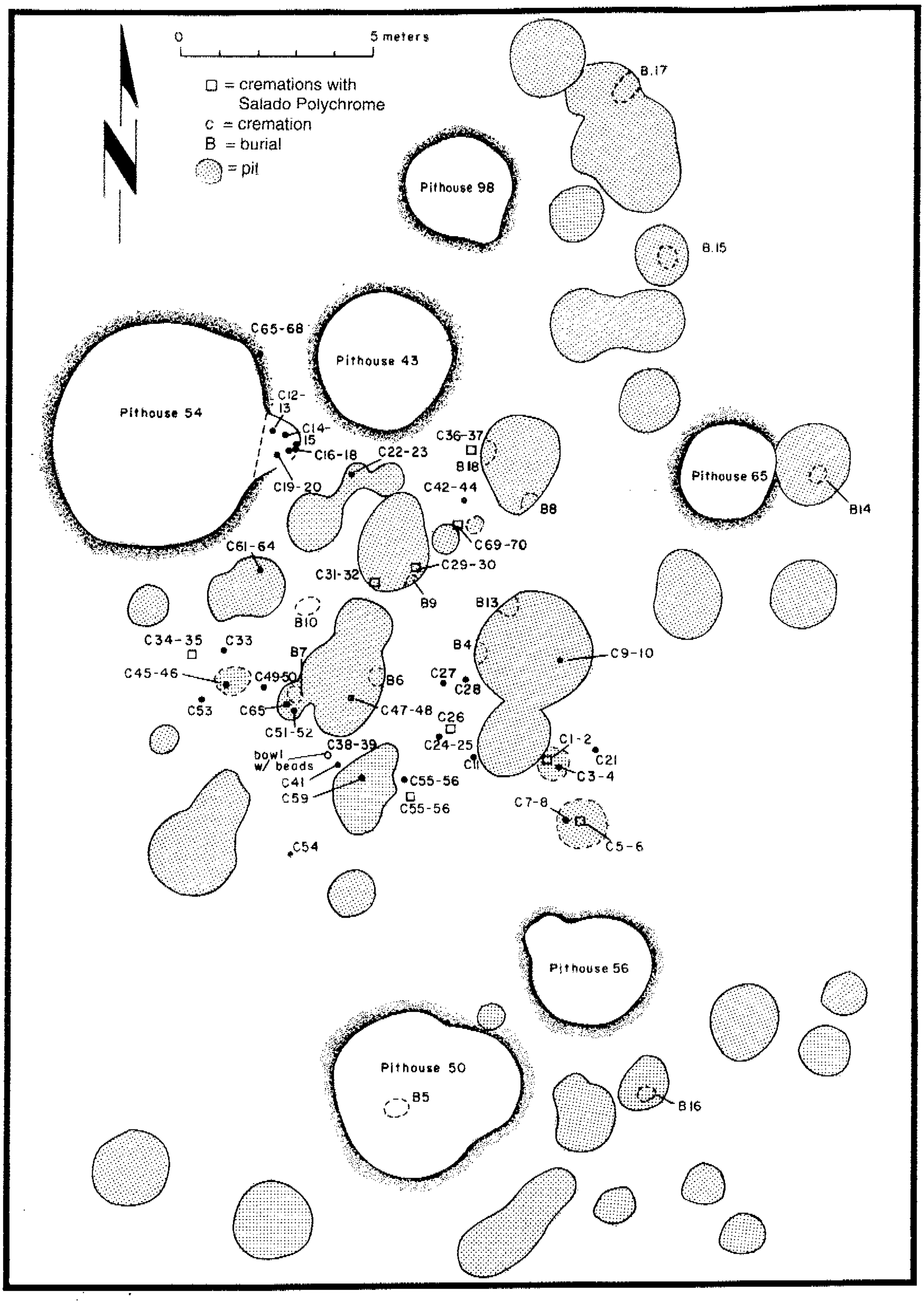

Figure 102. Map of east cremation cemetery.

SUMMARY OF SALADO OCCUPATION

The Salado presence at the Ormand Village site was extensive and complex, extending from as early as A.D. 1300 to as late as A.D. 1450. Associated features included four surface roomblocks, a large centrally placed, surface ceremonial structure, two separate cremation cemeteries on the extreme west and east of the site, and a center plaza area formed by the roomblocks placed roughly at cardinal points. The discovery of locally produced Maverick Mountain Polychrome and its stylistic derivative Tucson Polychrome pottery, in architecturally early roomblock proveniences and at the ceremonial structure, indicated maintenance of ceramic traditions originating from the Mogollon Rim and from southeastern Arizona (Brown 1973; Crown 1994; Franklin 1980; Lindsay 1987; Nelson and LeBlanc 1986; Wilson, this volume). The lack of Pinto Polychrome pottery at Ormand Village, however, does not support a major occupation prior to A.D. 1300 (Wilson, this volume). Locally produced Gila Polychrome pottery represented 10 percent of the total ceramic count, and is the second of two distinct ceramic traditions maintained but originating from the west and northwest of Ormand.

Remodeling episodes, extensive trash deposits, numerous mealing receptacles, strong evidence of intensive corn processing, and a site location on the first terrace above wide, excellent floodplains, suggested that the Salado occupation was supported and extended over several generations. It is possible that the Ormand Salado used the site as one of many residential bases within the Cliff Valley, cycling between bases every 20 to 75 years, as suggested for the Mimbres Valley Salado (Nelson and Anyon 1996; Nelson and LeBlanc 1986:250). However, the settlement pattern in the Cliff Valley shows regular spacing of Salado villages, which has been used as evidence of a more sedentary population (Nelson and LeBlanc 1986:119).

The surface roomblocks were constructed of adobe, either beaten into place, puddled, or perhaps formed with molds. Walls were also quite thin, averaging 20 cm for early construction and 40 cm for later construction. These thin walls could have supported a light roof (Lekson 1992a:11), but did not provide the necessary support for a multistoried structure. Several rooms did have roof hearths and other evidence of extensive use of the roof. Roofing material was rarely collected, and the few specimens mentioned in field records were not located for analysis. Species identification of beams was aided by records of dendrochronological specimens sent to the Tree- Ring Laboratory at the University of Arizona in 1966. The evidence suggests that cottonwood was used for larger support beams, and juniper and piñon used for smaller cross beams. Reeds and reed matting were used for closing material. A thin layer of adobe capped the roof exterior (see Fig. 36).

Although portions of just two roomblocks were excavated in 1965-1966, some temporal sequencing of construction can be presented. The north roomblock was constructed during the initial Salado occupation, perhaps as early as A.D. 1300. Associated with this initial construction was Maverick Mountain Polychrome and Tucson Polychrome pottery in floor and subfloor proveniences. Most of the east roomblock was built as a contiguous whole sometime in the mid-A.D. 1300s. Room 31 in the east roomblock provided the one dateable tree-ring specimen for the entire site, cut for roofing sometime after A.D. 1342. Beneath the north edge of the east roomblock was trashy fill from the initial occupation at the north roomblock, measuring 28 cm below Room 29. Extensive later construction onto the north roomblock may have been contemporaneous with the two later room additions onto the northeast corner of the east roomblock, since both utilized a "black" adobe. This last remodeling episode may date to the late fourteenth or early fifteenth centuries A.D.

North roomblock rooms averaged 16.8 sq m, with a mean room length of 4.9 m and a mean room width of 3.4 m. The mean for interior door widths averaged 40.4 cm, and doors were placed 34 cm above the floor on average. This roomblock also had several interior vents between rooms. These averaged 26.8 cm in diameter, and were typically 35 cm above the floor. Other floor features in the north roomblock included an adobe step in Room 23, ash pits, pits, and subfloor pits in various rooms.

East roomblock rooms were somewhat smaller on average, measuring a mean of 15.4 sq m. Mean room length was 4.8 m, and mean room width was 3.2 m. Construction techniques were identical to the north roomblock. Later additions (Rooms 35 and 36) followed the same pattern as the north roomblock, using black adobe with thicker walls than earlier construction. Interior door widths averaged 42.5 cm, and the mean height of doors above floor surfaces was 41.3 cm. The one open exterior door was wider (60 cm) and level with the exterior plaza surface, opening into a sunken floor 25 cm below the plaza level. These elevational differences between exterior surfaces and interior roomblock floors were not commented on in field records for the north roomblock. Two rooms in the east roomblock may have had specialized functions, and both had restricted access through the roof. Room 34 had a depressed center strip containing all the floor features, and raised adobe floor areas on either side of this depression. This room looks similar to ethnohistoric documentation of Hopi and Zuni storage rooms (Dohm 1992; Fleming and Luskey 1986; Fowler 1989; Gaede 1986; Judd 1925). Room 79 may have been a ceremonial room, with a floor groove, an adobe-collared circular hearth with a slab deflector, and many paint stones, palettes, and a stone bowl on the floor.

The Ormand Village pattern of aggregated roomblocks enclosing a plaza has similarities to other Salado sites in the Cliff Valley, the Mimbres Valley, and the Dutch Ruin near Redrock, New Mexico (Lekson n.d.; Nelson and LeBlanc 1986). Aggregated pueblos are also noted at Salado sites in the Middle Gila River and tributaries south (DiPeso 1958; Franklin and Masse 1976; Gerald 1975), some with "transitional" traits (Brown 1973; Franklin 1980:47). Very large aggregated sites along the Mogollon Rim (Lindsay 1987; Lowell 1988; Reid 1989) present a compelling origination example, although these east-central Arizona sites are much larger than sites found in the Upper Gila Valley. Compound settlements and platform mounds in the Tonto Basin have been presented as a strong architectural contrast to the aggregated pueblo pattern (Doyel 1976:10; Nelson and LeBlanc 1986:3), although recent investigation in this area discovered a high degree of variability in architecture (Clark 1995:374-384; Elson 1996:137; Stark and Elson 1995:37), perhaps supporting the multi-ethnic dimension of the Salado phenomenon.

Social units structure how larger pueblos aggregate; large pueblos were not integrated units but clusters of smaller household modules, reducing dispute but inhibiting cooperation (Johnson 1989:381). Studies of household units at the very large Grasshopper Pueblo (A.D. 1275 to 1400) discovered two distinct household types that may be useful in understanding the Ormand Village example. Household units at Grasshopper ranged between one-room units and units with two or more rooms. The multiroom households typically contained a room for domestic use and a room for storage and manufacturing activities. One-room households at Grasshopper relied heavily on roof use and storage. Household size and variability were related to changes in domestic groups, changes in the occupation of Grasshopper Pueblo, and to wealth and prestige factors. Larger socioreligious units were noted, following ratio patterns of three households to a ceremonial room and six households to a kiva (Reid 1989:85-86).

The Grasshopper evidence suggests provocative insights into the household and suprahousehold structuring at the Ormand Village. Definitive statements on social structure at Ormand were hampered by partial excavation, but certain patterns were clear. Ormand had household units that also ranged between one-room units and households with two or more rooms. Interestingly, the partial excavation of the north roomblock revealed only larger households (two or more rooms), while the east roomblock contained a number of one-room households and a few larger households. Storage rooms within households were not found, but roof use was extensive for both one-room and larger households. One would expect that more ceremonial rooms would have been noted within the interior of both roomblocks; no specialized rooms were noted in the north roomblock. The east roomblock had one room (Room 79) that contained strong suggestions for ritual use. Using our present knowledge of Ormand, the pattern of households connected to an internal ceremonial room was found only in the east roomblock, and not with the same ratio noted at Grasshopper Pueblo. This difference between the north and east roomblocks in terms of household structure and presence or lack of specialized ritual space is heightened by some of the faunal evidence from these structures. Bird species were highly represented at the north roomblock, consisting mainly of wing and leg elements commonly interpreted as important ritual items used in medicine bundles. White pelican *(Pelecanus erythrorhynchos)*, turkey, and roadrunner remains were found in Room 23, and golden eagle *(Aquila chrysaetos)* in Room 19. An almost complete coracoid from a Canadian goose (*Branta canadensis*) was found in the roof fall in Room 15. A partial scapula from a turkey vulture came from floor fill in Room 22 (Akins, this volume). While bird remains were also found at the east roomblock, the presence was much reduced (n=5) from the variety and total count found at the north roomblock (n=15, see Table 45, Akins, this volume).

Several other differences were found between the Grasshopper Pueblo example and Ormand. Hearths were found in nearly all rooms at Ormand. Since hearths are used to define domestic space (Adams 1983:45), does this mean that household units with many rooms, each with a hearth, signify densely populated households at this Salado settlement? Two distinct hearths were found at Ormand: slab-lined and simple basin-shaped fire pits. Slab-lined hearths predominated at both roomblocks, represented in 69.2 percent of north roomblock rooms and 56.3 percent of east roomblock rooms. Mealing stations, consisting of one to three bowls or bowl fragments set into the floor with associated metate rests, were found in 53.8 percent of the north roomblock rooms and 43.7 percent of the east roomblock rooms. Two exterior doors were found in the east roomblock; one was open at the time of abandonment. Other exterior doors in both roomblocks may have gone undetected due to wall erosion.

Perhaps most striking about the Salado architecture at the Ormand site, and at other Salado sites, was the lack of obvious storage rooms. Several rooms in the east roomblock had either no features (Rooms 35 and 36) or mealing stations but no other features (Room 30), and could have been used for storage. Food must have been stored in living spaces, perhaps similar to ethnohistoric accounts of Western Pueblos (Dohm 1992). Historic documentation of Hopi and Zuni roof storage and use (Dohm 1992; Fleming and Luskey 1986; Fowler 1989; Gaede 1986) may also aid our understanding of the extensive use of roof surfaces found at Ormand Village and other Salado sites. One of the greatest information gaps from the Ormand site and other contemporary Salado sites stems from the loss of the few botanical samples collected, and our historical misfortune of excavation prior to ethnobotanical flotation sampling. Pollen, flotation, and macrobotanical studies would certainly aid our understanding of room function and use, and future excavators of Salado sites will hopefully bear this in mind.

The centrally located ceremonial structure was a rare example of Salado ritual architecture (Doyel 1988:289; LeBlanc 1989:196-197), and suggests communal use and availability. The large size and central location also suggests a commitment to village-level social integration (Adams 1989; Lowell 1988). If most of the Salado period rooms were occupied at the same time, with at least 100 or more rooms, the population was probably greater than 200 individuals at a very conservative estimate. Scalar stress theory (Johnson 1982) predicts an increase in size in communal structures in response to the need for integrating larger numbers of village members (Adler 1989:41). The Ormand ceremonial structure is, at present, the only known large ceremonial structure within the Cliff Valley, and may have held particular significance for the Salado settlements within this area.

The Salado presence at the Ormand Village shares many distinct behavioral characteristics with Salado settlements across southeastern Arizona and southwestern New Mexico. An environmental preference for the Upper Chihuahuan desert and Upper Sonoran grassland river valleys is noted (Brown 1973; Franklin 1980:223). Salado sites tend to be found on the first terrace above the floodplain (Brown 1973; Doyel 1978:209, Franklin 1980; Shelley and Altshul 1996). Isolation from other culture areas is also noted, with few ceramic trade contacts found (Franklin 1980:226; Wilson, this volume). The exception to this appears to be the Mimbres Valley Salado occupation, with evidence of strong ceramic trade connections to the El Paso area (LeBlanc 1989:192-196; Nelson and LeBlanc 1986:246-247). The three Salado sites located in the Mimbres Valley are interestingly located at the extreme eastern edge of known Salado sites.

Most of the similarities that exist between the Ormand Village site and other Salado horizon sites can be found to the west, in areas of east-central and southeastern Arizona. Some authors consider southeastern Arizona the true "core" area of the Salado, since Salado Polychrome pottery reaches peak representation here, typically over 10 percent of the total ceramic assemsblage (Franklin 1980; Lange 1992:328). The dynamic spread of populations associated with the production of Salado polychrome pottery in the fourteenth and fifteenth centuries is discussed in more detail in the section titled "Examining the Ormand Salado" (Wallace, this volume). The Ormand Village Salado occupation was clearly part of a larger phenomenon that drew upon multi-ethnic sources for building styles, ceramic traditions, ritual activity, and potentially every aspect of living in this large and complex community.

ORMAND CERAMIC ANALYSIS PART I: METHODOLOGY AND CATEGORIES

by C. Dean Wilson

Only artifacts from well-described proveniences were included in material culture analyses, resulting in the analysis of 23,805 sherds and 83 complete or partially reconstructed vessels. This included all floor and floor fill designated artifacts from features, and some general fill designated artifacts from pithouses. A list of exact proveniences included is provided in Appendix 2. While this does not include all the pottery recovered during the original excavations, it is a sizable and fairly representative sample of pottery recovered from pithouses and surface room contexts. Previous discussions of pottery from the Ormand site are limited to a brief unpublished report by Harlow (1968) that described the decorated pottery. Although a very small proportion of the pottery recovered from this site constituted types associated with Mimbres Mogollon pithouse occupations, the great majority of the ceramics represent types associated with fourteenth-century Salado occupations. Therefore, data recorded during this study presented a rare opportunity to systematically describe large ceramic assemblages associated with the poorly known Salado occupation of the Upper Gila drainage of west-central New Mexico.

Analysis Background and Goals

The ceramic analysis system used in this study was designed and directed by Dean Wilson from December 1995 to April 1996. Ceramics were analyzed by several volunteers including Bob Green, Dennis Hall, Robin Lyle, Martha Mace, Roland Mace, and members of Museum of New Mexico, Office of Archaeological Studies staff, including Kelly Hoodenpyle, Macy Mensel, Pat Severts, and Laurel Wallace. Clays from potential sources in the vicinity of the Ormand site were collected and characterized in the field during May 1996 by Martha Mace, Roland Mace, and Dean Wilson.

Data recorded during Ormand ceramic analysis provided for the examination of a number of issues, including the dating of various features and contexts, determinating origin and affiliation of occupations on this site, describing patterns of vessel production and exchange, and establishing vessel function and use. To support these investigations, a wide range of ceramic type categories and descriptive attribute classes were recorded.

Analysis of sherds involved assigning unique lot numbers to existing field specimen (FS) designations by ceramic type categories, creating unique descriptive attribute class codings. Information about each lot was recorded on a distinct data line. Consecutive lot numbers were also assigned to each separated group of sherds. Information recorded for sherds included FS and lot numbers, typological assignments, descriptive attribute codings, and sherd count and weight. Sherds assigned to each lot grouping were placed into a separate bag along with a small slip of paper with the site, FS, and lot number. This provided for the matching of ceramics in a particular bag with data lines during subsequent editing and more detailed analyses.

Descriptive Attributes

Descriptive attribute categories recorded during the analysis of Ormand ceramics include interior pigment, exterior pigment, interior manipulation, exterior manipulation, interior slip, exterior slip, vessel form, vessel appendage, modification, rim radius, and rim arc. Additional attributes, recorded for a smaller subsample of sherds, include temper, stylistic, and refiring analyses.

Because the majority of sherds from the Ormand site were tempered with similar material, temper categories were recorded for a small subset of the pottery analyzed. Temper, as described here, refers to either aplastic particles intentionally added to the clay or particles naturally occurring in the clay serving the same purpose. Temper categories were initially recorded by examining freshly broken sherd surfaces through a binocular microscope. Different temper categories are recognized based on combinations of color, shape, fracture, and sheen of tempering particles. Most of these categories reflect material sources available to and utilized by prehistoric potters in the Upper Gila drainage. A very small sample of sherds displaying representative temper were subjected to petrographic analysis (see Hill, this volume).

Local volcanic temper refers to the presence of natural volcanic inclusions common in the local alluvial clays. Visual examination and petrographic analysis of surrounding clay sources and ceramics from the Ormand site indicate that the most suitable paste clays from this area were from the uppermost alluvial or pedogenic sources that have been weathered from surrounding volcanic outcrops and volcanic-clastic sandstone outcrops (Wilson 1994). These sources usually contain numerous fragments of igneous rock and sandstone, and in most cases the addition of separate tempering material would have been unnecessary. Additional aplastic material that may have been added as temper is derived from the same parent material as the local clay, so that it is not possible to distinguish inclusions that may have been intentionally added to those occurring naturally in the clay. Petrographic analysis indicates that these inclusions consist primarily of quartz, feldspars, and rock fragments (Hill, this volume). Basalts, rhyolite porphyries, and rhyolitic tuffs are also present in varying proportions.

Other temper types identified include sand, sherd, and sand and sherd. These appear to represent materials added to the clay, and are probably indicative of pottery produced in other regions.

Paint pigment categories were recorded for both interior and exterior surfaces. Different pigment categories are differentiated by surface relief, delineation, and color (Shepard 1956). The great majority of the painted pottery recovered from the Ormand site exhibited a black lustrous organic pigment indicating the use of vegetal paint only. Other pigment categories recognized during the present study include indeterminate, organic, mineral black, mineral red, white clay paint, black pigment with white clay paint, red clay paint, and black organic with white paint.

The variable "manipulation" refered to surface treatments describing coil construction, the degree of obliteration of coils, as well as subsequent surface textures, decoration, and polishing. Manipulation categories were recorded for each surface. Values used were plain unpolished, plain polished, scored, incised, polished over incised, punctate or punched, applique, filleted (neckbanded), single fillet, single fillet polished, clapboard overlapping (plain) corrugated, indented corrugated, polished indented corrugated, and smeared corrugations.

Slip refers to intentional applications of distinctive clay, mineral, or organic deposits over the vessel surface. The use of slips allows for black, white, or red surface colors, often not possible using paste clays or firing techniques normally employed. Slip categories recognized during the present study include indeterminate, white slip, red slip, white and red slip, smudged, and fugitive red.

Vessel form categories were assigned to all sherds and vessels based on observed shape. The resolution of vessel form characterization was often dependent on sherd size and portion of vessel. The consistent placement of sherds into similarly defined vessel form categories provided for basic functional comparisons. More specific vessel form categories were utilized during the analysis of whole vessels. Vessel form categories recognized during sherd analysis included indeterminate, indeterminate polished body, bowl body, bowl rim, flared bowl rim, jar body, corrugated exterior polished interior jar body, corrugated exterior bowl, seed jar rim, handle only, pipe, olla rim, ladle, effigy, and canteen rim.

Evidence of post-firing alteration of vessels or sherds for repair or modification into tools was also recorded. Most of the sherds did not exhibit evidence of modification and were simply assigned to a "none" category. Modification categories recognized during the present study include indeterminate, drill hole (repair), small regular form (abraded), modified edge (beveled), and reshaped rim. Small regular form (chipped) refers to small items of indeterminate function shaped through chipping.

Description of Complete Vessels

In addition to the data recorded during sherd analysis, other information was recorded for the 83 complete or partially complete vessels recovered from the Ormand site. These included vessels identified during sherd analysis as well as whole or reconstructed vessels stored in the Museum of Indian Arts and Culture (MIAC) whole vessel collection (Figs. 103-115). Reconstructed vessels composed of sherds identified during inventory analysis were first analyzed as sherds and then identified by vessel number.

Complete and partially reconstructed vessels provided information on the shape and potential uses of ceramic vessels that could not be ascertained from sherd analysis alone. In addition, the combined recovery of vessel forms and types from specific proveniences determined pottery-related activities in these contexts. Attributes used in the sherd analysis were also recorded for reconstructed vessels along with some additional information.

Vessel dimensions were recorded including rim diameter, orifice diameter, maximum diameter, and height. Profiles were also made for each vessel. All vessels were photographed. Painted decoration was sketched and described, the relative completeness and construction status was noted, and location and degree of wear, as well as patterned location of sooting, were also recorded.

Shape and profile of recovered vessels indicated that the great majority exhibited a single style. The lower portions of vessels or bases were spherical; the upper portions gradually curved inward toward the upper third of the vessel with a terminal outward flare. Curve angle tended to be very gentle and fluid for both jar and bowl forms. Curves and basic profiles of most jars and bowls were remarkably similar despite form differences, reflecting a relative "squatness" of vessel height.

Basic vessel shapes contrast dramatically to those associated with earlier sites in the Mogollon and Anasazi regions where bowls and jars are shaped very differently. The size of vessels at Ormand and other Salado sites appear to be unusually large as compared to those produced by earlier groups in this area. It is unlikely that the forms represented at Ormand and nearby Salado sites developed directly from Mogollon forms in the Cliff area, but probably represent the spread of a distinct ceramic technology from areas in east-central Arizona.

While a few open bowls with gradual inward curves were recovered from Ormand, most exhibited inward and outward curves, similar to some of the vessels defined in other studies as wide mouth jars (see Fig. 116). Bowl forms were assigned here to vessels with relatively wide rim diameter. These included all vessels where the rim diameter was at least 1.5 times greater than the vessel height. Flared bowls exhibiting a rim diameter to vessel height ratio were classified as wide bowls. Those exhibiting a rim to height ratio between 1.5 to 1.9 were classified as narrow bowls. An examination of these vessels indicate forms that are in many ways intermediate between flared bowls and wide mouth jars. Vessels with a ratio of greater than 1.9 were classified as bowls. Despite the constriction on these vessels, their overall shape is such that they would have been much better suited for activities such as food serving or preparation, requiring open forms rather than cooking or storage activities, which require closed forms.

Jar forms tended to exhibit rim diameters less than or only slightly greater than the vessel height. An attempt was made to separate jars into narrow- versus wide-necked categories. Wide-necked jars refer to vessels in which rim diameter is as great or only slightly smaller than the maximum diameter of the vessel. Such vessels would have been best suited for cooking or the storage of solid items. Narrow-necked jars refers to vessels in which the rim diameter is significantly smaller than the maximum width of the vessel. Such vessels may have been best suited for storage activities. While some vessels were easily separated into these groups, the classification of some jar vessel forms tended to be more subjective. Miniature forms refer to jar and bowl forms too small to have been utilized for those functions. Such forms are assumed to have been utilized as toys or for ceremonial purposes.

Typological Categories

All ceramics examined from the Ormand site were assigned to ceramic type categories based on combinations of characteristics with spatial, functional, or temporal significance. The assignment of types involved first the determination of associated tradition, next ware group, and finally ceramic type. Recognition of ceramic traditions involved the separation of pottery into broad groups reflecting region of origin or "cultural" tradition. Sherds from the Ormand site were assigned to ceramic traditions or series based on temper, paste, and paint characteristics. Finally, ceramic items were assigned to ceramic types based on temporally sensitive painted decorations or textured treatments. During the present study ceramics were assigned to a large number of type categories based on differences in surface manipulation, texture, and painted decoration. Ceramic type categories provide the basis for the examination of various trends and issues. For example, the placement of sherds into spatially sensitive traditions allows for the examination of issues pertaining to interaction and exchange. Recording ware categories allows for the examination of basic functional trends. The grouping of sherds into the distinct types provides for the examination of temporal trends.

The majority of sherds recovered from the Ormand site exhibited paste, temper, surface manipulation, and styles similar to those noted on pottery from various sites found throughout the Southwest attributed to the Salado or Western Pueblo culture (Colton and Hargrave 1937; Crown 1994; DiPeso 1958; Franklin 1980; Gladwin and Gladwin 1930; Lindsay and Jennings 1968). These ceramic similarities provide most of the impetus for speculation that the Ormand site was occupied by Salado groups. Within the Ormand assemblage, most ceramics exhibited similar pastes and forms. Most pottery was assigned to Salado Plain Brown, Salado Red, Salado polychromes (Roosevelt Red Ware), and Maverick Mountain-Tucson Polychrome types based on the presence of slipped surfaces and painted decorations. A few sherds with local pastes and temper categories exhibited manipulations or painted decorations indicating association with earlier Mimbres Mogollon occupations. It is usually easy to differentiate Mimbres White Wares from Salado polychromes based on slip, paint type, forms, and designs. In contrast, due to similar clay resources used during widely separated periods, and similar surface treatments of plain wares, the differentiation of Mimbres Brown Wares from Salado utility wares can be a difficult if not impossible task. Given the dominance of the Salado occupation at the Ormand site, some of the utility ware pottery potentially produced by Mogollon groups could have been assigned to Salado plain ware types. Other regional traditions were recognized by the presence of pastes or stylistic attributes not employed locally, and include very low frequencies of Casas Grandes or Jornada Mogollon pottery.

Indeterminate Pottery Types

Single sherds that could not be assigned to a particular ware group were assigned to an indeterminate category. Sherds assigned to a particular ware, but indeterminate as to a specific type, were assigned to general ware categories. These include indeterminate white, indeterminate late white, and indeterminate red.

Salado Brown Utility Ware Types

The majority (74.9 percent) of the sherds and just under half (49.3 percent) of the vessels recovered from the Ormand site were brown utility wares exhibiting similar pastes and temper. Utility wares from this site display very similar ranges of surface treatments and shapes as noted at contemporaneous sites in surrounding regions attributed to the Salado (Abbott 1994; DiPeso 1958; Franklin 1980; Nelson and LeBlanc 1986; Simon 1994a; Stark 1995; Stark and Heidke 1992). An examination of surface characteristics and forms of fourteenth-century utility wares indicates the production of surprisingly similar utilitarian pottery over an extremely wide area at least as large as that associated with Salado polychromes, and probably larger. The strong similarities in the utilitarian pottery produced over an extremely wide area in the fourteenth century is often lost in the wide assortment of plain ware traditions used to describe a similar utility ware in different regions. In contrast, the distinctness of Salado period assemblages from earlier plain ware assemblages may also be obscured through the assignment of earlier local Hohokam or Mogollon plain ware into the same type categories as Salado plain wares, often without reference to possible differences in plain ware associated with different occupations. While plain utility wares from various Salado sites display a number of characteristics in common with earlier Mogollon Brown Ware and Hohokam plain wares types, the overall range of treatments and forms noted in the utility wares at fourteenth-century Salado sites appears to be distinct.

Red wares are separated from brown wares solely based on the presence of a red slip. Plain utility and red wares from contemporaneous sites have long been assigned to types of a number of wares or series including Salado, Gila, Cliff, Salt, Verde, Tonto, or Roosevelt Red Wares based on associated paste and temper and area of recovery (Colton and Hargrave 1937; Gladwin and Gladwin 1930; Hayden 1957; Nelson and LaBlanc 1986; Lindsay and Jennings 1968; Stark 1995). While these type names are still sometimes used to characterize Salado utility wares, the assignment of utility ware pottery to distinct spatially based groups must be based on detailed compositional analysis (Abbott 1994; Stark 1995; Stark and Heidke 1992). Attempts to identify a possible eastern variant of Salado utility ware produced in southwestern New Mexico (Lekson 1992a; 1992b) are reflected by the definition of "Cliff" Plain Ware at Salado sites in the Mimbres Valley (Nelson and LeBlanc 1986). The descriptions of the various Cliff types, however, are such that it is probably not possible to differentiate the plain ware from eastern Salado sites and those in other regions of the Salado without detailed temper or compositional analysis.

Therefore, during the present study, the undecorated pottery recovered from Ormand was not assigned to groups of specific wares or series. Instead utility wares were assigned to a series of descriptive categories based on combinations of surface polish, slip, and texture characteristics (Abbott and Schaller 1992; Simon 1994a; Stark 1995; Stark and Heidke 1992). Variation noted in surface characteristics is sometimes used to divide utility wares into three basic groups: plain wares, red wares, and corrugated wares. Such divisions, however, do not always adequately reflect the full range of variation of utility wares, as some sherds or vessels exhibit various combinations of these treatments. Thus, during the present study, brown ware and red ware pottery were placed into a fairly large number of type categories based on various combinations of surface treatments. Ceramic categories used in this study are such that it is fairly simple to lump the types defined here into the more broadly defined types or ceramic groups often utilized in other studies.

Most of the utility wares from the Ormand site reflect the use of similar clay sources, construction techniques, and firing technologies. Similar pottery from some Salado sites have been characterized as having been produced using the paddle-and-anvil technique often associated with the Hohokam culture (Simon 1994a). Much of the utility ware pottery recovered does exhibit characteristics such as variability in thickness, polishing marks or striations, and evidence of wide coils similar to that characterized for pottery thought to be made using the paddle-and-anvil technique. A careful examination of this pottery, however, yielded no strong evidence of the use of a distinct paddle-and-anvil technique. Instead, characteristics noted in brown ware from the Ormand site and other contemporaneous brown wares may reflect techniques and conventions associated with the production of large and distinctively shaped utility wares, common at Salado sites, using a variation of earlier employed coil-and-scrape techniques. Careful examination of utility wares in Salado sites from a number of regions, as well as experimental studies, will be required, however, before issues concerning the full nature and origin of the technology used to produce these brown wares can be evaluated.

Almost all the utility wares recovered from the Ormand site exhibit high iron clays with volcanic temper, reflecting the use of self-tempered clays occurring in alluvial and pedogenic deposits in areas of the Mogollon Highlands along the Upper Gila drainage. Refiring analysis indicated that brown utility wares from the Ormand site consistently fired to similar red colors. While the brown to red surface color commonly occurring in these utility wares have been characterized as reflecting the use of a oxidizing atmosphere; the wide range of surface and paste colors from brown, red, buff, gray to black may actually indicate variation associated with low-oxidizing or neutral atmosphere. The dominance of utility wares with gray to brown surfaces indicates the effects of low iron or neutral atmospheres on high iron clays. Utility ware vessels tend to be quite large and varied in form. While the majority of plain utility ware sherds from Salado period sites are derived from jars, bowl forms are also relatively common. Jars tend to exhibit flared, gradually curving rims, with wide openings. Most, but not all the bowls of these plain wares also exhibit flared rims, sometimes making the distinction of plain bowl and jar forms difficult to determine. Vessel walls tend to be relatively thick, usually ranging from about 4 mm to 1 cm wide.

The wide range of treatments apparently employed in the production of utility wares at the Ormand site and surrounding sites resulted in the recognition of a large number of utility ware types. Type categories were separated on the basis of a number of attributes including slip polish, slip, smudging, and textured treatments. The common occurrence of red slips on sherds otherwise exhibiting similar ranges of surface manipulations resulted in a parallel typology of unslipped brown ware and slipped red ware types. Categories used during the present study describe the combination of surface treatments present.

Most of the unslipped brown ware exhibiting plain unsmudged surfaces from the Ormand site were polished on at least one surface. Surfaces were sometimes highly polished, but are usually moderately to slightly polished. Polishing often resulted in a bumpy or dimpled surface, and the sporadic remnants of the wide coils were sometimes present. Polishing streaks may be oriented diagonally or parallel to the rim. Sherds exhibiting these characteristics are similar to Alma Plain, a Mogollon Brown Ware type (Haury 1936), although the range of vessel walls are wider and vessel shape is different. The distinction of individual Alma Plain sherds from the later Salado period polished utility wares, however, is usually impossible. During the present study, Alma Plain was only assigned to sherds clearly representing earlier Mogollon forms, although it is very likely that some of the sherds placed into polished brown ware types could actually represent Alma Plain. The very small number of sherds placed into Alma Plain are described later in this section.

Most of the polished brown utility wares from the Ormand site were assumed to have been produced during the Salado occupation and were classified as plain polished body. Because some forms exhibit textured treatment along the neck, rim sherds exhibiting similar characteristics were placed into a separate plain polished rim, and includes most whole brown ware vessels (see Figs. 103-105). Similar smoothed utility wares with a single unobliterated wide coil near the rim were classified as polished with single fillet near rim. Utility wares exhibiting a plain polished surface with a series of distinct parallel striations created during the smoothing or wiping of the wet exterior surface were classified as striated exterior.

Similar pottery with smoothed surfaces but lacking surface polishing were assigned to other categories. These surfaces often exhibited streaks and irregularities. Surfaces are usually rough in appearance, and white temper particles may be visible through the surface. Body sherds exhibiting these manipulations were classified as plain unpolished body, and rim sherds were classified as plain unpolished rim (Fig. 103). Small, unpolished, crudely made, and low-fired effigy or miniature forms were classified as mud ware (see Fig. 108e).

In most previous studies unpolished plain wares from Salado components were not usually separated from plain polished forms. A similar convention to that used here involves the separation of polished and unpolished pottery within Mogollon Brown Wares, resulting in the recognition of Alma Plain. While most of the ceramics assigned to this category simply represent unpolished variants of Salado plain wares, a low frequency could represent Alma Rough, a type associated with earlier Mogollon occupations (Martin 1943).

Other plain brown ware ceramics exhibit plain unslipped exteriors along with highly polished and intentionally sooted interiors. Intentionally sooted or smudged surfaces consist of very lustrous dense black surfaces deposited during the final stages of the firing process. During this time the fire is smothered with organic material in order to blacken deposits on one or both vessel surfaces, although in the prehistoric Southwest this treatment is most common on interior surfaces. Smudged interior surfaces are often highly lustrous and black in color contrasting dramatically with unsmudged exterior surfaces, providing a means to decorate vessels high in iron in what would otherwise be a difficult surface to decorate beyond added surface texture. Smudged surfaces, however, may have been produced for functional as well as aesthetic reasons. Smudging apparently helped produce a hard durable surface and reduce permeability.

Plain sherds exhibiting smudged surfaces were assigned either to plain smudged interior body or plain smudged interior rim (see Figs. 106-107). Smudging of plain ware vessel interiors represents a very long-lived trait over an extremely wide area covering most of the Hohokam and Mogollon regions, but appears to have become more common during later occupations of these regions. Thus, whatever the ultimate source of Salado plain ware technology, it is not surprising that utility wares continued to be smudged. While most of the sherds from Ormand assigned to smudged categories represent Salado plain wares, a few could represent Reserve Smudged from earlier Mimbres Mogollon occupations (Rinaldo and Bluhm 1956).

Corrugated pottery (Fig. 108) exhibits thin obliterated coils or indentations on exterior surfaces. All unslipped and unpainted vessels exhibiting corrugated treatments were assigned to brown ware types. Corrugated utility wares were placed into a variety of types depending on the obliteration. Ceramics exhibiting exteriors with thin overlapping coils without indentations were classified as plain corrugated. A few rim sherds exhibiting similar treatments were assigned to a plain corrugated rim category. Those with regularly spaced indentations along the corrugations were described as indented corrugated (Fig. 117a). Those with polished indented treatments were classified as polished indented corrugated. Sherds exhibiting exterior surfaces similar to indented corrugated types, but with partly obliterated coils, were described as smeared corrugated (Fig. 117b). Smeared corrugated ceramics from Ormand often had fine coils and regularly spaced pitted patterns. A high frequency of pottery with smeared corrugated exteriors had smudged interiors, and were classified as smeared corrugated smudged interior. While corrugated types such as Mimbres Corrugated and Reserve Corrugated are fairly common in earlier Mogollon occupations, most of the corrugated pottery probably represents a variation of the Salado utility wares, indicated by the dominance of finely coiled and patterned corrugated construction, distinct from those normally noted in Mimbres Corrugated (Woosley and McIntyre 1996). Sherds with exterior incised designs created using a sharp tool or fingernail were classified as plain incised exterior (see Fig. 117c). Incised designs are often very small, well executed, and sometimes arranged in rows.

A very small number of brown ware sherds exhibited distinct manipulations. Inferred vessel shapes indicate they represented utility types produced during the Mogollon period. All of these sherds exhibited plain surfaces and were classified as Alma Plain polished. It was only possible, however, to identify the most distinct of the Mogollon Brown Wares given the considerable overlap in the utility ware vessels produced by Mogollon and Salado groups in this area.

A single utility ware sherd exhibiting a light gray paste, large sand temper, and an unpolished smoothed surface was distinct from the other utility wares from this site. These characteristics are similar to those noted in Anasazi gray wares produced over wide areas. This sherd was assigned to a plain gray category, indicating a probable origin somewhere on the Colorado Plateau.

Salado Red Utility Ware Types

Unpainted ceramics exhibiting similar pastes noted in local brown utility wares, but with distinct red slips on at least one surface, were assigned to red utility ware types. While unslipped types fired in an oxidation atmosphere may exhibit distinct red surfaces, red wares as defined here are limited to types exhibiting a distinct dark red slip. The red slips are thin and even in profile and the distinction between the lighter paste and red slip is sharp. Slip sources tend to contain fewer inclusions than the paste so that underlying fragments in the paste are often covered by the slip. Fire clouds or smudging may obscure slipped surfaces, sometimes making their identification difficult.

Most of the exteriors of slipped types from the Ormand site are a deep bright red to dark red color, similar to red slipped areas of Salado polychromes. These slips probably represent the use of local volcanic-derived sources similar to those used for paste clay but with higher iron content and fewer inclusions. Such sources have an extremely high iron content and are present in the Ormand area, but are much rarer than clay paste sources. The red slipped pottery from the Ormand site is similar to earlier Mogollon types such as San Francisco Red, and very similar to Playas Red defined for areas to the south and east.

Similar conventions were used to assign unpainted pottery with red slips to type categories as those employed for unslipped brown ware. For example, polished or unpolished surface treatments were distinguished subdivisions within all utility and unpainted types.

Red slipped pottery with a plain surface refers to pottery with a smooth polished or unpolished surface (Figs. 109-110). Similar pottery with smudged interiors were classified as red slipped smudged interior. Some of the sherds assigned to red slipped categories may actually represent unpainted portions of red slipped decorated types.

Ceramics with red slipped exteriors and smudged interiors, and several rows of finely executed corrugated or incised treatments were assigned to red slipped Tularosa Fillet Smudged. This type represents a modification of a previously defined Mogollon type (Rinaldo and Bluhm 1956). Some of the pottery recovered from the Ormand site had smudged interiors and slipped exteriors and exhibited exterior decorations in clay paint. This pottery is very similar to other smudged ceramics identified, but was classified as a white-on-red type.

Corrugated treatments on red slipped ceramics were rare but present, and were often polished. This combination of corrugation, slip, and polish resulted in the recognition of several types including red slipped plain corrugated (Fig. 111a), red slipped polished over indented corrugated (Fig. 111c), red slipped indented, and red slipped polished over indented. Red ware pottery was also decorated with incised textures. Incised red ware types included red slipped incised exterior, red slipped incised exterior smudged interior, and red slipped polished over punched or incised surface (see Fig. 117d). Ceramics with these treatments are very similar to Playas Incised or Playas Tooled.

"Local" Decorated Types

A total of 11.9 percent of the sherds recovered from the Ormand site had painted decorations, pastes, or slipped surfaces indicating they derived from painted vessels. The majority of decorated types were placed into one of three groups including Salado polychromes, Tucson-Maverick Mountain, and white-on-red types. While types belonging to these decorated groups exhibit distinct surface manipulations and design styles, they contain similar paste clay and temper fragments similar to that noted in local brown ware and red wares, and indicate the use of local clays.

Salado Polychromes

Most of the decorated pottery from Ormand exhibited surface manipulations or painted styles previously described for Salado polychrome types (Crown 1994; Gladwin and Gladwin 1930; Lindsay and Jennings 1968). This pottery is sometimes referred to as Roosevelt Red Ware, and includes Pinto, Gila, and Tonto Polychrome, and Gila Black-on-red (Colton 1965; Gladwin and Gladwin 1934; Lindauer 1994).

Salado polychromes are characterized by distinct combinations of slipped treatments, pigment types, and painted designs over brown ware pastes. Painted decorations are executed in a black organic paint over a low iron slip of white, buff, or cream, sometimes in combination with motifs executed in a red slip. The combination of a black organic paint and cream and red surfaces produces a spectacular effect, which would have required a unique combination of clay paste, slip, and pigment resources. In addition, it was necessary to obtain well-controlled firing atmospheres since the intensely black organic paint would have normally burned out during firing in oxidizing atmospheres, resulting in red and cream colored surface colors if controlled. Controlled firing must have been at fairly low temperatures in a low oxidizing or neutral atmosphere, utilizing paste clays that mature at relatively low temperatures, and utilizing slip clays that retain organic pigment in partial oxidizing conditions. The fact that potters over such a wide area were able to employ the necessary firing regimen and locate the suitable clay resources was a considerable accomplishment, and indicates a great deal of pressure toward the widespread production of a distinct and uniform pottery. This is further reflected by the lack of regionally specific styles or forms of Salado polychrome (Crown 1994).

Salado polychrome types are differentiated on the basis of temporally sensitive differences in painted styles and the additional presence of painted designs applied in red slip. Salado polychromes are among the most widely distributed Southwestern types, occurring over the vast territory previously occupied by the Hohokam, Mogollon, and the Southwesternmost Anasazi (Crown 1994; Lindsay and Jennings 1968; Wood 1987; Young 1967, 1982). While surface characteristics and painted styles noted in Gila Polychrome are very similar, characterization of pastes and temper from vessels recovered from sites throughout the Southwest indicate that they were produced over an extremely wide area, with evidence for the exchange of Salado polychromes between groups in some areas (Crown 1994; Peterson 1994; Wood 1987).

Ceramics with Salado polychrome characteristics, but without distinct designs noted for the previously described types, were assigned to a series of descriptive type categories. Unpainted slipped Salado refers to ceramics lacking painted decorations but exhibiting combinations of surface and slipped treatments clearly indicative of Salado polychromes. Indeterminate Salado painted includes painted ceramics apparently derived from late Salado polychromes without distinct motifs indicating a particular type. Sherds placed in the unpainted Salado polychrome category have the white and red slips of Salado polychrome, but no painted decorations.

Individual decorations and overall design patterns have been used to place Salado polychromes into types or stylistic groupings. Type groupings based on style are very general and include the placement of Gila Polychrome with earlier design patterns into Pinto Polychrome and those with later styles into Gila Polychrome or Tonto Polychrome. Crown (1994) attempts to further place Salado polychrome vessels into a series of Southwest styles that crosscut types and include the Pinedale, Roosevelt, Tusayan-Kayenta, Gila, Escondida, and Salado styles.

The earliest Salado polychrome type is Pinto Polychrome. The area over which Pinto Polychrome occurs is geographically smaller than that noted for the later Salado polychrome types (Crown 1994; Lindsay and Jennings 1968). No sherds clearly derived from Pinto Polychrome were identified at Ormand Village. This indicates that the Salado occupation at this site may not have begun until after this type was no longer produced.

Gila Polychrome developed out of Pinto Polychrome, and represents by far the most common painted type at Ormand. Gila polychrome appears to have been produced around A.D. 1300, and is most abundant at sites dating to the late A.D. 1300s. It lasted into the middle 1400s (Crown 1994; Lindauer 1994). Gila Polychrome is represented by both bowl and jar forms. Gila Polychrome bowls from the Ormand site consistently display distinct buff or cream-colored slips on the decorated surface, although reduced examples may be white to gray in color. Undecorated surfaces are usually covered with a red slip. Painted decorations are usually in a dark gray-black organic paint on light-colored pastes, sometimes in combination with painted decorations in red clay.

Painted designs on Gila Polychrome usually begin as bands or life lines directly below the rim. These may occur as wide isolated lines, a series of connected triangles or squares, or thin lines incorporated into a group of solid motifs. The lines occur on jar exteriors at the bottom of the neck or below the design band, and may be continuous or have a break. The top framing line of Gila Polychrome vessels from the Ormand site averaged 15.2 mm, and the second line averaged 12.8 mm.

Gila Polychrome painted designs tend to be bold, large, and fairly simple (see Figs. 112-114). Motifs appear to have been expediently executed with relatively few brush strokes. Painted decorations cover much of the surface, and often result in the creation of negative designs in empty space. Solid design elements predominate, although hatched designs may be present. Hatching, when present, tends to be thicker on Gila Polychrome when compared to earlier types. Painted decorations on bowls cover much of the interior surface. This decoration does not extend to the rim, but usually begins with an isolated or incorporated encircling line near the rim, filling the remainder of the interior. Designs on jars often include a banded design framed by lines along the neck and a larger design covering all of the remaining part of the vessel except the lowest part of the base. Areas between painted designs and the unpainted base are often covered by unpainted bands of red slip.

Design motifs on Gila Polychrome include triangles and scrolls, stepped triangles, checked squares, lines of adjoining squares and triangles, hatched triangle panels, thick horizontal lines, and stylized anthropomorphic designs of stylized birds and serpents. Solid designs often contain ticked lines or scalloping along the edges. These designs often include a negative area with a dot or series of dots, often resulting in an eye effect. Elements may include hatched, straight, or cross-hatched lines, or a series of small connecting lines or triangles. Several motifs are usually present and decorations often consist of bands and solid motifs.

Previous studies indicate potential temporal changes in the frequency of solid versus hatched designs on Salado polychrome pottery. In an attempt to provide very basic information concerning design styles of Gila Polychrome, all sherds assigned to this type were placed in groups based on the occurrence of solid designs versus hatched decoration. This resulted in the recognition of three categories including Gila Polychrome solid designs, Gila Polychrome hatched designs, and Gila Polychrome solid and hatched designs (see Figs. 118-119).

Most of the Gila Polychrome ceramics examined appear to be derived from bowls, although jar forms are relatively common (Fig. 116). Vessel forms associated with Gila Polychrome from the Ormand site appear to be consistent. Bowls from Ormand tend to be wide and are often flared. Harlow (1968) used the consistent presence of flared bowl rims to create the type Cliff Polychrome. Cliff Polychrome was characterized by Harlow (1968) as a late form of Gila Polychrome dating to the fourteenth century. Given the common occurrence of this flaring in other Gila Polychrome sherds from other areas, it seems that the contrast between earlier Gila Polychrome versus later Cliff Polychrome (Harlow 1968) parallels the contrast between Pinto Polychrome and Gila Polychrome described by others (Crown 1994; Lindsay and Jennings 1968; Wood 1987; Young 1967). During the present study, most ceramics exhibiting treatments and design style characteristics of late Salado polychromes were classified as Gila Polychrome. The common occurrence of flared bowls and fairly homogeneous designs and treatments may indicate that the Gila Polychrome sherds recovered from Ormand village were produced during a relatively brief period sometime during the fourteenth century.

Gila Polychrome jars also exhibit similar shapes. Rim diameters tend to be relatively small in relation to rim size and necks are produced through gradual flaring from the body. The upper portions of Gila Polychrome vessels tend to be slipped and polished on the unpainted interior surface, while the lower areas of vessel interiors are often not polished or slipped.

Sherds exhibiting Gila Polychrome designs and treatments described for other types were also assigned to distinct types. These include Gila Polychrome with smudged interior (Fig. 114f) and Gila Polychrome with red-on-white exterior.

Tonto Polychrome is often considered a variety of Gila Polychrome rather than a separate type (Lindsay and Jennings 1968). Tonto Polychrome is similar to Gila Polychrome but distinguished by the addition of designs in a red clay paint along with the black designs over a white slip (Fig. 115). Black designs on Tonto Polychrome have varied shapes that are surrounded by the red slipped areas. Designs are extremely similar to those noted on Gila Polychrome. Design layout is generally bold and lacks hatching; designs commonly display stylized life forms. Tonto Polychrome is always associated with Gila Polychrome, although it appears to have begun later, and was probably produced from 1350 to 1450. Similar to Gila Polychrome, Tonto Polychrome sherds were assigned to a series of types based on the occurrence of solid and hatched painted motifs. A single sherd was classified as Tonto Polychrome with smudged interior.

Tucson Polychrome and Maverick Mountain Polychrome

The second most common class of painted pottery noted from the Ormand site consisted of pottery decorated in black mineral paint outlined with thin lines of white clay paint. The paint stays black when fired in an oxidizing atmosphere, indicating that it is probably derived from manganese rather than iron pigments. This group includes pottery previously classified as Maverick Mountain Polychrome or Tucson Polychrome. The red slip is dark red to purple. Clay applied as a paint is extremely white, and represents a source distinct from the yellow to buff clay utilized as a slip for Salado polychromes. In contrast to the distinct slip and paint clays, the temper and paste clay in Tucson Polychrome pottery from the Ormand site is identical to that noted in Salado utility wares and Salado polychromes from this site (Hill, this volume), and probably indicates local production of a second polychrome tradition at Ormand alongside Salado polychromes.

While technological and stylistic traits of Maverick Mountain Polychrome and Tucson Polychrome indicate they are part of a single continuum or tradition, in previous syntheses two types have been placed into distinct ware groups or traditions such as Mogollon Brown Ware and White Mountain Redware (Colton 1965; Lindsay 1992; Lindauer 1994). This has resulted in considerable confusion concerning the origin, significance, and relationship of these types to other contemporaneous types. Confusion also stems from the fact that while these types are widely distributed, they seldom dominate assemblages anywhere. They are consistently found in assemblages with higher frequencies of Salado polychromes in sites in the San Pedro Valley, Tucson Basin, Sulphur Springs Valley, Point of Pines region, and Middle Gila (Brown 1973; DiPeso 1958; Danson 1957; Franklin 1980; Johnson and Thompson 1963; Mills and Mills 1972, n.d.).

The similarities between Maverick Mountain and late polychromes from the Tusayan or Kayenta regions of the northwestern Anasazi region, such as Kiet Siel Polychrome, have also been noted and interpreted as resulting from the combination of various traditions by migrant groups from northwestern Arizona into both the Point of Pines and San Pedro Valley (DiPeso 1958; Franklin 1980; Franklin and Massey 1976; Haury 1958; Lindsay 1987). Tucson Polychrome is more common in later assemblages, and appears to have evolved out of Maverick Mountain Polychrome (Lindsay 1992). Groups producing pottery of this tradition may have moved several times during the fourteenth century, so that while much of the Tucson pottery is ultimately derived from decorated pottery from the Kayenta or Tusayan tradition, this connection may be indirect.

Maverick Mountain and Tucson polychromes were separated based on design styles (Lindsay 1992). Ceramics assigned to Maverick Mountain Polychrome consist of elaborate and solid lines usually with balanced hatched designs, framed with narrow white lines (Fig. 120). Maverick Mountain styles appear to have directly derived from Tusayan Polychrome styles, and are best known from assemblages in the Point of Pines area. Similar pottery is sometimes referred to as Tucson Polychrome Hatchured variant (DiPeso 1958).

Tucson Polychrome is recognized by the presence of broad black solid designs framed by thin white lines. These lines may frame both solid and hatched elements, and tend to be thin (2 to 4 mm thick) (Fig. 121). During the present study, these stylistic distinctions were used to differentiate Tucson Polychrome and Maverick Mountain Polychrome. As defined here, these two types should be considered varieties of a single type.

While the shapes and forms of both bowls and jars described for Gila Polychrome are similar for the Tusayan Polychrome and Maverick Mountain Polychrome from the Ormand site, the actual frequency of vessel forms is very different in sherds assigned to these groups. The majority of the vessels assigned to these types are derived from necked jars, although low frequencies of these sherds are from bowls. Jars tend to be decorated on the exterior surface only, and the interior is usually not painted, slipped, or polished. The rare sherds belonging to bowl forms are slipped and polished on both sides, but are usually decorated with black and white paint on the exterior surface only. A low frequency of the bowl sherds are decorated black-on-white on the interior, and may have been painted in white slip only on the exterior surface.

Tucson Polychrome sherds display a dramatic tricolor effect, with black solid lines framed by narrow white lines on a brick red surface. Solid designs were executed in wide brush strokes.

Other design elements include stepped triangles, squares, frets and diamonds, and dotted bands. These designs are often organized into rectilinear patterns forming a wide band around the vessels. Often the vessels are framed by large, sometimes broken, broad lines.

A few sherds exhibited slips, pigment, and a decorative style identical to that noted for Maverick Mountain Polychrome, except outlines in white clay paint were absent. Similar ceramics have been assigned to Tucson Black-on-red (DiPeso 1958). A close examination of similar ceramics from Ormand indicate that many of these black-on-red sherds may simply represent unslipped portions of Tucson Polychrome and Maverick Mountain Polychrome or portions of sherds where the slip has weathered off. Similar conventions were used in the classification of Tucson Black-on-red types as Tucson Polychrome types. Thus, similar black-on-red ceramics exhibiting solid designs were classified as Tucson Black-on-red, while those exhibiting hatched designs were classified as Maverick Mountain Black-on-red.

White-on-Red Type

Other decorated pottery contained local pastes and temper and decorations in white clay paint over a red slipped surface. It usually had smudged interiors (see Fig. 115a, b). In some ways white-on-red pottery bridges the gap between smudged unpainted red wares and decorated pottery occurring at Salado period sites. During the present study these were simply described as white-on-red, although pottery from Ormand assigned to this category is similar to that previously described as Salado White-on-red or Gila White-on-red (Colton and Hargrave 1937; Lindsay and Jennings 1968). It also resembles pottery from earlier Mogollon sites classified as Tularosa White-on-red (Rinaldo and Bluhm 1956), and may have ultimately derived from this type. The clay slip used as decoration is extremely white, and is the same color as that noted in Tucson Polychrome and Maverick Mountain Polychrome rather than the Salado polychromes.

Given difficulties in determining differences in types exhibiting white exterior painted decorations defined for various traditions, the term white-on-red is used here, although similar pottery in this region appears to be most commonly assigned to Gila White-on-red. White-on-red (slipped) as defined here refers to white clay decorations on slipped red surfaces (Fig. 122). Pottery exhibiting similar decorations on unslipped surfaces was assigned to a white-on-red (unslipped) category. Most of the pottery assigned to this type represents bowls with smudged exteriors and white painted decorations on the interior, although a few red ware jars exhibited designs executed in white clay on the exterior. Most of the white-on-red pottery from Ormand had smudged interiors and was classified as white-on-red unslipped to partially slipped.

Designs in white clay were usually executed in very wide brush strokes ranging from about 10 to 20 mm in thickness, although thinner lines are occasionally represented. These lines form a series of motifs including long straight lines, zigzag lines or chevrons, stepped or pendant triangles, and rectilinear scrolls. Similarities in pastes and temper used on white-on-red types, and the presence of similar white painted designs on a very small proportion of Salado polychrome types and Tucson Polychrome indicate that the production of white-on-red pottery overlapped with that of other decorated types recovered from the Ormand site.

Other Red or Polychrome Types

Very low frequencies of sherds exhibiting black painted decorations on a red surface occur that are not represented by types belonging to traditions described elsewhere in this section. Some painted red ware sherds simply could not be assigned to previously defined types and were assigned to the category other black-on-red for those exhibiting red surfaces, and unslipped black-on-red for those without slipped surfaces.

A small number of sherds also exhibited paste and treatments similar to those described for late Tsegi Orange Ware (Beals et al. 1945; Smith 1971). These sherds exhibited angular rock, sometimes along with sherd temper inclusions similar to that noted at Ormand and may represent direct copies of Tusayan region orange wares by potters somewhere in the Mogollon Highlands. It should be noted that most of the sherds exhibiting Tsegi Orange treatments and styles exhibited designs and styles similar to that noted on Kiet Siel Polychrome and were classified as Maverick Mountain Polychrome. A single sherd exhibiting decoration in red pigment on an orange surface was classified as Tsegi Black-on-orange. A sherd exhibiting similar paste with decorations in red, black, and white paint was classified as Kiet Siel Polychrome.

Chihuahuan or Jornada Mogollon Types

A small amount of decorated pottery represented types from regions to the east and south.

Ramos Polychrome. One distinct sherd exhibited a fine yellow paste and polychrome decorations indicating it derived from the Chihuahua region of northern Mexico and was thus classified as a Ramos Polychrome (DiPeso et al. 1974). The exterior of this sherd had a raised effigy, possibly a snake, and had a high polished yellow surface (Fig. 123a). This surface was decorated with black and red colored mineral paint.

El Paso Polychrome. El Paso Polychrome refers to decorated pottery of the Jornada Mogollon tradition exhibiting characteristics indicative of production along the Texas-New Mexico border near El Paso. El Paso Polychrome exhibits brown paste and large granite temper characteristic of other El Paso Brown Ware types. It is also characterized by large geometric motifs executed in red and black paint (Stallings 1931). Since decoration on jars is often limited to the rim or neck areas, unpainted body sherds from El Paso Polychrome may be classified as El Paso Brown body.

Chupadero Black-on-white. Chupadero Black-on-white refers to a long-lived ware commonly occurring at Jornada Mogollon sites (Hayes 1981; Mera 1931). Examples of this type exhibit dense light gray to white paste and sherd temper. The decorated surfaces of Chupadero Black-on-whites are often unpolished with striated or scored treatments resulting from scraping. The decorated surface is covered with a white slip, which is often streaky. Painted designs often consist of alternately hatchured and solid motifs (Fig. 123b).

Mimbres or Mogollon Decorated Types. The presence of a very low number of Mogollon Mimbres decorated types indicate some pottery from occupations dating considerably prior to the Salado period occupation at or near Ormand. Early decorated types identified include both Mogollon Red-on-brown and several Mimbres White Ware types.

Mogollon Red-on-brown represents the earliest painted type produced in the Mogollon region, and is distinguished by later Mimbres White Ware types by the lack of a white slip (Haury 1936). Vessel surfaces are well smoothed and highly polished. Vessels are often slipped with a soft light brown to light red clay. Surfaces are decorated with a red pigment and then polished, producing a blurred effect. Decorations often consist of fairly wide straight or wavy lines arranged in simple patterns.

Mimbres White Ware refers to decorated pottery produced by Mogollon groups. Mimbres White Wares display a brown paste similar to that utilized in local brown utility ware vessels, but also exhibit at least one surface covered with a white slip, and are usually decorated with mineral pigment applied over the slipped surface. Surfaces are usually moderately to lightly polished. Slips tend to be soft and easily weathered, resulting in the obliteration of painted or slipped surfaces. Painted decorations are always executed with a mineral pigment and then usually polished, resulting in a lustrous appearance, as opposed to the more dull appearance noted in Cibola White Wares. Painted decorations are often distinct from contemporary painted types from other regions of the Southwest, and reflect a long-lived tradition and gradual development from Three Circle Red-on-white to Mimbres Black-on-white. All Mimbres Black-on-white sherds identified at the Ormand site were decorated with black paint. A few Mimbres White Ware sherds displayed indistinct designs in black paint preventing their assignment to a specific Mimbres White Ware type, and were classified as indeterminate Mimbres Black-on-white.

The earliest Mimbres White Ware type consistently decorated with black paint is Mangus or (Boldface) Black-on-white (see Fig. 123c). Similar ceramics have been described as both Mangus Black-on-white (Haury 1936) and Mimbres Bold Face Black-on-white (Brody 1977; Cosgrove and Cosgrove 1932). Design styles are boldly executed and cover much of the vessel surface (Brody 1977; Haury 1936). Motifs include wavy lines, triangles, curvilinear scrolls, and wavy hatched elements.

Mimbres Classic Black-on-white was the last Mimbres White Ware type produced. While sherds exhibiting late styles are usually classified as Mimbres Classic (Haury 1936), they are sometimes referred to as Mimbres Black-on-white (Style III). Characteristics of this type include the use of fine, regularly spaced hatchures bordered by thin lines (see Fig. 123d, e). A diagnostic feature of this type is the presence of framing lines near the rim. These framing lines vary considerably and may include one to four broad lines, multiple fine lines, multiple fine lines bordered by one or two fine lines, or a single fine line. Naturalistic motifs are sometimes present and vary from simple to complex forms, and the more elaborate represent painted motifs divided by geometric motifs.

Collection and Characterization of Clay Samples

In addition to the characterization of sherds and vessels, ceramic studies of the Ormand site involved the collection and examination of local ceramic resources. These studies provide for the recognition of locally produced pottery as well as an examination of the influences of local geology on Salado ceramic technology.

A total of nine clay samples from sources around the Ormand site were located and described during the present study, and included likely sources for both paste and slip clays. Clay samples from sources in surrounding regions have also been similarly characterized and described in other studies conducted by the Museum of New Mexico, and provide for a comparison of resources available to potters residing at the Ormand site and those available to potters elsewhere in the Mogollon Highlands. Clay samples located were described in the field, collected, and analyzed and characterized in the laboratory.

In addition to small samples of clay collected from all sources located and described, large amounts of clay were collected from particularly suitable clay sources. This clay was used to make pottery vessels during replication studies conducted by staff members at the Office of Archaeological Studies, and provides information concerning the qualities and constraints of local clay sources. Characteristics of vessels produced during these studies were compared with those noted in ceramic assemblages recovered at the Ormand site to evaluate potential source areas.

The present study was concerned with fairly simple descriptions allowing for the characterizations and comparison of associated clay samples and ceramics. Each clay source collected was described, molded into tiles, and fired in order to obtain information relating to the characteristics and quality of these clays. Attributes recorded include form, plasticity, natural color, refired color, and associated inclusions.

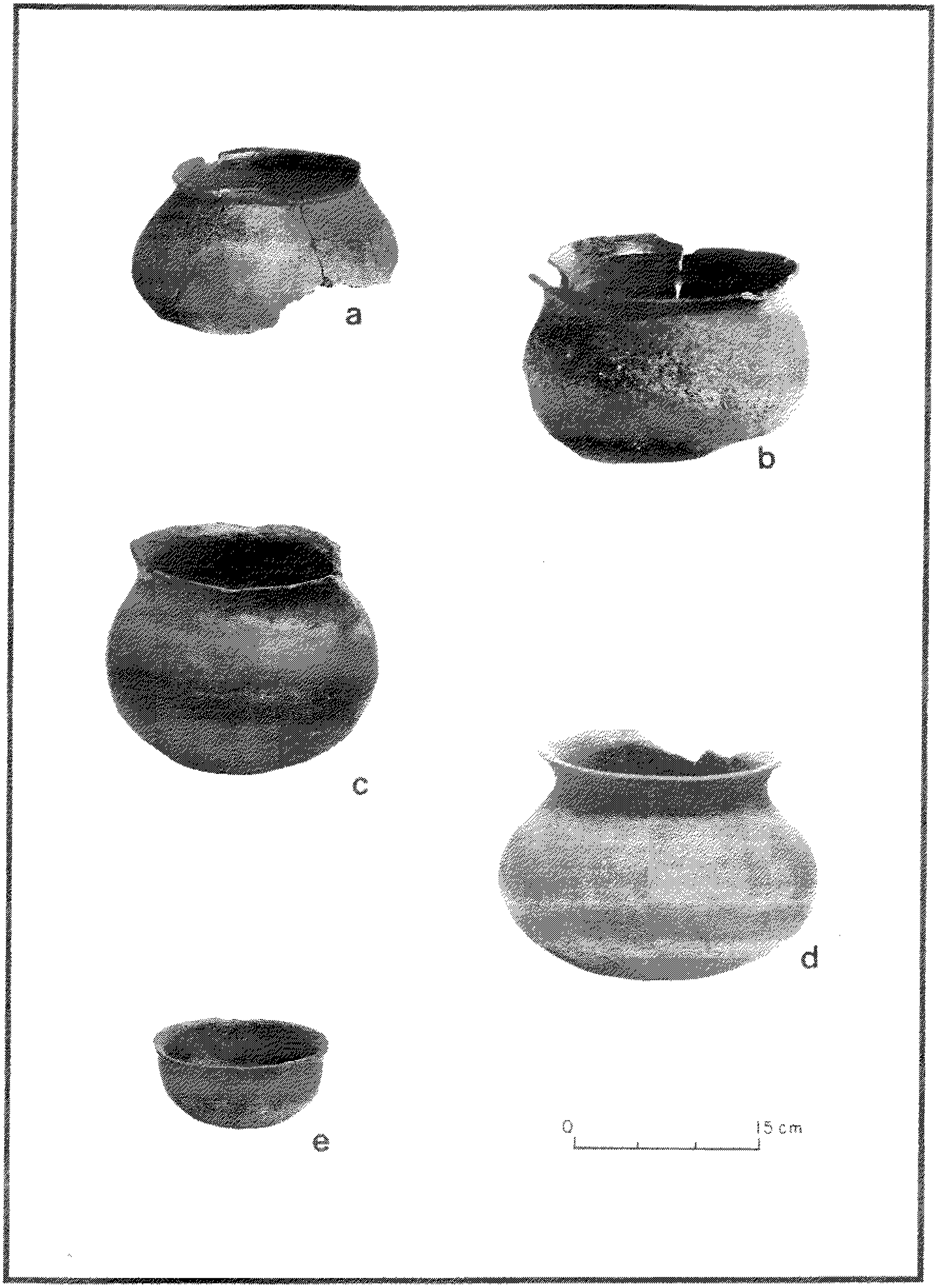

Figure 103. Plain unpolished: (a-e) Vessels 39, 60, C4, C25, C60, respectively. (Nancy H. Warren, photographer, MNM/OAS, views a-b; Blair Clark, photographer, MNM/LOA, views c-e.)

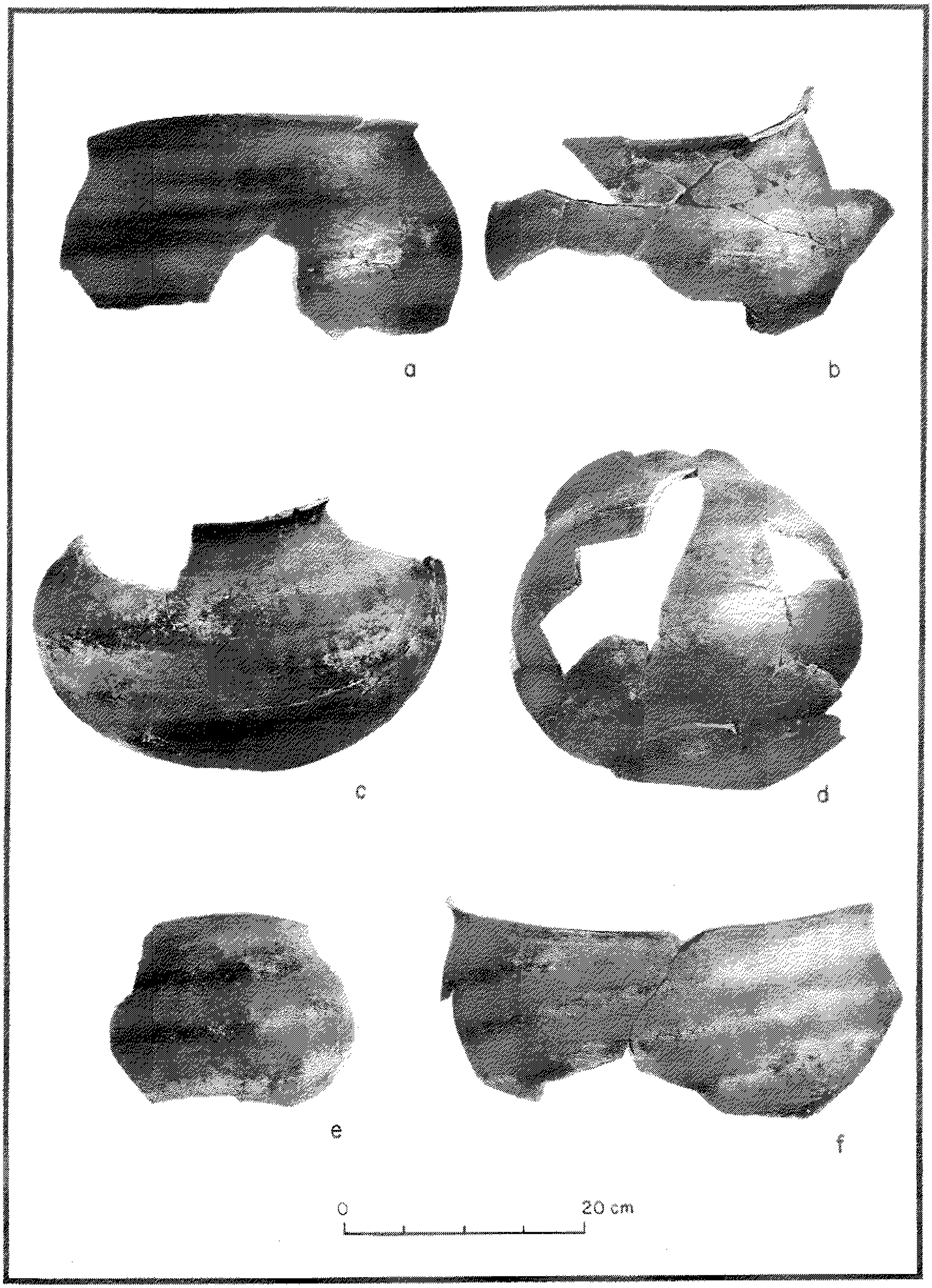

Figure 104. Plain polished: (a-f) Vessels 1, 7, 17, 27, 40, 47, respectively. (Nancy H. Warren, photographer, MNM/OAS.)

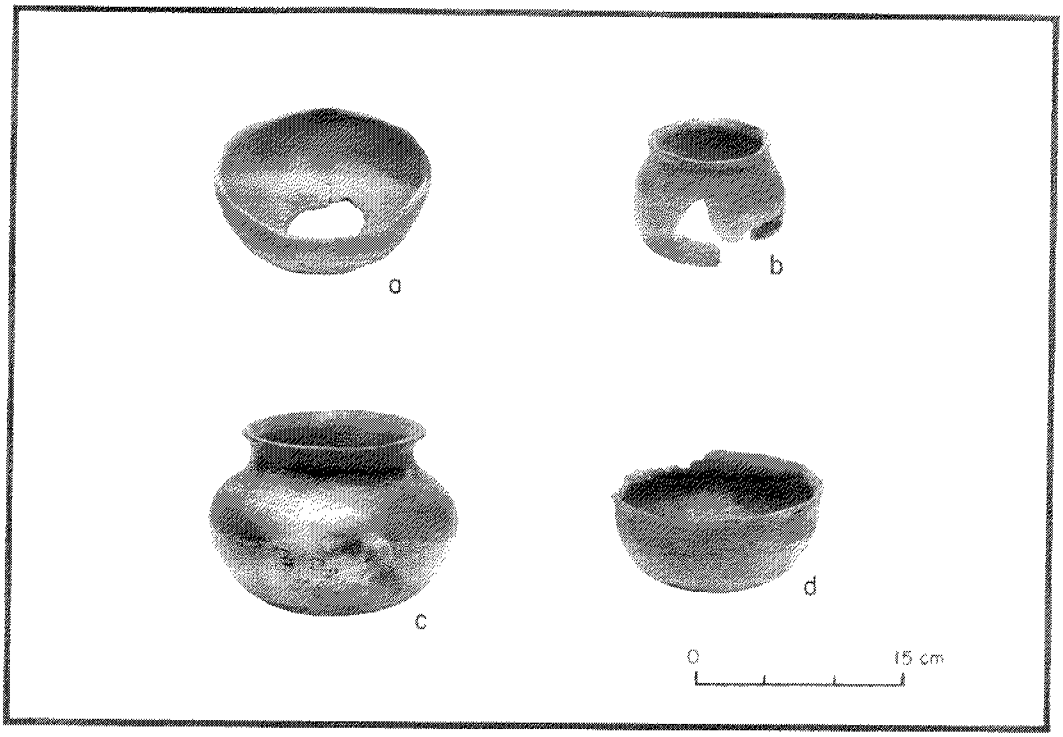

Figure 105. Plain polished: (a-d) Vessels C5, C18, C20, C50, respectively. (Blair Clark, photographer, NMN/LOA.)

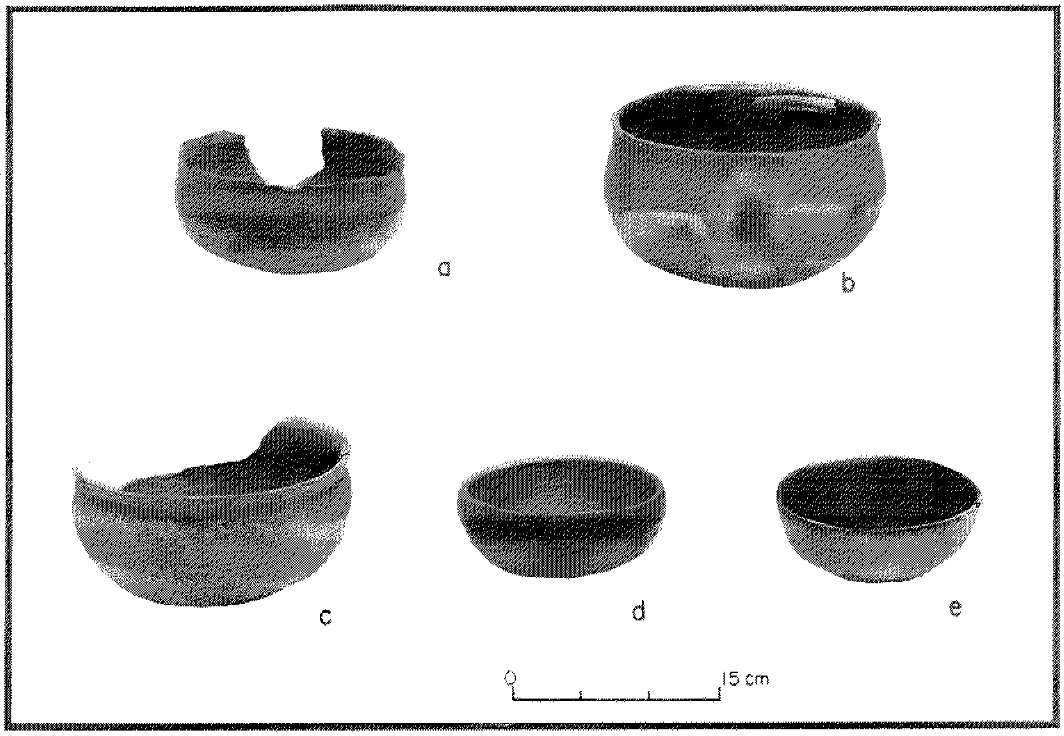

Figure 106. Plain smudged interior: (a-e) Vessels C3, C9, C14, C43, C54, respectively. (Blair Clark, photographer, MNM/LOA.)

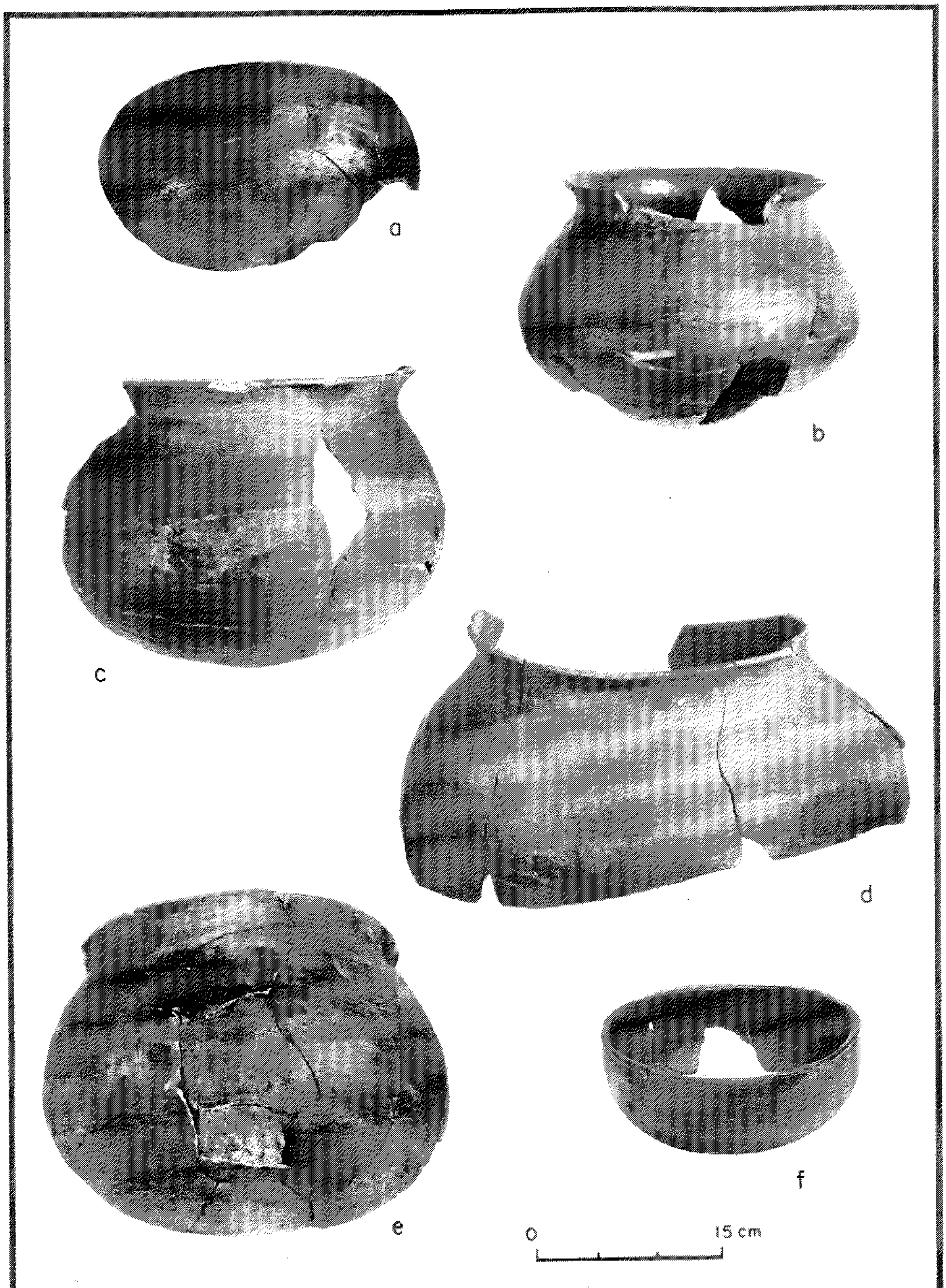

Figure 107. Plain smudged interior: (a-f) Vessels 9, 25, 41, 45, 50, 90. (Nancy H. Warren, photographer, MNM/OAS, views a-e; Blair Clark, photographer, MNM/LOA, view f.)

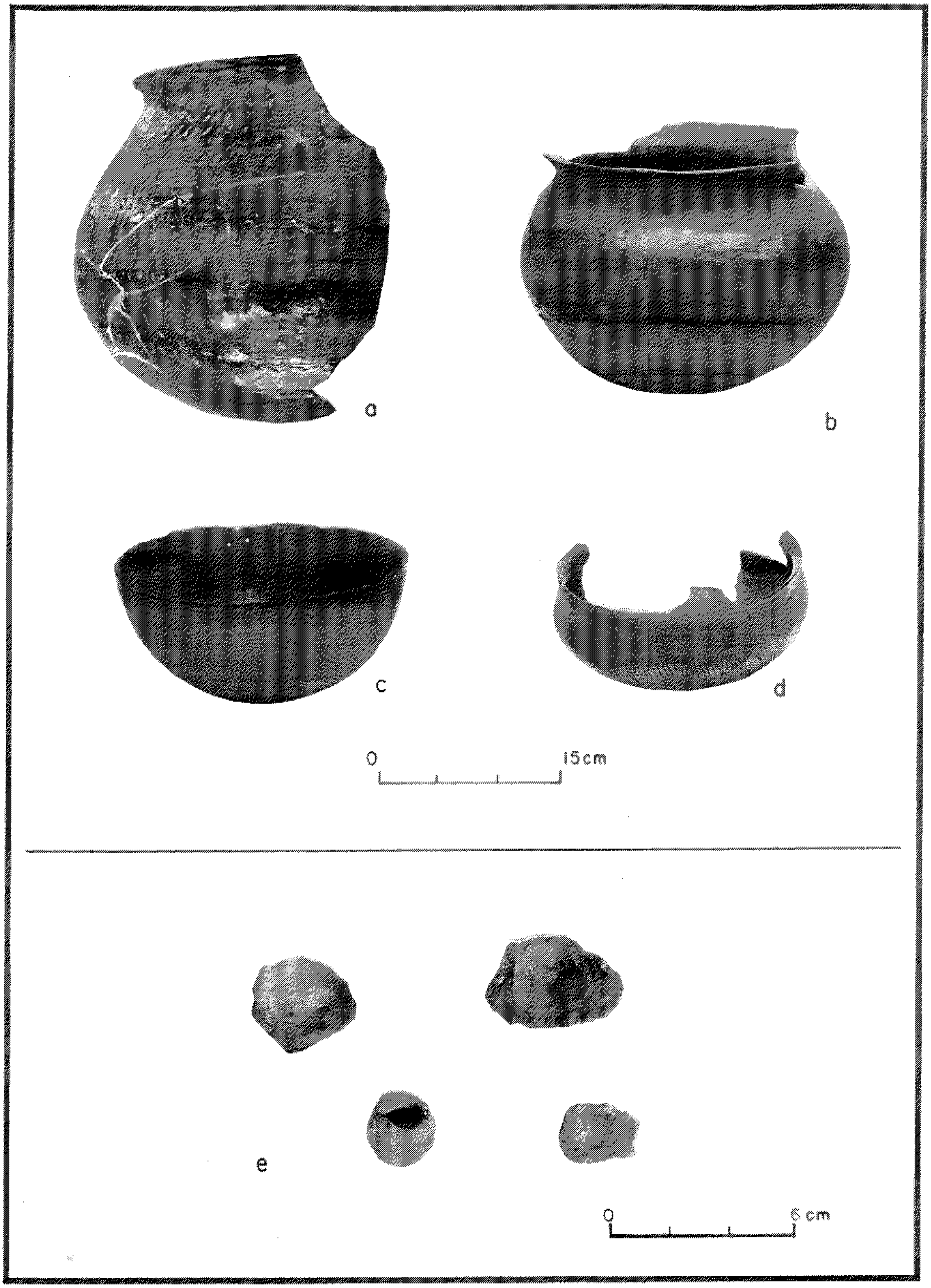

Figure 108. (a) Smeared corrugated, Vessel 52; (b) Plain brown dimpled exterior, Vessel C13; (c) Incised corrugated brown, Vessel C12; (d) Punched exterior/smudged interior, Vessel C1; (e) Mud wares, Vessels 15, 34, 61, 62, respectively. (Nancy H. Warren, photographer, MNM/OAS, views a, e; Blair Clark, MNM/LOA, views b-d.)

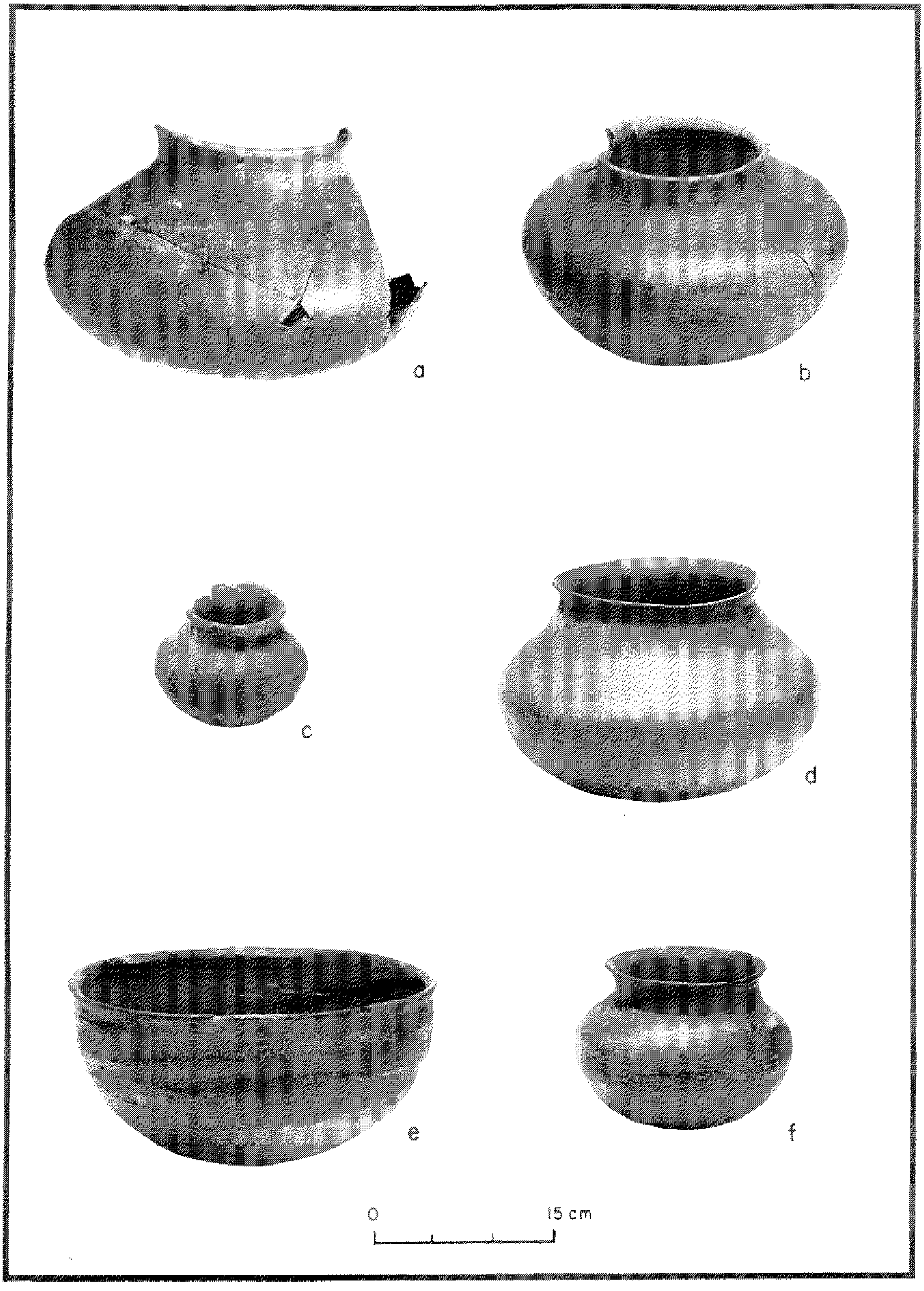

Figure 109. Red slipped plain polished: (a-f) Vessels 35, C10, C28, C30, C32, C35, respectively. (Nancy H. Warren, MNM/OAS, view a; Blair Clark, MNM/LOA, views b-f.)

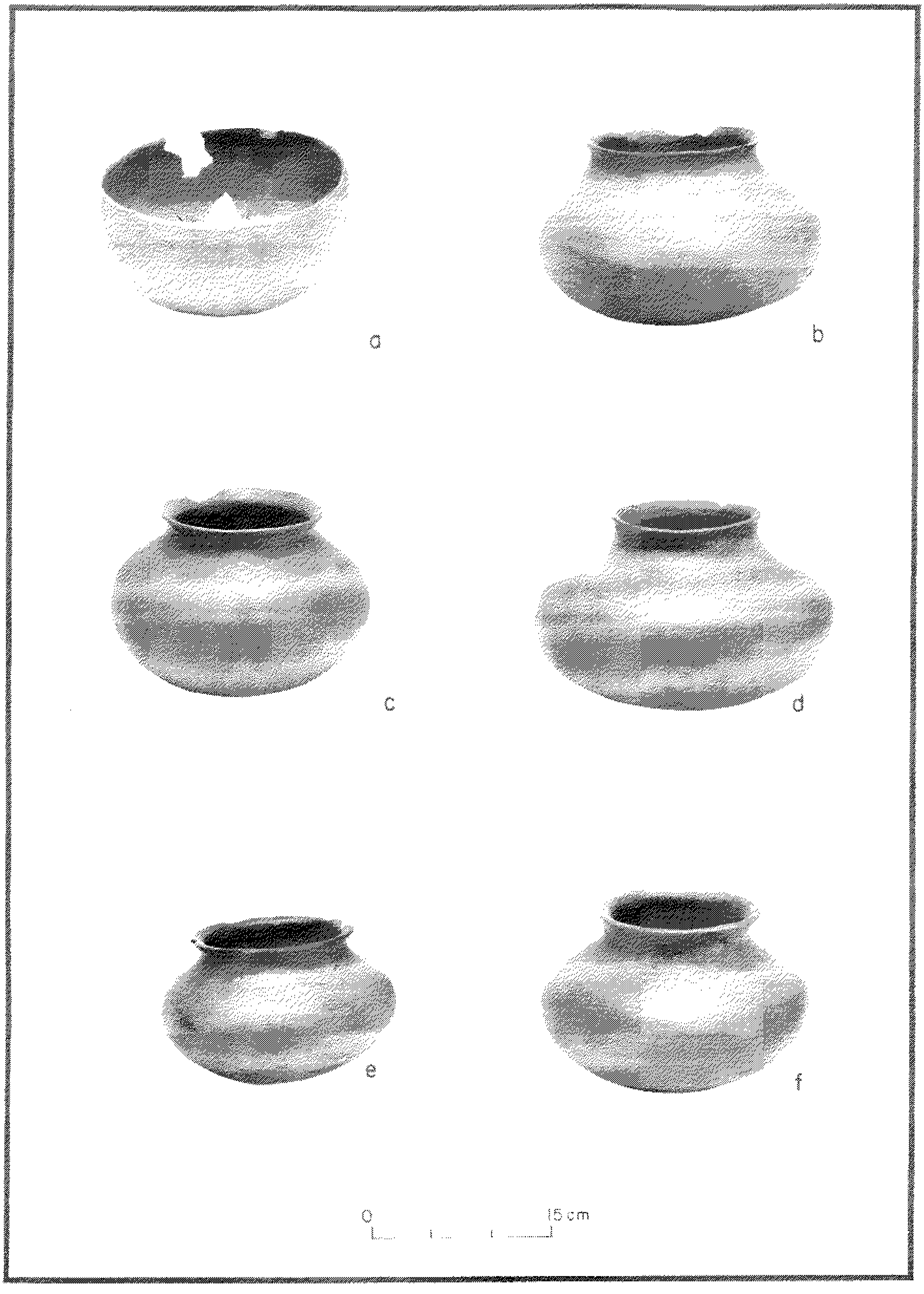

Figure 110. Red slipped plain polished; (a-f) Vessels C36, C39, C46, C48, C56, C70, respectively. (Blair Clark, photographer, MNM/LOA.)

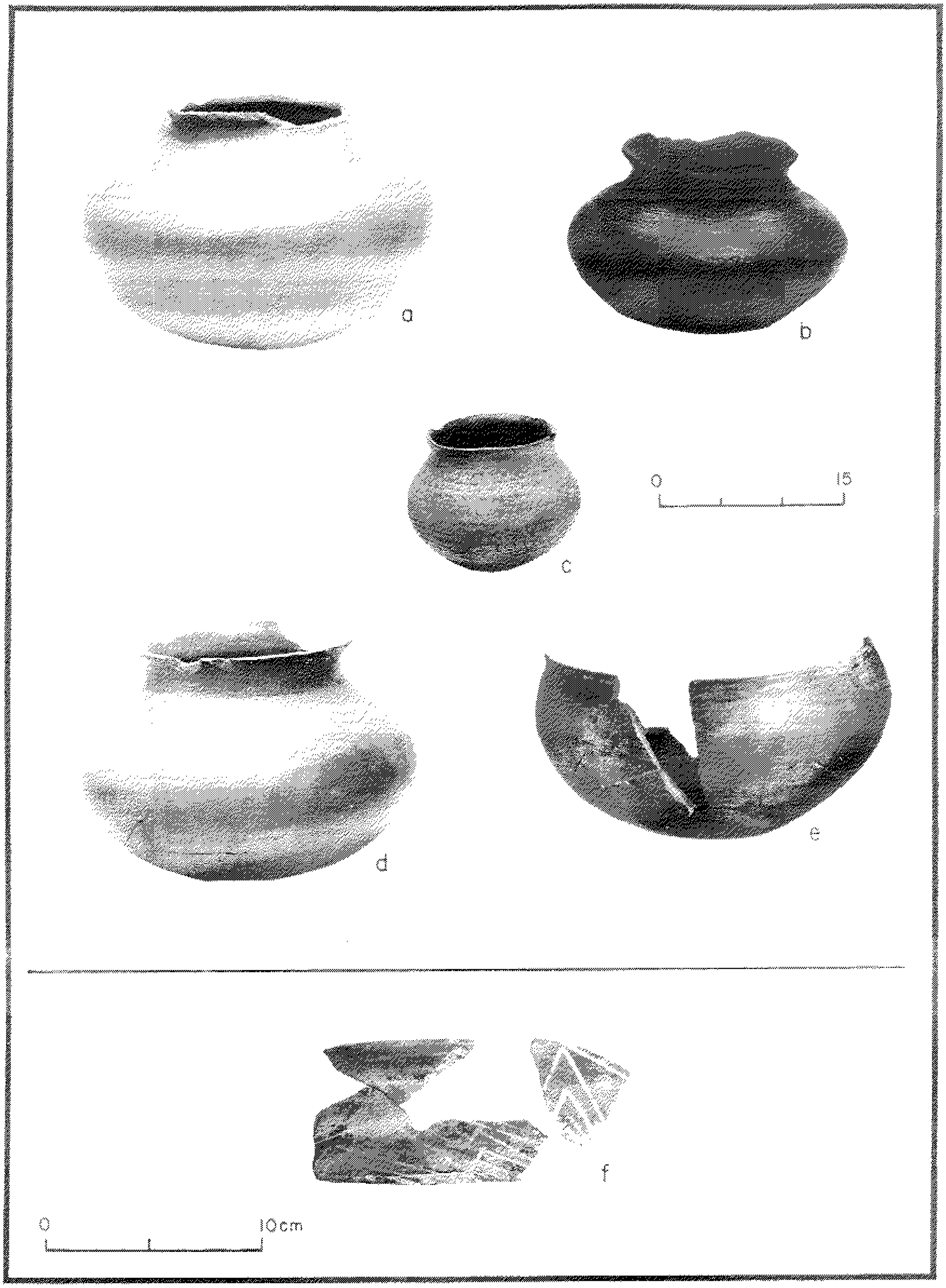

Figure 111. (a) Polished corrugated red, Vessel C8; (b) Corrugated red, Vessel C27; (c) Polished red indented corrugated, Vessel C66; (d-e) Red slipped smudged, Vessels 3, 86; (f) Tucson Polychrome, Vessel 12. Nancy H. Warren, photographer, MNM/OAS, views a-d; Blair Clark, MNM/LOA, views e-f.

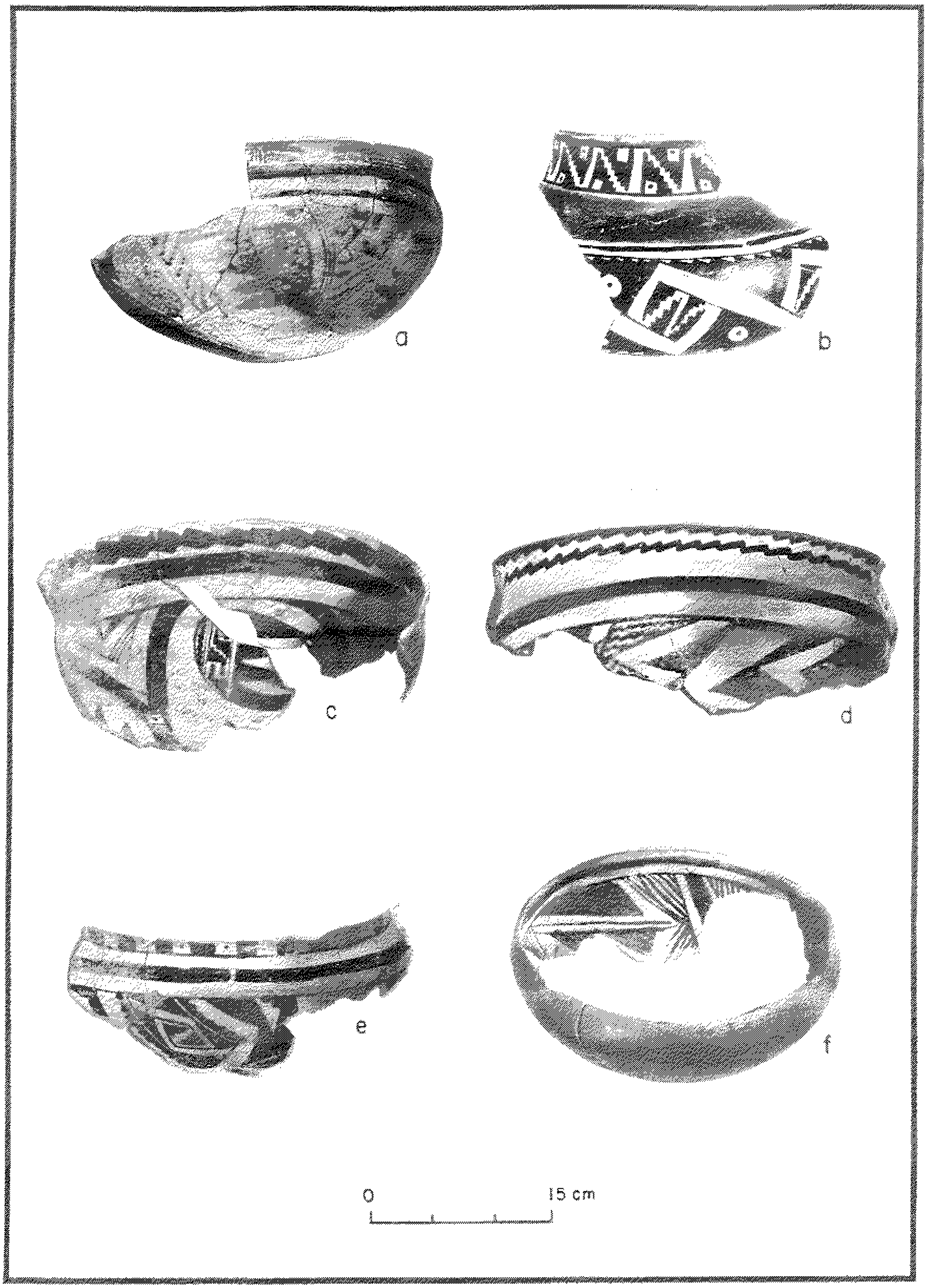

Figure 112. Gila Polychrome: (a-d) Vessels 16, 18, 19, 21, 22, 29. (Nancy H. Warren, photographer, MNM/OAS.)

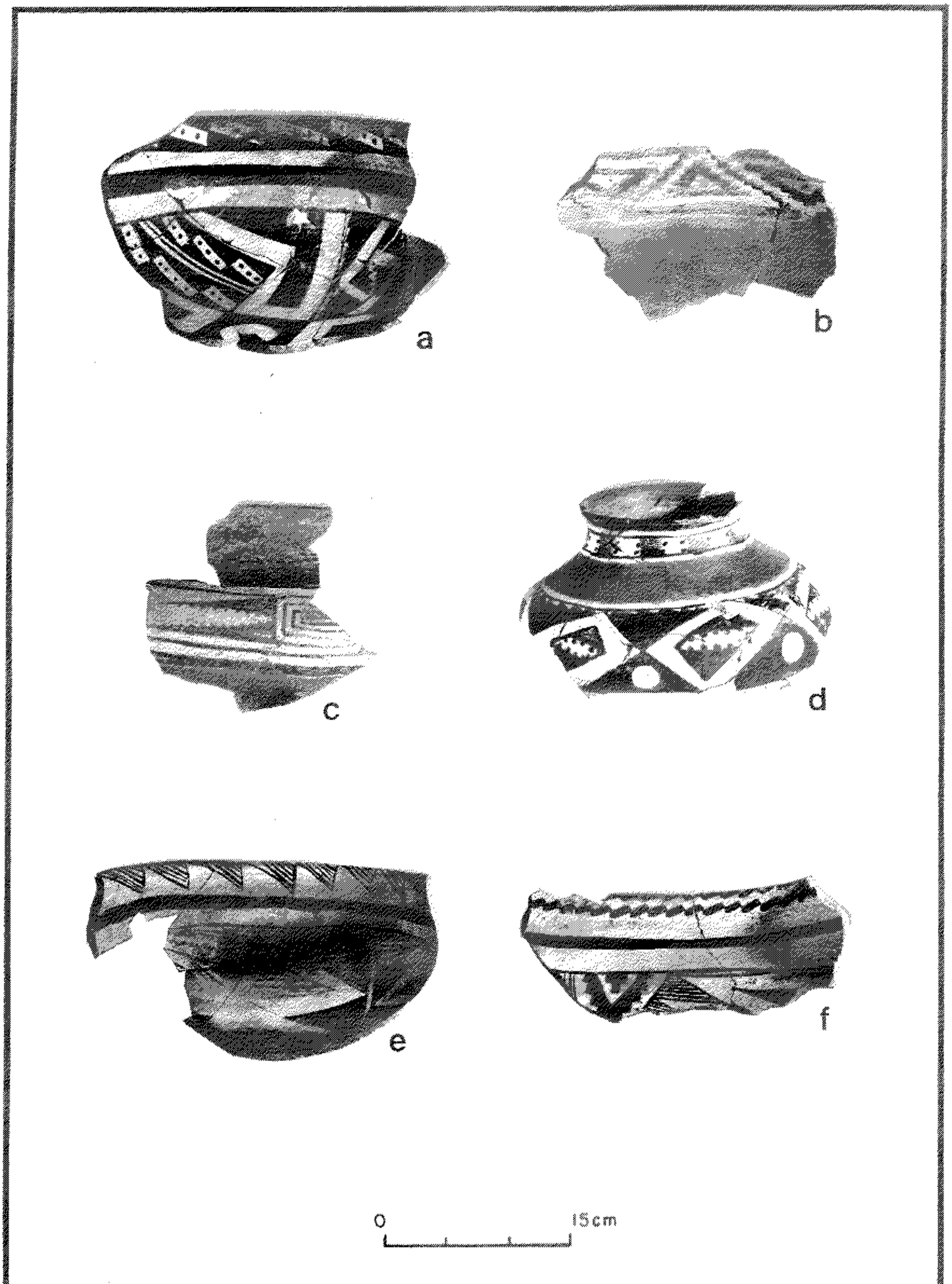

Figure 113. Gila Polychrome: (a-f) Vessels 30, 31, 53, 54, 55, 56. (Nancy H. Warren, photographer, MNM/OAS.)

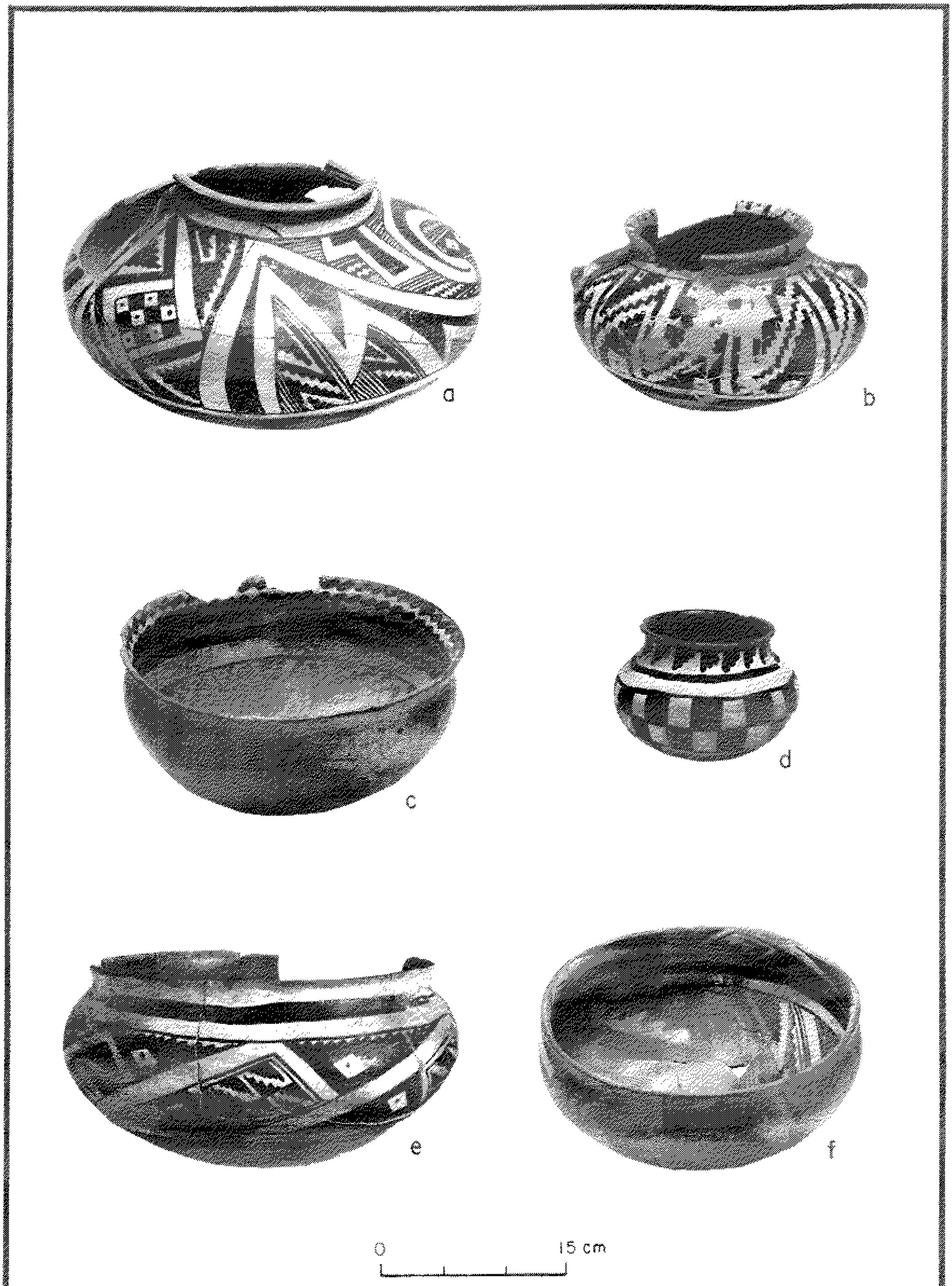

Figure 114. Gila Polychrome: (a-d) Vessels 81, C2, C31, C37, C69; Gila Polychrome with smudged interior: (f) Vessel 58. (Nancy H. Warren, photographer, MNM/OAS, views a-d; Blair Clark, MNM/LOA, view f.)

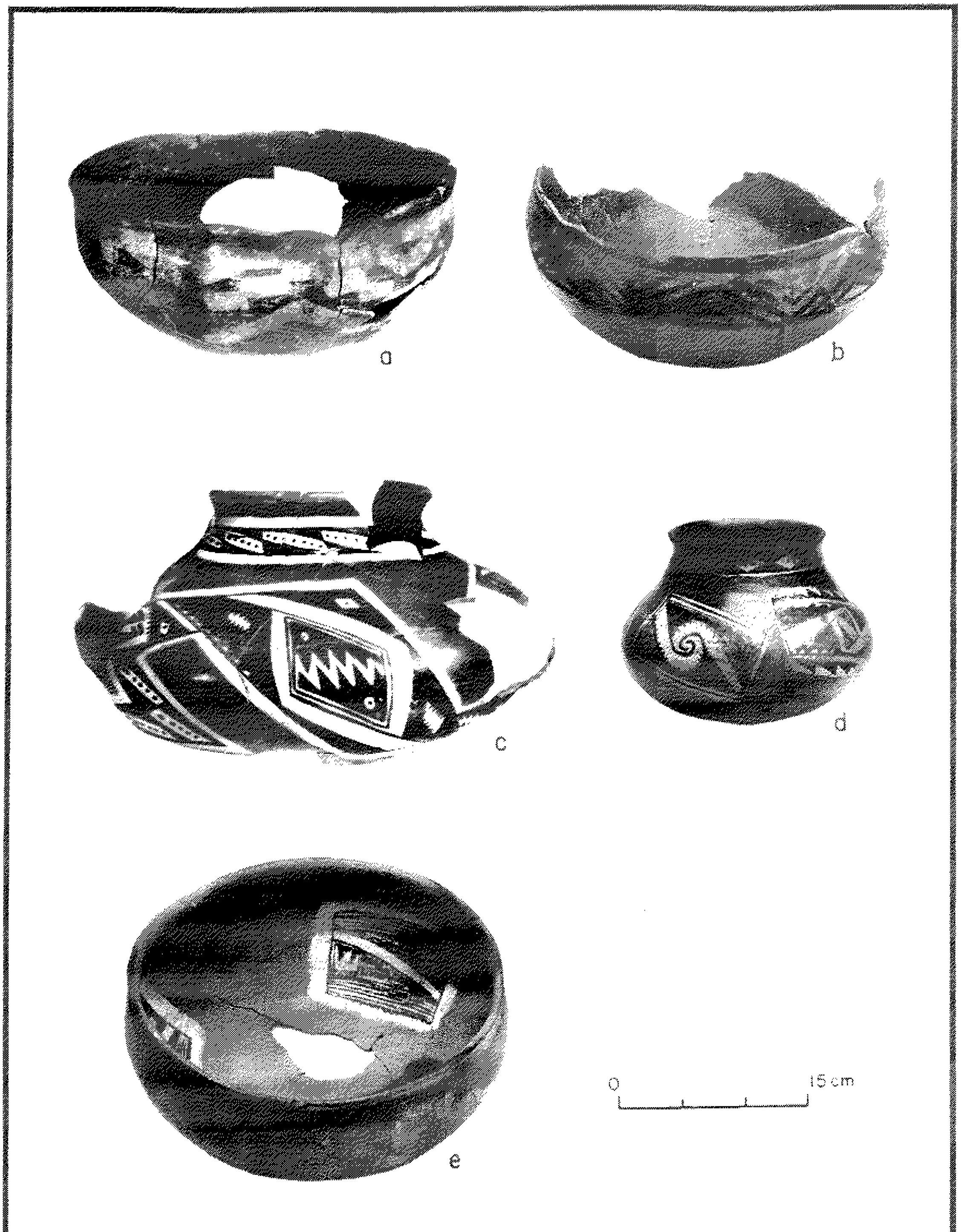

Figure 115. Gila White-on-red: (a-b) Vessels 49, 66; Tonto Polychrome: (c-e) Vessels 59, C6. C29. (Nancy H. Warren, photographer, MNM/OAS, views a, c; Blair Clark, MNM/LOA, views b, d, e.)

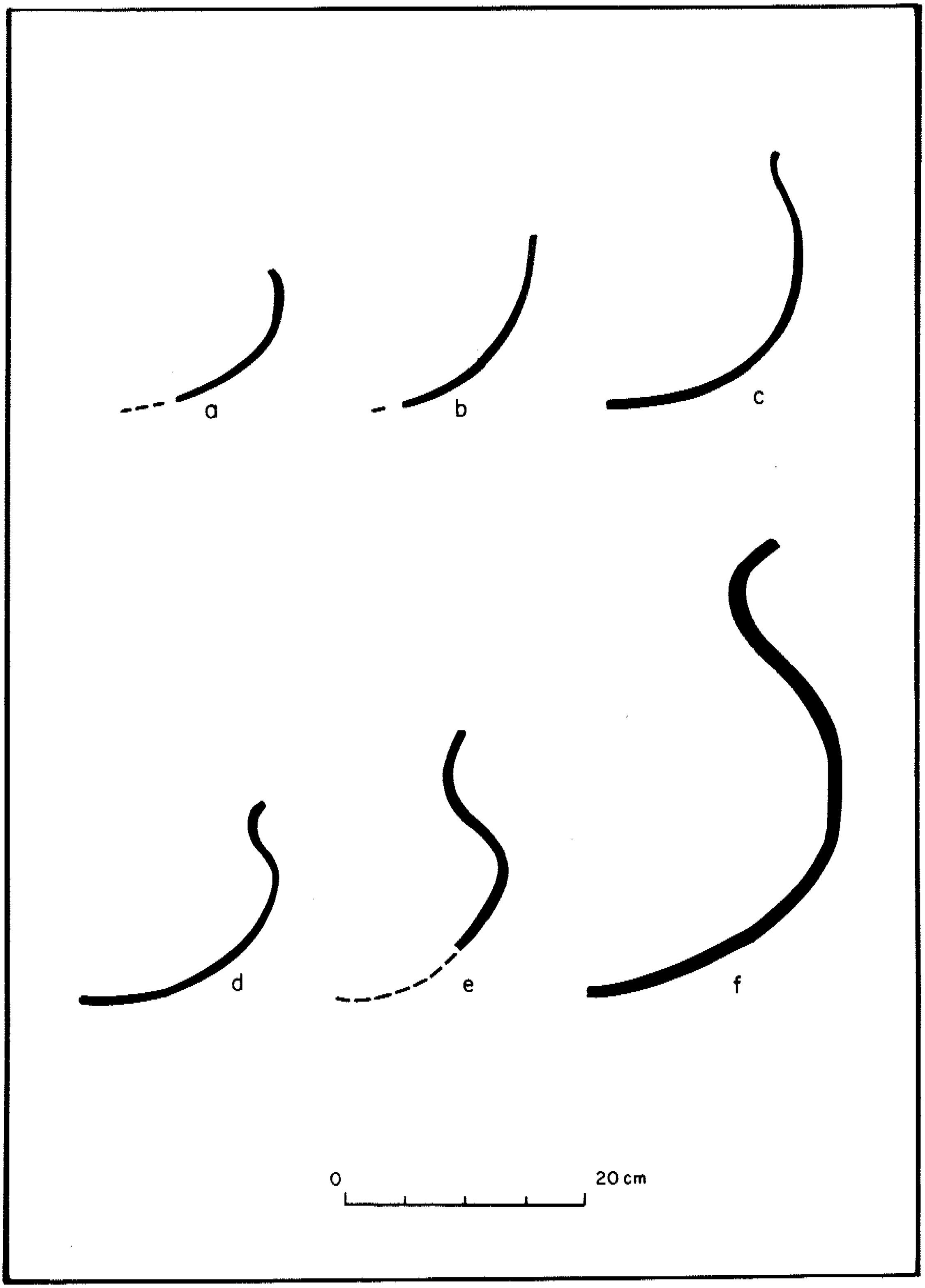

Figure 116. Ormand Village rim profiles: (a) constricted bowls; (b) open bowls; (c) narrow flaring rim bowls; (d) wide flaring rim bowls; (e) narrow curving rim jars; (f) wide curving rim jars.

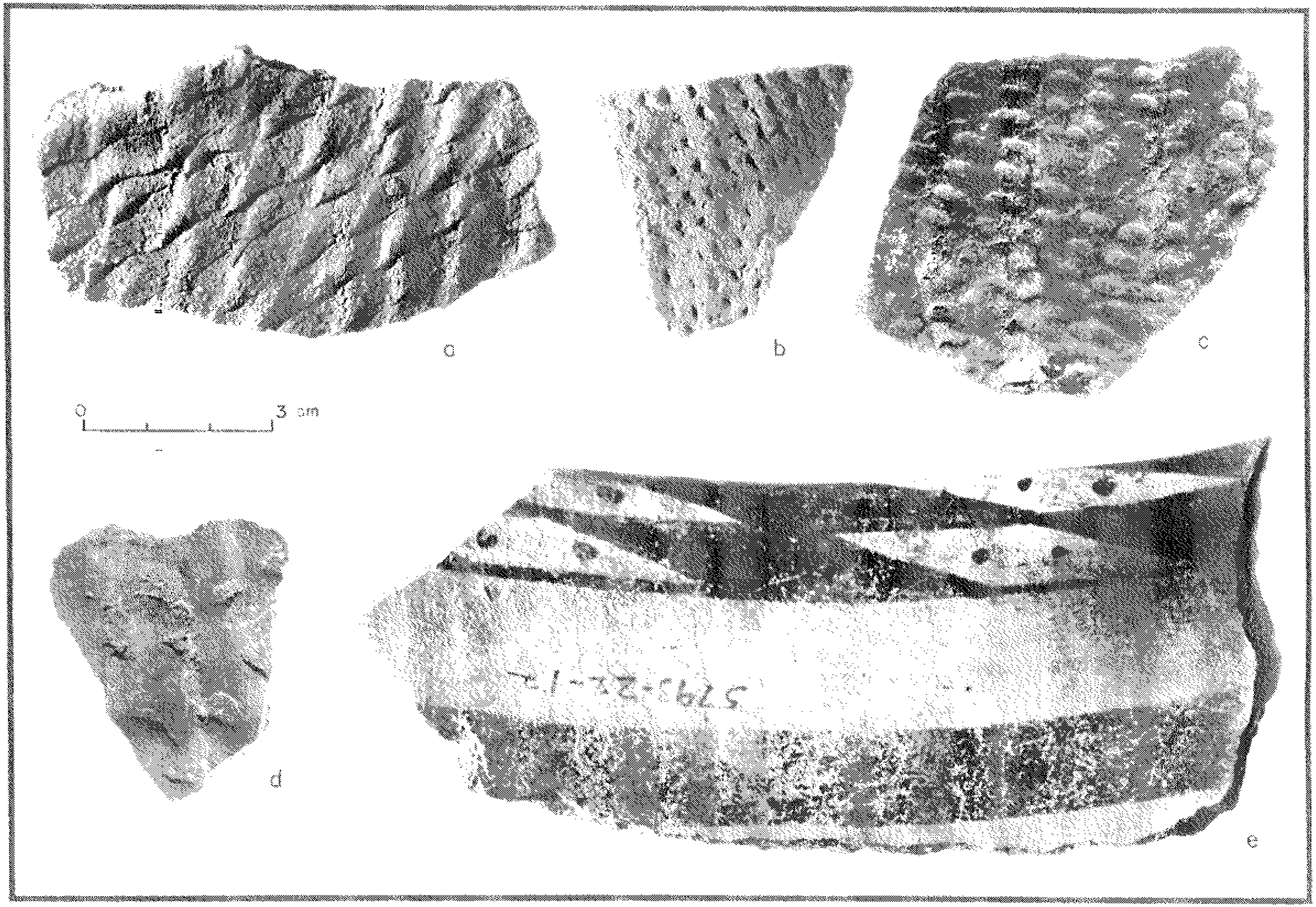

Figure 117. (a) Indented corrugated; (b) Smeared corrugated; (c) Plain incised; (d) Red slipped polished over incised; (e) Gila Polychrome design motif.

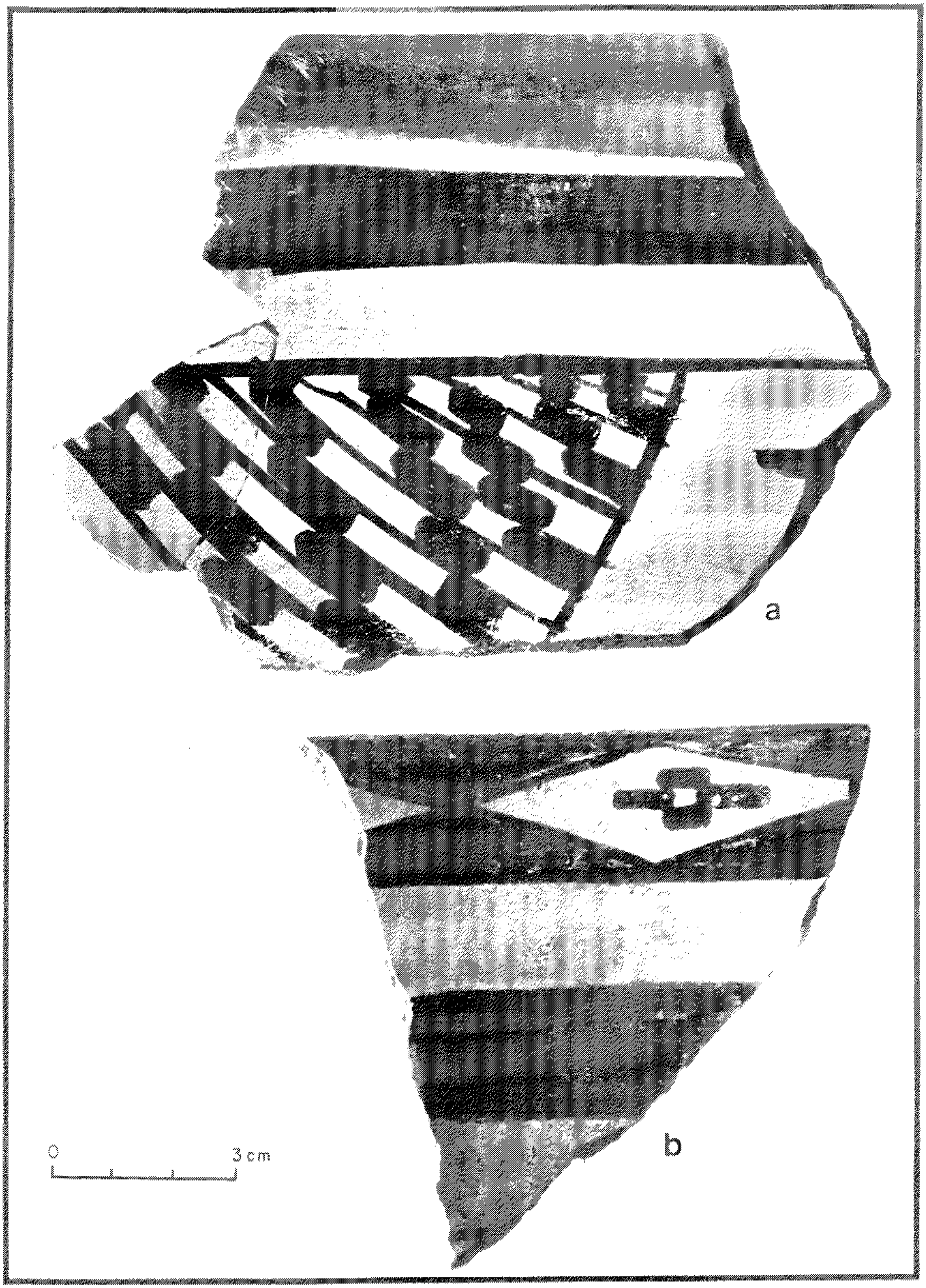

Figure 118. Gila Polychrome design motifs.

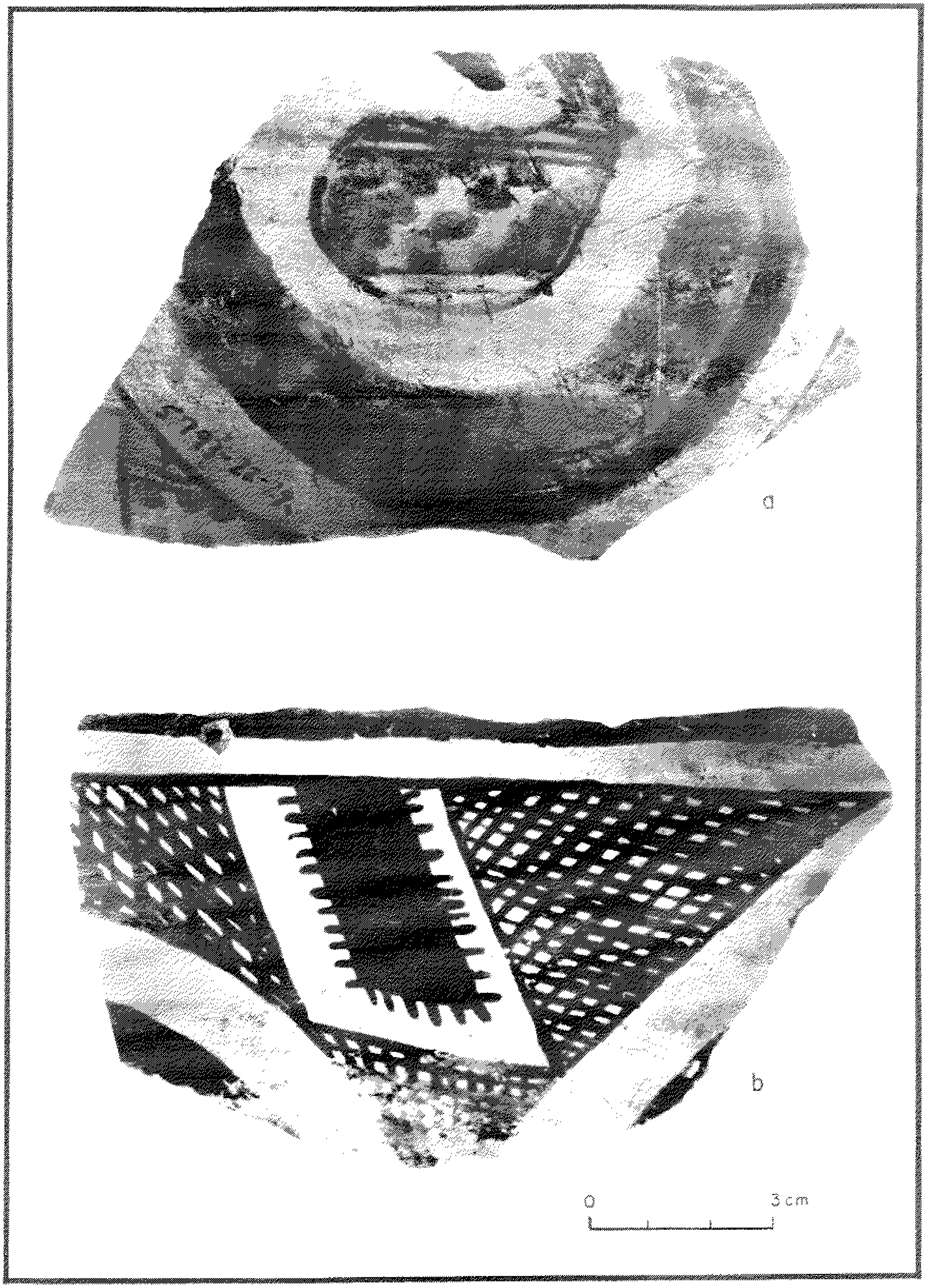

Figure 119. Gila Polychrome design motifs: (a) solid designs; (b) hatchured designs.

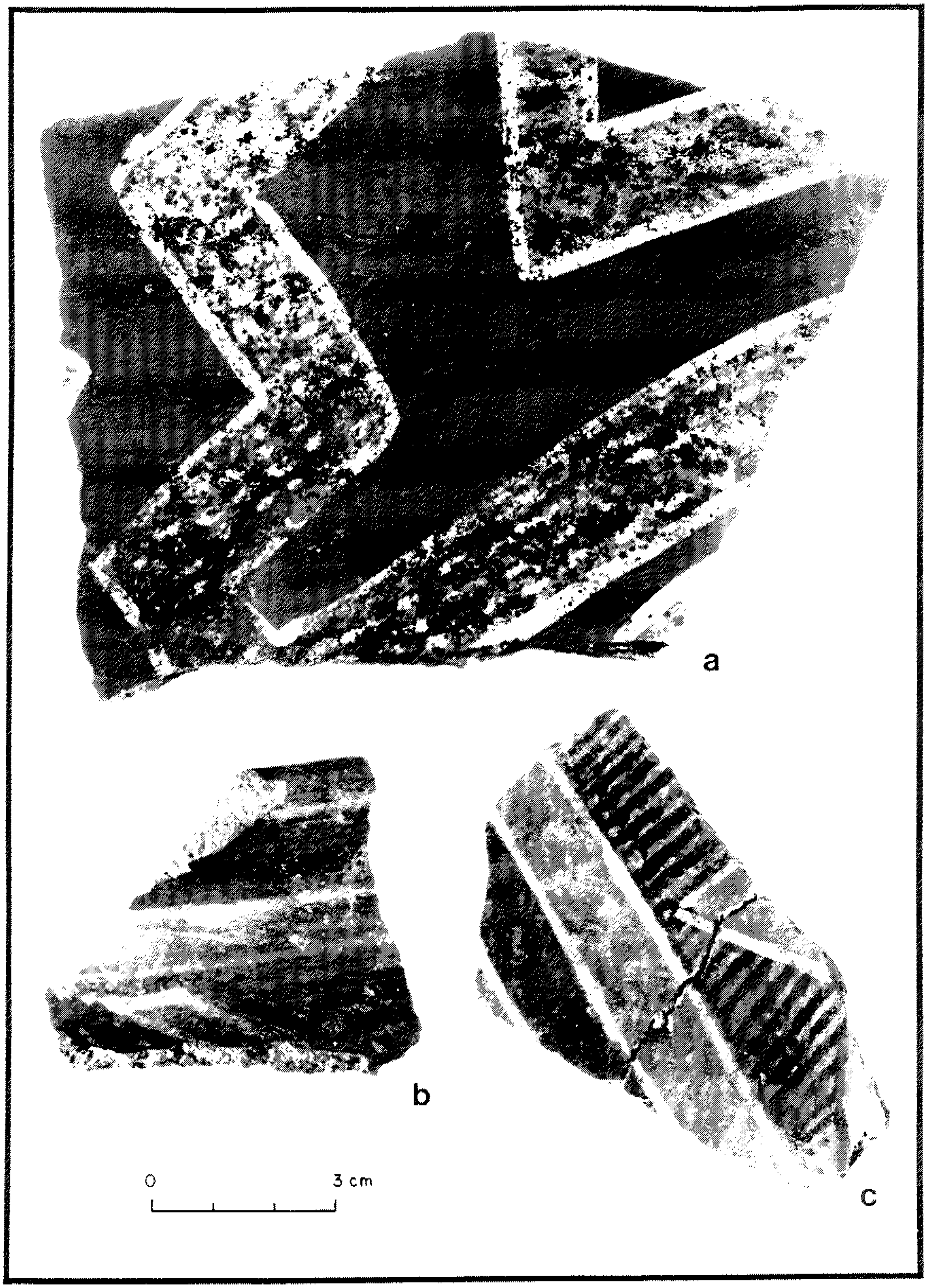

Figure 120. Maverick Mountain Polychrome.

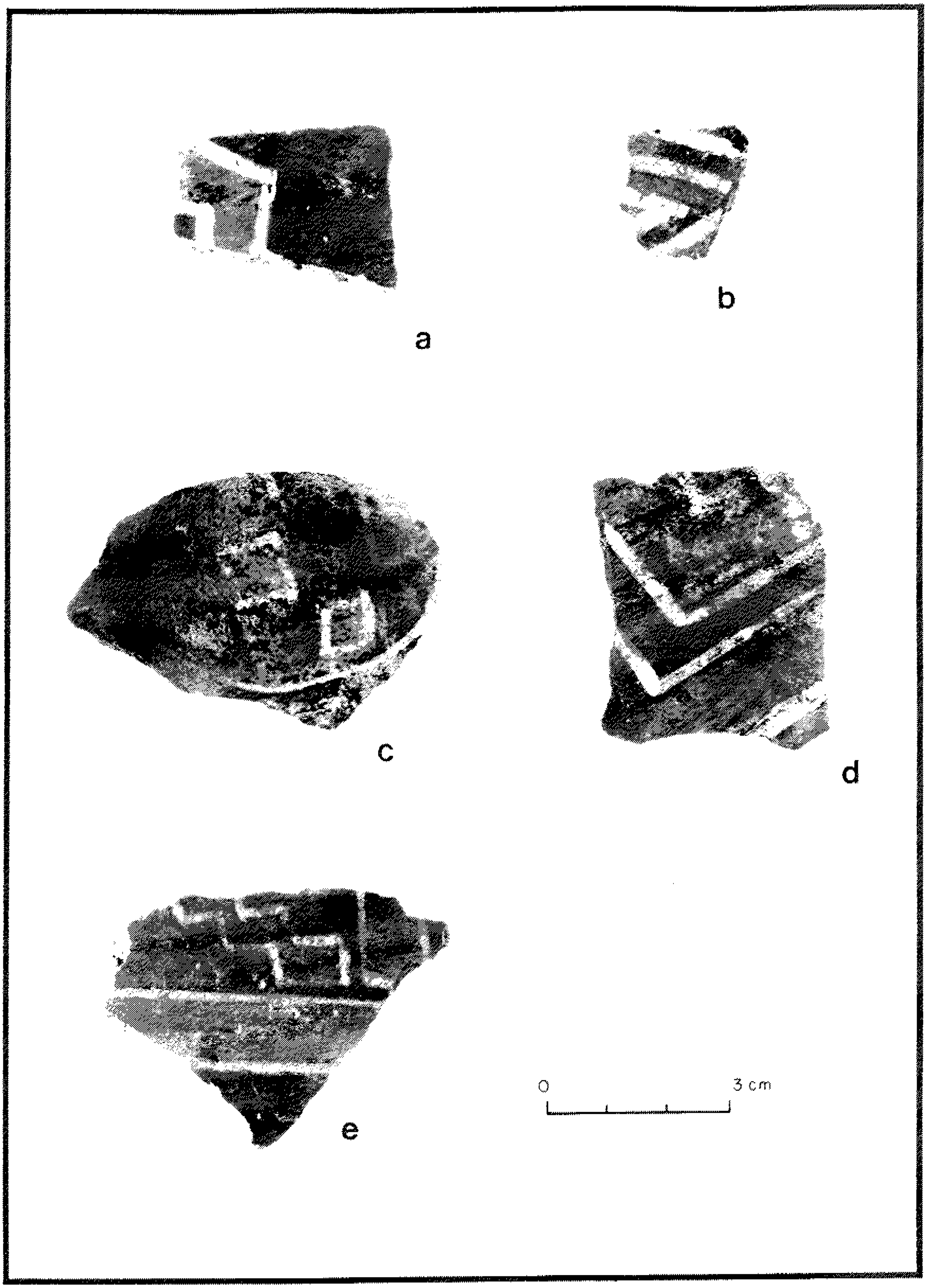

Figure 121. Tucson Polychrome.

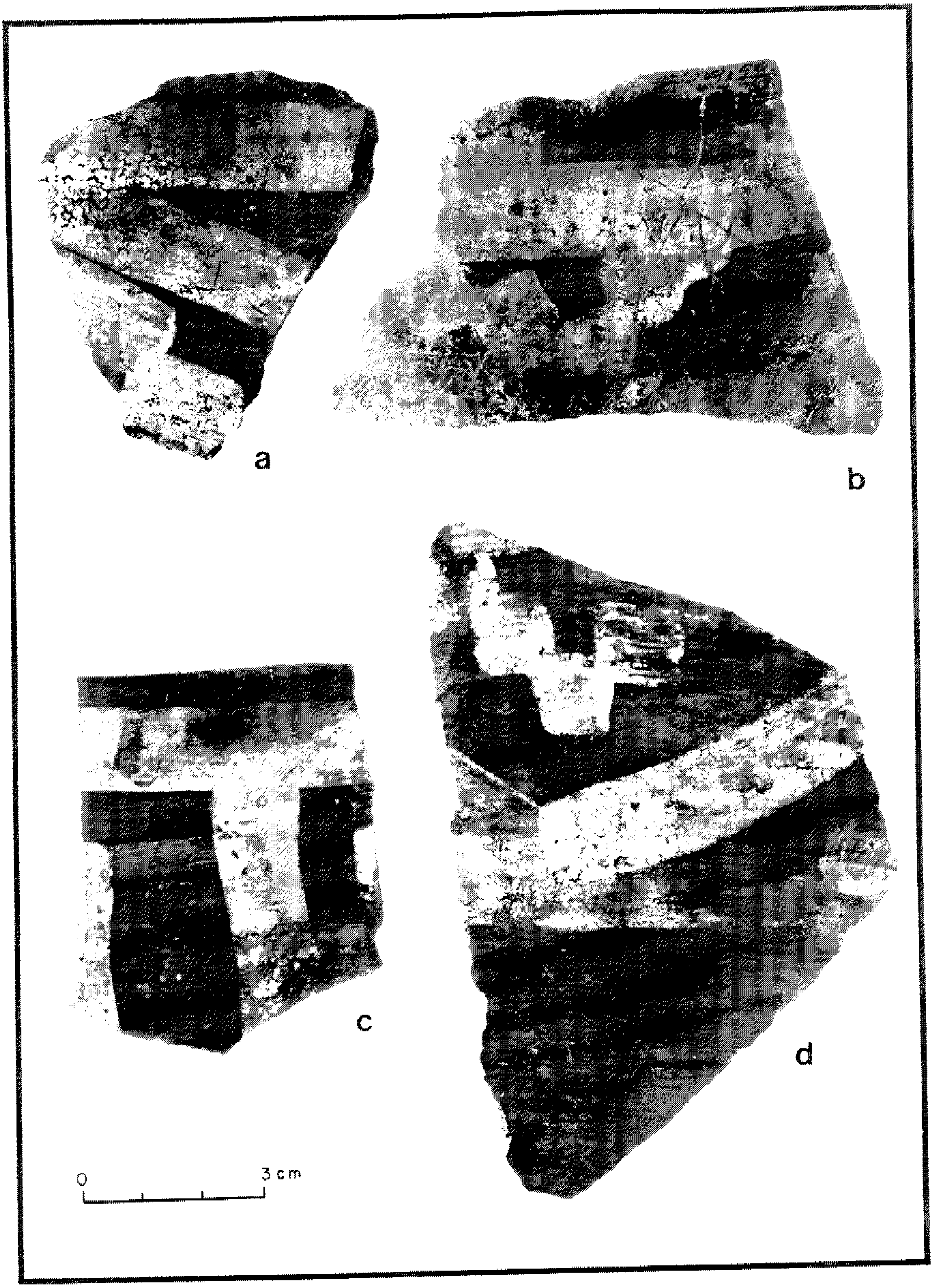

Figure 122. White-on-red.

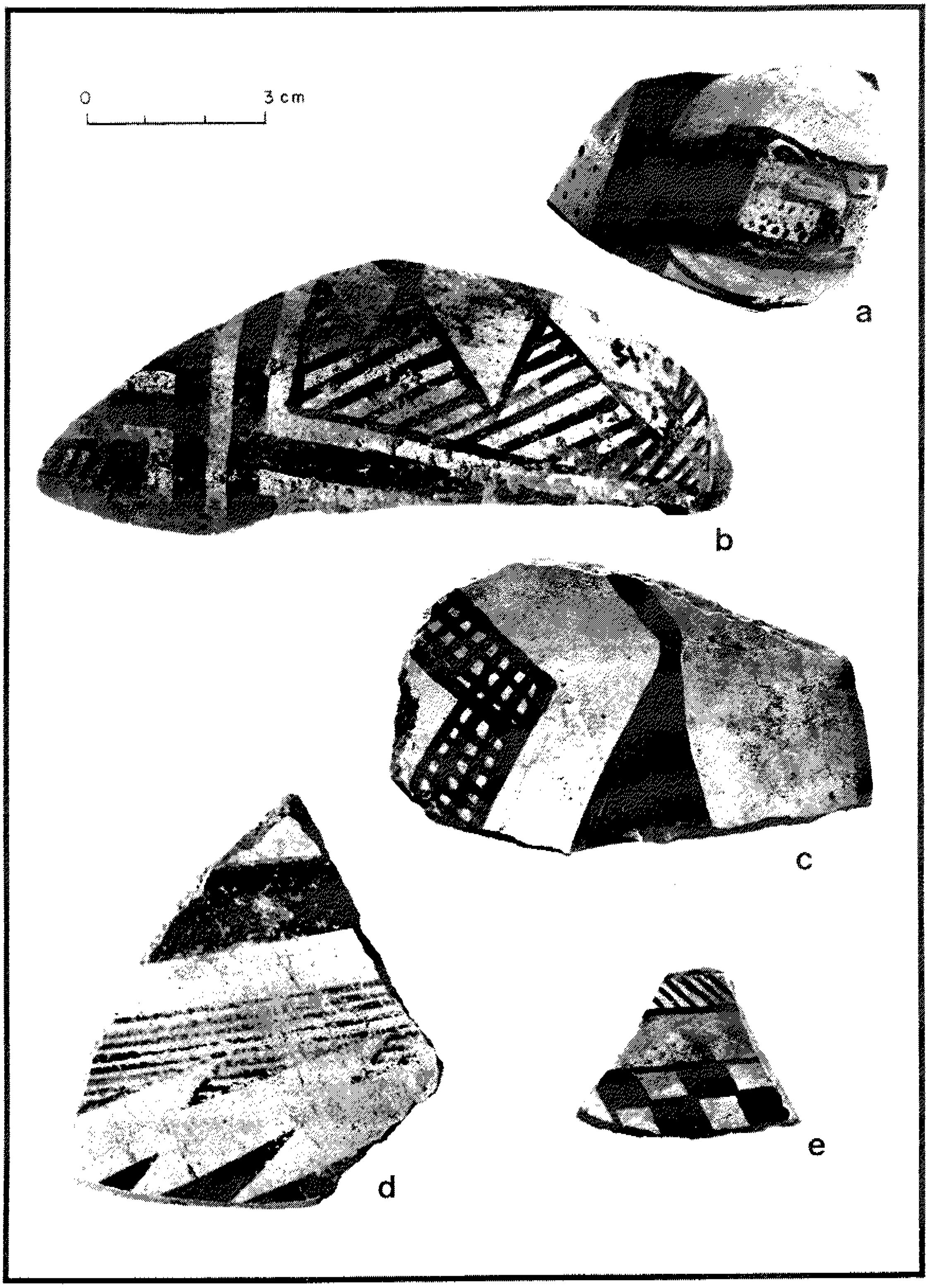

Figure 123. (a) Ramos Polychrome; (b) Chupadero Black-on-white; (c) Mangus (or Boldface) Black-on-white; (d-e) Mimbres Classic Black-on-white.

ORMAND CERAMIC ANALYSIS PART II: CERAMIC TRENDS FROM THE ORMAND VILLAGE

by C. Dean Wilson

Analysis and characterization of 23,805 sherds and 83 vessels recovered during excavations of the Ormand Village by Hammack in 1965-1966 provided a rare opportunity to examine ceramic trends associated with a site dating to the poorly known Salado occupation of the Upper Gila drainage of southwest New Mexico. While the lack of detailed ceramic analysis at contemporary sites elsewhere in southwest New Mexico limits comparisons of ceramic trends at the Ormand site with other contemporary "Eastern Salado" occupations, data from the few reported studies in this area provide for some comparison (Nelson and LeBlanc 1986; LeBlanc 1980b, 1986; Lekson 1989a, 1992b). In addition, detailed studies of ceramics recovered from contemporaneous Salado sites in Arizona (Franklin 1980; Lindauer 1994; Peterson 1994) provide for comparisons of ceramic trends at sites associated with the large Salado occupations in regions to the west.

Goals and Strategies

Analysis of pottery from the Ormand site involved recording attributes and categories useful in examining a variety of issues. These include dating of various contexts, as well as examination of patterns of vessel production, exchange, and use. These patterns are examined through the distributions of traits reflecting area of origin, method of manufacture, stylistic treatment, firing technology, and vessel function of Ormand pottery. In order to examine these issues, a range of descriptive attributes and typological categories were recorded. The categories and attributes recorded during the analysis of Ormand ceramics are described in the methodology presented earlier. Data concerning ceramic types are presented both in reference to the many type categories recorded during analysis (see Table 1), as well as categories resulting from the grouping of various types allowing for more basic comparisons (see Table 2).

Ceramic Dating of the Ormand Site

Initial reports of investigations at the Ormand site noted evidence of late Archaic, Mogollon, and Salado period occupations (Hammack et al. 1966). The majority of the pottery from the examined contexts, however, represent types occurring at fourteenth-century and early fifteenth-century Salado period occupations (see Tables 1 and 2). In fact, the Salado period in southwestern New Mexico has been termed the Cliff phase (LeBlanc and Nelson 1976; Nelson and LeBlanc 1986; Lekson 1992b) because of the concentration of Salado villages such as Ormand near Cliff, New Mexico.

The very small number of Mogollon Brown Wares and Mimbres White Wares identified at the Ormand site reflect the small size of the associated Mogollon occupation, as well as difficulties in distinguishing Mogollon from Salado brown utility wares. Mogollon Brown Wares identified are limited to a very small number of Alma Plain sherds. Mimbres White Ware ceramics are represented by a very small number of sherds assigned to a number of types including Mangus (Boldface Black-

Table 1. Ceramic Types for Sherds from the Ormand Site

Ceramic Type	#	%
Indeterminate	1	*
Indeterminate white	3	0
Indeterminate late white	1	0
Indeterminate red ware	5	0
Plain polished body	4806	20.2
Plain polished rim	470	2.0
Polished with single fillet near rim	10	*
Striated exterior	12	.1
Plain unpolished body	3517	14.8
Plain unpolished rim	81	.3
Single fillet near rim	24	.1
Mud ware	126	.5
Plain smudged interior body	7581	31.8
Plain smudged interior rim	424	1.8
Plain corrugated	55	.2
Plain corrugated rim	13	.1
Indented corrugated	45	.2
Polished indented corrugated	102	.4
Smeared corrugated	452	1.9
Smeared corrugated smudged interior	192	.8
Plain incised exterior	24	.1
Alma Plain polished body	2	*
Alma Plain polished rim	1	*
Plain gray	1	*
Red slipped plain polished body	2000	8.4
Red slipped plain polished rim	107	.4
Red slipped plain unpolished body	75	.3
Red slipped plain unpolished rim	29	.1
Red slipped smudged interior body	654	2.7
Red slipped smudged interior rim	80	.3
Red slipped Tularosa fillet smudged	7	0
Red slipped plain corrugated	3	0

Ceramic Type	#	%
Red slipped indented corrugated	2	0
Red slipped polished over indented corrugations	20	.1
Red slipped plain incised exterior	8	0
Red slipped incised exterior smudged interior	6	0
Red slipped polished over punched or incised	14	0
Unpainted slipped Salado	147	.6
Indeterminate Salado painted	249	1.0
Gila Polychrome solid designs	1512	6.4
Gila Polychrome hatchured designs	95	.4
Gila Polychrome solid and hatchured designs	169	.7
Gila Polychrome with smudged interior	25	.1
Gila Polychrome with white-on-red exterior	1	*
Tonto Polychrome solid designs	152	.6
Tonto Polychrome hatchured designs	4	*
Tonto Polychrome with smudged interior	1	*
Maverick Mountain Polychrome (hatchured)	25	.1
Tucson Polychrome (solid)	162	.7
Maverick Mountain Black-on-red (hatchured)	12	.1
Tucson Black-on-red (solid)	7	*
Tucson Polychrome (solid and hatchured)	33	*
White-on-red (slipped)	132	.6
Smudged interior exterior white painted decorations over red slip	75	.3
White-on-red (unslipped to partially slipped)	5	*
Indeterminate black-on-red	6	*
Unslipped black-on-red	7	*
Tsegi style painted	1	*
Kiet Siel Polychrome	4	*
Mogollon Red-on-brown	3	*
Indeterminate Mimbres Black-on-white	3	*
Mangus (Mimbres Boldface) Black-on-white	3	*
Mimbres Classic Black-on-white	4	*
Ramos Polychrome	1	*
Chupadero Black-on-white	1	*

Ceramic Type	#	%
El Paso Polychrome	12	.1
Total	23805	100

Table 2. Ceramic Groups for Sherds from the Ormand Site

Ceramic Group	#	%
Plain brown ware	8874	37.3
Brown smudged	8005	33.6
Brown textured	12	.1
Brown corrugated	932	3.9
Plain red	2211	9.3
Red smudged	741	3.1
Red textured	17	.1
Red corrugated	37	.2
Salado polychrome	2364	9.9
Tucson-Maverick Mountain Polychrome	220	[illegible]
Tucson Black-on-red	23	.1
White-on-red	210	.9
Ramos Polychrome	1	*
Chupadero Black-on-white	1	*
El Paso Polychrome	12	.1
Alma Brown	3	*
Mimbres White Ware	11	*
Tsegi Orange Ware	5	[illegible]
Indeterminate	126	.5
Total	23805	100

on-white, Classic Mimbres Black-on-white, and indeterminate Mimbres Black-on-white. In addition, Mogollon Red-on-brown sherds were also identified. Sherds associated with the early Mimbres White Ware occupation are scattered through various contexts, and none of the assemblages from any context examined were dominated by types indicative of Mimbres Mogollon occupations. The range of Mogollon Brown Ware and Mimbres White Wares recovered indicates they could have derived from components dating from the third to middle twelfth centuries. Some of these sherds may represent contaminants from nearby Mimbres Mogollon sites occupied during various periods. The presence of a small number of sherds dating to various Mogollon periods is not surprising as the Ormand site is in a favorable location within an area known to have been long occupied by Mimbres Mogollon groups (Chapman et al. 1985; Fitting 1972a; Lekson 1990, 1992b; Wendorf 1957).

The dominant decorated pottery at contexts from all proveniences examined, including the floors, as well as the fill of pithouses previously assumed to be associated with a Mogollon occupation (Hammack et al. 1966), represent ceramic types associated with Salado period occupations occurring over a wide area. Thus, ceramic-based examinations of temporal trends focused mainly on the Salado occupation of this site.

There is some disagreement concerning the use of the term Salado to characterize the late occupation at Ormand. This is partly because this site is located well outside the Salado heartland, usually defined as the Tonto Basin, Globe, Miami region, and lacks some characteristics found at Salado heartland sites such as the presence of platform mounds (Hohman 1992; Lekson 1992c; Doyel 1992). Thus, some archaeologists have been reluctant to define sites outside this area as Salado, and describe occupations dominated by Salado polychrome types occurring outside the Salado heartland as Western Pueblo (DiPeso 1958; Reed 1950). The use of Western Pueblo, however, to characterize late occupations is very vague and confusing; and the use of the term has obscured our understanding of the nature and significance of the distribution of Salado polychromes. Another view merging from studies in the Salado heartland and elsewhere is that rather than a specific ethnic or cultural group, the Salado is best considered as a distribution of traits over a broad area with numerous regional variants (Stark and Elson 1995). As such, an important aspect of the Salado system involved the production and circulation of similar Salado decorated pottery that began with Pinto Polychrome and culminated with Gila Polychrome and Tonto Polychrome (Crown 1994). Thus, a broad ceramic-based definition of the Salado is appropriate, as the Salado is best defined as a pan-Southwest horizon or phenomenon with many local variants, rather than any specific regional culture area. Areas originally assigned to the Salado heartland based on platforms mounds and other traits are best considered as one of several regional variants, incorporating certain Hohokam traits, while occupations at other areas including the Ormand site represent other equally important regional expressions of the Salado. Different regional variants of the Salado may be in part identified by the associated decorated types that occur alongside Salado polychromes. As the Ormand site is well within the area in which Gila Polychrome occurs, and contains higher frequencies of Salado polychromes than some contemporaneous sites in areas of the Salado heartland, the Cliff area should definitely be characterized as representing one of many regional expressions or variants of the Salado as defined here.

The term Salado as used in this study is as much a temporal category, noting periods of occupations post-dating the abandonment of this area by Mimbres Mogollon groups, during which similar Salado polychromes and contemporaneous utility ware types occur over wide areas of the Southwest. Other factors relating to the production and use of Salado pottery, however, are also important in understanding the nature of the Salado.

All contexts noted at Ormand are dominated by plain and decorated ceramics similar to those noted at other contemporaneous sites (see Tables 1 and 2). Most of the ceramics examined belong to brown utility wares, representing 74.9 percent of all sherds (see Table 3). The majority of the utility wares exhibit plain, untextured treatments on both surfaces, although polished surfaces are very common (see Table 4). A significant frequency of the brown utility wares from the Ormand site also have smudged interiors. A low frequency of the utility wares exhibit corrugated or other textured treatments. While red wares exhibit similar surface and textured treatments as brown wares, they display lower frequencies of smudged treatments or surface textures (see Tables 5 and 6).

Table 3. Distribution of Ware Groups for Sherds from the Ormand Site

Ware Group	North Roomblock		East Roomblock		Ceremonial Structure		Pithouses		Total	
	#	%	#	%	#	%	#	%	#	%
Brown	8030	78.6	6797	70.9	157	66.8	2841	75.5	17825	74.9
Red	1221	11.9	1307	13.6	35	14.9	443	11.8	3006	12.6
Decorated	970	9.5	1357	14.2	43	18.3	477	12.7	2847	12.0
Indeterminate	1	*	124	1.3	0	0	1	*	126	.5
Total	10222	100	9585	100	235	100	3762	100	23804	100

Table 4. Distribution of Brown Ware Textures for Sherds from the Ormand Site

Surface Treatment	North Roomblock		East Roomblock		Ceremonial Structure		Pithouses		Total	
	#	%	#	%	#	%	#	%	#	%
Plain	3870	48.2	3417	50.3	65	41.4	1524	53.6	8876	49.8
Plain smudged	3900	48.6	2937	43.2	88	56.1	1080	38.0	8005	44.9
Textured	9	.1	3	*	0	0	0	0	12	.1
Corrugated	251	3.1	440	6.5	4	2.5	237	8.3	932	5.2
Total	8030	100	6797	100	157	100	2841	100	17825	100

Table 5. Distribution of Red Ware Textures for Sherds from the Ormand Site

Surface Treatment	North Roomblock		East Roomblock		[illegible] Structure		Pithouses		Total	
	#	%	#	%	#	%	#	%	#	%
Plain	888	72.7	1002	76.7	31	88.6	290	65.5	2211	73.6
Plain smudged	323	26.5	279	21.3	4	11.4	135	30.4	741	24.7
Textured	4	.3	2	.2	0	0	11	2.5	17	.6
Corrugated	6	.5	24	1.8	0	0	7	1.6	37	1.2
Total	1221	100	1307	100	35	100	443	100	3006	100

Table 6. Distribution of Plain Ware Textures for Sherds from the Ormand Site

Surface Treatment	Brown		Red Slipped		All Plain Wares	
	#	%	#	%	#	%
Plain	8876	49.8	2211	73.6	11087	53.2
Plain smudged	8005	44.9	741	24.7	8746	42.0
Textured	12	.1	17	.6	29	.1
Corrugated	932	5.2	37	1.2	969	4.6
Total	17825	100	3006	100	20831	100

The plain brown and slipped red utility wares from the Ormand site exhibit similar forms and ranges of surface treatment as noted in other fourteenth-century Salado sites. While variation in the frequency of various brown ware surface treatments may be temporally sensitive, not enough is known about such changes to effectively use surface texture frequencies to date Salado components. Much more information is needed concerning changes in utility wares, and it is important that ceramic studies of Salado period sites systematically record a wide variety of treatments noted in plain brown and red utility ware sherds.

At most major contexts, slightly over 10 percent of the total ceramics represent decorated types, and make up 12 percent of all sherds examined (see Table 3). The majority of all decorated ceramics represent Salado polychrome types (Table 7). Other decorated types identified include those assigned to a Maverick Mountain-Tucson Polychrome group, Gila White-on-red, Mimbres White Ware, El Paso Polychrome, Chupadero Black-on-white, and Ramos Polychrome (Table 7).

The dominance and styles noted for Gila Polychrome within decorated assemblages at the Ormand site are similar to trends noted at contemporary Salado sites covering an extremely large area (Crown 1994; Doyel 1992; DiPeso 1958; Franklin 1980; Haury 1945; Lindauer 1994; Nelson and LeBlanc 1986; Peterson 1994; Young 1967). Areas with the highest frequency of Gila Polychrome include the lower San Pedro, the Globe-Miami district, and Middle Gila River Valley (Franklin 1980), and frequencies of Gila Polychrome at the Ormand site and are similar to these areas. If the Ormand site represents the upper or eastern part of the fourteenth-century settlement of the Middle Gila River Valley, the high frequency of Gila Polychrome is not surprising.

Almost all Salado pottery from Ormand that had sufficient design elements allowing their assignment to a specific type could be Gila Polychrome. The identification of Gila Polychrome was made easy by the extremely limited range of design styles and treatments occurring on Salado polychromes from the Ormand site. Table 8 illustrates basic styles for this type. The dominance of Gila Polychrome in decorated assemblages at Ormand indicates that most of the Salado occupation at Ormand dates to the Gila phase (as usually defined). The beginning date for this type is often given at A.D. 1300, although a beginning date during the middle of the thirteenth century is sometimes given, and Gila Polychrome is assumed to have been produced until A.D. 1400 (Breternitz 1966; Doyel and Haury 1976). It has recently been suggested that the appearance of Gila Polychrome may be later at Grasshopper Ruin (Reid and Whittlesey 1994), although this could simply reflect a late introduction date of this type at this site. Potentially supporting a relatively late date for the Salado occupation at the Ormand site is the consistent occurrence of very low frequencies of Tonto Polychromes in assemblages with large amounts of Gila Polychrome. A tree-ring date from Ormand of A.D. 1342 is certainly consistent with the dating of the associated types. It is possible that Ormand could have been occupied anytime during the fourteenth century, and perhaps into the early fifteenth century. Most of the intrusive types identified, such as Chupadero Black-on-white, El Paso Polychrome, and Ramos Polychrome also represent types known to have been produced during the fourteenth century, although the rarity and long temporal span attributed to these types contributes little to determine the exact time of occupation of Ormand.

Other dating arguments for Ormand are more speculative. In contrast to Gila Polychrome, which occurs in roughly equal frequencies in all contexts at Ormand, changes in frequencies in the Maverick Mountain-Tucson Polychrome group (the second most common decorated pottery class at Ormand) may provide information concerning slight differences in the time of occupation associated with various contexts (see Tables 7, 9 and 10). The presence of Maverick Mountain Polychrome exhibiting styles of late thirteenth-century polychrome pottery from the Kayenta-Tusayan region also provides information concerning the time of occupation and cultural influences or connections at the Ormand site. Given the association of Maverick Mountain Polychrome at other sites, the presence of this type at some contexts could indicate that the Ormand site was initially occupied sometime during the Maverick Mountain phase, defined as the late thirteenth century for the Point of Pines area (Haury 1945; Lindsay 1987). This assignment, however, is partially contradicted by the absence of Pinto Polychrome, and the dominance of Gila Polychrome in all contexts. Pinto Polychrome is thought to have been produced until about A.D. 1300 after which it was replaced by Gila Polychrome. As previously indicated, the dominance and associated characteristics of the Gila Polychrome from Ormand most likely indicates an occupation spanning the fourteenth century. Similarities in the decorations of Gila Polychrome from the Ormand site could also point to a short occupation sometime during the fourteenth century. The lack of Pinto Polychrome could reflect some analysis bias in the classification of Salado polychromes, particularly for smaller sherds. Although Gila Polychrome is the dominant decorated type in all major contexts, this could reflect mixing and the lack of stratigraphic control during the excavation of the Ormand site. Thus, it is possible that the occurrence of very low frequencies of Maverick Mountain Polychrome may indicate that the initial occupation of the Ormand site occurred sometime during the late thirteenth century, although ceramic distributions and associated tree-ring dates indicate that the major occupation of this site was during the fourteenth century.

Table 7. Distribution of Decorated Types for Sherds from the Ormand Site

Ware Group	North Roomblock		East Roomblock		Ceremonial Structure		Pithouses		Total	
	#	%	#	%	#	%	#	%	#	%
Salado polychrome	828	85.4	1144	84.3	31	72.1	361	75.7	2364	83.0
Tucson-Maverick Mountain	67	6.9	105	7.7	10	23.2	66	13.8	248	8.7
White-on-red	62	6.3	104	7.6	2	4.7	42	8.9	210	7.4
Jornado types	11	1.1	1	.1	0	0	1	.2	13	.5
Chihuahuan	0	0	0	0	0	0	1	.2	1	*
Mimbres	2	.2	3	.2	0	0	6	1.3	11	.4
Total	970	100	1357	100	43	100	477	100	2847	100

Table 8. Distribution of Basic Painted Style by Type for Selected Types of Sherds from the Ormand Site

Decorated Types	Gila-Tonto Polychrome		Tucson-Maverick Mountain Polychrome	
	#	%	#	%
Solid	1664	89.7	139	70.5
Hatchured	96	5.1	25	12.7
Solid and Hatchured	95	5.1	33	16.8
Total	1855	100	197	100

Table 9. Distribution of Decorated Ware Traditions for Sherds from the North Roomblock

Ware Group	North Roomblock (Early)		North Roomblock (Early Middle)		North Roomblock (Late Salado)		Total	
	#	%	#	%	#	%	#	%
Salado polychrome	36	69.2	144	81.8	648	87.3	828	85.4
Tucson-Maverick Mountain	13	25	21	11.9	33	4.4	67	6.9
White-on-red	3	5.8	11	6.3	48	1.1	62	6.4
Jornado types	0	0	0	0	11	1.5	11	1.1
Mimbres decorated	0	0	0	0	2	.3	2	.2
Total	52	100	176	100	742	100	970	100

Table 10. Distribution of Decorated Ware Traditions for Sherds from the East Roomblock

Ware Group	East Roomblock (Early Middle)		East Roomblock (Late Salado)		Total	
	#	%	#	%	#	%
Salado polychrome	968	82.9	177	90.7	1145	84.0
Tucson-Maverick Mountain	95	8.1	15	7.7	110	8.1
White-on-red	102	8.7	2	1.0	104	7.6
Jornado types	1	.1	1	.5	2	.1
Mimbres decorated	2	.2	0	0	2	.1
Total	1168	100	195	100	1363	100

While all the contexts from Ormand exhibited a similar combination of types, indicative of a fourteenth or early fifteenth-century occupation, the frequency of decorated types associated with different contexts varies. Although Salado polychrome types dominate decorated assemblages from all Ormand proveniences, the frequency of Maverick Mountain and Tucson Polychrome is significantly higher at contexts thought to have been occupied earlier (see Tables 7, 9, and 10). At the earliest surface rooms and subfloor components, this group makes up about 25 percent of the total decorated pottery. This frequency appears to have declined through time, and in later rooms the combined frequency of Maverick Mountain-Tucson Polychrome is less than 5 percent of the decorated pottery. Frequencies of sherds assigned to the Maverick Mountain-Tucson Polychrome group are also high at assemblages from the floor and fill of some of the pithouses (13.8 percent of the decorated wares) and the ceremonial structure (23.2 percent), and indicates that these structure may be associated with earlier occupations of this site.

Distributions of other types were very similar in contexts thought to have been occupied during different times. Examinations of ceramic distributions from various room contexts indicate a possible decrease in the frequency of brown utility ware sherds exhibiting corrugated exteriors. The frequency of corrugated sherds is highest at pithouse contexts.

Investigations in other regions, such as the Pine Lawn Valley, San Pedro Valley, and the Safford area indicate similar trends in ceramic change as higher frequencies of Maverick Mountain-Tucson Polychrome are noted at components dating early in the Salado occupation, with much lower frequencies occurring later (Franklin 1980). Initial occupations at some of these sites are represented by briefly occupied pithouses dominated by Maverick Mountain Polychrome and followed by pueblo sites dominated by Gila Polychrome (Lindsay 1987).

Ormand Ceramics in Regional Context

As previously indicated, it can be safely assumed that the ceramic tradition associated with the Salado occupation in the Cliff area of the Upper Gila did not develop out of local Mimbres Mogollon components or even out of the later Black Mountain phase of the eastern Mimbres (Lekson 1992b). Instead, the Salado component of this site appears to ultimately reflect the migration of groups from areas to the west where the Salado ceramic technologies first developed. Ceramic distributions provide some clues concerning the potential origin of such groups and the nature of interaction and relationship with surrounding groups as well as the technology practiced by these pioneering groups. Such relationships are indicated by stylistic similarities between pottery produced at Ormand and elsewhere, as well as the identification of small numbers of ceramics that can be demonstrated to have been produced in other regions.

The appearance and expansion of distinct Salado polychrome pottery and decorated pottery types reflect a complicated series of abandonments, movements, and intrusions, ultimately reflecting responses to environmental and population pressures. These factors are mirrored by widespread population shifts and changes beginning by A.D. 1100 and reaching their height during the late A.D. 1200s with the abandonment of large areas of the Southwest. Among the major population movements noted for this period is the movement of Anasazi groups on the Colorado Plateau in the Kayenta-Tusayan regions of northeastern Arizona to mountainous areas along the Mogollon Rim in Arizona (Dean 1996; Haury 1958; Lindsay 1987). Investigations at Point of Pines indicate the long-distant movement of Anasazi migrants who produced local versions of Tusayan pottery types using local pottery resources during the late thirteenth century (Haury 1958; Lindsay 1987). Evidence of even longer migrations from the Kayenta-Tusayan region have been noted at Salado sites in the San Pedro Valley of southeast Arizona (Bronitsky and Merritt 1986; DiPeso 1958; Franklin 1980; Franklin and Masse 1976; Lindsay 1987). Designs noted on Pinto Polychrome incorporated elements occurring in earlier Anasazi types. The execution of decorations with organic paint represents a technique long employed in the production Tusayan White Wares (Colton 1955).

Investigations at Chodistaas Pueblo in the Grasshopper region provide some clues concerning the appearance of Pinto Polychrome, the earliest Salado polychrome, during the late thirteenth century. This type appeared quite suddenly at sites along the Mogollon Rim in Arizona replacing Cibola White Ware, a type which was never locally manufactured, as the major decorated type in the late thirteenth century (Reid et al. 1992; Reid et al. 1996; Zedeno 1994). The initial production of early Salado polychromes appears in mountainous areas of central Arizona, and reflects the use of late Pueblo III Anasazi traditions from the Colorado Plateau as groups moved into mountainous areas of Arizona. Another tradition resulting from such movements was even more directly influenced by the Tsegi Orange Ware tradition from the Kayenta-Tusayan region. This tradition is represented by the Maverick Mountain-Tucson Polychrome group, and reflects the application of a red slip over brown clays derived from mountainous sources, in designs reminiscent of Kayenta-Tusayan styles. An extremely small number of sherds from Ormand appear to closely resemble Tsegi Orange Wares.

The movement of these immigrant Anasazi groups into mountainous areas of the southern upland Southwest (also referred to as the Mogollon Highlands) contributed to the development of new ceramic manufacturing conventions that involved the production of decorated wares uniquely suited for the high iron volcanic-derived mountainous pedogenic clays common in such regions. The lack of low-iron clays used by groups in areas to the north appears to have encouraged experimentation with locally available paste and slip clays and organic pigments.

The technology employed by Salado groups in mountainous areas is similar to that employed by earlier Mogollon groups (Wilson 1994; Wilson et al. 1996). The resulting ceramic technology reflected properties and conventions suited for the production of ceramic vessels out of the distinct and homogeneous clay resources of the Mogollon Highlands. Such a scenario better accounts for both the distinct color and surface treatments (smudging and polishing) noted in Mogollon Brown than earlier (Mogollon), culture-based traditions used to account for ceramic distributions (Gladwin and Gladwin 1934; Colton 1939; Haury 1936; Martin and Plog 1973). While the best of the mountainous "brown ware" clays are extremely plastic and mature at relatively low firing temperature, the high iron content of such clays makes the application of painted decorations very difficult. As pottery decorations appeared to have been a very important stylistic marker in the Southwest (Hegmon 1990), this presented a major obstacle to potters in the Mogollon Highlands. The resulting decorated pottery technologies based on mountainous clays represents a major technological accomplishment.

Earlier Mogollon groups attempted to deal with these limitations in a number of ways (Wilson 1994). One affect achieved by Mogollon potters involved the use of fine, well-executed coiled textures often in combination with highly smudged surfaces. In some cases, painted decorations were applied to brown ware surfaces. In addition, in many areas of the Mogollon Highlands, painted pottery was not made locally, but imported from areas of the Colorado Plateau to the north. Most of the Cibola White Ware types such as Reserve Black-on-white and Tularosa Black-on-white, consistently occurring on Pueblo period sites in the Mogollon Highlands, are the result of exchange with groups on the Colorado Plateau to the north. Another solution to the lack of white clays in the Mogollon Highlands is represented by the production of Mimbres White Wares made by a white slip of volcanic ash applied over self- tempered clays identical to those used in the production of local brown wares. This technology reached its culmination in the spectacularly decorated Mimbres Classic Black-on-white. It is interesting, however, that despite the sensational decorations found on Mimbres White Ware vessels, this technology appears to have been largely limited to the Mimbres region, and did not spread to many of the areas where brown wares were produced. In part, the inability of this technology to be transferred to new production areas accounts for the distinctness of the associated styles. This geographic isolation partially resulted from weaknesses and difficulties in this technology, as attested by the common flaking of pigments and slips of Mimbres vessels. The major difficulties encountered may have been both the softness of slip clays and problems reaching atmospheres and temperatures allowing for the retention of mineral paint.

Like Mimbres White Wares, Salado polychromes are represented by slipped brown wares. The emergence of Salado polychromes and their apparent production of very similar forms over a very wide area essentially represents the rediscovery of techniques used to produce a white-colored decorated pottery with the mountainous clays of the Mogollon Highlands. The conventions employed in Salado polychromes, however, represented a new and improved white-slipped pottery technology applied to these clays. The key to the manufacture of Salado polychromes was the use of brown ware clays that matured at relatively low temperatures, as well the discovery of slips or slip combinations that retain organic paint, and successful control of low-oxidizing firing atmospheres. A similar technology involving the production of polychromes painted with black organic paint and red slipped surfaces, on a white or cream-colored slipped surface appeared later in areas along the Northern Rio Grande occupied by Keres and Tewa Pueblo groups (Batkin 1987; Frank and Harlow 1974; Harlow 1990). These technologies are still practiced by modern Puebloan potters, and while they utilize different fuel and clay resources, ethnographic accounts of pottery production by modern Pueblo potters provide important clues concerning the nature of the Salado polychrome ceramic technology.

Salado polychromes, reflecting the use of similar resources, technologies, and decorative styles, spread over an extensive area, much wider than that noted for earlier Mimbres White Wares. Similar brown and red utility wares were produced over this area with similar clays. The maximum geographic distribution of Salado polychrome and associated utility wares appears to correspond closely to the area where Mogollon Brown Wares were produced earlier. Prior to the Salado occupation of this area, similar brown wares were associated with decorated types belonging to a number of traditions including Mimbres White Ware, White Mountain Redware, Cibola White Ware, and Hohokam Buff Ware.

The spread of the technological and decorative conventions reflected by Salado polychrome and associated types was spurred by a variety of factors leading to the resettlement of huge areas of the Southwest with similar "brown ware" clay sources. This resulted in the widespread distribution of remarkably similar pottery including Salado polychrome. Crown (1994) notes the widespread distribution of similar styles in Salado polychromes and similarities with styles associated with other traditions, and suggests this reflects the spread of the "Southwestern Cult." This appears to be reflected by the conservative styles of Gila Polychrome, where identical designs and symbols recur in boldly executed and dramatic forms. Crown (1994) further proposes that the widespread distribution of styles associated with Salado polychromes reflects an open iconography or belief system. She notes that such an inclusive ideology may have contributed to the stabilization of social relationships during times of stress and upheaval (Crown 1994). The signaling of common beliefs and practices in the material culture of rapidly expanding populations may have been beneficial in that it reinforced cooperation in separated groups, and explains the very conservative nature and widespread nature of Salado polychrome pottery. The specialized nature of the production of Salado polychromes and the absence of competing painted decorative ceramic technologies in most of the mountainous Southwest during the fourteenth century may have reinforced the widespread use of specific painted styles. Thus, information concerning a technology allowing for the production of light-colored organic-painted polychromes using mountainous clays, and rules concerning appropriate decorative styles, may have spread together as a single package, reinforcing the widespread production of distinct Salado polychrome pottery.

Ceramic Trends at the Ormand Site

Ceramic trends at the Ormand site provide clues concerning the origin and nature of the spread of various groups into the Cliff Valley. Postulated sources of immigrant populations and influences for Salado period occupations for this area include Kayenta-Tusayan groups that had already migrated into areas to the west as well as groups associated with Casa Grandes to the south and El Paso phase groups to the southeast (Lekson 1992b; Schaafsma 1979).

Overall, the ceramic assemblage at Ormand most closely resembles contemporaneous pottery occurring at sites in east-central and southeast Arizona thought to reflect a technology carried by Kayenta-Tusayan immigrants. While Salado polychrome occurs overs an extremely broad area, the joint occurrence of Salado polychromes along with polychromes of the Maverick Mountain -Tucson group are more limited and may more closely reflect influences of Kayenta-Tusayan migrants. Similar assemblages reflecting the possible movement of these groups occur at the Point of Pines, as well sites in the Safford area and Lower San Pedro Valley. I believe the Salado occupations in these areas, as well as the Upper Gila where the Ormand site is located, represent a distinct variant of the Salado, reflecting the gradual southeastern movement of groups that were Western Anasazi in origin into previously abandoned areas of the Southwest. The movement and settlement of these groups probably occurred over several generations and ultimately resulted in large concentrations of populations along the Cliff Valley and nearby drainages of the Upper Gila (Hammack et al. 1966; Lekson 1978a, 1992b).

The widespread occurrence of Salado polychrome types indicates the participation of groups over a wide area in a "Western Pueblo" technological-ideological complex that spread to groups with diverse histories and ethnicities where brown ware clays sources predominated. In contrast, the joint production of Maverick Mountain and Tucson Polychrome reflect the continual importance of Kayenta-Tusayan styles by groups of Kayenta-Tusayan migrants who moved over several generations into the Point of Pines and Lower San Pedro valleys, the Safford area, and finally into the Upper Gila Valley.

Ceramic associations at other Salado sites are very different, indicating different histories and influences. Although sites with Tucson Polychrome or Maverick Mountain Polychrome consistently contain Salado polychrome types, many sites with Salado polychrome completely lack Tucson or Maverick Mountain polychromes. In different regions, Salado polychromes are associated with decorated types belonging to a number of different traditions. For example, in other areas of southwestern New Mexico, Gila Polychrome is present at sites contemporaneous with Ormand, while Maverick Mountain and Tucson Polychrome sherds are absent. Instead, Gila Polychrome is associated with Casas Grandes types in areas to the south and with Chupadero Black-on-white and

El Paso Polychrome in areas to the east and southeast. At sites along the Mimbres Valley containing Gila Polychrome, Salado polychromes seldom represent more than 5 percent of the total ceramics at fourteenth-century sites (Nelson and LeBlanc 1986) so that it is much more rare than at the Ormand site. The presence of Casas Grandes types at sites in the southernmost part of New Mexico have been interpreted as indicating distinct eastern Salado populations (Nelson and LeBlanc 1986; Lekson 1992a, n.d.), thought to better reflect a repopulation of this area by immigrants from the Casas Grandes system of northern Mexico than Salado groups to the west.

An examination of distributions of decorated types from the Ormand site, however, indicates very different associations from sites in other areas of southwest New Mexico containing Gila Polychrome and similar utility ware types (Nelson and LeBlanc 1986; Schaafsma 1979). Other ceramic types occurring in significant frequencies at sites in these areas include Chihuahuan polychromes and Jornada Mogollon types, and indicate participation in very different regional exchange and interaction systems. Thus, in many ways the Ormand site should not be considered as part of the Eastern Salado closely tied with the Chihuahua or Jornada Mogollon branches (Lekson 1992a, 1992b; Schaafsma 1979). Instead, Ormand and other sites in the Upper Gila of New Mexico were probably part of a Tusayan-Kayenta variant of the Salado that included the Point of Pines, Lower San Pedro Valley, and the Safford area. Assemblages in these areas are characterized by a low frequency of Salado polychrome (over 10 percent of all sherds), as well as the continual presence of Tusayan-Kayenta inspired types such as Maverick Mountain Polychrome and Tucson Polychrome. It should be noted, however, that both Maverick Mountain Polychrome and Tucson Polychrome from the Ormand site were always rare and appear to get rarer through time. It is likely that factors contributing to the production of distinct Tusayan-Kayenta-like pottery were gradually disappearing, particularly at sites in the Upper Gila on the extreme eastern margin of the area these groups settled.

Another explanation for differences in ceramic types associated with Salado pottery in various areas of southwest New Mexico is that this variation reflects temporal patterns. In this view the Ormand site may reflect earlier connections with areas to the west; while occupations such as those along the Mimbres Valley reflect the later spread of Chihuahua or Jornada Mogollon influences. This could possibly explain the higher frequency of Chihuahua types at the Dutch Ruin near Redrock on the Upper Gila River, although Lekson (1978a, 1992a) explains this higher frequency in terms of its location near a distinct serpentine or ricolite resource that could have been exported to Casas Grandes. Better dating is required before these issues can be adequately resolved, although the occupation at Ormand does overlap with sites yielding Gila Polychrome in areas to the east and south.

Evidence of Production at Ormand

Evidence concerning the nature of pottery production associated with various ceramic groups at Ormand may provide further information on the interaction and influence with groups in other regions. Of particular importance is determining whether various forms of utility and decorated pottery were produced locally using clay available near the Ormand site. Distributions relating to clay pastes, tempering material, and design styles and treatments of pottery recovered from the Ormand site can be used to examine related patterns of production and exchange of ceramic vessels.

The only way to reliably identify locally produced pottery is through the identification of ceramic materials from local sources. In order to accomplish this goal, samples of ceramic-quality clays were collected from various sources in the vicinity of the Ormand site and compared to ceramic pastes occurring in Ormand ceramics belonging to various ware groups and traditions (see Appendix 1). Data concerning temper classes were identified using a binocular microscope, paste color and characteristics of refired samples were recorded, and petrographic analysis of a small but varied sample of ceramics was performed (see Hill, this volume).

The examination of clay samples collected in the vicinity of Ormand indicate that high-quality clay sources are common in layers of alluvial and pedogenic soils. These are weathered from nearby volcanic sources, are high in volcanic aplastic inclusions, and often do not to require the addition of separate tempering materials. These self-tempered clays are usually brown to red in color, and very high in iron content. The best of these clay sources are fine and extremely moldable and plastic. Firing experiments with some of these clays indicate they produce hard durable vessels at surprisingly low firing temperatures. Samples collected at the Ormand site are extremely similar to pastes noted in various ceramic wares at Ormand. Sources for the red slip clay found in red wares and Salado polychromes are found in other alluvial deposits within a reasonable distance from the Ormand site, although their distribution is much more spatially limited than that noted for paste clays. Sources for the white or buff slips appear to be present in volcanic ash lenses scattered through this area. While they are more rare than paste clays, given the small amount of slip clays required, suitable sources would have been available within a reasonable distance from Ormand.

Refiring analysis of clays and sherds belonging to ceramics associated with various ware groups indicated the use of clays firing to similar colors when exposed to oxidation atmospheres. Examinations of sherd and clay samples through a binocular microscope indicate the occurrence of very similar inclusions dominated by white angular fragments and lower frequencies of dark gray or black fragments. Petrographic analysis of smaller samples indicated the presence of natural volcanic inclusions consisting of quartz, feldspars, and rock fragments, basalts, and rhyolite porphyries, so that the addition of separate tempering material was not necessary (Hill this volume). Similar rock inclusions and pastes were noted in the plain utility wares, red wares, white-on-reds, Salado polychromes, and the Maverick Mountain-Tucson Polychrome recovered from the Ormand site. These inclusions are significantly different than those observed on similar pottery types known to have been produced at sites in other regions (see Hill, this volume). Evidence of local production is also indicated by similar ranges of colors and other characteristics of pastes associated with these various traditions. Similarities in vessel forms associated with different traditions could also reflect local production. Thus, it appears that pottery associated with all these ware groups were locally produced at Ormand or nearby sites. This may indicate that the immigrant populations who moved into the Upper Gila, while practicing ceramic technologies used in their area of origin, may have been isolated. Rather than establishing ties with groups in other areas to obtain vessels of various forms and uses, groups arriving into this region may have had to immediately seek out quality clay resources, and employed these in the production of a wide range of pottery forms. The basic Salado technology was well designed for the production of a very wide range of vessel forms using the locally available resources.

Pottery from Ormand with distinct resources that could clearly be ascribed to nonlocal types was limited to a single Chupadero Black-on-white and Ramos Polychrome sherd and an extremely small number of El Paso Polychrome sherds. Thus, while groups had access to pottery produced in regions to the south and southeast, the amount of pottery obtained from these areas was extremely small, and the lack of such ceramics and homogeneous temper and paste of this pottery points to the relative isolation of groups in the Upper Gila.

The characterization of pottery pastes indicate that the wide range of wares and traditions represented at Ormand reflect the local use of diverse technological and stylistic practices. Thus, the immigrant groups who settled areas of the Upper Gila near Cliff appear to have begun immediately producing a diverse range of pottery resulting in their assignment to types belonging to a number of ware groups and traditions. In contrast, there is very little evidence of exchange with areas where distinct clay resources were employed. This observation conforms to those studies indicating that Salado polychromes were produced locally in most areas where they were found (Crown 1994), although some studies indicate exchange of Salado polychromes (Abbott and Schaller 1992).

Not only were a wide range of ware groups produced locally, but a wide range of treatments and technologies were utilized within these ware groups. For example, both plain brown and red wares exhibit a wide range of treatments including plain, smudged, corrugated, and incised surfaces, and occasional exterior decorations in a white clay paint. Types associated with both ware groups exhibit similar pastes, temper, surface treatments, and vessel forms, and appear to have been produced by the same potters using the same conventions.

While the local production of a wide range of brown and red wares along with Salado polychromes was not unexpected, evidence of the utilization of similar pastes in the production of painted wares assigned to various decorated traditions is very surprising. For example, identical local pastes and inclusions were noted for white-on-red, Salado polychromes, and the Maverick Mountain-Tucson Polychrome types. This is unexpected given the dramatic and consistent difference in design motifs and styles associated with these different decorated traditions. This indicates the probable production of several distinct pottery traditions, possibly by potters at the same site, and at least at sites in the same clay resource zone.

An examination of painted types from the Ormand site indicate a great deal of homogeneity in the design motifs used in pottery belonging to a specific type or tradition. These examinations also indicate very little overlap in ceramics associated with a given tradition. For example, the motifs, brush stroke width, and overall layout of designs used on Gila Polychrome from Ormand reflect similar wide lines and bold geometric forms (stepped triangles, connected squares, ticked triangles, and scrolls). White-on-red types tended to exhibit wide lines and stepped triangles, but arranged in different conventions than noted on Salado polychromes. In contrast, ceramics assigned to Maverick Mountain-Tucson Polychrome exhibit distinct designs representing hatched or rectilinear lines. Design arrangements, slip colors and combinations, vessel wall thickness, and rim eversion noted on sherds and vessels assigned to a specific tradition were also extremely homogeneous. Thus, very specific decorative conventions were used to decorate pottery assigned to types belonging to various traditions.

In contrast, the rules used to decorate pottery assigned to various traditions at Ormand were almost identical to those used in other areas. For example, the Gila Polychrome ceramics from the Ormand site exhibit very similar ranges of slipped treatments and painted decorations as that from other contemporaneous sites over a very wide area. Such similarities also apply to Maverick Mountain and Tucson Polychrome, as well as to the painted exteriors of white-on-red from this site.

There is some evidence that other cases involving the local production of types belonging to different traditions are represented in areas where this combination of types occurs. A similar situation has been described for the Reeve Ruin in the San Pedro Valley, where DiPeso (1958) felt that both Gila Polychrome and Tucson Polychrome were locally produced. Other studies indicate similar combinations of Gila Polychrome and Tucson Polychrome at sites in the San Pedro Valley

(Franklin 1980; Danson 1957). DiPeso interpreted the joint production of pottery belonging to these distinct traditions as ultimately stemming from the intermingling of groups with different origins and ceramic traditions within this site. Potters from some lineages were postulated to have continued to produce pottery more closely related to the Kayenta-Tusayan tradition, while others produced typical Salado polychrome pottery.

Such a division appears to have been maintained only in some of the areas Salado polychrome was produced. Tucson Polychrome is absent in much of the area where Salado polychromes occur. The distribution of sites containing both types is spotty (Franklin 1980; Lindsay 1987), and reflects the complex history of the movement of groups from the Colorado Plateau into various areas of the mountainous and desert Southwest.

It is possible that the production of Salado polychrome types, reflecting the use of similar resources, technologies, and decorative practice at Ormand, did signal the participation of groups in the "Southwest Cult" as previously discussed (Crown 1994), and may reflect the participation of this site in this widespread ideological system. In contrast, the production of Maverick Mountain and Tucson Polychrome at this site using color combinations and geometric designs much more similar to earlier Tusayan Polychrome types than Salado Polychrome types may indicate the participation in a second decorative system. This system may have involved Kayenta-Tusayan migrants who first settled into areas such as Point of Pines, and later into the San Pedro Valley, the Safford area, and finally the Upper Gila Valley. If groups in all of these areas continued to produced pottery in these two traditions, Maverick Mountain and Tusayan polychrome may ultimately reflect earlier conventions or ideologies common to groups in these regions but distinct from those in other areas where Salado polychrome was produced. Thus, the production of pottery associated with these distinct traditions may reflect the maintenance of pan-Southwestern ideologies as well as more localized regional icons.

Interestingly, the closest analogy to the joint production of different but related Salado polychromes and Maverick Mountain-Tucson Polychrome are at Pueblo III components in the Tusayan-Kayenta regions. During the Pueblo III period two distinct decorative traditions were practiced in the Tusayan-Kayenta region (Beals et al. 1945; Smith 1971). One tradition included organic-painted Tusayan White Wares that gradually developed out of earlier painted types. Tusayan White Wares produced over wide areas of the Tusayan-Kayenta region are very similar, although they are quite distinct from contemporary ceramics produced in regions to the east (Blinman and Wilson 1993). Tsegi Orange Wares appear to have developed out of earliest San Juan Red Wares produced in southeast Utah (Hurst 1983), and began to be produced in areas of the Tusayan-Kayenta region during the Pueblo II period. Pottery belonging to contemporaneous types of these two traditions exhibit distinct technologies and painted decorations. While types of both decorated traditions are common in most Pueblo II and Pueblo III sites in the Kayenta-Tusayan region, they consistently display different pastes and temper. These differences along with distributions of wares indicate that pottery belonging to these two traditions may have been produced by potters in different locations of this region, and the widespread mixture of pottery belonging to these traditions may reflect the widespread exchange of pottery. Areas within these regions were abandoned during the late thirteenth century as larger settlements were established. This could have brought together groups practicing different red ware technologies. The continual production of these distinct traditions may have expressed social or ethnic differences of groups with different affiliations or origins. Such practices and distinctions may have continued at fourteenth-century sites in the Upper Gila Valley and San Pedro valleys long after groups from the Tusayan-Kayenta region moved outside the Colorado Plateau, and merged with other groups forming new ceramic technologies and traditions suitable to distinct resources of these areas.

Ceramic Function and Use

Despite the wide range of issues that can be examined using ceramic data, the presence of ceramics at a particular context ultimately resulted from the production and use of vessels for specific tasks or activities. These activities are reflected by distributions of a variety of traits including vessel shape, vessel size, wear patterns, soot deposits, surface manipulation, technological attributes, and paste characteristics. Many of the functionally significant categories are reflected in ware categories and vessel forms, and examinations of trends associated with these two data classes form the basis for interpreting vessel use and function.

Interpreting the distribution of individual sherds differs from interpreting whole or partially complete vessels. Sherd-based data represent large samples distributed through a variety of contexts. Sherds, however, represent limited and incomplete samples of the vessels from which they were derived, and are often not recovered from their actual context of use. As both bowl and jar body sherds of vessels associated with Salado occupations often exhibit polishing on both sides, it is difficult to determine the vessel form for which a given body sherd originated. Discussions on vessel forms are limited to the sample of rim sherds recovered. The identification of 83 whole vessels from Ormand provides more complete information concerning the use of specific containers in particular contexts, but the recovery of whole vessels is rare, and they are often absent in many types of contexts. Therefore, data concerning the distribution of all sherds (including those belonging to reconstructed vessels) and complete and partial vessels are presented separately.

Sherd Functional Trends

Sherds were assigned to basic functional categories based on surface manipulation or rim form. Considerable caution must be employed when function, based on forms, is assigned to body sherds. Problems can result from the widespread use of polished vessel surfaces because they belong to a wide range of forms in Salado assemblages. Examinations of rim sherds and complete vessels indicate a wide range of surface treatments on vessels associated with all the basic forms. Examination of data concerning general rim sherd distribution, however, indicate that the majority of the sherds recovered from the Ormand site are from necked jars.

An examination of form-related trends noted for sherds assigned to various ware groups provide a starting point to examine functional trends (see Tables 11 and 12). The frequency of ware groups is very similar at all features and stratigraphic units, and no temporal changes in the distributions of ware groups or vessel forms were noted.

The majority (74.9 percent) of the sherds from Ormand were assigned to unslipped and unpainted brown ware types (see Table 3). Most of these exhibit a wide range of surface treatments including plain unslipped treatments on both surfaces (49.8 percent of all brown wares), plain exteriors and smudged interiors (44.0 percent), textured exteriors (.1 percent), and corrugated exteriors (5.2 percent). A comparison of exterior treatments and vessel forms for brown wares indicate little relationship among these attributes (see Tables 13 and 14).

Table 11. Distribution of Sherd Vessel Forms by Ceramic Ware

Vessel Form	Brown Utility		Red Utility		Decorate Ware		Total	
	#	%	#	%	#	%	#	%
Indeter. body	5348	30.0	887	29.5	502	17.6	6737	28.5
Bowl rim	379	2.1	54	1.8	160	5.6	593	2.5
Bowl body	343	1.9	346	11.5	967	34.0	1656	7.0
Jar body	9100	51.0	1338	44.5	679	23.8	11117	47.0
Cooking storage	1284	7.2	145	4.8	151	5.3	1580	6.7
Cooking storage	1218	6.8	174	5.8	170	6.0	1562	6.6
Corrugated ext.	24	.1	1	0	0	0	25	.1
Flared bowl rim	79	.4	51	1.7	182	6.4	312	1.3
Seed jar body	16	.1	0	0	1	5.9	17	.1
Flared bowl body	24	.1	8	.3	32	1.1	64	.3
Effigy	2	0	0	0	1	0	3	0
Figurine	1	0	0	0	0	0	1	0
Lug handle	0	0	2	.1	1	0	3	0
Corrugated jar	3	0	0	0	0	0	3	0
Bowl dipper	1	0	0	0	0	0	1	0
Seed jar rim	4	0	0	0	1	0	5	0
Total	17826	100	3006	100	2847	100	23679	100

Table 12. Distribution of Sherd Rim Forms by Ceramic Ware

Vessel Form	Brown Utility		Red Utility		Decorate Ware		Total	
	#	%	#	%	#	%	#	%
Bowl rim	379	21.7	54	21.6	160	32.4	593	23.8
Flared bowl rim	79	4.5	51	20.4	182	36.8	312	12.5
Flared jar rim	1284	73.5	145	58.0	151	30.6	1580	63.5
Seed jar rim	4	.2	0	0	1	.2	5	.2
Total	1746	100	250	100	494	100	2490	100

Table 13. Brown Ware Sherd Form by Surface Treatment

Vessel Form	Plain		Smudged		Textured		Corrugated	
	#	%	#	%	#	%	#	%
Indeterminate body	3136	35.3	1858	23.2	1	8.3	353	37.9
Bowl rim	169	1.9	188	2.3	0	0	22	2.4
Bowl body	171	1.9	159	2.0	0	0	37*	4.0
Jar body	4413	49.7	4281	53.5	0	0	406	43.6
Cooking/storage jar rim	554	6.2	657	8.3	2*	16.7	74*	7.9
Cooking/storage jar neck	380	4.2	796	9.9	9	75	33	3.5
Flared bowl rim	14	.2	61	.8	0	0	4	.4
Seed jar body	15	.2	0	0	0	0	1	.1
Flared bowl neck	17	.2	5	.1	0	0	2	.2
Effigy vessel	2	*	0	0	0	0	0	0
Figurine	1	*	0	0	0	0	0	0
Bowl dipper	1	*	0	0	0	0	0	0
Seed jar rim	4	*	0	0	0	0	0	0
Total	8877	100	8005	100	12	100	932	100

Table 14. Brown Ware Sherd Rim Form by Surface Treatment

Vessel Form	Plain		Smudged		Textured		Corrugated	
	#	%	#	%	#	%	#	%
Bowl rim	169	22.8	188	20.8	0	0	22	22.0
Flared bowl rim	14	1.9	61	6.7	0	0	4	4.0
Cooking/storage jar rim	554	74.8	657	72.5	2*	100	74*	74.0
Seed jar rim	4	.5	0	0	0	0	0	0
Total	741	100	906	100	2	100	100	100

Table 15. Red Ware Sherd Form by Surface Treatment

Vessel Form	Plain		Smudged		Textured		Corrugated	
	#	%	#	%	#	%	#	%
Indeterminate body	692	31.3	184	24.8	4	23.5	8	21.6
Bowl rim	17	.8	36	4.9	1	5.9	0	0
Bowl body	256	11.6	82	11.1	5	29.4	3	8.1
Jar body	976	42.8	335	45.2	4	23.5	23	62.1
Cooking/storage jar rim	118	5.3	27	3.6	0	0	0	0
Cooking/storage jar neck	133	6.0	36	4.9	2	11.8	3	8.1
Flared bowl rim	13	.6	37	1.7	1	5.9	0	0
Flared bowl neck	4	.2	4	.5	0	0	0	0
Jar body with lug handle	2	.1	0	0	0	0	0	0
Total	2211	100	741	100	17	100	37	100

Table 16. Red Ware Rim Form by Surface Treatment

Vessel Form	Plain		Smudged		Textured	
	#	%	#	%	#	%
Bowl rim	17	11.5	36	36	1	50
Flared bowl rim	13	8.8	37	37	1	50
Cooking/storage jar rim	118	79.7	27	27	0	0
Total	148	100	100	100	2	100

Table 17. Sherd Form by Decorated Tradition

Vessel Form	Salado Polychrome		Tucson/Maverick Mountain Polychrome		White-on-red		Other	
	#	%	#	%	#	%	#	%
Indeterminate body	402	17.0	47	19.3	50	23.8	3	10
Bowl rim	137	5.8	6	2.5	14	6.7	3	10
Bowl body	895	37.9	14	5.8	48	22.9	10	33.3
Jar body	507	21.4	110	45.3	52	24.8	10	33.3
Cooking/storage rim	116	4.9	15	6.1	19	9.0	1	3.3
Cooking/storage neck	120	5.1	43	17.0	7	3.3	0	0
Flared bowl rim	159	6.7	4	1.6	17	8.1	2	6.7
Seed jar body	0	0	1	.4	0	0	0	0
Flared bowl neck	28	1.2	1	.4	3	1.4	0	0
Effigy vessel	0	0	0	0	0	0	1	3.3
Jar body with lug handle	0	0	1	.4	0	0	0	0
Seed jar rim	0	0	1	.4	0	0	0	0
Total	2364	100	243	100	210	100	30	100

Table 18. Rim Sherd Form by Decorated Tradition

Vessel Form	Salado Polychrome		Tucson-Maverick Mountain Polychrome		White-on-red		Other	
	#	%	#	%	#	%	#	%
Bowl rim	137	33.3	6	23.1	14	28	3	50
Flared bowl rim	159	38.6	4	15.4	17	34	2	33.3
Cooking-storage rim	116	28.2	15	57.7	19	38	1	16.7
Seed jar rim	0	0	1	3.8	0	0	0	0
Total	412	100	26	100	50	100	6	100

Table 19. Complete Vessels from Ormand

V #	Provenience	Type	Completeness	Form	Wear	Sooting	Rim Diameter	Height
1	Room 37	Plain Polished Brown	40%	Jar, narrow curving rim	None	Exterior	32	
3	Room 37	Plain Smudged Red	66%	Bowl, constricted rim 1.5	None	None	29.5	20
5	Room 37	Plain Unpolished Brown	?	Jar, wide curving rim	None	Lower half sooted	?	?
7	Room 37	Plain Polished Brown	20%	Jar, narrow curving rim	None	None	28	?
9	Room 36	Plain Smudged Brown	40%	Open Bowl 2	Light to medium basal wear	None	28	14
10	Room 36	Plain Polished Brown	20%	Open Bowl	None	None	32	?
12	Pithouse 76	Tucson Poly.	15%	Jar, narrow curving rim	None	None	20	?
13	Pithouse 76	Plain unpolished brown	25%	Bowl, narrow flaring rim	None	None	20	?
15	Pithouse 52	Mud Ware	100%	Miniature Bowl	None	None	1.5%	1.5%
16	Room 57	Gila Poly.	66%	Bowl, wide curving rim 1.9	Basal Abrasion	None	30	16
17	Room 79	Plain polished brown	60%	Jar, pointed bottom, narrow curving rim .92.	None	None	26	2
18	Room 34 mealing bin	Gila Poly.	25%	Jar, wide curving rim	N/A	N/A	21	?
19	Room 33	Gila Poly.	33%	Bowl, wide flaring rim 2.1	Basal Abrasion, and Interior Abrasion Below Neck	None	32	15.5
21	Room 30 mealing bin	Gila Poly.	30%	Bowl, narrow flaring rim	None	None	32	?
22	Room 20	Gila Poly.	20%	Jar, narrow curving rim	NA	None	20	?
24	Room 10	Plain smudged brown	15%	Jar, wide curving rim	NA	None	26	?

V #	Provenience	Type	Complete-ness	Form	Wear	Sooting	Rim Diameter	Height
25	Room 10	Plain smudged brown	70%	Jar, wide curving rim .95	NA	None	20	21
27	Room 15	Plain polished brown	40%	Jar, wide curving rim, straight walled .88	NA	None	28	?
28	Room 15	Plain polished brown	40%	Jar, wide curving rim	NA	None	26	?
29	Room 15	Gila Poly.	30%	Jar, narrow curving rim	Chipped Rim	None	31	14
30	Room 20 mealing bin	Gila Poly.	65%	Bowl, narrow curving rim 2.2	Basal Abrasion and Interior Abrasion	None	31	14
31	Room 20 mealing bin w/Vessel 30	Gila Poly.	20%	Bowl, narrow curving rim	Interior abrasion	None	29	?
33	Room 23 mealing bin	Plain polished brown	25%	Bowl, narrow curving rim	NA	N/A	32	?
34	Room 57	Mud ware	50%	Miniature Jar	NA	NA	1.5	2.5
35	Room 79	Plain polished red	66%	Jar, narrow curving rim .9	Exterior Basal Abrasion	None	18	19
39	Room 22	Plain unpolished brown	40%	Jar, narrow curving rim	NA	None	22	?
40	Room 36	Plain unpolished brown	30%	Jar, wide curving rim	NA	None	17	?
41	Room 20	Plain smudged indented brown	40%	Jar, wide curving rim	None	None	26	?
45	Room 89	Plain smudged brown	35%	Jar, narrow curving rim	NA	None	30	?
47	Room 89	Plain polished brown	20%	Bowl, wide flaring rim	NA	Lower side	44	?
50	Room 48	Plain smudged brown	50%	Jar, wide flaring rim 1.1	None	None	30	27
51	Room 48	Plain smudged brown	50%	Jar, narrow curving rim	None	Fire Clouds	?	?

V #	Provenience	Type	Complete-ness	Form	Wear	Sooting	Rim Diameter	Height
52	Room 48	Smeared corrugated smudged brown	50%	Jar, wide curving rim .87	Abrasion on base and sides	Oxidized and Sooted	32	36.5
53	Room 31	Plain smudged brown	80%	Bowl, wide flaring rim 1.9	Abrasion on bottom, interior abrasion near rim, some rim chipping	None	30	16
54	Room 19	Gila Poly.	33%	Bowl, wide flaring rim	NA	None	28	?
55	Room 19 mealing bin	Gila Poly.	20%	Bowl, wide flaring rim 1.9	NA	None	25	13
56	Room 22	Gila Poly.	70%	Bowl, constricted rim 1.9	NA	None	26	18
58	Room 33 mealing bin	Gila polished smudged interior	80%	Bowl, wide flaring rim 1.7	NA	None	30	17
59	Room 36	Tonto Poly.	70%	Jar, narrow curving rim .91	Basal Abrasion	None	20	22.5%
60	Room 10	Plain unpolished brown	45%	Jar, narrow curving rim	NA	NA	16	?
61	Pithouse 76	Mud ware	66%	Miniature Bowl	NA	NA	4	2
62	Pithouse 52	Mud ware	50%	Miniature Jar	None	NA	2	4
63	Pithouse 52	Plain polished brown	15%	Bowl, narrow flaring rim	NA	None	16	?
64	Room 10	Plain polished brown	20%	Jar, wide flaring rim	NA	None	27	?
65	Cremation C39	Plain polished red	98%	Jar, wide flaring rim .90	Moderated Basal Abrasion	Light Interior Sooting	14	15.5
66	Room 58 mealing bin	Gila White-on- red	80%	Bowl, narrow flaring rim 1.8	None	Slight	30.5	16.5
67	Cremation C8	Polished corrugated red	97%	Jar, narrow flaring rim .89	None	Slight Fire Clouds on exterior	15.5	17.5
68	Cremation C50	Plain polished brown	98%	Bowl, wide flaring rim 2.0	Base Moderately Abraded	Slight Fire Cloud	16	8.5

V #	Provenience	Type	Complete-ness	Form	Wear	Sooting	Rim Diameter	Height
69	Cremation C60	Plain unpolished brown	100%	Bowl, wide flaring rim 2.3	Base Moderately Abraded	Surfaces Sooted	16	7
70	Cremation C9	Plain smudged brown	100%	Bowl, narrow flaring rim 1.5	Base Heavily Abraded	Fire Clouds on exterior	21	14.5
71	Cremation C20	Plain polished brown	97%	Jar, narrow curving rim .76	Slight basal worn	Bottom slightly sooted	8	10.5
72	Cremation C6	Tonto Poly.	100%	Jar, narrow curving rim .77	Base slightly worn	None	12	15.5
73	Cremation C3	Plain smudged brown	90%	Bowl, narrow flaring rim 1.7	Slight basal abrasion	Exterior fire clouding	19	10
74	Cremation C36	Plain polished red	90%	Bowl, constricted rim 1.7	Slight basal abrasion	Exterior fire clouds	21	12.5
75	Cremation C14	Single fillet smudged interior brown	80%	Bowl, narrow flaring rim 1.8	Slight basal abrasion	None	23	13
76	Cremation C18	Plain polished brown	60%	Jar, narrow curving rim .90	Slight basal Abrasion	Exterior sooted	10	14
77	Cremation C1	Punched smudged brown	70%	Bowl, wide flaring rim 1.9	Slight basal erosion	Fire clouds on exterior	21.5	11,5
78	Cremation C69	Gila Poly.	90%	Bowl, wide flaring rim 2.0	Heavy basal erosion	Fire clouds on exterior	28	14
79	Cremation C25	Plain unpolished brown	95%	Jar, wide curving rim 1.0	Slight basal abrasion	Small fire cloud	21	20
80	Cremation C13	Plain brown dimpled surface	90%	Jar, wide curving rim 1.1	Slight basal abrasion	Small fire cloud	26.5	23
81	Room 57	Gila Poly.	80%	Jar, narrow curving rim .81	None	None	18	22
82	Cremation C46	Plain polished red	98%	Jar, narrow curving rim .87	None	None	14	16
83	Cremation C2	Gila Poly.	90%	Jar, narrow curving rim .91	Slight basal abrasion	None	15.5	17
84	Cremation C37	Gila Poly.	100%	Jar, narrow curving rim 1.0	None	None	12	11.5

V #	Provenience	Type	Complete-ness	Form	Wear	Sooting	Rim Diameter	Height
85	Cremation C12	Incised corrugated	100%	Open Bowl 2.2	None	None	26	12
86	Room 21	Plain smudged red	100%	Bowl, wide flaring rim 2.0	Moderated basal abrasions	Minor fire clouds	32	16
87	Cremation C48	Plain polished red	100%	Jar, narrow curving rim .7	Heavy basal abrasions	None	12	17
88	Cremation C31	Gila Poly.	90%	Bowl, wide flaring rim 2.1	Heavy basal abrasion with hole in center	None	30	14.5
89	Cremation C29	Tonto Poly.	95%	Bowl, wide flaring rim 2.0	Heavy basal abrasion	None	31	15.5
90	Room 33 mealing bin	Brown smudged interior	85%	Bowl, wide flaring rim 2.2	Heavy basal abrasion	Exterior sooted	24	11
91	Cremation C54	Plain smudged brown	100%	Open bowl	Light basal abrasion	None	14	7
92	Cremation C5	Plain polished brown	90%	Open bowl 2.1	Light basal abrasion, Heavy Interior Abrasion	None	14	6.5
93	Cremation C43	Plain smudged brown	100%	Bowl, constricted rim 2.0	Light basal abrasion	Exterior sooting	14	7
94	Cremation C4	Plain unpolished brown	98%	Jar, wide curving rim 1.1	None	Scattered sooting	20	18.5
95	Cremation C56	Plain polished red	100%	Jar, wide curving rim 1.0	Moderate basal abrasion	Scattered sooting	14	14
96	Cremation C70	Plain polished red	100%	Jar, narrow curving rim .83	Moderate basal abrasion	Interior sooted	13	15.5
97	Cremation C28	Plain polished red	100%	Jar, wide curving rim 1.1	Moderate basal abrasion	Exterior surface with fire clouds	14	13
98	Cremation C30	Plain polished red	100%	Jar, narrow curving rim .92	Moderate basal abrasion	None	18	19.5
99	Cremation C35	Plain polished red	100%	Jar, wide curving rim .9	Moderate basal abrasion	None	18	20

V #	Provenience	Type	Complete-ness	Form	Wear	Sooting	Rim Diameter	Height
100	Cremation C32	Corrugated red	100%	Jar, narrow curving rim 1.1	Slight basal erosion	Exterior fire clouds	15	13
101	Cremation C10	Plain polished red	90%	Jar, narrow curving rim .68	Moderate basal abrasion	Exterior fire cloud	14	20.5
102	Cremation C27	Corrugated red	90%	Jar, narrow curving rim .64	Heavy basal; abrasion	None	14	22
103	Cremation C66	Indented corrugated brown	100%	Jar, wide curving rim .87	Heavy basal abrasion	Exterior sooted	10	14

A total of 12.6 percent of all sherds lacked painted decorations but exhibited red-colored slips and were classified as red wares (see Table 3). Most of these exhibited plain unsmudged surfaces, while others exhibited plain exteriors with smudged interiors. Other red ware sherds exhibited textured or corrugated exteriors. The remaining sherds were assigned to decorated types based on the presence of white slips or painted decorations. A very low proportion of sherds could not be assigned to a specific ware group. A comparison of exterior treatments and vessel form for red wares indicates a strong association between smudged forms and bowls and plain forms and jars (see Tables 15 and 16).

A total of 12 percent of all sherds examined were assigned to decorated types (see Table 3). Distributions of vessel forms were compared for sherds assigned to the most common decorated traditions (see Tables 17 and 18). Both Salado polychromes and white-on-red types are dominated by bowl forms, while most of those associated with the Tucson-Maverick Mountain group are derived from jars. In fact, sherd form distributions associated with the Tucson-Maverick Mountain group more closely resemble those noted in utility wares than other decorated wares.

Comparisons between ware groups and form trends indicate a strong relationship between these attributes (see Tables 11 and 12). This relationship is not as strong as many earlier Southwestern traditions where there are consistent differences between utility and decorated forms. At the Ormand site, the frequency of jar forms is higher for brown wares than other forms. Bowls sherds are more common for decorated and red ware types. The basic shapes of bowls also varies between wares. For example, the majority of brown ware bowls more often exhibit straight or curved rather than flared rims. In contrast, red ware and decorated bowls are more often flared.

Whole Vessel Analysis

Additional information concerning vessel form and function is provided by data recorded for the 83 whole or partial vessels from Ormand (see Table 19). These included vessels recognized and reconstructed during sherd analysis conducted during the present study, those previously reconstructed and stored along with the sherd collections, and complete vessels (mostly recovered from cremations) stored at the Museum of Indian Arts and Culture. Attributes recorded for these vessels include type, completeness, form, wear patterns, sooting patterns, rim diameter, and height. In addition, profiles of each vessels were sketched.

Table 20. Distribution of Types for Complete Vessels

Ceramic Type	#	%
Plain polished brown	14	16.9
Plain unpolished brown	8	9.6
Plain smudged brown	12	14.5
Single fillet plain smudged brown	1	1.2
Plain smudged indented brown	1	1.2
Indented corrugated brown	1	1.2
Incised corrugated brown	1	1.2
Smeared corrugated smudged brown	1	1.2
Punched smudged brown	1	1.2
Plain dimpled brown	1	1.2
Plain polished red	11	13.3
Plain smudged red	2	2.4
Corrugated red	2	2.4
Polished corrugated red	1	1.2
Gila Polychrome	16	19.3
Tonto Polychrome	3	3.6
Gila Polychrome w/smudged interior	1	1.2
Gila White-on-red	1	1.2
Tucson Polychrome	1	1.2
Mud ware	4	1.2
Total	83	100

Table 21. Distributions of Ware for Complete Vessels

Ceramic Type	#	%
Brown ware	41	49.4
Red ware	16	19.3
Decorated polychrome	22	26.5
Mud ware	4	4.8
Total	83	100

Complete vessels are represented by a wide variety of types (see Table 20). A total of 20 types are represented . Of these vessels, 49.4 percent represent brown ware types; 19.3 percent belong to red wares; 26.5 percent are decorated types, and 4.8 percent are miniature mud ware types (see Table 21). The frequency of brown ware vessels is significantly lower than that noted for the sherd sample from the Ormand site. The red ware vessel frequency is similar to the sherd frequency, and the frequency of decorated vessels is much higher than that observed for sherds. A variety of factors may have resulted in these differences. One contributing factor could be that a greater frequency of brown wares are from jars, which tend to be larger, and contributed more sherds than other forms. In addition, sherds derived from unpainted portions of decorated vessels were assigned to other ware groups. Finally, there has been a slight bias in identifying and reconstructing decorated vessels as compared to those belonging to other ware groups.

Examination of vessel profiles from the Ormand site provide for the determination of precise forms, not possible through the examination of sherds alone. The great majority of vessels from all ware groups exhibited shapes oriented around a single theme (see Fig. 116). The lower portions of vessels or bases are spherical, while the upper portions of vessels gradually curve inward toward the upper third of the vessel and then flare outward. Angles of curves tend to be very gentle and gradual for both jar and bowl forms. The curves and basic profiles of most jars and bowls are remarkably similar, as the differences in forms are related to squatness or relative height to thickness between width of rim and vessel height. Evidence and location of ware and sooting also seem to indicate similar uses for vessels belonging to different ware groups.

Basic vessel shapes and similarities among different forms contrast with observations from earlier sites in the Mogollon and Anasazi regions, where shapes associated with various jars and forms tend to vary dramatically. This similarity in basic vessel shape regardless of size and ware appears to be widespread in Salado assemblages. Complete vessels belonging to various wares were examined (see Table 22). A majority of the vessels examined were assigned to jar forms, while just under half of these vessels represent bowls. The remaining vessels represent miniature forms. Frequencies of vessels belonging to different forms vary for different wares. The overall proportion of bowls is the highest for decorated ware types, slightly lower for brown ware types, and still lower for red ware types. All of the red ware and decorated bowl forms display a flared rim, while brown ware bowls include a mixture of flared and constricted bowl forms. Jars were most common for the sample of red ware vessels, were slightly more rare for brown wares, and even more rare in the sample of decorated vessels. Most of the decorated and red ware jars exhibit narrow rim diameters, while the majority of the brown ware jars exhibit wider diameters.

Examinations of vessels from various proveniences may also provide information concerning ceramic-related activities in various contexts (see Table 23). The number of vessels from most contexts is small. Although ware types and forms represented at various proveniences vary, this may reflect sampling error resulting from the small number vessels. A large number of vessels were recovered from the eastern cremation area of the Ormand site. While a wide variety of types and forms were noted, the frequency of red ware jars is unusually high in this sample, and indicates the importance of this form in mortuary contexts.

Table 22. Distributions of Vessel Forms within Ware Groups

Vessel Form	Brown Ware		Red Ware		Decorated Ware		Mud Ware		Total	
	#	%	#	%	#	%	#	%	#	%
Open bowl	5	12.2	0	0	0	0	0	0	5	6.0
Indeter. constricted flared bowl	4	9.8	0	0	4	18.2	0	0	8	9.6
Wide constricted flared bowl	6	14.6	1	6.3	8	36.4	0	0	15	18.1
Tall constricted flare bowl (jar)	3	7.3	2	12.5	2	9.1	0	0	7	8.4
Indeter. curved neck jar	4	9.8	0	0	0	0	0	0	4	4.8
Wide curved neck jar	12	29.3	4	25	2	18.2	0	0	18	21.7
Narrow curved neck jar	7	17.1	9	56.3	6	27.3	0	0	22	26.5
Miniature bowl	0	0	0	0	0	0	2	50	2	2.4
Miniature jar	0	0	0	0	0	0	2	50	2	2.4
Total	41	100	16	100	22	100	4	100	83	1005

Table 23. Distribution of Complete Vessels from Various Proveniences

Provenience Description	Vessel Descriptions
Initial construction, North Roomblock, Room 15, Roof Fall or Floor (3 vessels)	2 plain polished brown jars with wide curving rims (Vessels 27,28) 1 Gila Polychrome jar with narrow curving rim (Vessel 29)
Initial construction, North Roomblock, Room 57, Floor (3 vessels)	1 mud ware miniature jar with narrow flaring rim (Vessel 34) 1 Gila Polychrome bowl with wide flaring rim (Vessel 16) 1 Gila Polychrome jar with narrow curving rim (Vessel 81)
Initial construction, North Roomblock, Room 58, floor (1 vessel)	1 Gila White-on-red bowl with narrow flaring rim (Vessel 66, used as a mealing bin)
Later addition, North Roomblock, Room 10, Floor (3 vessels)	1 plain polished brown jar with curving rim (Vessel 64 1 plain smudged brown jar with wide curving rim (Vessel 24) 1 plain unpolished brown jar with narrow curving rim (Vessel 60)
Later addition, North Roomblock, Room 19, Floor and Floor Fill (2 vessels)	1 Gila Polychrome bowl with wide flaring rim (Vessel 54) 1 Gila Polychrome bowl with wide flaring rim (Vessel 55, used as a mealing bin)
Later addition, North Roomblock, Room 20, Floor and Floor Fill (4 vessels)	1 plain smudged indented brown jar with wide curving rim (Vessel 41) 1 Gila Polychrome jar with narrow curving rim (Vessel 22) 1 Gila Polychrome bowl with narrow flaring rim (Vessel 30, used as a mealing bin) 1 Gila Polychorme bowl with narrow flaring rim (Vessel 31, used as a mealing bin with Vessel 30)

Provenience Description	Vessel Descriptions
Later addition, North Roomblock, Room 21, Floor (1 vessel)	1 plain smudged red bowl with narrow flaring rim (Vessel 86)
Later addition, North Roomblock, Room 22, Floor and Floor Fill (2 vessels)	1 plain unpolished brown jar with wide curving rim (Vessel 39) 1 Gila Polychrome bowl with constricted rim (Vessel 56)
Later addition, North Roomblock, Room 23, Floor (1 vessel)	1 plain polished brown bowl with narrow flaring rim (Vessel 33, used as a mealing bin)
Initial construction, East Roomblock, Room 30, Floor (1 vessel)	1 Gila Polychrome bowl with narrow flaring rim (Vessel 21, used as a mealing bin)
Initial construction, East Roomblock, Room 31 Floor (1 vessel)	1 plain smudged brown bowl with wide flaring rim (Vessel 53)
Initial construction, East Roomblock, Room 33, Floor (3 vessels)	1 brown smudged interior bowl with narrow flaring rim (Vessel 90, used as a mealing bin) 1 Gila Polychrome bowl with wide flaring rim (Vessel 19) 1 Gila Polychrome exterior, smudged interior bowl with narrow flaring rim (Vessel 58, used as a mealing bin with Vessel 90)
Initial construction, East Roomblock, Room 34, Floor (1 vessel)	1 Gila Polychrome jar with narrow curving rim (Vessel 18)
Initial construction, East Roomblock, Room 37, Floor and Floor Fill (4 vessels)	2 plain polished brown jars with narrow curving rims (Vessels 1, 7) 1 plain unpolished brown jar with wide curving rim (Vessel 5) 1 plain red smudged interior bowl with narrow curving rim (Vessel 3)
Initial construction, East Roomblock, Room 48, Floor (3 vessels)	2 plain smudged brown jars with wide curving rims (Vessels 50, 52) 1 plain smudged jar with wide curving rim (Vessel 51)
Initial construction, East Roomblock, Room 79, Floor (2 vessels)	1 plain polished red jar with narrow curving rim (35) 1 plain polished brown jar with narrow curving rim, and pointy bottom (Vessel 17)
Initial construction, East Roomblock, Room 89, Floor (2 vessels)	1 plain smudged brown jar with narrow curving rim (Vessel 45) 1 plain polished brown bowl with narrow flaring rim (Vessel 47)
Later addition, East Roomblock, Room 36, Floor and Floor Fill (4 vessels)	1 plain unpolished brown jar with wide curving rim (Vessel 40) 1 plain polished brown bowl (Vessel 10) 1 plain smudged brown bowl (Vessel 9) 1 Tonto Polychrome jar with wide curving rim (Vessel 59)
Pithouse 52, Fill (3 vessels)	1 plain polished brown bowl with narrow flaring rim (Vessel 63) 1 mud ware miniature bowl (Vessel 15) 1 mud ware miniature jar with narrow flaring rim (Vessel 62)
Pithouse 76, Fill (3 vessels)	1 plain unpolished brown bowl with narrow flaring rim (Vessel 13) 1 Tucson Polycrhome jar with wide flaring rim (Vessel 12) 1 mud ware miniature bowl (Vessel 61)

Provenience Description	Vessel Descriptions
East Cremation Area (35 vessels examined: 22 urns, 12 covers, 1 accompaniment)	URNS: 1 Gila Polychrome jar with handles, wide curving rim (C2) 1 plain unpolished brown jar with wide curving rim (C4) 1 Tonto Polychrome jar with narrow curving rim (C6) 1 polished corrugated red jar with narrow curving rim (C8) 1 plain polished red jar with narrow curving rim (C10) 1 plain brown dimpled exterior jar with wide curving rim (C13) 1 plain polished brown jar with narrow curving rim (C20) 1 plain unpolished brown jar with wide curving rim (C25) 1 corrugated red jar with narrow curving rim (C27) 1 plain polished red jar with wide curving rim (C28) 1 plain polished red jar with narrow curving rim (C30) 1 corrugated red jar with narrow curving rim (C32) 1 plain polished red jar with wide curving rim (C35) 1 Gila Polychrome jar with narrow curving rim (C37) 1 plain polished red jar with wide curving rim (C39) 1 plain polished red jar with narrow curving rim (C46) 1 plain polished red jar with narrow curving rim (C48) 1 plain polished brown bowl with wide flaring rim (Vessel C50) 1 plain polished red jar with wide curving rim (C56) 1 plain unpolished brown bowl with wide flaring rim (C60) 1 polished red indented corrugated jar with wide curving rim (C66) 1 plain polished red jar with narrow curving rim (C70) COVERS: 1 punched smudged brown bowl with wide flaring rim (C1) 1 plain smudged brown bowl with narrow flaring rim (C3) 1 plain polished brown open bowl (C5) 1 plain smudged brown bowl with wide flaring rim (C9) 1 incised corrugated brown open bowl (C12) 1 plain smudged brown bowl with narrow flaring rim (C14) 1 Tonto Polychrome bowl with wide flaring rim (C29) 1 Gila Polycrhrome bowl with wide flaring rim (C31) 1 plain polished red bowl with constricted rim (C36) 1 plain smudged brown open bowl (C43) 1 plain smudged brown open bowl (C54) 1 Gila Polychrome bowl with wide flaring rim (C69) ACCOMPANIMENTS: 1 plain polished brown jar with narrow curving rim (C18)

PETROGRAPHIC ANALYSIS FOR CERAMICS FROM THE ORMAND SITE

David V. Hill

Introduction

A total of thirteen sherds derived from excavations conducted at the Ormand site by the Museum of New Mexico (Hammack et al. 1966) were examined through petrographic analysis. Types examined included Maverick Mountain Polychrome, Gila and Tonto Polychrome, red-on-white, and utility wares. A single geological clay sample collected by C. Dean Wilson was also examined for purposes of comparison with the ceramic pastes.

Methodology

The ceramics and clay sample were analyzed by the author using a Nikon Optiphot-2 petrographic microscope. The sizes of natural inclusions and tempering agents were described in terms of the Wentworth Scale, a standard method for characterizing particle sizes in sedimentology. These sizes were derived from measuring a series of grains using a graduated renticle built into one of the microscope's optics. The percentages of inclusions in untempered ceramics were estimated using comparative charts (Matthew et al. 1991; Terry and Chilingar 1955).

Maverick Mountain Polychrome

36-6-20: The paste of this sherd is a reddish tan. The paste was not tempered in the traditional sense. Rather, the vessel was made using a pedogenic clay. This clay contains approximately 20 percent fine to medium-sized inclusions. These inclusions consist of subangular to subrounded quartz and feldspar grains and volcanic rock fragments. These materials are present in approximately a 2 to 1 ratio of isolated grains to rock fragments. Black opaque angular fragments in the paste probably represents biotite that has altered to hematite and clay minerals.

The mineral grains consist of quartz, orthoclase, and plagioclase. The feldspars range in appearance from fresh to highly weathered obscuring the optical characteristics of the grain. Other minerals were present, but in trace amounts. These minerals included reddish brown biotite, green-brown hornblende, and pyroxene.

The most common type of rock fragment is a fine-grained intersertal basalt. The basalt fragments consist of andesine plagioclase with brown glass occupying interstices between the plagioclase laths. Sparse ferro-manganese cubes are also present in the basalt fragments. Also present in the paste are fragments of a light reddish brown tuff. One tuff fragment includes secondary chalcedony with its distinctive chatoyant texture.

76-1-41: The paste of this sherd is a reddish tan color like the previous specimen. The paste also contains the same types of isolated mineral grains and rock fragments as Sample 36-6-20 in the same amounts.

76-4-74: The paste color and temper in this specimen are quite similar to that of the previous two specimens. However, a few very coarse rhyolitic tuff fragments were also observed in this sherd. The tuff fragments display evidence of compaction and welding. A few of the largest tuff fragments contain sanidine porphyritically.

Smudged White-on-red

76-3-81: The paste of this sherd is a dark brown. The paste was not tempered, but rather the vessel was made using a pedogenic clay. The inclusions present in the clay body constitute about 25 percent of the paste. The inclusions range from subangular to rounded. The inclusions fall into two groups: isolated mineral grains and rock fragments. Isolated grains include, in order of abundance, quartz, andesine plagioclase, orthoclase and/or sanidine with trace amounts of brown biotite and augite. The isolated mineral grains make up about 85 percent of the total inclusion.

The most common type of rock fragment is basalt. The basalt is a fine-grained intersertal basalt. The basalt fragments consist of andesine plagioclase with black ferro-manganese cubes occupying interstices between the plagioclase laths. Sparse ferro-manganese cubes are also present in the basalt fragments. Also present was a few fragments of spherulites, secondary chalcedony, and tuff.

Tonto or Gila Polychrome

29-40-3: The paste color and inclusions are virtually identical to Samples 36-6-20 and 76-1-41. The inclusions make up between 15 and 20 percent of the paste.

36-5-3: The paste and temper of this sherd are virtually identical to the previous specimen. The inclusions make up approximately 20 percent of the paste.

76-3-73: The paste of this sherd is a reddish brown. It is similar to the previous two specimens with a few exceptions. The isolated mineral grains appear overall to be slightly smaller than in the previous specimens. The inclusions also make up 25 percent of the paste.

76-1-56: The paste of this sherd is a bright brownish red and is slightly birefringent. The paste was virtually free from inclusions. The paste was tempered using a very coarse grained hypidiomorphic to porphyritic granular granite. The feldspars in general appear fresh, although some plagioclase has been altered through sericitization. The quartz displays undulose extinction. Brownish red biotite is present in both the paste and rock fragments. Occasionally, the biotite is altered to hematite and clay minerals leaving a black opaque inclusion.

76-3-101: The paste of this sherd is a light tan and is similar to Specimens 29-40-13, 36-5-3, and 76-3-73. A few of the quartz grains in this sherd display embayment, suggestive of a volcanic origin.

Utility Wares

30-4-24 (Red Slipped): The paste of this sherd is a light yellowish brown. The inclusions are a natural constituent of the ceramic paste. The inclusions are quite similar to those observed in the other self-tempered pastes observed in the Ormand site decorated ware sample. The major difference is that there are several very coarse fragments of reddish brown rhyolitic tuff porphyry. The tuff displays evidence of some compaction and welding. Some axiolitic texture is present in the tuff fragments. Sanidine contains porphyries in the tuff. A few very coarse-sized basalt fragments were also observed. These basalt grains resemble the ones identified in the other self-tempered sherds.

30-4-36: The paste of this sherd is a dark brown color. It is quite similar to that of the previous untempered sherds. The major difference is that the inclusions make up about 10 percent of the paste. The lack of inclusions is likely an artifact of the plucking out of some of the inclusions during the sample preparation process.

30-4-37: The paste of this sherd is a medium yellowish brown color. The paste of this sherd is quite similar to that of the other self-tempered sherds examined from this site. The inclusions range from fine to coarse in size and constitute about 15 percent of the paste.

30-4-39: The paste color and inclusions within this sherd are virtually identical with those of the previous specimen. There is a gravel-sized (.85 mm) tuff fragment present in the paste, most likely as a natural inclusion.

Local Alluvial Clay

Sample 8: The clay is a reddish brown. The clay contains silt-sized to fine quartz, feldspars, and brownish red biotite. A few coarse-sized rock fragments are also present. These rock fragments include a fine-grained basalt and rhyolite porphyry.

Discussion

With the exception of Sample 76-1-56, all of the sherds had very similar pastes. The pastes ranged from a light yellowish brown to a dark brown and contained abundant microinclusions. These microinclusions consist primarily of quartz, feldspars, and rock fragments. While the majority of the inclusions present in the sherds were isolated mineral grains, numerous volcanic rock fragments were also included. Basalts, rhyolite porphyries, and rhyolitic tuffs are present in all of the samples in varying proportions. Chalcedony is also infrequently present and was probably derived from secondary alteration of the tuffs. All of the rock fragments and mineral grains observed in the sherds represent natural inclusions in the clay used to make the ceramics.

The single clay sample has fewer inclusions present than those observed in the ceramics. However, the basalt and rhyolite fragments are quite similar to those observed in the majority of the Maverick Mountain Polychrome, Gila or Tonto Polychrome, and the utility wares.

Based on the similarity of the clay sample to the sherds, in spite of its having a smaller percentage of mineral grains and rock fragments, it is likely that all of the Maverick Mountain Polychrome, smudged red-on-white, and utility wares were produced locally. All but one of the Gila or Tonto Polychromes were made using local materials, possibly derived from the Gila Conglomerate or other local Quaternary deposit rich in clay and sediments.

Sample 76-1-56 (Gila or Tonto Polychrome) differed from the other sherds. This sherd had a bright brownish red paste that was tempered using crushed granite. The lack of granitic outcrops in the vicinity of the Ormand site indicated that this sherd represents a trade item. Gila Polychrome from the University Indian Ruin in the Tucson Basin was found to be tempered with granite or sediments derived from granite (Wallace 1954). Usually Gila Polychrome has been described as being tempered with sand or crushed potsherds (Crown 1994).

A previous analysis of ceramics from the Ormand site has been conducted (Rugge 1977). Two sherds each of Gila Polychrome and plain utility were examined. The temper was thought to be volcanic in origin, but was derived from sands. This temper may have been obtained locally, and was distinctive from the volcanic material used in Salado wares from the Janss site in the Mimbres Valley.

Petrographic study of Maverick Mountain Polychrome had also been conducted previously. Maverick Mountain Polychrome at Point of Pines, the type site, was tempered using a locally available leucite tuff (Wasley 1962). No leucite, a mineral with a distinctive trapezohedral outline, was observed in any of the Ormand site ceramics. Some Maverick Mountain Polychrome from the Safford Valley was tempered using crushed granite (Brown 1974).

ORMAND CHIPPED STONE AND GROUND STONE

Laurel T. Wallace

Chipped Stone

A full descriptive analysis of the chipped stone artifacts from the Ormand site included attributes that describe a range of aspects of stone tool manufacturing. Descriptions followed the standardized chipped stone analysis for the Office of Archaeological Studies (OAS Staff 1994), and are consistent in approach with other chipped stone analyses used in the Southwest (Chapman 1977; Chapman and Schutt 1977; Schutt and Vierra 1980; Vierra 1993). OAS's standardized methodology was used to identify material selection, reduction technology, and tool use. Material selection studies cannot reveal how materials were collected, but they can indicate the location of material sources (Boyer et al. 1994:9). Each artifact was studied under a binocular microscope, with varying magnification between 7x and 45x. Dimensions were measured with a sliding caliper. Analytical results were entered into a computerized data base using SPSS/PC+ Data Entry 6.1.3 for Windows.

Morphological characteristics define recognized stages of lithic reduction, namely, core reduction and tool production. Primary and secondary flakes are produced during core reduction. Primary reduction refers to the removal of the weathered outer rind of cortex from nodules. Secondary reduction is the further removal of flakes from a core for immediate or expedient use, or for further modification into a formal tool. Tool production, where debitage has been modified into formal tools, is indicated by the presence of biface or tool manufacturing flakes. The presence of whole or broken tools at a site indicates formal tool use, but does not provide conclusive evidence of tool-making activity. Use wear was included as a descriptive attribute, but wear patterns were not interpreted as evidence of any specific tasks. Chapman and Schutt (1977) have attempted to replicate use wear on a variety of lithic materials to correlate wear patterns with specific activities; such an attempt was not made here.

A limited interpretation of the chipped stone data will be presented. Soil was not screened during excavation, and while chipped stone was recovered, it is hard to determine how representative it is of any given provenience. This is a particular problem in assessing the presence of potential biface reduction locations on site, since smaller biface flakes are harder to find without the aid of screening, and without the use of smaller gauge screens. Floor, floor fill, and subfloor artifacts were selected for particular study, since they were the best described proveniences on the site. Considerable effort was spent in locating these proveniences in the state repository. Most of the artifacts were located, but not all of them. Some items had been removed for research and exhibition long before the present careful tracking of items began, and were somehow "lost in the shuffle." A list of the proveniences that were analyzed by this project is provided in Appendix 2. Given these qualifications, an assessment of artifact types, material preferences, thermal alterations, assemblage characteristics, comparisons of site proveniences, and regional comparisons will be described below.

Artifact Types

Artifact descriptions followed a typology common to archaeologists working in the Southwest (Chapman 1977; Chapman and Schutt 1977; Schutt and Vierra 1980; Vierra 1993). In lithic analyses of the past two decades, two general technological approaches have been correlated to the degree of mobility of a population. These technologies are referred to as "curated" or "expedient," and are at opposite ends along a behavioral continuum reflecting population mobility. A "curated" technology is associated with a highly mobile population, where stone tools are created for future use (Binford 1977, 1979). Reduction techniques involve a high investment in tool production, creating large, generalized biface-cores. The frequency of formal tools is expected to be high in this type of assemblage, as is the presence of secondary and tertiary reduction flakes. Large, generalized bifaces are multipurpose tools that are light weight and portable. The generalized biface form is multifunctional and flexible, meaning that it can perform more than one task: sharp flakes can be easily produced from large bifaces used as cores, and biface edges can be used for cutting, scraping, drilling, and penetrating tasks. Large bifaces are also multi-use implements because they can be resharpened and reused repeatedly. The materials used for tool production tend to be of high quality and high diversity, due to movement over a wider geographic area. A flexible and portable lithic technology is an obvious advantage for the spatial and situational changes inherent in a highly mobile lifeway (Bamforth 1986:38; Parry and Christenson 1987:3-4, 227).

More sedentary populations are associated with an "expedient" technology. Tools are typically single-use, "casual flake tools" and exhibit lower investment with infrequent retouch or resharpening. Bifaces can be as representative or more in the assemblage than curated technologies, but bifaces tend to be small and have specialized uses. Since portability is not required, heavier and larger tools are present in the assemblage. Material use is less diverse and of relatively lower quality (Bamforth 1986:38; Parry and Christenson 1987:3, 4, 227). The concept of a curated technology is not employed for complex societies for two reasons: (1) it is not a useful analytical concept for societies where trade, long-distance transport, and specialization are a recognized part of the system, and (2) the sedentary nature of complex societies negates certain definitions of the term, such as transport from one locality to another by the same group of people (Odell et al. 1996:381).

More recently, the concept of "curated" and "expedient" technologies has been seen as a rigid approach to Binford's schema, with an overloaded meaning attached to ideas that were never intended to explain the whole complex of a culture's lithic technology. Mobile hunter-gatherers are not exclusively foragers or collectors, and it is apparent that groups change their strategies according to local conditions (Odell et al. 1996:381-382). This is worth noting for the latest data on late Archaic sites in the Southwest, with evidence of increased sedentism along riparian locales (Roth 1993), perhaps applicable to the possible late Archaic presence at Ormand.

With the possibility of three distinct temporal periods at Ormand Village, the potential for studying changes in formal characteristics of chipped stone assemblages between components seemed great. Unfortunately, very few artifacts were found in association with the possible late Archaic (n=1) and the possible early Mogollon (n=15) occupations, with a total of two diagnostic items (projectile points) from the possible early Mogollon period. The Salado occupation contained not only a much larger population of artifacts, but a concurrent expansion of tool types. All of the artifact types from the Ormand Village chipped stone assemblage are shown in Table 24 by temporal periods.

Core flakes were the most numerous category in this assemblage, at 781 items (67.9 percent). Biface flakes were very rare in this assemblage, and typically are poorly represented without the aid of very fine screens. Biface flakes can measure in the hundreds to nearly one thousand from a single tool, depending on the tool type and size (James L. Moore, pers. comm. 1996). The few bipolar flakes found indicate the use of small obsidian nodules for reduction. This procedure is expected for

Table 24. Ormand Chipped Stone: Artifact Type by Temporal Association

Artifact Type	Late Archaic		Early Pithouse		Salado		TOTAL	
	N	%	N	%	N	%	N	%
Angular debris			1	6.7	103	9.1	104	9.0
Core flake			9	60.0	772	68.0	781	67.9
Biface flake			1	6.7	13	1.1	14	1.2
Bipolar flake					6	.5	6	.5
Tested cobble					3	.3	3	.3
Core					78	6.9	78	6.8
Chopper					3	.3	3	.3
Hammerstone					3	.3	3	.3
Scraper					5	.4	5	.4
Agave knife					7	.6	7	.6
Drill					7	.6	7	.6
Unidentified projectile point			1	6.7	28	2.5	29	2.5
Stemmed projectile point					3	.3	3	.3
Side-notched projectile point			2	13.3	13	1.1	15	1.3
Triangular projectile point					30	2.6	30	2.6
Corner-notched projectile point					3	.3	3	.3
Serrated edge projectile point					1	.1	1	.1
Ovate projectile point					6	.5	6	.5
Uniface	1	100.0			7	.6	8	.7
Biface			1	6.7	44	3.9	45	3.9
COLUMN TOTALS	1	100.0	15	100.0	1135	100.0	1151	100.0

the obsidian used at this location, since Mule Creek obsidian consists of small, 10-cm-long nodules. Very few hammerstones were found at Ormand, and this pattern has been noted at Mimbres and post-Mimbres phase sites in this locality (Lekson 1990:71).

Several "agave" knives were recovered. In this assemblage this term refers to large, flat spalls with one or two either bifacially or unifacially retouched edges. Agave knives appear to be correlated to desert zones and the Salado horizon (Franklin 1980:178), and are found from the Tonto Basin in Arizona down to Paquimé in northern Chihuahua (Brown 1973:30, 36; DiPeso 1958:129; DiPeso et al. 1974, vol. 7, p. 372; Franklin 1980:148-149; Simon et al. 1994:740). Plan forms show a variety of shapes, from trapezoidal, rectangular, to oval. Edges can be ground or chipped. At Ormand, agave knives came in several shapes, typically with one long edge used for cutting (Fig. 124). These tools can be used to cut the leaves and stalks of the agave plant, and to strip the pulp off the thick fibers found in the leaves (Rice 1994:810). Agave plants do not at present grow in the Ormand Village vicinity, but the lower edges of bajadas overlooking river valleys were frequently used in prehistoric times for the planting and raising of agave (Rice 1994:810). No obvious agave roasting pits have been located at Ormand.

Formal tools were low in frequency, and included drills made of chert, and projectile points made primarily from obsidian. All of these formal tools were made by pressure flaking thin, flat flakes. Whole projectile points had a mean length of 2.4 cm. The largest point measured 5.5 cm. All other points ranged between 1.5 and 3.9 cm in length. Most of the points found were a simple triangular form (n=28, 36 percent). Whole triangular points ranged in length from 1.5 to 2.9 cm, with a mean of 2.1 cm.

Material Types

An examination of material sources is critical in determining a "curated" from an "expedient" technology (Moore 1994:289). These strategies are traditionally conceived of as opposite ends of a behavioral continuum revolving around the degree of population mobility (Kelly 1988; Bamforth 1990), although material availability is also argued to be a major contributor for characterizing a lithic assemblage (Bamforth 1986).

All of the materials used in the chipped stone industry at Ormand came from the near environment. Out of the total of 1,151 chipped stone items examined by this analysis, chert and obsidian represented 34 percent and 26.2 percent of all materials used, respectively (Table 25). An extensive and well-known obsidian source, extending for miles around the small town of Mule Creek, New Mexico, is 37 km to the northwest of the site area. Obsidian nodules from this source have been documented in the Upper Gila River gravels (Shackley 1992), offering easy availability. Nearly all materials had some evidence of waterworn cortex, with chert, chalcedony, and welded tuff exhibiting high percentages (Table 26). This suggests collection from the Gila River or other nearby streams.

The geology of the Mogollon area is complex, with sedimentary, igneous, and metamorphic rocks closely integrated. Several of the material types identified had to remain as general categories due to this geologic mixing. Many areas within the region still lack detailed geologic publications, and very little attention has been given to lithic materials research (Banks 1990:73). The full range of material types and material quality found on the site is shown in Table 27. Material types were coded by gross categories unless specific sources could be identified. Texture was measured subjectively, depending on grain size, which was applied within material types, not across them. Materials were described as fine, medium, or coarse and further divided by evidence of interior flaws or inclusions. Obsidian was classified as glassy by definition, and this category was applied to no other material. Each material type is described below.

Chert is a sedimentary siliceous rock containing at least 50 percent silica. Opinions on its origin differs in certain details, although it is clearly formed as a result of accumulated siliceous organic remains. Generally, chert is a dense siliceous rock of horn-like appearance (Schumann 1993:292-295). Material quality ranges from fine-grained to coarse-grained. Color is white, yellow, gray, brown, and red, and can be opaque to translucent. At Ormand, small chert fragments were

Table 25. Ormand Chipped Stone: Material Type by Temporal Association

Material Type	Late Archaic		Early Mogollon		Salado		TOTALS	
	N	%	N	%	N	%	N	%
Chert			3	20.0	388	34.2	391	34.0
Chalcedony			3	20.0	140	12.3	143	12.4
Obsidian	1	100.0	4	26.7	297	26.2	302	26.2
Igneous, unspecified			5	33.3	225	19.8	230	20.0
Welded tuff					19	1.7	19	1.7
Basalt					2	.2	2	.2
Rhyolite					9	.8	9	.8
Sedimentary, unspecified					2	.2	2	.2
Siltstone					26	2.3	26	2.3
Metamorphic, unspecified					11	1.0	11	1.0
Quartzite					4	.4	4	.3
Quartzitic Sandstone					12	1.1	12	1.1
TOTALS	1	.1	15	1.3	1135	98.6	1151	100.0

Table 26. Ormand Chipped Stone: Artifacts with Cortex by Cortex Type (with row percentages)

Material Type	Waterworn Cortex		Nonwaterworn Cortex		TOTALS/Column %	
	N	%	N	%	N	%
Chert	89	62.7	53	37.3	142	26.8
Chalcedony	51	79.7	13	20.3	64	12.1
Obsidian	27	17.4	128	82.6	155	29.0
Unspecified Igneous	20	15.7	107	84.3	127	24.0
Welded Tuff	5	62.5	3	37.5	8	1.5
Nonvesicular Basalt			1	100.0	1	.2
Rhyolite	1	14.3	6	85.7	7	1.3
Siltstone	3	25.0	9	75.0	12	2.3
Unspecified Metamorphic	2	25.0	6	75.0	8	1.5
Quartzitic Sandstone			6	100.0	6	1.1
TOTALS	198	37.4	332	62.6	530	100.0

615 items with no cortex

Table 27. Ormand Chipped Stone: Material Type by Material Quality (with column percentages)

Material	Glassy		Glassy and Flawed		Fine-grained		Fine-grained and Flawed		Medium-grained		Medium-grained and Flawed		Totals	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Chert					72	18.5	301	77.0	1	.3	17	4.4	391	34.0
Chalcedony					67	46.9	74	51.7			2	1.4	143	12.4
Obsidian	288	95.4	14	4.6									302	26.2
Igneous*					24	10.4	157	68.3	1	.4	48	20.9	230	20
Welded tuff			1	5.3	4	21.1	13	68.4					19	1.7
Basalt*					1	50	1	50					2	.2
Rhyolite					1	11.1	6	66.7	1	11.1			9	.8
Sedimentary*					2	100							2	.2
Siltstone					11	42.3	15	57.7					26	2.3
Metamorphic*					8	72.7	3	27.3					11	1.0
Quartzite					4	100							4	.3
Quartzitic sandstone					9	75	1	8.3			2	16.7	12	1.0
TOTALS	288	25	15	1.3	203	17.6	571	49.6	3	.3	71	6.2	1151	100

* nonspecific

found with heavily water-patinated exteriors. These small fragments were found in various stages of reduction, attesting to the desirability of this material. The chert at Ormand ranged in quality from fine grained to medium grained and flawed. Most of the chert was fine grained and flawed, at 76.9 percent. A few items had a very waxy luster (n=16, 4.3 percent of chert items), and may have been heat-treated.

Chalcedony refers to a microcrystalline quartz that in a very narrow and more typical sense is white-gray in color, has a hardness of 6.5 to 7.0, exhibits a waxy luster, and is translucent in appearance. In a broader sense the term includes other microcrystalline quartz materials like agate, jasper, and onyx (Schumann 1993:38). Chalcedony is often a component of other cherts and frequently is found as an aqueous deposit filling or lining cavities in rocks (Banks 1990:150). At Ormand, items described as chalcedony refer to the specific interpretation of white-gray, translucent, waxy lustered material. The quality of the chalcedony used was fine grained, and nearly evenly divided between flawed and unflawed material.

Obsidian is a compact volcanic glass, 5.0 to 5.5 in hardness (Schumann 1993:238). An extensive source called Mule Creek is located at its southern end just 37 km (23.13 miles) to the northwest of Ormand. Several "source localities" are found in this area because this is a redeposited layer of volcanic material (Findlow and Bolognese 1982:299), and marekanites have been found eroding into the Gila and San Francisco rivers at least 50 to 100 km from the primary source (Shackley 1995:534). This obsidian is part of a very large late Tertiary ash-flow sheet that covers a wide area in Greenlee County, Arizona, and Catron and Grant counties, New Mexico, and may extend over the Mogollon Mountains to the east. The nodules are typically small, up to 10 cm in length, and may have been pyroclasts within the large ash flow. Colors range from translucent smokey gray with gray banding, to a few pieces of mahogany brown with black bands. Some of the cortex exhibits a silvery sheen, but most is a thin black-brown. The material is fairly good for tool production, but is quite brittle. Mule Creek obsidian is readily available in Upper Gila River gravels, without a significant amount of effort needed for collection (Shackley 1992: 322-323). Mule Creek obsidian is also found in numerous other streams that cut through the deposit (Findlow and Bolognese 1982:299). At Ormand, a large majority of the obsidian was unflawed, at 95.4 percent. Obsidian was the preferred material for projectile points, representing 75.8 percent of all whole projectile points, and 70.7 percent of all projectile point types found. Only one of these obsidian points was made from flawed material.

The type "igneous" refers to an unspecified type that is clearly magmatic in origin but does not fit a specific type readily. Rocks of igneous origin abound in this region and are notoriously difficult to type (Elston 1965; Fitzsimmons and Lochman-Balk 1965). Over half of this material category was fine-grained and flawed (68.3 percent).

"Welded tuff" is another volcanic material that has also been identified as an andesitic ash flow. Geologists have assured us that either term is appropriate, and is indicative of the general overall intensive volcanization of the larger region (Julie Jacobs, pers. comm. 1996). Welded tuff in this analysis was a distinctive greenish gray color with a very glassy material quality. Although this material has some properties akin to both obsidian and chert, it must not have been the ideal material to work. Most of the welded tuff items present in this assemblage were flawed (68.4 percent). This material literally lines the bottom of the Gila River (personal experience in a very dry May 1996), and considering its proximity and ubiquity was rarely found in the assemblage. One item exhibited a color change possibly induced through heat treatment. It seems unlikely that this material was purposely heat-treated. The naturally glassy quality of this material does not need improvement.

Other volcanic materials, such as nonvesicular basalt and rhyolite were rare in the Ormand assemblage, and not used for formal tools. Basalt is a dark rock, typically gray to black in color. The texture is usually very fine grained and dense (Schumann 1993:244-247). The nonvesicular basalt used at Ormand was all fine grained; half was flawed. Rhyolite is a silica-rich volcanic rock that is dense and fine grained. Colors range from white, gray, yellow, to reddish and reddish purples (Schumann 1993:240). Two-thirds of the rhyolite at Ormand was fine grained and flawed (66.7 percent).

Sedimentary rocks are secondary rocks originating on the earth's surface from the weathered debris of other rocks. Almost all sedimentary rocks are layered. Normally there is a long transport time between the place of origin and the final place of deposition. Typically the new rock is chemically altered by mixing with different constituents through the agents of water, ice, wind, and gravity (Schumann 1993:260). Sedimentary materials were present at Ormand but low in frequency. Two core flakes were made from a nonspecific sedimentary material of fine-grained quality. All of the siltstone was fine grained, and about evenly divided between flawed and unflawed material. Quartzitic sandstone, or sedimentary quartzite in petrology, is quartz-rich sandstone with siliceous cement and at least 85 percent quartz or quartzitic rock fragments (Schumann 1993:274, 318). Material quality was 75 percent fine grained, but a few items were medium grained and flawed (16.7 percent).

Metamorphic rocks develop through the transformation of all kinds of rock, from igneous, sedimentary, and older metamorphic rocks, under the influence of high pressure and high temperature (Schumann 1993: 304). Nearly 75 percent of the metamorphic material used at Ormand was fine grained in material quality. Quartzite, or metaquartzite in petrology, is composed of more than 80 percent quartz. The quartz grains are interlocked because of the way the cement has crystallized out during the metamorphism (Schumann 1993: 318). All of the quartzite used was fine grained.

Other studies (Fitting 1970, 1972a) of prehistoric chipped stone industries in the Upper Gila noted differences in raw material usage among pre-Mimbres, Mimbres, and post-Mimbres occupations. Pre-Mimbres occupations showed a higher usage of fine-grained cherts, Mimbres occupations used more coarse cherts, and post-Mimbres occupations utilized "igneous" (unspecified as to what this is exactly) materials (Fitting 1970:18-20). These studies came from surface collections, and do not readily fit the pattern of excavated chipped stone materials found at Ormand. Unlike these other studies, no distinct changes in material types or quality were noted between temporal periods at Ormand.

Thermal Alteration

Out of the total of 1,151 chipped stone items, 51 exhibited some form of thermal alteration. It should be noted that these indicators do not alone prove intentional heating of material to enhance workability. Intentional heating, usually of core flakes, is done so that siliceous materials respond more like glass (Gregg and Grybush 1976:189). Core flakes can be heated to improve their workability for formal tool manufacture, and they are typically of a size that are large enough to accommodate the necessary shaping that will result in a projectile point or other formal tool form. Thermal alteration is usually recorded by the presence of over-heated attributes, including crazing, potlids, and color change. Crazing of the outer surface and potlid fractures are attributes that are easily seen as evidence of heat treatment. Color change can actually occur at temperatures lower than those needed to alter the crystalline structure, which enhances flakeability (Collins and Fenwick 1974:135).

Thermally altered attributes were noted on angular debris, core flakes, cores, and bifaces (with frequencies of 9, 27, 9, and 6, respectively) at Ormand. Nearly all of these items were made from chert or chalcedony (chert, n = 44, 86.3 percent; chalcedony, n = 5, 9.8 percent; total, n = 49, 96.1 percent). The remaining two items were made from obsidian and welded tuff, materials that do not need thermal alteration to improve their workability. Out of the artifact types at Ormand that were thermally altered, only the core flakes and bifaces are logical candidates for intentional heat treatment. Of the 27 core flakes with thermal alteration (2 with potlids, 15 crazed, 9 color change, and 1 crazed and potlids), 6 came from rooms with extensive burning, which probably caused the thermal alterations. Just three flakes came from floor contexts—1 from an early Mogollon pithouse (Pithouse 24), and 2 from Room 20 in the Saladoan north roomblock. The remaining 18 flakes came from various fill associations from Saladoan contexts. Only eight out of the total were whole. Whole flake size ranged from 1.0 to 3.5 cm, which is quite small. None of these factors support an obvious use of intentional thermal alteration to facilitate formal tool manufacture.

Assemblage Characteristics

Just one obsidian uniface was recovered from a possible late Archaic provenience (from the large, subfloor pit beneath Pithouse 52), and no attempt will be made here to characterize this assemblage.

A total of 15 chipped stone items were found in possible early Mogollon associated contexts. Artifact types for this occupation included angular debris, core flakes, a biface flake, an unidentified projectile point, 2 side-notched projectile points, and a biface. These artifacts were nearly evenly distributed between floor and floor fill proveniences from three pithouses (Pithouses 24, 76, and 84). These few artifacts do not present enough data to confidently characterize the lithic technology of this occupation. The scant evidence from these few artifacts indicates total use of local materials (chert, 20 percent; chalcedony, 20 percent; obsidian, 26.7 percent; unspecified igneous, 33.3 percent), and nearly total use of fine-grained materials (26.7 percent glassy, 13.3 percent fine grained, 53.3 percent fine-grained and flawed, and 6.7 percent medium grained and flawed), with flawed material texture representing 60 percent of this small assemblage. Of the nine core flakes recovered from this temporal period, no utilization was noted.

The chipped stone artifacts associated with the Salado occupation represented the majority of stone artifacts at the Ormand Village site, at 98.6 percent out of the total. Concurrent with this larger artifact population is a greater variety of artifact and material types. Post-Archaic lithic technologies are characterized as an "expedient" strategy, with pieces of debitage produced for immediate use (Vierra 1985:158). Using comparisons made between various attributes, Vierra has noted differences in ratios and percents for Archaic and later Anasazi lithic assemblages (Vierra 1985:159). These attributes include core use ratios, flake to core ratios, flake to angular debris ratios, cortical to noncortical debitage ratios, percentage of formal tools present, formal tools to debitage ratios, percentage of tertiary flakes present, and the percentage of utilized debitage. Table 28 records these attributes with an interpretation of which strategy the results indicate. Several of the Ormand results contradict each other. The low percentage of formal tools (in this case, drills and projectile points) clearly reflects an expedient strategy, but this is contradicted by the ratio of formal tools to debitage. The high percentage of utilized debitage again indicates an expedient strategy, which is contradicted by the results of the flake to angular debris ratio. What this seems to suggest is that collection bias for angular debris in the field strongly affected the representativeness of this artifact category. Formal tools tend to be well represented, particularly if collection bias is suspected for an assemblage. Core flakes were also well represented in this assemblage, as they are the most numerous category of items (n=772, at 68 percent). Some cores were also reused as hammerstones, which is characteristic of expedient technologies. The combined

Table 28. Ormand Chipped Stone: Ratios and Associated Lithic Strategies

Attributes	Ratio/Percent	Indications	Associated Lithic Technology Strategy
Core use present	2.5%	Cores used multipurpose	Expedient
Flake:core ratio	10.141	Tool manufacture	Curated
Flake:angular debris ratio	7.679	Extensive core preparation	Curated
Cortical:noncortical debitage ratio	0.879	Low tool production	Expedient
Formal tools present	7.9%	Low; expedient tools emphasized	Expedient
Formal tools:debitage ratio	0.101	High; tool production important	Curated
Tertiary flakes present	1.2%	Low; few formal tools made	Expedient
Utilized debitage present	5.0 %	High; expedient tools emphasized	Expedient

results of formal tool and utilized debitage percentages seem to most accurately represent an expedient technological strategy overall.

To further interpret the Salado lithic technology, reduction stages and strategies, flake platform types, and tool use were examined. Reduction can be divided into two stages: core reduction and tool manufacture. Flakes are removed for immediate use or for further modification during core reduction. Primary core reduction removes the outer cortical surface. Flakes from this process are called *primary core flakes*, and in this analysis include flakes with 50 percent or more dorsal cortex. Secondary core reduction is the further removal of flakes from the nodule or core interior. Cortex is rarely totally removed from a core before secondary reduction begins. *Secondary core flakes* have less than 50 percent dorsal cortex in this analysis. Comparisons of frequencies and percentages between these two flake categories aid in determining how cores were treated on site. In general, the presence of few primary flakes suggest that primary reduction occurred off site, while few secondary flakes suggest that cores were removed off site for further reduction. Tool manufacture is noted by the presence of the by-products of purposeful modification of debitage into specialized forms. Biface flakes (tertiary flakes) represent the last stage of reduction, and are defined in this standardized analysis using a polythetic set of variables including platform and flake form attributes (OAS Staff 1994).

Table 29 divides Salado core flakes into primary and secondary by material type. The high percentage of secondary flakes indicates that the later stages of core reduction dominated this assemblage. The very small presence of biface flakes (1.2 percent) suggests that core reduction, rather than tool manufacture, was the emphasis of this technology.

Reduction strategies can be further examined by core types and core flake platform modification. Core types are categorized by the direction of flake removals. Flakes are removed in the same direction from one surface on unidirectional cores, in opposing directions from one surface on bidirectional cores, and in many directions from more than one surface on multidirectional cores. Multidirectional cores tend to dominate core types, and this assemblage is no exception. Multidirectional cores constituted 84.6 percent of all cores types at Ormand (n=66), with unidirectional cores, bidirectional cores, and a fragmentary indeterminate core type present in descending order (n=10 at 12.8 percent, n=1 at 1.3 percent, and n=1 at 1.3 percent, respectively). Multidirectional cores also tend to be smaller than other cores, and reduced as far as possible before discard (Moore 1994:315). This appears to be the case for this assemblage (Table 30), where multidirectional cores ranged from 1.3 to 7.5 cm in length. These measurements are small for cores, and suggest that material is either reduced very efficiently as far as possible, that the original pieces of material are quite small to start out, or a combination of both of these factors. Chert dominates the material types represented, at 68.2 percent of multidirectional cores, and 62.8 percent of all cores. Chert cores are much more prevalent than the overall representativeness of chert as a material type in this assemblage (at 34 percent). This factor suggests that very small nodules were used for reduction, and that chert was used to create flakes for expedient use. Obsidian was surprisingly ill represented for core material, although selected for formal tools in the assemblage. The Mule Creek obsidian source is known to consist of redeposited nodules that measure no larger than 10 cm (Shackley 1992), and personal observation and collection confirms this. The paucity of obsidian cores seems to indicate that the very small nodule size was used for formal tool manufacture only. The high percentage of obsidian projectile points supports this claim.

Table 29. Ormand Salado Core Flakes With Cortex Percentages and Material Types

Material Type	Primary Flakes (50-100% dorsal cortex)	Secondary Flakes (0-40% dorsal cortex)	Totals	
			N	%
Chert	33	218	251	32.5
Chalcedony	16	86	102	13.2
Obsidian	47	123	170	22.0
Unspecified Igneous	50	134	184	23.8
Welded Tuff	1	9	10	1.3
Basalt	1	1	2	0.3
Rhyolite	3	5	8	1.0
Unspecified Sedimentary	0	2	2	0.3
Siltstone	9	15	24	3.1
Unspecified Metamorphic	4	4	8	1.0
Quartzite	0	2	2	0.3
Quartzitic Sandstone	3	6	9	1.2
TOTALS	167 (21.6%)	605 (78.4%)	772	100.0

Table 30. Ormand Salado Multidirectional Cores by Material Type and Length

Material Type	1.3-1.7 cm	2.1-4.0 cm	4.2-6.0 cm	6.3 -7.5 cm	TOTALS	
					N	%
Chert	1	37	6	1	45	68.2
Chalcedony		3	1		4	6.1
Obsidian	1	6			7	10.6
Unspecified Igneous		2	1	1	4	6.1
Welded Tuff		1	1	1	3	4.5
Siltstone				1	1	1.5
Unspecified Metamorphic				1	1	1.5
Quartzitic Sandstone		1			1	1.5
TOTALS	2 (3.0 %)	50 (75.8%)	9 (13.6%)	5 (7.6%)	66	100.0

Table 31. Ormand Salado Core Flake Platform Types by Material Type

Material Type	Unmodified Platforms	Modified Platforms	Totals	
			N	%
Chert	148	6	154	31.4
Chalcedony	63		63	12.9
Obsidian	96	7	103	21.0
Unspecified Igneous	116	2	118	24.0
Welded Tuff	8		8	1.6
Rhyolite	7		7	1.4
Unspecified Sedimentary	2		2	0.4
Siltstone	20	1	21	4.3
Unspecified Metamorphic	6		6	1.2
Quartzite	1		1	0.2
Quartzitic Sandstone	8		8	1.6
TOTALS	474 (96.8%)	16 (3.2%)	490	100.0

Core flake platform modification is another attribute that can elucidate more about reduction strategies. Platform modification is more likely to occur during tool manufacture, but modified platforms also increase control over flake length, shape, and to prevent platform shattering (Moore 1994:318). Most platforms in the Ormand Salado assemblage were unmodified, at 96.8 percent (n=474, see Table 31). Modified platforms are associated with tool production, although this factor alone does not indicate manufacture (Moore 1994:304). The low presence of modified flake platforms in this assemblage suggests that tool manufacture did not dominate the Salado lithic strategy at the Ormand Village.

Formal tools were rare, including 7 drills and 84 projectile points (Fig. 125), at 8.0 percent of the total Salado assemblage. Silicious, cryptocrystalline materials were used solely for the drills (3 chert, 4 chalcedony). Obsidian was preferred for the projectile points, at 73.5 percent. Chalcedony, chert, unspecified igneous material, welded tuff, and quartzite followed in frequency (10.8 percent, 9.6 percent, 4.8 percent, 1.2 percent, and 1.2 percent, respectively) for projectile point manufacture. All of the formal tools were made from either glassy or fine-grained materials, with flawed materials representing 12 percent of the total. Most of the identifiable points were a simple triangular form (n=28, 32.6 percent). Whole triangular points ranged in length from 1.5 to 2.9 cm, with a mean of 2.1 cm (Table 32). Triangular points are the most common form for projectile points from later periods in the Southwest (Whittaker 1987a:1, 1987b:467), although triangular points are noted from "Pre-Mimbres" to "Post-Mimbres" periods in the Upper Gila area (Fitting 1972a:44). Side-notched points originate from triangular protoforms, suggesting the possibility that triangular points are unfinished forms (Whittaker 1987a:3). A few points were corner-notched (n = 3). While this style is typically interpreted as a Pithouse period style elsewhere, this is not the case in the Mogollon region. Corner-notched projectile points are consistently found in late Archaic through Salado period sites in the Mogollon region, and are considered poor temporal markers for the area (James L. Moore, pers. comm. 1998).

Table 32. Ormand Projectile Point Types by Associated Date, Material and Mean Length

Projectile Point Type	Early Mogollon A.D. 200-500	Salado A.D. 1300-1450	Totals		Mean Artifact length in cm, whole items
			N	%	
Unidentified	1 (obsidian)	32 (4 chert, 5 chalcedony, 20 obsidian, 3 igneous)	33	38.4	2.4 cm (n=4)
Stemmed		3 (1 chert, 2 obsidian)	3	3.5	2.6 cm (n=2)
Side-notched	2 (obsidian)	14 (1 chert, 1 chalcedony, 11 obsidian, 1 igneous)	16	18.6	2.8 cm (n=6)
Triangular		28 (2 chert, 3 chalcedony, 22 obsidian, 1 welded tuff)	28	32.6	2.1 cm (n=17)
Serrated edge		1 (obsidian)	1	1.2	3.8 cm (n=1)
Ovate		5 (4 obsidian, 1 quartzite)	5	5.8	3.5 cm (n=3)
TOTALS	3 (3.5%)	83 (96.5%)	86	100.0	2.4 cm (n=33)

Recently there has been discussion challenging the usefulness of relying on the formal characteristics of projectile points as temporal indicators. Projectile points, and other bifacially worked tools, were continually modified until discarded or made nonfunctional (Frison 1968:149). Studies of modern-day hunter-gatherer groups have shown that sets of projectile points may be formally similar within one day of flintknapping, but do not maintain a consistent style through time (Wiessner 1983:265). In an eloquent rebuttal to these criticisms, David Hurst Thomas points out that any type of time marker, whether "stylistic" or "technological," is defined by intensive trial-and-error, applying morphology against dated stratigraphy (Thomas 1986:622-623). What is lacking in the Upper Gila is systematic excavation and recording of Salado sites. Without local comparative information, there is little that can be said about what constitutes a Saladoan projectile point seriation, aside from the obvious late Puebloan similarities, such as triangular and side-notched projectile points.

The Salado chipped stone assemblage has several attributes that suggest an expedient technological strategy, including few formal tools, a high use of informal tools, cores used for multiple purposes (as cores, then hammerstones), and few tertiary flakes. Collection bias is a potential hazard in interpreting this assemblage; angular debris appears to be discriminated against, and should be much higher in frequency than is noted. An examination of floor chipped stone seems to confirm this bias—the flake:angular debris ratio is 6.7 in the north roomblock and 17 in the east roomblock—remarkably high for the profile of a lithic technology typically associated with a sedentary population.

Regional Comparisons

Fitting's survey (1972a) of surface chipped stone artifacts in the Upper Gila drainage provides a general idea of the type of materials and kind of artifacts found in the area for all prehistoric time periods. Four temporal categories were designed for the study, including a "lithic" category representing all nonceramic sites, presumed to be Paleoindian to Archaic (10,000 B.C. to A.D.

200), a "Pre-Mimbres" category representing the Pine Lawn through Three Circle phases (A.D. 200 to 1000), a "Mimbres" category representing the Mangus and Classic Mimbres phases (A.D. 1000 to 1150), and a "Post-Mimbres" category representing sites with "later ceramic types" (Fitting 1972a:5-7), presumably the Black Mountain and Salado periods (A.D. 1150 to 1450). Similar projectile point types were noted for all temporal periods, but in varying percentages per type. For the "lithic" phase, the most frequent to the least frequent types were lanceolate, medium side-notched, large side-notched, miscellaneous, triangular, and flat corner-notched (at 29, 24, 19, 14, 10, and 5 percent respectively). "Pre-Mimbres" projectile points had some of the same types, but in different percentages, with the addition of some new types. The most frequent to the least frequent types were medium side-notched, large side-notched, triangular, small side-notched, contracting stemmed, lanceolate, and miscellaneous (at 32, 21, 20, 8, 8, 4, and 4 percent, respectively; Fitting 1972a:44). No difference was noted in the kind and frequency of scrapers and retouched flakes between all time periods ("lithic" to "post-Mimbres"). As a group of unifacial tool types, retouched flakes represented 60-70 percent, with scrapers representing 30-40 percent (Fitting 1972a:52). Flake types were recorded as "blocky," "flat," or "retouched." No differences were noted for the "pre-Mimbres" to the "post-Mimbres" periods, with a nearly even representation between blocky and flat flakes. For the Archaic period, flat flakes represented 65 percent of the total (Fitting 1972a:55). Within the Upper Gila drainage, lithic material usage changes slightly between time periods. Basalt was a favored material during the Archaic period (at 55 percent), coarse chert and glossy chert were popular in the pre-Mimbres period (at 35 and 30 percent, respectively), Coarse chert and basalt were used primarily in the Mimbres period (at 42 and 20 percent, respectively), and coarse chert and basalt were preferred in the post-Mimbres period (at 35 and 31 percent, respectively). Obsidian use is strikingly low in this study, ranging from 0 percent in the Archaic, 2 percent in the pre-Mimbres, 3 percent in the Mimbres, and 3 percent in the post-Mimbres periods (Fitting 1972a:12). Other investigations of material use in the Upper Gila point out the comparison of coarse materials (including basalt, andesite, and rhyolite) to fine materials found at various sites. Coarse materials were used much more in the Archaic period, 61 percent, and in general decreased in usage to 37 percent by the post-Mimbres period (Lekson 1990:61).

A synthesis of Fitting's surface study (1972a) presents a different story of material use than the excavated evidence from the Ormand Village site. Basalt was used infrequently at Ormand, even during the Salado period. Obsidian and chert were used predominantly through all time periods at Ormand, directly contradicting the pattern of material use from the surface study. Two factors are striking from Fitting's study: (1) local material use, to the exclusion of any exotic material, is evident for several areas in southwestern New Mexico, including the Upper Gila, and (2) projectile point types existed across a great expanse of time, with only minor fluctuations in the proportions of specific types between temporal periods. Triangular points are more frequent in the post-Mimbres period, but they are present from aceramic horizons onward.

What is unclear in Fitting's study is the relationship of expedient tools to curated tools by site, and for the Upper Gila as a whole. The paucity of chipped stone artifacts from the two early occupations at Ormand does not remedy this information gap; but it must be acknowledged that this is a major question remaining in the area. A breakdown of basic chipped stone categories taken from Fitting's Upper Gila data (Fitting 1972a:20, 27, 44, 52, and 55) shows that cores represented 7 percent, bifacial tools 2.3 percent, projectile points 0.6 percent, retouched flakes 14.3 percent, scrapers 7.2 percent, and flakes 68.6 percent. Projectile points were not separated by area, so I divided the total by the number of areas examined--not the most accurate measure, but the best that could be done. Overall, the pattern is similar for the Upper Gila and Ormand for all occupations.

Some of the best potential for comparison comes from the study of Salado sites in the Mimbres Valley (M. Nelson 1986). Much of the interpretation of the chipped stone assemblages from these sites was heavily influenced by the evaluation of ethnobotanical and faunal remains (Minnis 1986). Although the Salado phase peoples clearly depended upon maize as a staple, the hunting of large-game resources (such as antelope and deer) was seen as a different food procurement strategy than the preceding occupations (Minnis 1986:205-239). Both chipped stone and subsistence studies stress the similarity of the Salado adaptation to the Mogollon Early Pithouse phase, with a relative emphasis on hunting over agricultural practices. The chipped stone assemblage for these sites was separated into two distinct analyses, focusing on debitage and non-projectile tools and a separate analysis of projectile points (M. Nelson 1986:141-176). Debitage and nonprojectile tools were examined for the dichotomy between "durable" and "sharp" edges, with corresponding assumptions that durable edges were used for plant processing and sharp edges for meat processing. This interpretation stems from studies done on the effectiveness of unworked flakes for butchering tasks (Walker 1978). While this distinction was acknowledged as not being absolute, extensive interpretation and comparison of these perceived categories structured this analysis. Projectile points were examined as indicators of "cultural affiliation" and as evidence of hunting strategies. Following ethnographic analogy, projectile points were also assumed to be used in hunting large game rather than small animals.

Material selection for the Mimbres Valley assemblage was local, with all materials available in cobble form in the near vicinity. Retouched tools were also rare, and both of these factors are usually interpreted as an indication of a relatively expedient technology. Other factors, such as a narrow "production edge angle" (least acute tool edge angle), use of cryptocrystalline and volcanic materials, pattern of little cortex on tool edges, and overall small formal tool size were used to support the interpretation that hunting was relatively more important for subsistence. The number of projectile points was not correlated within the overall assemblage due to concern that prehistoric curation of these tools could potentially skew their representativeness. The presence of biface flakes was relied upon as evidence of projectile point use. Although biface flakes were very rare in this assemblage, it is argued that projectile points were used in great numbers. No particular projectile point types were seen as cultural markers, although side-notched points were rare during the Mogollon Early Pithouse phase in the Mimbres valley. "Large" points are more common during the Salado phase, with large interpreted as bigger than 2.3 cm. What constitutes large in this analysis appears to be arbitrary; what these size differences mean is not discussed through comparison with other chipped stone analyses, or to some other study that may elucidate how meaning was attached to a particular size. The projectile points at these Salado phase Mimbres sites are in the same size range as those at Ormand and those of late Puebloan sites (Parry and Christenson 1987, plates 11 and 12); they are much smaller than Paleoindian and Archaic projectile points.

Some differences were noted between the one Salado site at the north end of the Mimbres Valley (Janss) and the two Salado sites in the middle valley (Stailey and Disert). The north end of the Mimbres Valley is physically less suitable for agriculture: the floodplain is more narrow and the soil development is more shallow. The north end is closer to the mountainous transitional ecozone, interpreted as having greater proximity to large game. The chipped stone assemblage for the northern Janss site suggested a greater exploitation of large animals. Material texture and quality, cortex on tool edges, production edge angles, and presence of biface thinning flakes were used to substantiate these interpretations (M. Nelson 1986:151). The overall interpretation of the Mimbres Valley lithic assemblage points to a relative emphasis on formal tool production, akin to what was found during Early Mogollon Pithouse occupations. As the title "short-term sedentism" implies, the Salado occupation in the Mimbres Valley was conceived as a combination of agricultural sedentism and hunter-gatherer strategies (Nelson and LeBlanc 1986).

Comparisons with the Ormand Village data are somewhat difficult due to history: the Ormand site was excavated before ethnobotanical sampling became known or the norm. There is no question, however, from the high percentage of rooms with mealing stations, that maize was a substantial part of the diet and subsistence effort. The careful analysis of the faunal remains from Ormand (Akins, this volume) noted the same high percentage of large mammal remains, but cautioned against collection bias. Since collection proceeded without the aid of screening, larger faunal remains can be expected to show higher representation. With this qualification in mind, medium artiodactyls, deer, and rabbits showed clear signs of alteration consistent with use as food resources. There is no evidence that the Ormand residents had to go great distances to obtain these animals. These species favor grasslands or concentrate near agricultural fields as prey or grazers. The strategy for Ormand residents appears to have taken advantage of a land of plenty—hunting animals that concentrated around their fields (Akins, this volume). This was true for a time in the Gila Valley where the Salado presence was substantial compared to the presence in the Mimbres Valley; in fact, the heavy Salado presence in the Gila Valley marks it as the local "homeland" area, with the few sites in the Mimbres Valley interpreted as pioneering outposts (Minnis 1986:205; Nelson and LeBlanc 1986:247, 249). The chipped stone assemblage at Ormand was difficult to interpret due to the potential for collection bias, but appeared to be consistent with other late Puebloan assemblages, reflecting a sedentary population using many informally produced tools and a few specialized formal tools. This comparison between the Ormand and the Mimbres Valley study raises interesting questions about similar data but differing conclusions that will not be resolved here.

Salado Phase Chipped Stone Conclusions

Due to several factors, the chipped stone assemblage at the Ormand Village can be characterized as an expedient technology. These factors include few formal tools, a high use of informal tools, cores used for multiple purposes (as cores, then hammerstones), and few biface flakes. Collection bias is a potential hazard in interpreting this assemblage; angular debris appears to be discriminated against, and should be much higher in frequency than is noted. The high percentage of secondary flakes at Ormand indicates that the later stages of core reduction dominated this assemblage. The very small presence of biface flakes (1.2 percent) further indicates that core reduction, rather than tool manufacture, was the emphasis of this technology.

Material selection was local, with the possibility that most materials were collected from the nearby Gila River. Silicious, cryptocrystalline materials were selected for core flake and drill manufacture, and obsidian was preferred for the projectile points. All of the formal tools were made from either glassy or fine-grained materials, and flawed materials represented 12 percent of the total. Most of the projectile points were a simple triangular form, with a mean length of 2.1 cm for whole items. Triangular points represented 52.8 percent of identifiable point types. Triangular points are noted in the Upper Gila area through a broad range of time, from pre-Mimbres to post-Mimbres periods (Fitting 1972a:44).

While the exact function of each stone tool cannot be reconstructed, several tools suggested use in plant harvesting and processing. These included agave knives, typically interpreted as functioning in the cutting or harvesting of agave or mescal leaves (Fish et al. 1985:107). Agave knives are found in desert zones and appear common at Salado sites (Franklin 1980:178), suggesting that agave was cultivated during this horizon. No direct evidence of agave cultivation was found at Ormand, although it is possible that several large extramural pits were used for agave roasting.

Ground Stone

Ground stone, as a category of objects, encompasses a wide range of artifact types and functions beyond mere food-processing equipment. The common factor for these objects is the manner in which they were shaped, which typically comes from grinding or pecking, or a combination of both. Analysis proceeded by following the standardized ground stone analysis established by the Office of Archaeological Studies (OAS Staff 1994). As was true for all artifact classes for this project, ground stone objects from floor, floorfill, subfloor, and pithouse fill were examined. Most but not all of the artifacts associated with these proveniences were located in the state repository; a list of examined artifacts is provided in Appendix 2. Artifacts were primarily examined macroscopically; dimensions were measured with a sliding caliper. Analytical results were entered into a computerized data base using SPSS/PC+ Data Entry 6.1.3 for Windows.

Along with providing information on site activities, this analysis measured assemblage costs and values. This refers to the kinds of artifacts entering and leaving the site, length and type of occupation, and processes of site abandonment. Planned site abandonment usually includes the removal of ground stone items with an intrinsic value that outweighs the difficulty of transport. Unplanned abandonment has evidence of valuable ground stone items, and items that are easy to transport are left behind. A long-term sedentary occupation should have evidence of broken and exhausted ground stone tools demonstrating a wide range of activities (Boyer et al. 1994:13).

Recorded attributes included material type, material texture and quality, function, portion, preform morphology, production input, plan view outline form, ground surface texture and sharpening, shaping, number of uses, wear patterns, evidence of heating, presence of residues, and dimensions. Specialized attributes included mano cross-section and ground surface cross-section. Due to large size and durability, ground stone tools may undergo a number of different uses, even after being broken. Attributes associated with ground stone use-life are dimensions, portion, evidence of heating, sharpening, wear patterns, alterations, and presence of adhesions. These attributes describe the value of an assemblage by the amount of wear and use. Assemblage cost can be assessed by examining material type, material texture and quality, production input, preform morphology, and plan form. Production costs are further examined when combined with the amount of use and the degree of recycling. Mano cross-section and ground surface cross-section descriptions trace the use-life of manos and metates through a natural cycle of wear that can be used as a relative measure of age (Boyer et al. 1994:13-14). Nonfood ground stone, such as craft, ornament, construction, and miscellaneous items, leave signs of the extent and nature of a variety of activities.

Pre-Salado Ground Stone

As with the chipped stone analysis, most of the ground stone items examined by this project were associated with the Salado occupation on the site (Table 33). A brief description and discussion of

Table 33. Ormand Ground Stone: Material Type by Temporal Association

Material Type	Late Archaic	Early Mogollon	Salado	Probably Salado	Totals
Indeterminate	1 (100.0%)				1 (.3%)
Chert			3 (75.0%)	1 (25.0%)	4 (1.3%)
Chalcedony			4 (100.0%)		4 (1.3%)
Igneous		1 (4.2%)	21 (87.5%)	2 (8.3%)	24 (7.8%)
Non-vesicular Basalt			22 (100.0%)		22 (7.1%)
Rhyolite			1 (100.0%)		1 (.3%)
Tuff			7 (100.0%)		7 (2.3%)
Sedimentary		1 (50.0%)	1 (50.0%)		2 (.6%)
Sandstone			15 (100.0%)		15 (4.9%)
Baked Shale			102 (100.0%)		102 (33.1%)
Metamorphic		1 (5.9%)	16 (94.1%)		17 (5.5%)
Quartzitic Sandstone			3 (100.0%)		3 (1.0%)
Serpentine			9 (69.2%)	4 (30.8)	13 (4.2%)
Minerals*			16 (76.2)	5 (23.8)	21 (6.8%)
Quartz Crystal		1 (25.0%)	2 (50.0%)	1 (25.0%)	4 (1.3%)
Hematite			3 (100.0%)		3 (1.0%)
Freshwater clam			51 (96.2%)	2 (3.8%)	53 (17.2%)
Olivella			1 (50.0%)	1 (50.0%)	2 (.6%)
Conus			3 (100.0%)		3 (1.0%)
Marine Shell*	1 (20.0%)		4 (80.0%)		5 (1.6%)
TOTALS	2 (.6%)	5 (1.6%)	285 (92.5%)	16 (5.2%)	308 (100.0%)

Minerals*= Turquoise, Azurite, Malachite, Asbestos, Massive Quartz
Marine Shell*= species unknown

Table 34. Ormand Salado Ground Stone: Local Material Types by Texture

Material Type	Unknown Texture	Fine-grained	Medium-grained	Coarse-grained	Totals
Chert		3 (100.0%)			3 (1.1%)
Chalcedony		4 (100.0%)			4 (1.4%)
Igneous	1 (4.8%)	18 (85.7%)	2 (9.5%)		21 (7.4%)

Material Type	Unknown Texture	Fine-grained	Medium-grained	Coarse-grained	Totals
Nonvesicular basalt		1 (100.0%)			1 (.4%)
Vesicular basalt		1 (4.5%)	18 (81.8%)	3 (13.6%)	22 (7.7%)
Rhyolite		1 (100.0%)			1 (.4%)
Tuff		7 (100.0%)			7 (2.5%)
Sedimentary		1 (100.0%)			1 (.4%)
Sandstone	1 (6.7%)	14 (93.3%)			15 (5.3%)
Baked shale		102 (100.0%)			102 (35.8%)
Metamorphic	1 (6.3%)	12 (75.0%)	3 (33.3%)		16 (5.6%)
Quartzitic sandstone		2 (66.7%)	1 (33.3%)		3 (1.1%)
Asbestos		1 (100.0%)			1 (.4%)
Quartz crystal	2 (100.0%)				2 (.7%)
Massive quartz		1 (100.0%)			1 (.4%)
Hematite		3 (100.0%)			3 (1.1%)
Freshwater mussel		51 (100.0%)			51 (17.9%)
Exotics	1 (3.2%)	30 (96.8%)			31 (10.9%)
TOTALS	6 (2.1%)	252 (88.4%)	24 (8.4%)	3 (1.1%)	285 (100.0%)

Table 35. Ormand Salado Ground Stone: Exotic Material Types by Texture

Material Types	Unknown Texture	Fine-grained	Medium-grained	Coarse-grained	TOTALS
Local Materials	5 (2.0%)	222 (87.4%)	24 (9.4%)	3 (1.2%)	254 (89.1%)
Serpentine	1 (1.1%)	8 (89.9%)			9 (3.2%)
Turquoise		12 (100.0%)			12 (4.2%)
Azurite		1 (100.0%)			1 (.4%)
Malachite		1 (100.0%)			1 (.4%)
Olivella		1 (100.0%)			1 (.4%)
Conus		3 (100.0%)			3 (1.1%)
Marine shell		4 (100.0%)			4 (1.4%)
TOTALS	6 (2.1%)	252 (88.4%)	24 (8.4%)	3 (1.1%)	285 (100.0%)

pre-Salado ground stone is offered here. No attempt at regional comparisons or extensive inter-assemblage discussion will be attempted for these earlier-phase ground stone objects due to the paucity of recovered objects for these time periods at Ormand. Just two items were associated with a possible late Archaic pithouse (Pithouse 52), including a marine shell fragment and a stone bowl made of an indeterminate material. The possible Mogollon Early Pithouse occupation also had very few ground stone items associated with two pithouse floor contexts. Pithouse 84 had an igneous two-hand mano that appeared to be used on a flat grinding surface, such as a slab metate, which does not correspond to the generally understood sequence of mano and metate development for this time period (Lancaster 1986:182-183). Typically, these manos are expected in the late Puebloan occupations that have made substantial investments in corn processing. In Pithouse 76, a nonvesicular basalt palette, a sedimentary "large grooved object," a metamorphic shaped slab, and a quartz crystal were found on the floor. The "large grooved object" is truly odd and unlike anything mentioned in ground stone literature (see Fig. 33). Deep grooves were found on one side only, suggesting the potential for hafting, although the weight of this object seems greater than one person could manage comfortably (at 1,080.0 g).

Salado Ground Stone Material Types

The Salado occupation had a wide variety of material types corresponding to a diverse representation of artifact types. The majority of materials (89.1 percent) used were available in the local environment (Tables 34 and 35). Nonlocal materials represented a relatively high percentage (10.9 percent). A closer examination of materials obtained through trade or long-distance procurement strategies shows that most of these items were available from sources within 16 to 64 km (10 to 40 miles) from the site area. Material types will be discussed in detail in other sections of this report as they pertain to specific functional categories, such as food processing equipment, since function and material selection assessed together shed the most light on equipment investment and material procurement.

Serpentine is found in a well-known location near Redrock, New Mexico. Personal observation of both material and the source location confirms that the Ormand samples originated here. It has been suggested by Lekson (1992b:20) that the Redrock serpentine source, and the nearby location of the large Salado phase Dutch Ruin, a few miles to the west of this source, indicates a direct trade link with Casas Grandes. Serpentine objects, ranging from carved stools, fetishes, and other objects have been found at Casas Grandes (DiPeso et al. 1974:307-334), and were traced through spectrographic analysis to the Redrock source (DiPeso 1974:749). This suggestion is tenuous at best. Problems with this hypothesis stem mainly from a simplistic view of what constitutes evidence for "exchange relationships" (Douglas 1992).

The various blue-green minerals found at Ormand (turquoise, azurite, and malachite) could potentially come from the Big Burro Mountains, which has readily accessible turquoise and chryscolla outcrops in large quantities (Anyon 1980:193; Northrup 1975:42-44). This mountain region is located to the southeast of Ormand, ranging from 16 to 64 km (10 to 40 miles) away from the site location. The Big Burro Mountains are considered the source of these minerals for Mimbres Valley sites (Anyon and LeBlanc 1984:201; Cosgrove and Cosgrove 1932:65), although no solid evidence supports this hypothesis (Anyon and LeBlanc 1984:307).

Marine shell, such as the few *Olivella* beads and *Conus* shells, probably originated in the Gulf of California (Kean 1965:17-31). *Olivella* beads are ubiquitous at prehistoric sites from the late

Archaic period onward, with well-established routes for procurement and trade (Kean 1965:27; Tower 1945:43). Small disc beads and fragments of shells from unknown marine origin were also present at Ormand. What is striking about these shell objects is the apparent paucity of shell ornamentation and the few species represented. Waste from shell working has never been reported from a Mogollon area site, and may indicate that only finished objects were brought into the system (Anyon 1980:195).

Salado Food Processing Equipment

Grinding equipment was a valuable commodity for all agrarian communities, and the examples in this analysis merely hint at what the total assemblage must have been. While the Ormand Village site abandonment included leaving some whole ceramic vessels behind, metates in particular were conspicuously absent from the many mealing stations found in both roomblocks. This pattern suggests several possible explanations, particularly since the site was topographically accessible and mostly unburned (Schlanger 1991). Two possibilities include a purposeful removal of metates upon abandonment, or scavenging by later populations with a total cleaning out of all of the floor metates. The thoroughness of in situ metate absence coupled with the presence of whole manos on the site, strongly suggests that purposeful removal of metates upon abandonment was the behavioral pattern.

Studies of mano and metate recovery contexts have shown that an exclusive focus on floor contexts may seriously bias a grinding tool assemblage (Diehl 1996:108; Schlanger 1991). Ormand floor assemblages appear to be a mix of floor and roof de facto refuse, with no hope of clarifying the difference between the two. Because of this inherent bias for the Ormand ground stone assemblage, no context-specific interpretations can be made. For the examples of grinding implements that were recovered, local materials were used exclusively, and many of the materials selected were volcanic in origin (Table 36). Material procurement of manos and metates appears to have been local across the Southwest, with ethnographic indications that the women who would use these tools did the collecting (Schlanger 1991:461). The differing textural quality of these various materials coupled with the presence of multiple mealing receptacles in several rooms, suggests that multistage corn processing existed at Ormand (Table 37). The general developmental trend through time for metates is recognized as progressing from basin metates to trough metates and ending with slab metates. Basin metates are interpreted as grinding implements for wild seeds and small amounts of corn. Trough metates are considered to be indicators of the importance of corn in the diet, and slab metates signal specialized use of room space during later Puebloan periods (Lancaster 1986:182-183). All types of metates and manos were found at Ormand, although trough and slab style metates seem to have been most common. Very few fragments of trough metates were analyzed in this assemblage, but the many two-hand trough manos recovered indicates the strong presence of this metate type. Given that mealing receptacles were present in 43.8 percent of the rooms in the east roomblock and 53.8 percent of the rooms in the north roomblock, corn processing was a very important part of the Saladoan diet at Ormand. No metates were found in situ.

Two-hand slab manos were also relatively numerous, and were made from a variety of materials that were mostly fine grained in texture. Slab metates were the best represented type of metate recovered (n=9) and were made from a range of fine-grained materials. One-hand manos were primarily made from volcanic materials of all texture types, from fine to coarse-grained. Just two basin metates were recovered from selected proveniences—both were made from fine-grained volcanic materials.

All of the manos and metates found had not been altered for use other than as grinding implements. One two-hand mano was used on a slab metate and a trough metate, and suggests several possibilities: (1) several types of metates were used in tandem in mealing bin sets, with manos rotated between them, or (2) manos were moved between areas with different types of metates. Several rooms at Ormand contained both slab and trough metates and manos (Rooms 18, 34, 48, 79, and 89). The roomblocks at Ormand appear to be contemporaneously inhabited, and possibly inhabited through several generations. Although slab metates appear to be more common, other metate types were used at Ormand. If the argument that slab metate use is the apex of metate efficiency (Adams 1993:331-344; Lancaster 1986:183), then why would there be a mix of metate types? This is an interesting question that may never be clearly understood at Ormand: floor artifacts were mixed to an unknown extent with roof artifacts, and we may be looking at different sets of grinding implements for different activity areas.

Mano size has been suggested as the best predictor of grinding time and related to the level of agricultural dependence (Hard 1990; Mauldin 1993). Larger manos reduce processing time, and from ethnographic observation, are used exclusively for processing agricultural grains (Mauldin 1993:318-320). Whole two-hand trough manos at Ormand ranged in length from 14.4 to 28.6 cm, with a mean of 19.2 cm (n=8). Whole two-hand slab manos at Ormand ranged in length from 16.8 to 26.3 cm, with a mean of 20.1 cm (n=7). The sizes for both of these mano types clustered around a 16.8 to 21.0 cm range (n=12), with one example in each category of a very long specimen (28.6 cm trough mano, 26.3 cm slab mano). Hard's study of manos determined that mano length over 13 cm corresponded to a substantial dependence on cultigens (Hard 1990:161). The two-hand mano length at Ormand clearly fits the "larger mano" category, indicating a high degree of dependence on cultigens and efforts to efficiently process corn.

Table 36. Ormand Salado Ground Stone: Food Processing Equipment by Material Type

Function	Igneous		Vesicular Basalt		Rhyolite		Tuff		Sandstone		Metamorphic		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
One-hand mano	3	42.9	2	28.6			1	14.3			1	14.3	7	14.3
Two-hand mano, nfs*							1	33.3	2	66.7			3	6.1
Two-hand trough mano	2	13.3	12	80.0							1	6.7	15	30.6
Two-hand slab mano	4	40.0	2	20.0					1	10.0	3	30.0	10	20.4
Pestle	1	100.0											1	2.0
Metate, nfs*			1	100.0									1	2.0
Basin metate	1	100.0											2	4.1
Trough metate			1	100.0									1	2.0
Slab metate			1	11.1			3	33.3	2	22.2			9	18.4
TOTALS	11	22.4	19	38.8	1	2.0	5	10.2	5	10.2	8	16.3	49	100.0

nfs*=not further specified

Table 37. Ormand Salado Ground Stone: Food Processing Equipment by Material Texture

Artifact Type	Fine-grained	Medium-grained	Coarse-grained	TOTALS
One-hand mano	5 (71.4%)	1 (14.3%)	1 (14.3%)	7 (14.3%)
Two-hand mano, nfs*	3 (100.0%)			3 (6.1%)
Two-hand trough mano	2 (13.3%)	12 (80.0%)	1 (6.7%)	15 (30.6%)
Two-hand slab mano	7 (70.0%)	3 (30.0%)		10 (20.4%)
Pestle	1 (100.0%)			1 (2.0%)
Metate, nfs*			1 (100.0%)	1 (2.0%)
Basin metate	2 (100.0%)			2 (4.1%)
Trough metate		1 (100.0%)		1 (2.0%)
Slab metate	8 (88.9%)	1 (11.1%)		9 (18.4%)
TOTALS	29 (56.9%)	19 (37.3%)	3 (5.9%)	51 (100.0%)

nfs*= not further specified

Raw material availability was apparently not a problem for a large area in the western Mogollon highlands (Mauldin 1993:324). Ormand ground stone was mainly fragmentary. Percentages of wholeness varied with artifact type. More manos were found whole, but the number of fragmentary pieces attest to the efforts of resharpening. Two-hand manos in particular needed to be resharpened periodically, possibly as often as every five days (Schlanger 1991:462). None of these fragmentary pieces were recycled into other artifact types.

All of the Ormand grinding implements, with the exception of the pestle, exhibited grinding and polishing for wear (the pestle showed battering). Manos were ground flat or convex according to their type (slab or trough, respectively), and a few two-hand manos were ground with facets. Manos with multiple grinding surfaces are strong indicators of intense grinding practices as a wear management technique (Adams 1993:340). Red pigment stains were noted on a slab mano and a basin metate, although this did not appear to be associated with a primary function for these objects.

Salado Crafts

Craft-related ground stone included a wide variety of tool types (Table 38). Missing from this analysis were several three-quarter grooved axes, noted in the preliminary report (Hammack 1966:34), but never relocated in the state repository. The categories with the highest frequencies were represented by palettes and lapidary stones. Both palettes and lapidary stones were made from local materials. Fine-grained materials were selected for most items (Table 39). Red pigment was noted on all of the palettes, and each of the specimens recovered at Ormand were unprepared or minimally prepared stone. This same use of "informal" palettes was noted at Salado phase sites in the Mimbres Valley, in stark contrast to earlier Classic Mimbres phase palettes that were fully shaped, some with decorative borders. Salado palettes in the Mimbres Valley had red and yellow pigment stains (Lancaster 1986:191). The red pigment found on Ormand palettes could have been used for a variety of functions, from ceremonial to pottery painting.

Table 38. Ormand Salado Ground Stone: Craft Tools by Material Type

Artifact Type	Igneous	Vesicular Basalt	Tuff	Sandstone	Metamorphic	Quartzitic Sandstone	Serpentine	TOTALS
Pottery polishing stone	1							1 (3.8%)
Abrading stone		1		1		1		3 (11.5%)
Leather-working stone?					1			1 (3.8%)
Polished stone	1							1 (3.8%)
Palette	1		1		2	1		5 (19.2%)
Lapidary stone	2	1	1	1	2	1		8 (30.8%)
Mining tool	1							1 (3.8%)
Shaped serpentine							1	1 (3.8%)
Grooved serpentine							5	5 (19.2%)
TOTALS	6 (23.1%)	2 (7.7%)	2 (7.7%)	2 (7.7%)	5 (19.2%)	3 (11.5%)	6 (23.1%)	26 (100.0%)

Table 39. Ormand Salado Ground Stone: Craft Tools by Material Texture

Artifact Type	Unknown Texture	Fine-Grained Texture	Medium-Grained Texture	TOTALS
Pottery polishing stone	1			1 (3.8%)
Abrading Stone	1		2	3 (11.5%)
Leather-working stone?	1			1 (3.8%)
Polished stone		1		1 (3.8%)
Palette		4	1	5 (19.2%)
Lapidary stone		7	1	8 (30.8%)
Mining Tool		1		1 (3.8%)
Shaped serpentine		1		1 (3.8%)
Grooved serpentine	1	4		5 (19.2%)
TOTALS	4 (15.4%)	18 (69.2%)	4 (15.4%)	26 (100.0%)

Very few pieces of the craft ground stone were used for more than one task. One of the palettes from Room 48 was used as an agave knife prior to use as a palette. Perhaps the most intriguing of the craft items recovered were several grooved serpentine objects. These appeared similar to arrow-shaft straighteners on first glance, but the variety of groove shapes suggested other possible functions (Fig. 126). Most of these objects were also fragments of larger pieces, and some items appeared to be edge portions of axes. Out of the total number of these objects recovered, 40 percent had rounded grooves that could indicate use as an arrow-shaft straightener. Through experimentation, it has been shown that arrow-shaft straighteners are used when heated on a wetted cane, with superior results (Cosner 1951:147-148).Objects tentatively called arrow-shaft straighteners in the Mimbres Valley were not made from serpentine (three basalt, one sandstone, one dolomite), and in one case was thought to be used as an abrader for projectile point manufacture (Lancaster 1986:195). Arrow-shaft straighteners used by the Salado in the Tonto Basin of Arizona had distinctive "u" shaped grooves on their upper surface and were typically made of steatite. In contrast, sharpening stones had "v" shaped grooves and were made of volcanic tuff or sandstone (Simon and McCartney 1994:782).

Other Ormand serpentine objects had "v" shaped grooves, with one example of a "w" shaped groove. The serpentine used for these objects corresponds exactly to a very high quality serpentine found near Redrock, New Mexico, and is not a local material found in the near vicinity at Ormand. This well-known and well-protected source was visited by the author in May of 1996. Most of the source has been mined to oblivion by historic efforts around the turn of the century, and the extent of the source was enough to keep historic efforts going full time for several decades.

Through spectrographic analysis, this same source of serpentine has been traced to objects found at Paquimé (DiPeso 1974:631).Paquimé serpentine objects included a great variety of mundane to perhaps ceremonial objects; objects of a far greater number and variety than those at Ormand. "Ceremonial axes" at Paquimé were made of several fine-grained materials including Redrock serpentine. These axes were typically smaller than a functional axe, were well polished, and in some cases depicted an effigy head. Paquimé ceremonial axes have been compared to Hopi ceremonial axes found on altars, and to axes found in kivas at Awatovi, Aztec Ruin, the Carter Ranch Pueblo, Mesa Verde, and at Cameron Creek (DiPeso et al. 1974:307-314). If the serpentine fragments at Ormand were pieces of ceremonial axes, they are far less finely worked than the Paquimé examples.

Paquimé is 282 km to the south of Redrock, and earlier interpretations of the relationship between these areas suggested that the Mimbres Mogollon controlled the trade of serpentine (DiPeso 1974:630). Recent reevaluation of tree-ring specimens from Paquimé places the florescence of most of the site contemporary with the Salado period, at around 1300 A.D. (Dean and Ravesloot 1993). The Mimbres Mogollon, therefore, had no temporal connection to Paquimé and could not have influenced trade between these regions. It remains unclear how the Salado horizon sites along the Gila River and the site of Paquimé related to the serpentine resource.

Salado Ornaments

Salado period ornaments at Ormand were neither plentiful in number nor variable in type (Table 40). The seemingly numerous baked shale disc beads were discovered as a pile in the southeast corner of Room 58 in the north roomblock. They were similar in size (3 mm in diameter by 1 mm in thickness) and material type and color (all dark pinkish orange), were all biconically drilled, and were probably from the same necklace strand. These beads are the only examples of local materials used for ornaments. All other ornaments came from marine shell or blue-green stone sources probably from the Burro Mountains. Most items were found whole (95.7 percent) and came from the north roomblock. Aside from the small pile of disc beads found in Room 58, other north roomblock rooms contained just one ornament each (*Conus* bead from Room 10, *Olivella* bead from Room 19, a marine shell disc bead in both Rooms 22 and 23, a serpentine pendant in Room 57, and a turquoise ornament in Room 63). Turquoise artifacts were rare at Salado phase sites in the Mimbres Valley, strikingly so compared to earlier occupations in that area. Marine shell, including *Olivella dama*, *Conus*, and *Glycymeris* were found in equivalent numbers compared to the Ormand site (Nelson and LeBlanc 1986:192).

Salado Miscellaneous Objects

The miscellaneous items were found as whole objects with the exception of the unworked freshwater shell. Miscellaneous objects in this assemblage included several items that may have been associated with ceremonial activities (Table 41). The twelve round pebbles found in the ceremonial structure fit into this category readily (Fig. 127), and shaman's kits containing shaped and natural stones similar to these have been found throughout the prehistoric Southwest. The sandstone pebbles were ground and pecked into shape, while the chert and chalcedony pebbles were naturally round.

Unworked pieces of turquoise, azurite, malachite, asbestos, and massive quartz were found throughout the site with no apparent pattern. Paint stones were exclusively hematite, and were found for the most part in the north roomblock (one each on Rooms 10, 18, and 19). The few crystals recovered did not seem to suggest a particular pattern.

An intriguing finding on site was the presence of freshwater clam shell (Fig. 128), which was kindly identified by Dr. Art Metcalf, Professor Emeritus at the University of Texas at El Paso, as *Anodonta californiensis*. Further examination was conducted by Brian Lang of the New Mexico Department of Game and Fish, in Santa Fe. These clams were apparently eaten by the prehistoric Saladoans at Ormand, since their shell is too fragile to work into ornaments. No worked shell of this species was found at Ormand. This species was found in small frequencies throughout the site, and only in Salado phase contexts. *Anodonta californiensis* has also been recovered at the Galaz Ruin in the Mimbres Valley, and interpreted as an edible species. Galaz *A. californiensis* shell came from Late Pithouse to Classic Mimbres contexts, circa A.D. 550-1150 (Anyon and LeBlanc 1984:306). High numbers of *Anodonta* sp. were found at Salado period sites in the Tonto Basin from a variety of provenience contexts. There was evidence that some of the *Anodonta* was worked into jewelry (Griffith and McCartney 1994:801-805). This freshwater clam is regarded as part of the subsistence base (Elson 1996:125-138).

Table 40. Ormand Salado Ground Stone: Ornament Types by Material

Artifact Type	Baked Shale	Serpentine	Turquoise	*Olivella*	*Conus*	Marine Shell*	TOTALS
Ornament			2			1	3 (2.6%)
Pendant		2					2 (1.7%)
Disc Bead	102					3	105 (91.3%)
Shaped Cylinder		1					1 (.9%)
Olivella bead				1			1 (.9%)
Conus tinkler					3		3 (2.6%)
TOTALS	102 (87.2%)	4 (3.4%)	2 (1.7%)	2 (1.7%)	3 (2.6%)	4 (3.4%)	115 (100.0%)

* not further specified.

Table 41. Ormand Salado Ground Stone: Miscellaneous Items by Material

Artifact Type	Chert	Chalcedony	Igneous	Sand-stone	Minerals*	Quartz crystal	Hematite	Fresh-water clam shell	TOTALS
Paint Stone			1				3		4 (4.8%)
Unworked Mineral					10 T 1 A 1 M 1 As 1 Qz				14 (16.9%)
Unworked Shell								51	51 (61.4%)
Crystal						2			2 (2.4%)
Round Pebble Set	3	4		5					12 (14.5%)
TOTALS	3 (3.6%)	4 (4.8%)	1 (1.2%)	5 (6.0%)	14 (16.8%)	2 (2.4%)	3 (3.6%)	51 (61.4%)	83 (100.0%)

*T = turquoise, A = azurite, M = malachite, As = asbestos, Qz = massive quartz

Further support that these clams were used as a food source comes from an urban renewal project in downtown Tucson that uncovered a Chinese trash dump dating 1880-1885. Many *Anodonta californiensis* valves were found associated with kitchen utensils. The clam was extinct in the Tucson area by 1915. The species was widespread in Arizona up into the last century, including the Gila River system. Like many other Unionidae, *A. californiensis* can survive only in association with certain species of fish. The steady deterioration by man of surficial waters in the Southwest has impacted indigenous biota dramatically. Living specimens are presently recorded in Oregon, California, Utah, Arizona, and Chihuahua, although in Arizona they are on the verge of extinction (Bequart and Miller 1973:220-223). In New Mexico, there is no record of *Anodonta californiensis* either alive or as fossil specimens (Dr. Art Metcalf, pers. comm.1996), but this issue is under investigation at present.

Salado Construction Elements

A few objects could be best described as pertaining to construction as either a possible element or a construction tool (Table 42). The function of the one obvious tool, a plaster polishing stone, speaks for itself, and this tool was made from volcanic or metamorphic materials. Several shaped slabs were included as construction elements, on the assumption that they could have been used as door lintels, hatch covers, and the like. Their exact function on the site is unclear.

The last object to discuss in this category was the most curious. An inverted cone-shaped hole was carved in the top face of a square block of igneous material (Fig. 129). This is a fragment of a larger whole, and it is assumed that the original was square. It is unclear what the function of this object was, and suggestions from other archaeologists who have viewed it is that it could have been a post support or a moveable loom support. This object came from Room 38 in the east roomblock; a room within the center of a four-room household unit.

Salado Contextual Comparisons

Comparisons within and between site contexts were not attempted due to the high potential of context mixing. Since roof surfaces were heavily utilized in the Salado roomblocks, as noted by the presence of hearths, ground stone equipment, and bone tools, the potential for confused activity loci was heightened. This was particularly acute for floor assemblages, which had the high potential of containing roof fall.

General locations of ground stone can be broadly compared between the two roomblocks and the ceremonial structure. Food processing equipment was recovered from roomblock proveniences almost exclusively; the one basin metate recovered from the ceremonial structure could indicate a nonfood grinding implement (Table 43). Craft, ornament, miscellaneous, and construction ground stone items were almost exclusively recovered from roomblock proveniences as well. The east roomblock recovered notable amounts of food processing and craft ground stone, with high representation of all types of ground stone. The east roomblock was noted for the number of single room habitation units, and this factor alone could account for the higher numbers of food processing equipment. Ground stone at the ceremonial structure consisted mainly of a few "ceremonial" objects, such as the set of twelve pebbles. an unworked mineral, and an ornament.

Regional Comparisons

As with the chipped stone regional comparisons, studies completed in the Mimbres Valley serve as the best comparative information to use, particularly for the Salado phase. The ground stone study for the Mimbres Valley (Lancaster 1986) separated the analysis of manos and metates from "miscellaneous objects," which included axes, ornaments, effigies, "arrow-shaft straighteners," bone tools, and a clay bead and pipe. These objects for the most part correspond to what was included in the Ormand Village ground stone analysis, with a few obvious deviations; bone and clay objects were subsumed under other material analyses for the Ormand study.

Lancaster's analysis for the Mimbres Valley noted two tool categories for manos and metates. One category included one-hand manos and basin and slab metates, hypothesized for a generalized processing function. The other category was composed of two-hand manos and trough metates, treated as a specific corn processing unit. Diachronic changes in shape, proportions of artifacts, and raw material selection were investigated.

Table 42. Ormand Salado Ground Stone: Construction Elements by Material

Artifact Type	Igneous	Nonvesicular Basalt	Vesicular Basalt	Sedimentary	Sandstone	Metamorphic	TOTALS
Plaster Polishing Stone	1		1			1	3 (33.3%)
Shaped Slabs		1		1	1	2	5 (55.6%)
Post Support ?	1						1 (11.1%)
TOTALS	2 (22.2%)	1 (11.1%)	1 (11.1%)	1 (11.1%)	1 (11.1%)	3 (33.3%)	9 (100.0%)

Table 43. Ormand Salado Ground Stone: Site Location by Group Type

Site Location	Indeterminate	Food Processing	Crafts	Ornaments	Miscellaneous	Construction	TOTALS
Pithouse			1	1	1		3 (1.6%)
North roomblock	2	14	5	7*	39	1	68 (37.0%)
East roomblock		34	20	5	30	8	97 (52.7%)
Ceremonial structure	1	1		1	13		16 (8.7%)
TOTALS	3 (1.6%)	49 (26.6%)	26 (14.1%)	14 (7.6%)	83 (45.1%)	9 (4.9%)	184 (100.0%)

* 102 disc beads counted as 1 strand/necklace

The majority of manos and metates were made from four material types: sandstone, rhyolite, basalt, and vesicular basalt. Only items made from these materials were discussed in detail. These four materials are "fairly homogeneous" in the Mimbres Valley, with the exception of sandstone. Accessible sandstone is more available in the southern portion of the valley, although availability did not seem to be the sole basis for material selection. One-hand manos and slab and basin metates were commonly made from basalt and rhyolite. Two-hand manos and trough metates were made mainly from vesicular basalt. Sandstone was rarely used for all kinds of metates, and was more commonly used for manos. Material texture corresponding to tool function was suggested as the reason for this selection: the local sandstone is of medium coarseness but is somewhat friable, rhyolite and basalt are of medium coarseness but are hard, and vesicular basalt is very coarse and hard.

An examination of striations and grinding surface shapes appeared to support the assumption that one-hand manos were used as generalized grinding tools. The presence of pigment on some one-hand manos also supported this multipurpose function. Two-hand manos were the most common for all time periods (Mogollon Early Pithouse to Salado phases), and consistently exhibited a convex grinding surface. Metates have been traditionally interpreted as developing through time from early basin metates to trough metates in later Pithouse and Puebloan periods, to a final slab metate stage related to specialized mealing rooms in Puebloan times. The Mogollon region differs in this ground stone development from the rest of the prehistoric Southwest. No slab metates or mealing bins were found in the Mimbres area (Lancaster 1986:183). This contrasts greatly with the pattern seen at the Ormand Village in the Gila Valley, due west approximately 60 km, and to contemporary fourteenth-century sites in the Mogollon Pueblo area. Several in situ metates were found in the Mimbres Valley sites. These metates did support the hypothesis that metates evolved into multistage processing areas with at least a coarse- and a fine-textured pair of metates associated with each mealing station. Metates were found in 3 out of 15 rooms, and did not appear to be associated with embedded mealing bowls. More manos were recovered than metates, which perhaps indicates that metates were shared and moved between rooms, while manos were privately owned. Metates may also have been removed during site abandonment (Lancaster 1986:189).

In general, the pattern of mano and metate use during the Salado phase in the Mimbres Valley is said to conform to "long-term regional trends," although it seems apparent that corn processing was not as overtly present. If the Salado presence at these sites represents a new ethnic group in the Mimbres Valley, it is not evident in the ground stone complex (Lancaster 1986:177-

190). Although the supposed lack of mealing bins and metates is noted in distinct contrast to the pattern seen at contemporary Mogollon Pueblo sites, several rooms at the Janss site contained bowls set into the floor as mealing receptacles (Rooms 2 and 8), and a "metate stand" and embedded vessel were found in Room 401 at the Disert site (Lancaster 1986:87-88, 183, 190). Why these are not counted as evidence of specialized corn processing stations on site remains a question.

The miscellaneous object analysis offered more similarities to what was found at the Ormand Village site. Overall, there was nothing that set any one artifact apart from another temporally or spatially across the region. Sites in southwestern New Mexico are not known for large quantities of exotic goods (Nelson and LeBlanc 1986:204), and the Ormand and Mimbres Valley studies have upheld this observation. Very few turquoise and shell items were recovered from the Mimbres Valley sites, and ornaments made from local materials were rare as well. Very little "artistic elaboration" was noted in general, particularly during the Salado phase. Stone palettes are the best example of this trend, where earlier Mogollon-Mimbres phase palettes were "formal," or well shaped, and at times elaborately carved with designs on the edges. The Salado phase palettes are simple unmodified stones used to grind pigment (Nelson and LeBlanc 1986:191-204). Although the lack of artifacts from the earlier occupations at the Ormand site make these temporal developments impossible to gauge, palettes at Ormand were typically unmodified stones like the Mimbres Valley examples. Perhaps the one striking difference between the Salado phase sites in both valleys is the greater presence of serpentine at Ormand, compared to the one worked serpentine disc or semicircle from the Disert site in the Mimbres Valley. The source for serpentine is located in a well-known location near Redrock, New Mexico. The Ormand Village site is approximately 35 km from this source, and the Mimbres Valley sites are approximately 75 km from this source, "as the crow flies." Whether this distance differential is the cause of the presence or absence of this material is unclear, but suggestive.

Salado Phase Ground Stone Conclusions

The careful removal of every metate from corn-processing areas in the Saladoan roomblocks, coupled with the presence of whole manos at Ormand, suggests a planned site abandonment. The Salado occupation at Ormand appears to have been sustained through several generations; long enough to necessitate repeated remodeling of the roomblocks, and to leave behind a variety of tool types, including whole to broken and exhausted ground stone tools. Recycling of ground stone was minimal to nonexistent, and indicates that material sources were readily obtainable. Material accessibility is a regionwide phenomenon (Mauldin 1993:324). Dependence on cultigens and efforts at extensive corn processing are indicated by a large two-hand mano size and wear patterns on two-hand manos (Adams 1993; Hard 1990; Mauldin 1993).

Grinding intensity and wear management techniques, however, may be less connected to technological developments and more socially relevant (Adams 1993:341). The presence of multiple, permanent mealing bins at Ormand suggests that groups of women processed corn, perhaps similar to ethnohistoric documentation of Puebloan corn preparation. Some of the rooms at Ormand could have been specialized mealing rooms (Rooms 29 and 30, east roomblock). Slab and trough metates were found together from numerous floor proveniences. Unfortunately, it is impossible to determine if these represent floor activity, or a mix of roof and floor work stations.

Prehistoric southwestern New Mexico is noted for the paucity of recovered exotic materials and ornamentation (Nelson and LeBlanc 1986:204). Ormand was no exception to this trend, which is interesting given the size of the site (roughly 100 rooms) and the number of people that lived there at any one time. The few turquoise items collected were mostly unmodified; recovered shaped turquoise consisted of a single cylindrical object. It is unclear how turquoise functioned in this society. No obvious turquoise ornaments were found, and no other obvious functional attribute was observed for this material. Marine shell, however, was used exclusively for personal adornment. Although several "lapidary stones" were found at Ormand, the exact function of these objects was unclear. No ornament workshops were found on site, and it is possible that jewelry entered the system as finished objects.

While it has been argued that Paquimé was a major influence in this area, attributed by the amount of Redrock serpentine found in Paquimé storage rooms (Lekson 1992a:20), it seems odd that well-known "exotics" like copper bells and macaws, known to be made or bred at Paquimé, were not present at Ormand or at Salado sites in the Mimbres Valley (Minnis 1989; Nelson and LeBlanc 1986:204). Literally one Ramos Polychrome sherd was found in the Ormand ceramic analysis (C. Dean Wilson, this volume), and no distinctly Chihuahuan architecture was noted at Ormand. The presence of Redrock serpentine at Paquimé clearly means something, but it does not appear to indicate close or regular trade relationships between these areas. The serpentine objects and raw material at Paquimé was found in a cache of goods of various kinds that was intended for the elite population only. The elite status of this material to the Paquimé people may actually indicate how difficult it was to obtain and therefore how precious this material was (Douglas 1992:2).

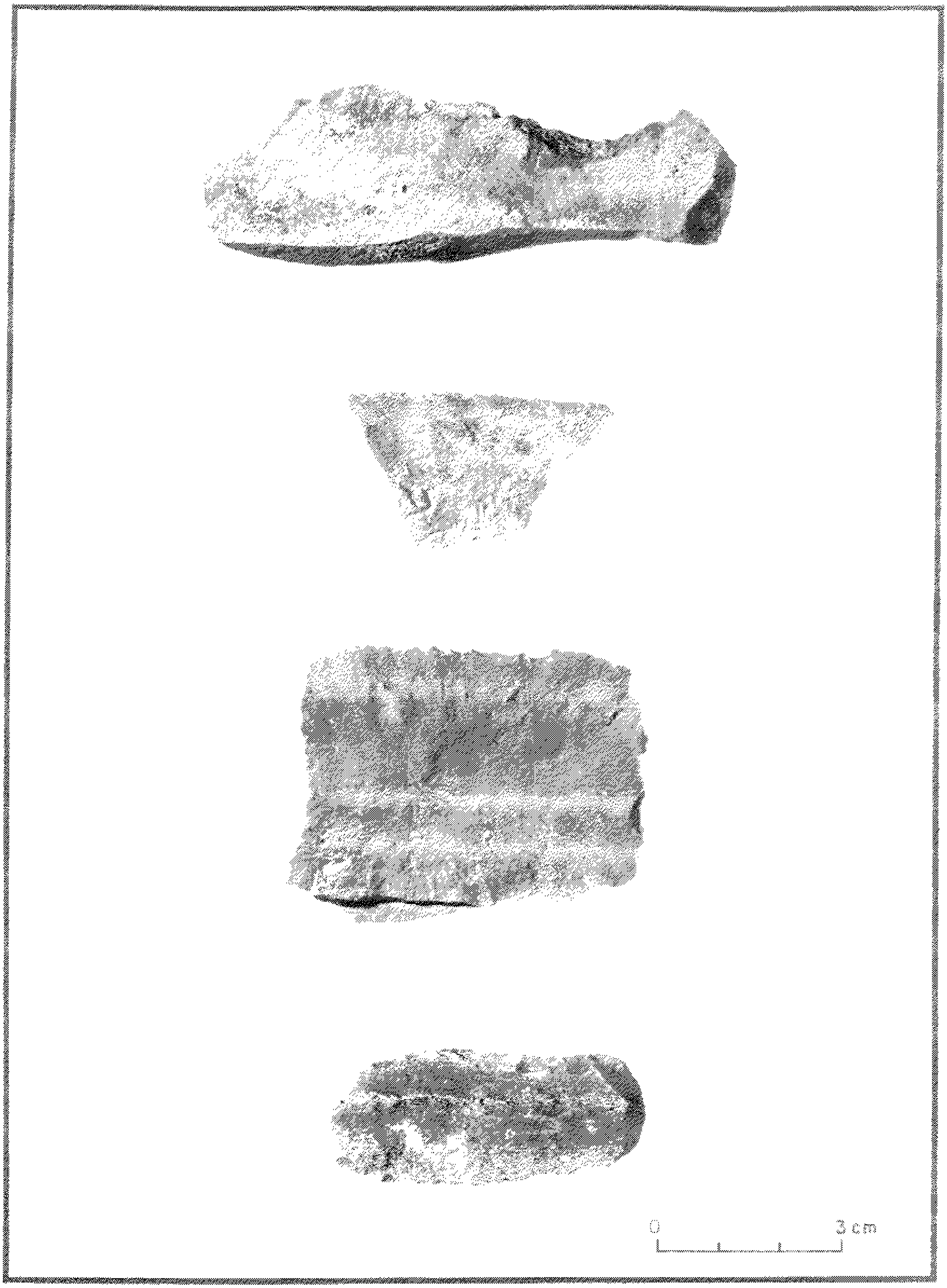

Figure 124. Examples of agave knives.

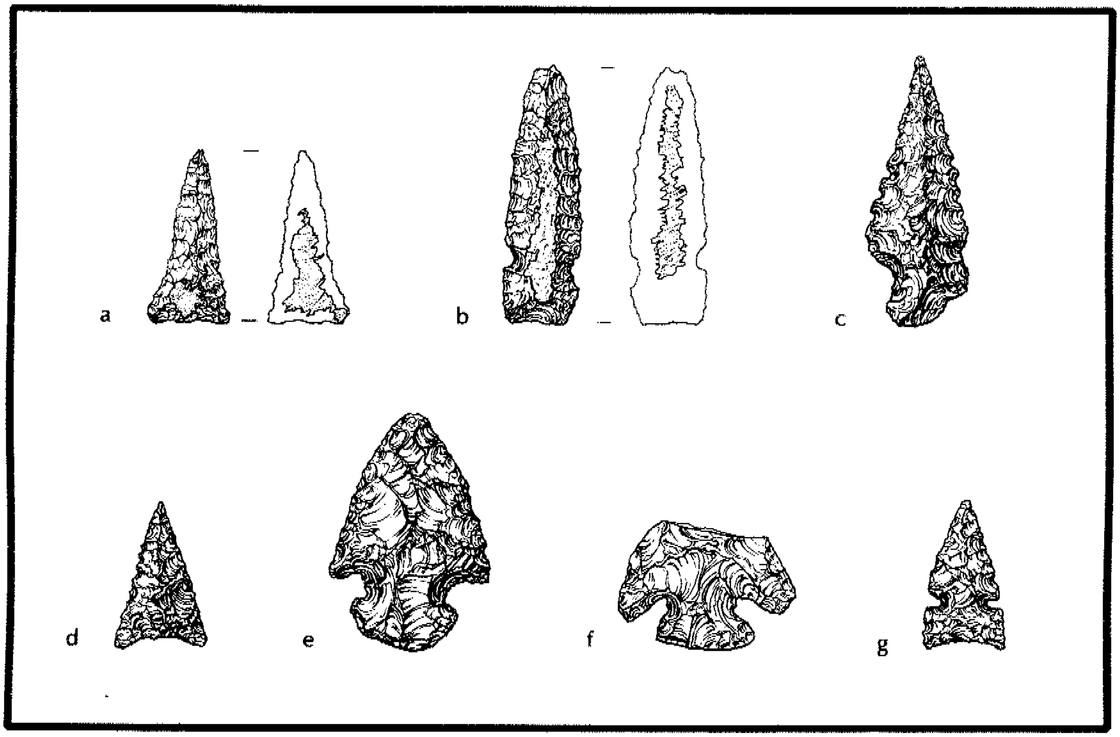

Figure 125. Selected projectile points from Ormand Village: (a) chalcedony with cortex on both sides, triangular point, from floor fill of Room 20, north roomblock (Salado A.D. 1300-1450); (b) chert with cortex on both sides, narrow Mogollon side-notched point, from floor fill of Room 20, north roomblock (Salado A.D. 1300-1450); (c) Mule Creek obsidian, serrated edge point, from wall and roof fall of Room 22, north roomblock (Salado A.D. 1300-1450); (d) Mule Creek obsidian, triangular point with indented base, from floor of Room 36, east roomblock (Salado A.D. 1350-1450); (e) Mule Creek obsidian, corner-notched point with convex base, from floor fill of Room 22, north roomblock (Salado A.D. 1300-1450); (f) Mule Creek obsidian, corner-notched point (proximal end), from general fill of Room 17, north roomblock (Salado A.D. 1300-1450); (g) Mule Creek obsidian, side-notched point with indented base, from floor of Room 20, north roomblock (Salado A.D. 1300-1450).

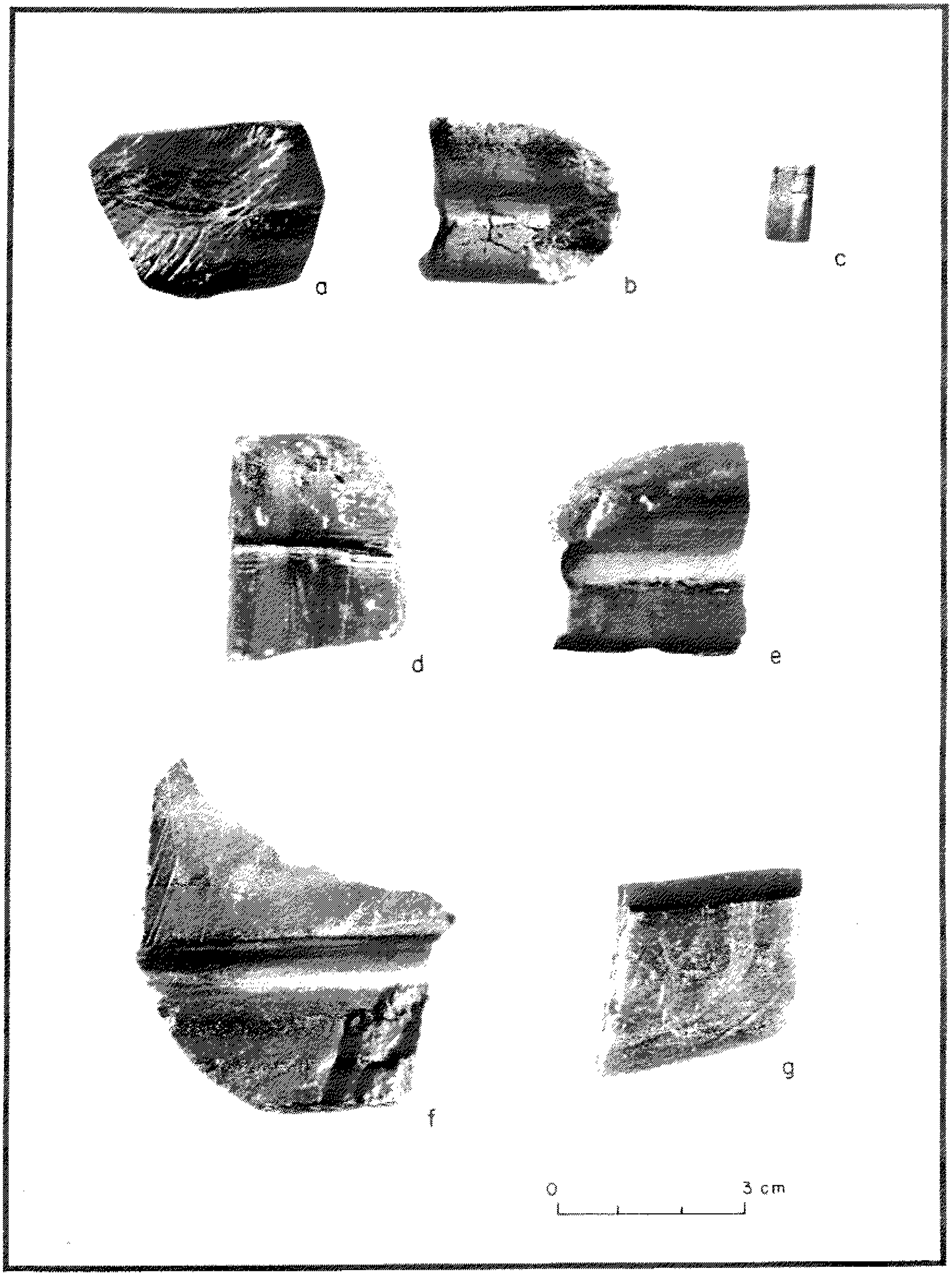

Figure 126. Serpentine objects from Ormand: (a) worked serpentine; (b) burned shaft straightener; (c) "prayer stick"; (d) axe edge?; (e) double-grooved shaft straightener; (f-g) axe edges?

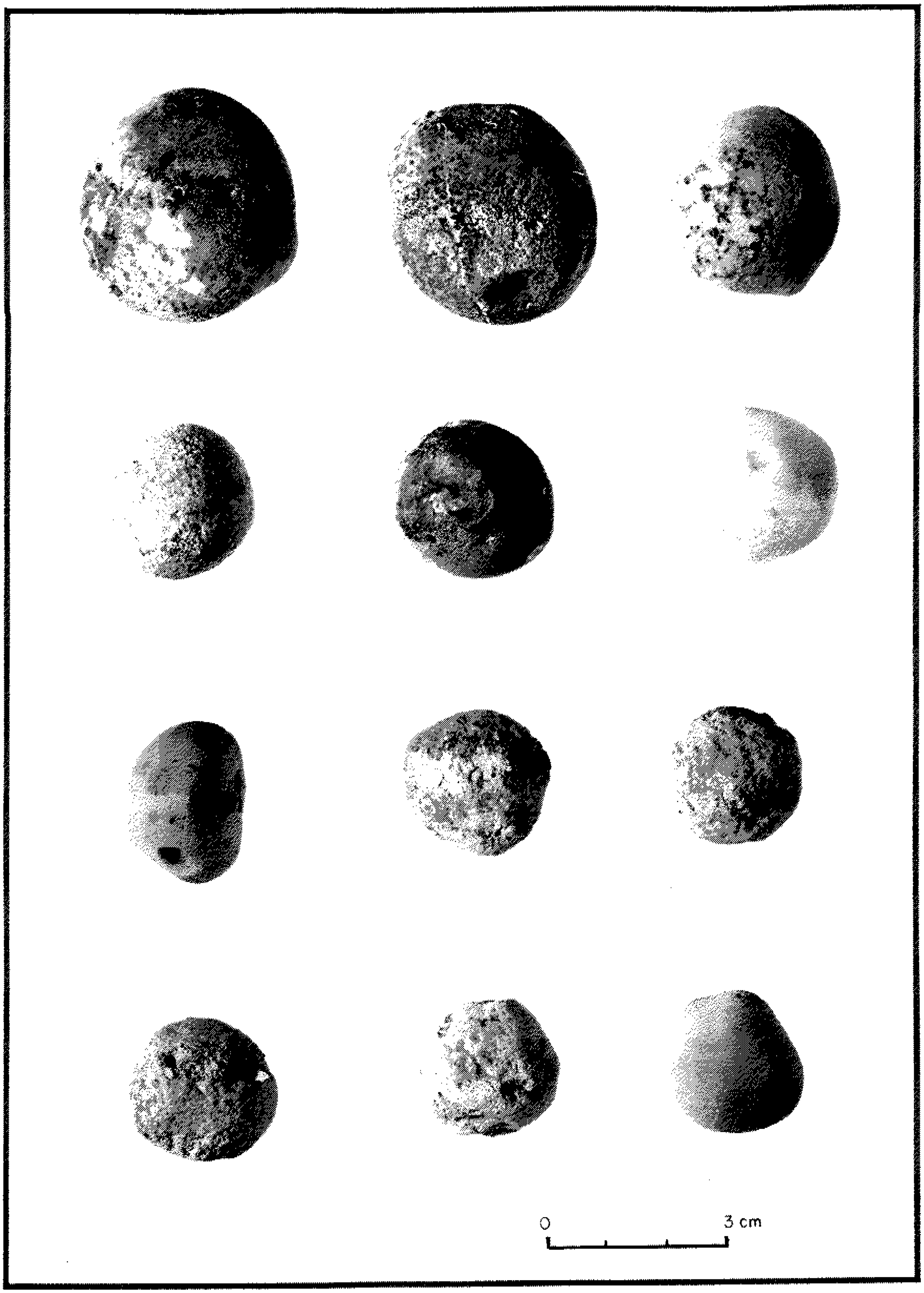

Figure 127. Cache of stone balls found in Feature 97 (ceremonial structure).

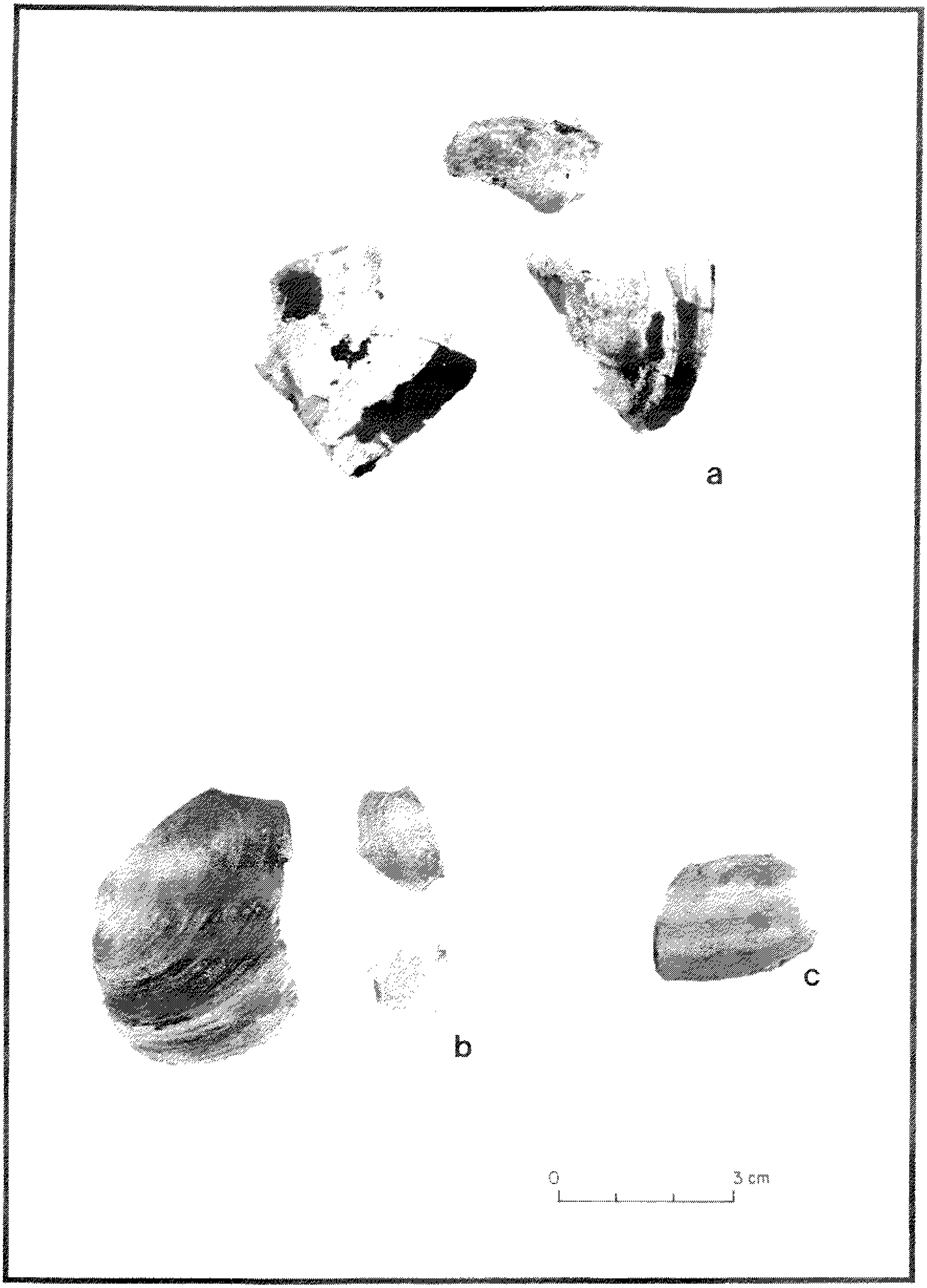

Figure 128. Fragments of fresh-water mussels (**Anodonta californiensis**).

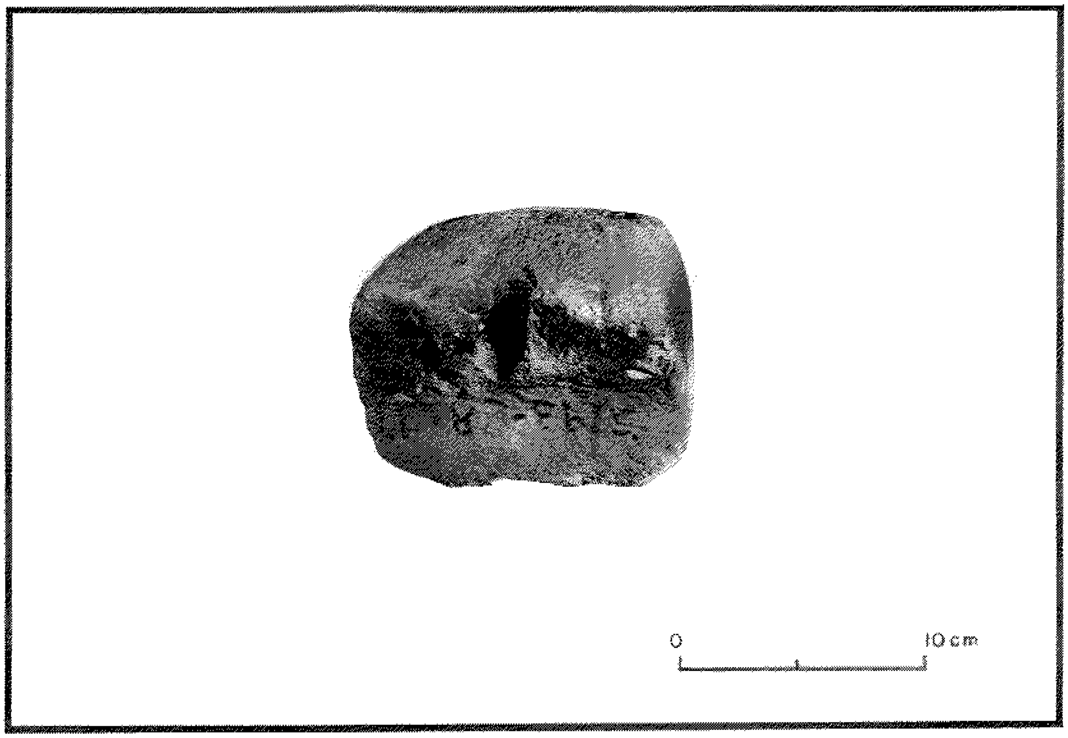

Figure 129. Ormand construction element; possible Salado post support.

ORMAND FAUNA

Nancy J. Akins

The fauna recovered during excavations at the Ormand site are an important collection While the lack of screening and unspecified collection procedures limits its utility for quantitative comparisons, any information on animal utilization at New Mexico Salado sites adds substantially to our knowledge of prehistoric adaptations.

Methods

Not all of the bone collected during the 1965 excavations was analyzed. Only those from well-described features, including select extramural pits, pit structures, and floor fill and floor assemblages from rooms in two separate roomblocks, were analyzed. Bone was dry brushed and occasionally washed when necessary to examine the specimen. Information was recorded using a modified version of the computer coding format developed for the OAS La Plata project. Variables coded include the feature number; field specimen (FS) number; number of specimens that fit the description on that data line; a notation if the identification was uncertain; the taxon; whether the piece or pieces were part of an articulation, the same individual, or the same bone; the body part or element; element side; how complete the element was; the fragmentation or which parts of the element were present; the age of the animal; the criteria for aging; environmental alteration and degree; animal alteration and location; burning intensity and location; rounding and discoloration that may be indicative of boiling; processing and processing location; and whether the element was modified.

Identifications were made using the OAS comparative collection. Bird bones that could not be identified with the OAS collection were taken to the Museum of Southwestern Biology at the University of New Mexico to complete the identifications. The pelican bone was identified by Kenneth E. Campbell of the Natural History Museum of Los Angeles County. Sources on New Mexico fauna (Bailey 1971; Findley et al. 1975; Hubbard 1978) were consulted to determine which species inhabit the area. Taxa were identified as precisely as possible. When a specimen was not identifiable, the size and kind of animal (e.g., mammal or bird) were recorded. A nearly complete skeleton of a western meadowlark was recorded as a single specimen while sparse representations of what was probably the same rodent were not. None of the rodents comprised enough of the animal to be confident it was indeed an burrow death.

Quantification is limited to counts (n= or NISP). Given the nature of the sample, the minimum number of individuals (MNIs) was not calculated. Descriptions of taxa indicate how many animals are represented in the analyzed assemblage.

Throughout this report, counts and descriptions are presented in three provenience groups. Pit structures and pits, lying north and east of the roomblocks, are treated as one unit, the excavated rooms in Mound 1 are referred to as the north roomblock , and those in Mound II and the ceremonial structure (Feature 97) as the east roomblock . The ceremonial structure produced a sample of only seven bones and has been included with the eastern roomblock because that is the closest excavated provenience. While there are chronological distinctions within each group, a refined chronology would have produced numerous groupings with very small sample sizes.

Taxa Recovered

Situated near the Gila River just below its confluence with Bear and Duck creeks in a hilly area cut by small arroyos, the Ormand residents had access to and utilized a variety of riverine and terrestrial fauna. Vegetation in the vicinity is juniper, mesquite, oak, cactus, and a variety of grasses (Hammack et al. 1966:21). The Mogollon and Big Burrow mountains provided ample access to large game.

The analyzed assemblage consists of 765 specimens. Table 44 lists the taxon, the common name or size of animal, and the counts and percent of the assemblage. Worked bone is included in the counts.

Unidentified Taxa

Just under a third (30.8 percent) of the bone was identified only to the size of the animal. The majority of the unidentified bone (23.9 percent) is from large mammals and is probably artiodactyl. This relatively small proportion of unidentified taxa is due in part to collection practices. Large and more complete bones are more easily spotted during excavations and appear to have been kept while smaller pieces may have been left behind. Selection of only the more visible items without screening tends to increase the identifiability of those specimens collected, resulting in the smaller than usual proportion of unidentified taxa here.

Small unidentified forms are exceedingly rare, only about 2.5 percent of the assemblage. Given the amount of rabbit and prairie dog, the figure would be much higher if the fill had been screened. Bone that could represent medium mammals, especially carnivores, is also rare, as are carnivores in general. Specimens in the medium to large category are either very fragmentary or immature so that the ultimate size of the animal could not be determined. Much of the large mammal is probably artiodactyl and the decision whether to place a specimen in the large mammal or artiodactyl taxon was somewhat arbitrary. If a piece was an identifiable element or closely conformed to an artiodactyl element, it was considered artiodactyl. Others were deemed artiodactyl based on the bone density and size of the specimen.

A larger proportion of the pit structure and pit assemblage was unidentified (53.7 percent) than in the roomblock assemblages (24.5 of the north roomblock and 20.1 percent of the east roomblock) (Table 45). This is probably because half of the pit structure and pit assemblage comes from fill (Table 46) and was more susceptible to collection bias than the roomblock samples, which are largely comprised of more carefully excavated and better collected floor fill and floor material. This is also shown in the amount of small unidentifiable bone which is only 0.9 percent of the pit structure and pit assemblage, but is 3.5 percent of the north roomblock assemblage and 2.8 percent of the east roomblock assemblage. Conversely, large mammal accounts for 45.9 percent of the pit structure and pit assemblage and only 18.8 and 12.6 percent of the roomblock assemblages. Rather than suggesting differential deposition of waste from the different sizes of animals, this pattern almost certainly results from collection methods and the nature of the sample.

Table 44. Taxa Recovered from the Ormand Site

Taxon	Common Name/Size	N	%
Small mammal/bird		5	.7
Small mammal	jack rabbit or smaller size	14	1.8
Small to medium mammal	small rabbit to coyote size	3	.4
Medium to large mammal	coyote to deer size	32	4.2
Large mammal	deer size	183	23.9
Cynomys ludovicianus	black-tailed prairie dog	8	1.0
Thomomys bottae	Botta's pocket gopher	9	1.2
Peromyscus sp.	mice	1	.1
Neotoma sp.	woodrats	2	.3
Microtus mexicanus	Mexican vole	5	.7
Ondatra zibethicus	muskrat	3	.4
Sylvilagus auduboni	desert cottontail	116	15.2
Lepus californicus	black-tailed jackrabbit	78	10.2
Medium carnivore	coyote or dog size	1	.1
Canis sp.	coyote, dog, or wolf	1	.1
Taxidea taxus	badger	1	.1
Felis rufus	bobcat	1	.1
Medium artiodactyl	pronghorn or deer size	156	20.4
Cervidae	deer or elk (antler)	24	3.1
Odocoileus sp.	mule or white-tailed deer	74	9.7
Antilocapra americana	pronghorn	14	1.8
Medium bird	quail-jay size	4	.5
Branta canadensis	Canadian goose	1	.1
Cathartes aura	turkey vulture	1	.1
Pelecanus erythrorhynchos	white pelican	1	.1
Aquila chrysaetos	golden eagle	4	.5
Falco mexicanus	prairie falcon	3	.4
Phasianidae	quail, partridges, and pheasants	1	.1
Lophortyx gambelii	Gambel's quail	2	.3
Meleagris gallopovo	turkey	1	.1
Geococcyx californianus	roadrunner	3	.4
Speotyto cunicularia	burrowing owl	1	.1

Taxon	Common Name/Size	N	%
Colaptes auratus	flicker	1	.1
Corvidae	jay	1	.1
Sturnella neglecta	western meadow lark	2*	.2
Testudinata	turtles and tortoises	1	.1
Osteichthyes	fish	7	.9
Totals		765	100.0

* includes a nearly complete skeleton

Table 45. Faunal Counts by Provenience Grouping

Taxon	Pit Structures		North Roomblock		East Roomblock	
	N	%	N	%	N	%
Small mammal/bird			3	1.3	2	.6
Small mammal	2	.9	5	2.2	7	2.2
Small to medium mammal	1	.5	2	.9		
Medium to large mammal	14	6.4	3	1.3	15	4.7
Large mammal	100	45.9	43	18.8	40	12.6
Prairie dog			6	2.6	2	.6
Pocket gopher	1	.5	6	2.6	2	.6
Peromyscus			1	.4		
Woodrat					2	.6
Vole			5	2.2		
Muskrat			2	.9	1	.3
Cottontail	3	1.4	42	18.3	71	22.3
Jack rabbit	27	12.4	17	7.4	34	10.7
Medium carnivore	1	.5				
Canid	1	.5				
Badger			1	.4		
Bobcat			1	.4		
Medium artiodactyl	26	11.9	44	19.2	86	27.0
Cervid	6	2.8	5	2.2	13	4.1
Deer	22	10.1	27	11.8	25	7.9
Pronghorn	3	1.4			11	3.5

Taxon	Pit Structures		North Roomblock		East Roomblock	
	N	%	N	%	N	%
Medium bird			2	.9	2	.6
Canadian goose			1	.4		
Turkey vulture			1	.4		
Pelican			1	.4		
Golden eagle	3	1.4	1	.4		
Prairie falcon			3	1.3		
Phasianidae			1	.4		
Gambel's quail			1	.4	1	.3
Turkey			1	.4		
Roadrunner	2	.9	1	.4		
Burrowing owl					1	.3
Flicker					1	.3
Jay	1	.5				
Meadow lark			2*	.9		
Turtle					1	.3
Fish	5	2.3	1	.4	1	.3
Totals	218	100.0	229	100.0	318	100.0

* includes a nearly complete skeleton counted as one element

Table 46. Fill Type by House

Fill Type	Pit Structures	North Roomblock	East Roomblock
N	218	229	318
General fill	50.0		
Roof fall		4.4	
Floor fill*	30.3	49.3	63.5
Floor	17.0	44.5	11.6
Features or pots	.5	.4	4.4
Subfloor	2.3	1.3	20.4

Note: floor fill contains material from roof-top activities

Rodents

Few rodents were found in the collection. Only the prairie dog and muskrat have burning that suggests they were eaten. Most rodent bones are complete or nearly complete, an indication that these are accidental additions to the archaeological deposits. Only one rodent bone was recovered from the pit structures and pits while the largest number was found in the north roomblock .

The black-tailed prairie dog, *Cynomes ludovicianus*, inhabits shortgrass plains and was once abundant in the grasslands of southwestern New Mexico (Findley et al. 1975:130-132). Bailey (1971:124) found extensive colonies throughout the Gila Valley, at Cliff, and along Duck Creek Valley and estimates that over six million inhabited Grant County alone. Because they live in colonies and devegetate large areas around their burrows, this species would have been easily located and trapped or hunted. Their primary food is green grasses and they can destroy crops planted near their burrows (Koford 1958:71), an additional incentive to keep their numbers in check.

Eight pieces of prairie dog bone were found in the collection. These occur in both roomblocks and are most numerous in the north roomblock assemblage (Table 45). All came from floor fill or floor contact proveniences in five rooms. Only one element is duplicated, indicating at least two prairie dogs are represented. One piece is lightly burned (Table 47) suggesting it may have been cooked. Proportions of complete and nearly complete elements are similar to those of cottontail rabbit, another indication that this species was eaten.

Table 47. Burning by Taxon and Area (percent burned)

Taxon	Pit Structures/ Pits		North Roomblock		East Roomblock	
	slight	heavy	slight	heavy	slight	heavy
Small mammal/bird				66.7		50.0
Small mammal		50.0	40.0		14.3	14.3
Medium to large mammal	10.5			33.3	6.7	13.3
Large mammal	12.0	6.0		16.3	2.5	20.0
Prairie dog			16.7			
Muskrat					100.0	
Cottontail	33.3	33.3	14.3	4.8	23.9	1.4
Jack rabbit			29.4	23.5	8.8	5.9
Medium carnivore		100.0				
Medium artiodactyl	11.5	19.2		6.8	5.8	9.3
Cervid		6.7		20.0		30.8
Deer				4.5		12.0
Pronghorn					3.2	
Golden eagle	33.3					
Meadow lark				50.0		

Taxon	Pit Structures/ Pits		North Roomblock		East Roomblock	
	slight	heavy	slight	heavy	slight	heavy
Turtle					100.0	
% of Total Assemblage	8.7	6.9	6.1	9.6	9.7	9.4

Botta's pocket gopher, *Thomomys bottae*, is the only species of pocket gopher that inhabits the Cliff area. It occupies almost every habitat from deep friable to shallow rocky soils (Findley et al. 1975:145-147). Pocket gophers spend most of their lives underground, eating bulbs and roots (Bailey 1971:232-233) and are more likely post-occupational burrowers than subsistence items.

Pocket gophers are the most common rodent in the Ormand assemblage, represented by nine specimens. They were found in all three areas of the site in floor fill and on floors of six features, mainly in the north roomblock . Mandible and maxilla parts are the predominate elements and at least four pocket gophers are represented. None are burned or exhibit other indications of processing and most specimens are complete or nearly complete, again suggesting these represent rodents burrowing into the site rather than human discards.

Several species of *Peromyscus* inhabit the western portion of Grant County. The single element, a partial cranium, could be from a cactus mouse (*P. eremicus*), a deer mouse (*P. maniculatus*), a white-footed mouse (*P. leucopus*), or a brush mouse (*P. boylii*) (Findley et al. 1975:201-215). Regardless of the species, *Peromyscus* are human commensals and this one may have moved in with or followed the human occupation of the site.

The southern plains woodrat (*Neotoma micropus*), the white-throated woodrat (*N. albigula*), Stephens' woodrat (*N. stephensi*), and the Mexican woodrat (*N. mexicana*) are all found in Grant County. The southern plains woodrat inhabits grasslands, the white-throated woodrat desert to conifer forests, Stephens' woodrat rock accumulations, and the Mexican woodrat primarily coniferous forests (Findley et al. 1975:238-247). This suggests that the two specimens from the Ormand site are probably either plains or white-throated woodrats. Both elements, a mandible and an innominate from two rooms in the east roomblock , are complete or nearly complete, and neither are burned or exhibit other evidence of processing. Neither species burrows, and the white-throated woodrat builds houses in cracks, crevices, brush, or even bunches of cactus by accumulating sticks, stones, cactus stems, branches, bones, and almost any stray article (Bailey 1971:175-176). The floor fill proveniences of these specimens are unlikely locations for natural occurrences of woodrat bones, suggesting these were deposited by human or other inhabitants of the site area.

The Mexican vole, *Microtus mexicanus*, generally inhabits conifer and piñon juniper woodlands (Findley et al. 1975:257) where they excavate burrows or occupy the abandoned burrows of pocket gophers (Bailey 1971:205). The elements here, vertebrae and a tibia from the same rodent, are probably from a burrow death. All are complete and none exhibit evidence of processing.

The only riverine mammal represented in the Ormand assemblage, the muskrat (*Ondatra zibethicus*), presently occurs in marshes and drainage ditches along the Rio Grande, Pecos, and San Juan rivers. According to Findley and others (1975:264) the only occurrence in the Gila drainage is of skulls found in a cave near Reserve. Generally nocturnal and spending much of their time underground in tunnels or nests, muskrats are vicious when cornered (Perry 1982:300-301). Used for food and their fur, they relish corn and can do considerable damage to crops near watercourses (Findley et al. 1975:306-307). The Ormand residents would have had several reasons to hunt or trap muskrats.

Three muskrat bones (a mandible and two innominates) were found in two features and represent two animals, one full-sized but not fully mature and the other mature (Table 48). One of the innominates is scorched suggesting use as food.

Rabbits

Rabbits often comprise a good proportion of southwestern animal bone assemblages. Relatively easily captured and occurring in large numbers, rabbits were a favored prehistoric food item. In the Ormand assemblage (Table 44), cottontails are the most numerous of the identified taxa (15.2 percent) followed by jack rabbit (10.2 percent) attesting to their importance as a food source. These percentages are especially remarkable given that smaller forms were less likely to have been collected. Percentages and proportions vary in the three site divisions (Table 45). The pit structures and pits produced very few cottontail bones but proportionately more jack rabbit when compared to the roomblocks. This could be a function of collection bias where the smaller cottontail bones were less likely to be recognized when removing general fill than the larger jack rabbit bones. In both roomblocks, cottontails outnumber jack rabbits.

The cottontail rabbits from the Ormand site are most likely the desert cottontail (*Sylvilagus auduboni*), which inhabits areas of piñon juniper and below. Eastern cottontails (*S. floridanus*), which occupy the mid-woodland and higher areas to the north and east of Ormand (Findley et al. 1975:83-87), are possible but less likely. Specimens generally agree with desert cottontail comparative material.

Cottontails prefer places where they can see for long distances and when startled rush for the nearest cover or run away (Bailey 1971:54-55). They utilize a wide range of disturbed, successional, and transitional habitats, especially grasslands with an abundance of weedy forbs and escape cover. Because of their high reproductive rates, cottontails can withstand heavy hunting pressure and are utilized for their fur and as a food source (Chapman et al. 1982:111)

At least 10 cottontail rabbits are represented in the Ormand collection. These include specimens from at least two very immature rabbits (Table 48) found in Rooms 31 and 35 of the east roomblock . Floor fill is the most common fill type followed by floor and subfloor (Table 49). A relatively large proportion of the bone is burned (24.1 percent) (Table 47). Cuts (n=1), impact breaks (n=4), and spiral breaks (n=13) may also indicate processing for food.

The black-tailed jack rabbit (*Lepus californicus*) is found throughout New Mexico below the ponderosa forest zone with the greatest densities in grasslands and deserts (Findley et al. 1975:93). In rangeland areas, they prefer open areas lacking dense vegetation. Crop damage from jack rabbits can be severe, especially when fields are adjacent to their resting areas (Dunn et al. 1982:137-139).

A minimum of four jack rabbits are represented in the assemblage. More are found in the pit structures and pits, but this may be a function of collection practices (Table 45). Over half were found in floor fill with considerable numbers on the floors and in the fill (Table 49). No very young individuals were found but full-sized young adults are found in all three site divisions (Table 48). A fair proportion of the bone is burned (17.9 percent) (Table 47). Further evidence of processing includes cuts (n=2), impact breaks (n=4), spiral breaks (n=4), and transverse breaks (n=3).

Carnivores

Carnivores in this assemblage include a canid, a badger, and a bobcat. The preliminary report on excavations at Ormand indicates that bear was found (Hammack et al. 1966:22), but it does not occur in the analyzed portion of the collection. In general, the carnivores lack evidence of processing or use as food. Only the medium carnivore, a partial caudal vertebra, is burned. The only other indication of processing is an impact fracture on the badger bone.

The canid element (*Canis* sp.) is a partial maxillary canine tooth found in Feature 25. The tooth is the size of a coyote or domestic dog. Coyotes occur in all habitats in New Mexico and are most common in grasslands (Findley et al. 1975:281). Domestic dogs are presumed to have been kept at Ormand. A small amount of bone has carnivore gnawing (0.4 percent), tooth punctures (0.4 percent), or characteristics of being digested (0.3 percent), some or all of which may be from dogs.

Badgers (*Taxidea taxus*) are most common in grasslands at lower altitudes but occur throughout the state. Their presence depends on the occurrence of their chief food source, burrowing rodents (Findley et al. 1975:308), especially ground squirrels and prairie dogs (Bailey 1971:344). Although they are primarily carnivorous, corn is often part of the fall diet (Lindzey 1982:658). As a mustelid, badgers have a rank odor and are tough and unpalatable, so they are rarely eaten by other carnivores. Fierce and defensive, humans are their only important enemy (Bailey 1971:343).

Table 48. Immature Species by Taxon and Area (percent immature and young adults)

Taxon	Pit Structures/Pits		North Roomblock		East Roomblock	
	Immature	Young Adult	Immature	Young Adult	Immature	Young Adult
Small to medium mammal		100.0	50.0	50.0		
Medium to large mammal	7.1	7.1			6.7	26.7
Large mammal		1.0				2.5
Prairie dog						50.0
Muskrat				50.0		
Cottontail		33.3		4.8	5.6	21.1
Jack rabbit		18.5		5.9		11.8
Badger				100.0		
Medium artiodactyl	3.8	3.8	4.6	2.3		9.3
Deer				3.7		4.0
Pronghorn		33.3				18.2
Roadrunner		50.0				
% of Total Assemblage	.9	5.5	1.3	3.1	1.6	11.3

Table 49. Taxa by Level (percent of taxon recovered from that level)

Taxon	N	Fill	Roof Fall	Floor Fill	Floor	Feature or Vessel	Subfloor
Small mammal/bird	5			40.0	60.0		
Small mammal	14			64.3	21.4	7.1	7.1
Small to medium mammal	3	33.3		66.7			
Medium to large mammal	32	21.9		43.7	15.6	6.3	12.5
Large mammal	183	21.3		42.6	30.1	.5	5.5
Prairie dog	8			62.5	37.5		
Pocket gopher	9			77.8	22.2		
Peromyscus	1				100.0		
Woodrat	2			100.0			
Vole	5				100.0		
Muskrat	3			100.0			
Cottontail	116		.9	69.0	20.7	1.7	7.8
Jack rabbit	78	15.4	1.3	53.8	19.2	1.3	9.0
Medium carnivore	1			100.0			
Canid	1			100.0			
Badger	1			100.0			
Bobcat	1		100.0				
Medium artiodactyl	156	14.7	1.3	41.0	21.2	3.2	18.6
Cervid	24	20.8	8.3	58.3	8.3		4.2
Deer	74	21.6	1.4	43.2	24.3	1.4	8.1
Pronghorn	14	7.1		14.3	14.3	21.4	42.9
Medium bird	4			100.0			
Canadian goose	1		100.0				
Turkey vulture	1			100.0			
Pelican	1			100.0			
Golden eagle	4	75.0		25.0			
Prairie falcon	3		33.3	66.7			
Phasianidae	1			100.0			
Gambel's quail	2			100.0			
Turkey	1				100.0		

Taxon	N	Fill	Roof Fall	Floor Fill	Floor	Feature or Vessel	Subfloor
Roadrunner	3	66.7			33.3		
Burrowing owl	1			100.0			
Flicker	1				100.0		
Jay	1			100.0			
Meadowlark	2			50.0	50.0*		
Turtle	1			100.0			
Fish	7			85.7	14.3		
Total counts	765	109	10	381	176	16	73
Number of taxa	37	10	8	30	19	8	9
Number of species	28	5	6	21	13	4	4

* most of a skeleton

The badger from Ormand is a partial radius from Feature 22. It is unburned but has an impact break suggesting processing for some purpose. This animal could have been taken for its fur or because it was damaging agricultural plots digging for rodents or raiding the corn. It is an unlikely food source.

Bobcats (*Felis rufus*) are found throughout the state in almost all habitats (Findley et al. 1975:320) but are most abundant in rough country with canyons, gulches, cliffs, and rock slopes where they can safely retreat (Bailey 1971:292). The single bobcat element from Ormand is the proximal end of a rib, also from Feature 22. It is not burned and has no evidence of processing.

Artiodactyls

Several species of artiodactyl inhabit the area surrounding Ormand. The collared peccary or javelina (*Dicotyles tajacu*) mainly occurs in the southwestern portion of the state, including western Grant County. Habitats range from mesquite savannahs and woodlands up to pine forests. Elk (*Cervus elaphus*) formerly occupied all major montane areas in New Mexico. Suitable range is found in the mountains north, east, and south of Ormand. Mule deer (*Odocoileus hemionus*) range through all elevations and habitats including the Ormand area. The smaller white-tailed deer (*Odocoileus virginianus*) occurs in rough, brushy country in the mountains of southwestern New Mexico, including those to the north, east, and south of Ormand. Pronghorn (*Antilocapra americana*) inhabit open grasslands below the woodlands, including the area along the Gila River near Ormand. Mountain sheep were once found on most New Mexico mountains, including those to the north, east, and south of Ormand (Findley et al. 1975:325-336).

Distributions of these species suggest that mule deer, pronghorn, and perhaps peccary, are the artiodactyls most readily available at Ormand. Elk, mountain sheep, and white-tailed deer were obtainable in areas not too distant from the site. Only deer and pronghorn were identified in the collection, although the excavators claim mountain sheep was recovered (Hammack et al. 1966:22).

Medium artiodactyl, is the largest taxon in the Ormand assemblage (20.4 percent). The pit structures and pits have the smallest proportion of medium artiodactyl (Table 45). Since this area also has the largest number of large mammal bones, it is likely that the specimens from these features are more fragmentary and classified as large mammal rather than artiodactyl. Very young artiodactyls are present in the pit structure and pit provenience and in the north roomblock assemblage (Table 48). Younger animals are represented in all sampled proveniences with greater proportions in the east roomblock .

Almost all of the medium artiodactyl bone is fragmentary, some due to extensive processing for food and use as tools. Fair amounts of burning are found in all three provenience groupings (Table 47). A wide variety of processing was noted, including cuts (n=3), impact breaks (n=40), spiral breaks (n=20), longitudinal breaks (n=3), and an abrasion suggestive of processing.

Antler was usually placed in the cervid taxon. Most are tips or small fragments that could be elk, mule deer, or white-tailed deer. Three pieces were complete enough to be identified as deer. Slightly more of the cervid was found in the east roomblock (Table 45). Antler (n=27) was found in 16 separate features at Ormand. Most was in floor fill (59.2 percent), followed by fill (18.5 percent), floors (11.1 percent), roof fall (7.4 percent), and subfloor (3.7 percent). Five pieces of cervid and one piece of deer antler are burned. Cuts were observed on two pieces and four others had been hacked into chunks. Four pieces have facets or wear on the tips suggesting use as flakers.

Deer follows cottontails and jack rabbits in abundance (Table 44). Most specimens are consistent with mule deer in size but a few are small enough that they could fall within the range of white-tailed deer. Spatially, proportions are fairly uniform ranging from a low of 7.9 percent in the east roomblock to 11.8 percent in the north roomblock . A minimum of three deer are represented by a wide variety of parts. Younger than mature animals are found in both roomblocks (Table 48). Burning is relatively rare and most common in the east roomblock (Table 47). Over a third of the bones are complete or nearly so and a third were represented by less than a 25 percent of the element. Cuts (n=7), portions removed (n=1), impact breaks (n=11), spiral breaks (n=1), and a longitudinal break were observed. Deer bones appear to have been processed for food with some parts curated and used for manufacturing tools.

Pronghorn is much less common than deer (Table 44) and does not occur at all in the north roomblock assemblage. Nine of the 14 specimens were found in Feature 29, a large room at the northwest corner of the east roomblock , either subfloor or in features or pots. Other pronghorn was found in adjacent or nearby rooms, a pit structure (Feature 76) just east of this roomblock , and two plaza pits (Features 40 and 42) east of Feature 76. This limited spatial distribution may suggest that pronghorn was generally sparse or difficult to obtain during the occupation of the site and its utilization may have been confined to a relatively short period of time. At least two pronghorns are represented by the analyzed specimens. These include cranial, front limb, and foot elements. One piece is lightly burned (Table 47), cuts were found on two, impact breaks on three, and a spiral break on one.

Birds

At least 13 species of bird are represented in the Ormand assemblage. Three species (6 specimens) were found in the pit structures and pits, ten (15 specimens) in the north roomblock , and three (5 specimens) in the east roomblock . Only one of these can be considered a riverine bird (Canadian goose). Bird of prey, grassland, and woodland species are more common. Evidence of processing for use of food is rare. The majority of the bird bones are complete or nearly so and few are fragmentary. Two pieces are burned, and possible processing is limited to a spiral break and an abrasion on golden eagle bones. Elements are mostly wing and leg parts, a distribution that is commonly interpreted as resulting from the production of ritual items such as medicine bundles. Birds taken for their plumage may be returned to the site as wings and skin only (Olsen 1990:83).

Several pieces of bone were identifiable only as medium-sized birds. These were relatively fragmentary and none were burned or had other evidence of processing. Parts include a partial sternum, a distal radius, a femur shaft, and a proximal carpometacarpus.

Canadian geese (*Branta canadensis*) migrate and winter almost statewide (Hubbard 1978:6). Breeding on lake shores and coastal marshes, they flock and graze in fields along water courses (Robbins et al. 1966:40). The specimen from Ormand is an almost complete coracoid found in the roof fall layer of Feature 15.

Turkey vultures (*Cathartes aura*) migrate and summer statewide, breeding in hollows and on the ground (Hubbard 1978:13). The Ormand specimen is a partial scapula from floor fill in Feature 22.

Probably the most interesting find at the site is most of a carpometacarpus from a white pelican (*Pelecanus erythrorhynchos*) found in the floor fill layer of Feature 23 in the north roomblock . It measures 131.4 mm in length and is from a bird with a wingspan of about 2.7 m. This room also had turkey and roadrunner remains. No indications of processing were observed. White pelicans migrate between the southeast and northwest part of the states and can be fairly common at large bodies of water (Hubbard 1978:2). They prefer shallow bodies of water rich in fish and often cooperate to surround fish (Udvardy 1977:474-475).

Pelican is a rare find in southwestern faunal assemblages. McKusick reports occurrences at Casas Grandes (n=3), Gran Quivira (n=1), at Awatovi in Arizona, and Rainbow House at Bandelier National Monument (1981:47). A large sample of bone from Grasshopper Pueblo (Olsen 1990) produced no pelican.

Golden eagles (*Aquila chrysaetos*) are found statewide (Hubbard 1978:16). Eagle is the most numerous bird species in the Ormand collection, represented by four specimens from the pit structures and pits (Features 52 and 76) and the north roomblock (Feature 19). Two eagles are represented by right tibiotarsi, one consisting of most of a shaft and the other a proximal end with most of the shaft. Other elements are a cervical vertebra and a humerus. The humerus is made into an awl. One tibiotarsus is lightly burned and has an abrasion, the other has a spiral break.

Prairie falcons (*Falco mexicanus*) live in most areas of the state, nesting on cliffs near grasslands and shrublands and ranging from rare to fairly common in open habitats (Hubbard 1978:17). The specimens, all from Feature 22 in the north roomblock , are a humerus, a tibiotarsus, and a tarsometatarsus. None are burned or exhibit evidence of processing.

The specimen recorded as Phasiandiae is from a member of the quail and partridge family. It strongly resembles a bobwhite (*Colinus virginianus*) but Hubbard (1978:19) places the range for bobwhite as east of the Dry Cimarron and the Pecos Valley and causal at Albuquerque, suggesting it is some other species. The part is a distal humerus and shaft from Feature 63 in the north roomblock . No evidence of processing or burning was noted.

Gambel's quail (*Lophortyx gambelii*) lives in shrubby lowlands up into woodlands (Hubbard 1978:19). The specimens from Ormand are from Feature 22 in the north roomblock and Feature 48 in the east roomblock . Elements are part of an innominate and a coracoid, neither of which have evidence of processing.

The presence of only one piece of turkey (*Meleagris gallopavo*) bone suggests that the wild rather than domestic form is represented. Wild turkeys are most common in montane regions but are also found in pine and adjacent riparian woodlands (Hubbard 1978:20). The element, a fragment of a carpometacarpus from Feature 23, is unburned and has no evidence of processing.

Roadrunners (*Geococcyx californianus*) are resident in the southern portion of the state, especially along major drainages (Hubbard 1978:32-33). At least two roadrunners are indicated by tibiotarsi from a mature and a younger than mature bird. Other elements are a carpometacarpus and a tarsometatarsus. None are burned or have other evidence of processing. Two are from Feature 23 in the north roomblock and two are from a pit structure, Feature 76.

Burrowing owls (*Speotto cunicularis*) summer statewide and are rare to common in grasslands, open shrublands, and woodlands (Hubbard 1978:34). This long-legged owl often nests in prairie dog towns (Robbins et al. 1966:164). The element, most of a tarsometatarsus, is from Feature 97 and has no evidence of processing.

The yellow-shafted form of flicker (*Colaptes auratus*) migrates and winters in the Mogollon Plateau and vicinity (Hubbard 1978:40). Found in open country near large trees, flickers have golden wing and tail feathers and spotted breast features (Robbins et al. 1966:180). This member of the woodpecker family was probably valued for its feathers. The element is most of a radius with no signs of processing.

One jay element was recovered, a partial humerus from Feature 25 that could not be identified to the species level. Blue jays (*Cyanocitta cristata*) are casual in the southwest part of the state and have been observed in the Mimbres Valley. Steller's jays (*Cyanocitta stelleri*) prefer mountains and forests but have been recorded at Cliff in summer. Scrub jays (*Aphelocoma coerulescens*) also prefer mountains but are casual in the south, including at Deming. Mexican jays (*Aphelocoma ultramarina*) are resident in mountain areas from the Mogollon Plateau south (Hubbard 1978:51-52). Any of these blue-feathered birds could be represented.

The western meadowlark (*Sturnella neglecta*) is resident along the Gila River, occurring in grasslands in the southwestern part of the state (Hubbard 1978:80-81). It has bright yellow breast and throat feathers and is commonly found in fields (Robbins et al. 1966:278). One of the specimens from Ormand is an almost complete skeleton, missing only a few small elements that were probably overlooked or lost, found on the floor of Feature 10, a room in the north roomblock . The other is a burned humerus fragment from Feature 21, also in the north roomblock .

Turtle

The single piece of turtle shell from Feature 33 in the east roomblock was not identified to species. Hard-shelled turtles inhabiting southwestern New Mexico include the yellow mud turtle (*Kinosternon* *flavescens*), which prefers xeric habitats with temporary water pools in grasslands, usually at elevations below 1,270 m, rarely in permanent rivers but often in ponds near permanent or intermittent streams; the Sonora mud turtle (*Kinosternon sonoriense*), which has been collected from the Gila River in Grant County and is associated with water in woodlands including creeks, ditches, and ponds; and the box turtle (*Terrapene ornata*), a terrestrial form that inhabits plains, rolling country, and open woodlands (Bernard and Brown 1977:100-103; Degenhardt and Christiansen 1974:27-31). The Ormand specimen is lightly burned, as is all bone from this room suggesting the bone assemblage burned as a unit rather than the turtle being processed.

Fish

Seven fish bones were recovered. These include three vertebra from Feature 76, a vertebra from Feature 16, a rib from Feature 10, and a cranial bones from Features 25 and 36. Except for the rib, which was on a floor, all specimens are from floor fill. Most were in pit structures (Table 45) with single occurrences in each of the roomblocks. None are burned or have other evidence of processing. The bones are all in good condition and there is no reason to believe that preservation of fish was a problem in these soils as the parts recovered are some of the smaller and more delicate elements.

Koster (1957) lists the following species of fish that are within the size range of the Ormand specimens as native to the Gila River: the Gila Trout (*Salmo gilae*) now found only in the smaller headwaters of the Gila and San Francisco rivers but believed to have once occupied a greater area in the Gila Basin (1957:31); the Gila sucker (*Catostomus insignis*), which inhabits the lower reaches of the Gila and San Francisco rivers up to trout waters (Koster 1957:45); the Gila Mountain sucker (*Pantosteus clarki*), found in the rocky, gravelly portions of the Gila and San Francisco rivers and their tributaries (Koster 1957:47); and the Colorado River chub (*Gila robusta*), found in creeks and rivers west of the Continental Divide and most common near the heads of ponds or riffles (Koster 1957:58).

Taphonomic Variables

Natural processes that affect bone are recorded as environmental and animal alteration. These variables are generally used to identify and gauge potential biases from nonhuman-related processes (Lyman 1994:1). In the Ormand sample, where human-induced biases (collection practices) have already influenced taxonomic abundance, these variables provide information on deposition within features.

Bone was recorded as pitted, sun bleached, checked or exfoliated, or root etched when these conditions were observed. None of the bone was sun bleached and only one specimen has the distinctive etching caused by roots. Surface pitting or corrosion, resulting from soil conditions, was noted on a small number of bones, most often from pit structures and pits. Weathering in the form of checking or exfoliation can occur in both surface and subsurface contexts. Buried bone weathers more slowly than exposed bone, and different sizes of animals and different elements weather at varying rates (Lyman 1994:360-361).

Proportions of weathered and pitted bones for each feature are given in Table 50 and summarized by provenience group and fill unit in Table 8. The pit structure and pit provenience has the most checking and pitting. The north roomblock sample has the least checking and are intermediate in pitting. Pit structure and east roomblock floors have proportionately more checking than general fill or floor fill. This could suggest some were left open long enough for the weathering process to begin, or it may simply reflect collection bias toward bones that weather more quickly.

Carnivore tooth punctures and gnawing are sparse and found in only two features (Features 29 and 76) and in fill, floor, and subfloor fill units (Tables 50 and 51). Rodent gnawing is more common, occurring in seven features and a wide variety of fill contexts. Rodents gnaw on dry bones to keep their incisors in good condition (Lyman 1994:195). Those found in this assemblage were probably encountered by the rodents in or near their burrows.

Processing

Fragmentation, burning, and marks attributed to butchering an animal provide information on whether and how animals were processed for consumption or other purposes. Similarly, the distribution of body parts for the larger taxa, such as artiodactyls can provide information on whether animals are hunted nearby and transported to the site complete or nearly complete or at a distance so that only choice parts were returned to the residence.

Table 50. Checking, Pitting, Carnivore Punctures and Gnawing, and Rodent Gnawing by Feature

Feature Number	N	% Checked	% Pitted	% Carnivore Gnawed or Punctured	% Rodent Gnawed
7	12	58.8			
8	2				
10	38	21.1			7.9
15	6	33.3			
16	9	44.4			
17	5				
18	5	40.0			
19	23	13.0	4.3		
20	34	23.5			
21	4				
22	76	21.1	2.6		6.6
23	15	33.3			
24	9	66.7			
25	20	40.0	10.0		
27	1				

Feature Number	N	% Checked	% Pitted	% Carnivore Gnawed or Punctured	% Rodent Gnawed
29	99	27.3	1.0	1.0	3.0
30	3				
31	37	18.9			
33	16	12.5			
34	7	57.1			
35	12	33.3			
36	20	15.0			
37	12	16.7			
38	13	38.5			
40	43	55.8	2.3		2.3
41	25	36.0			
42	1				
44	2				
48	17	29.4			11.8
52	6	16.7			
57	4	25.0			
63	5	40.0			
76	125	43.2	4.8	4.0	.8
79	10	60.0			
83	30	36.7			20.0
84	1				
89	8	62.5			
97	7	42.9			
153	3				
Total	765	31.9	1.7	.8	2.7

Table 51. Summary of Checking, Pitting, Carnivore Gnawing and Punctures, and Rodent Gnawing

House/Fill Type	N	% Checked	% Pitted	% Carnivore Punctured/ Gnawed	% Rodent Gnawed
Pit Structures and Pits	218	44.5	4.1	2.3	.9

House/Fill Type	N	% Checked	% Pitted	% Carnivore Punctured/ Gnawed	% Rodent Gnawed
General fill	109	34.9	6.4	3.6	1.8
Floor fill	66	37.9	3.0		
Floor	37	78.4		2.7	
Features or pots	1				
Subfloor	5	100.0			
North Roomblock	229	23.6	1.3		3.5
Roof fall	10	30.0			10.0
Floor fill	113	21.2	2.7		3.5
Floor	102	25.5			2.9
Features or pots	1				
Subfloor	3	33.3			
East Roomblock	318	29.2	.3	.3	3.5
Floor fill	202	27.7			3.5
Floor	37	45.9			5.4
Features or pots	14	7.1	7.1		
Subfloor	65	29.2		1.5	3.1

Fragmentation

Breakage can result from processing for marrow, rendering a piece small enough to fit in a cooking pot, or from natural processes. Trampling by humans and sediment weight and movement also fracture bone. Bone that is somewhat weathered is fairly easily broken when stepped on (Lyman 1994:379). Similarly, soil weight may crush or break buried faunal remains (Lyman 1994:424) and carnivores can fracture bone into small pieces.

Element completeness is examined in Table 52 where bones are recorded as more than 75 percent complete (mostly complete), 25 to 75 percent complete (fragmented), or less than 25 percent complete (fragmentary). As expected, the unidentified forms are mostly fragmented or fragmentary. Rodents, especially small burrowing rodents, are often complete or nearly so, suggesting they were not processed and much of the breakage found can be accounted for by carnivores, trampling, and sediment weight. The small economic taxa, or rabbits, prairie dogs, and muskrats, have a range of fragmentation. Fair amounts of bone are mostly complete or just fragmented, largely because animals in this size range do not require extensive processing. Carnivores have a good amount of breakage, which suggests processing, possibly for consumption. Artiodactyls have considerable breakage, especially the medium artiodactyl taxon. The complete bones are generally small, compact foot bones that were rarely processed and less subject to trampling and sediment damage due to their size and density. Bird bones are generally complete or fragmented and very rarely fragmentary. This suggests they were not processed for food or that, like the small economic taxa, little breakage was necessary

Table 52. Element Completion by Taxa and House (percent of those with that completion)

Taxon	Pit Structures and Pit			North Roomblock			East Roomblock		
	>75%	25-75%	<25%	>75%	25-75%	< 25%	>75%	25-75%	< 25%
Small mammal/bird						100.0			100.0
Small mammal			100.0			100.0		28.6	71.4
Small to medium mammal			100.0			100.0			
Medium to large mammal	42.9		57.1			100.0	6.7	6.7	86.7
Large mammal			100.0	7.0		93.0			100.0
Prairie dog				66.7	33.3		50.0	50.0	
Pocket gopher	100.0			66.7	33.3		100.0		
Peromyscus				100.0					
Woodrat							100.0		
Vole				100.0					
Muskrat				50.0	50.0			100.0	
Cottontail		66.7	33.3	33.3	59.5	7.1	49.3	38.0	12.7
Jack rabbit	44.4	37.0	18.5	29.4	47.1	23.4	32.4	44.1	23.5
Medium carnivore		100.0							
Canid			100.0						
Badger					100.0				
Bobcat						100.0			
Medium artiodactyl		3.8	96.2	4.5	11.4	84.1	2.3	5.8	91.9
Cervid		16.7	83.3			100.0			100.0
Deer	31.8	36.4	31.8	37.0	18.5	44.4	48.0	28.0	24.0
Pronghorn	33.3		66.7				18.2	45.5	36.4
Medium bird					100.0			50.0	50.0
Canadian goose				100.0					
Turkey vulture					100.0				
Pelican				100.0					
Golden eagle	66.7	33.3			100.0				
Prairie falcon				100.0					
Phasianidae				100.0					

Taxon	Pit Structures and Pit			North Roomblock			East Roomblock		
	>75%	25-75%	<25%	>75%	25-75%	< 25%	>75%	25-75%	< 25%
Gambel's quail					100.0		100.0		
Turkey					100.0				
Roadrunner	100.0			100.0					
Burrowing owl							100.0		
Flicker							100.0		
Jay			100.0						
Meadowlark				100.0					
Turtle									100.0
Fish	80.0		20.0	100.0					100.0
Totals	16.1	11.0	72.9	25.8	24.0	50.2	22.3	20.4	57.2

for preparation and consumption. The abundance of wing and leg elements does suggest uses other than food. Wing fans and legs may have served some higher purpose. The individual fish elements are generally complete. Those recorded as fragmentary are fairly complete individual bones but represent only small portions of the crania and are therefore considered fragmentary.

There are no obvious differences in fragmentation of taxa between the pit structure and pits, the north roomblock and the east roomblock . Large forms that require more processing have more breakage than small ones that can be cooked whole or nearly so. Overall, breakage is greatest in the pit structures and pits, but this may be due to the large proportion of this sample that comes from general fill (50 percent) as compared to no general fill in the other two groups (Table 46).

Burning

Burning, as recorded in Table 47, is similar in the three provenience groups. The east roomblock total is higher but much of this is due to the Feature 33 assemblage of 16 bones, which is all scorched or burned, possibly from burning of a roof or roof materials. Without this material, slightly burned or scorched bone would account for only 5.0 percent of the total, making the totals for the two roomblocks almost equivalent. The pit structures and pit group have more slightly burned and less heavily burned bone, but the differences are not great and could easily be due to the fill composition of this assemblage. Taxa with the most consistent amounts of burning in all proveniences are the small mammals, cottontails, jack rabbits, and medium artiodactyls, those taxa that are the most likely food sources.

Processing

Processing or the results of human activities directed toward extraction of consumable resources from a carcass (e.g., Lyman 1994:294-295) was monitored through one variable that could be recorded and located twice for each specimen. Types of alteration found at Ormand that are generally considered as a result of processing include cuts, parts removed, bone flakes, impact, spiral, longitudinal, and transverse breaks, abrasions, and scooped-out indentations on the surface of an antler. While much of the Ormand alteration probably does result from rendering carcasses, each type of alteration can result from other mechanisms, natural and accidental. Marks resembling cuts and abrasions can be produced by hoofed animals (Gifford-Gonzales 1989:192-193), archaeological excavators or preparators, carnivore gnawing, rodent gnawing, rockfall, water transport, and soil movement (Lyman 1994:297; Marshall 1989:12; Oliver 1989:89). Similarly, spiral and other fractures types can be created by trampling, rockfall, carnivores, water transport, soil compaction, soils shrinking and swelling, cryoturbation, and traumatic accidents (Marshall 1989:12, 20).

Alteration is recorded in Tables 53 and 54. Impact breaks, spiral breaks, and cuts are the most common observations. Medium artiodactyl, deer, and the rabbits have the most and the greatest variety of alteration, consistent with their use as food animals. When broken down by provenience group and fill type there are differences between the pit structures and pits and the roomblocks. The percent of altered bone is less for the pit structures (16.5 percent compared to 23.1 percent of the north roomblock and 24.5 percent of the east roomblock assemblages) possibly because half of this sample is drawn from fill while none of that from the roomblocks is from general fill. Floor fill levels, which contain a good deal of roof activity material, have a relatively high and remarkably uniform amount of altered bone (22.7, 23.9, and 21.8 percent) while floors in the north roomblock have considerably more (25.5 percent) altered specimens than floors in pit structures (2.7 percent) or the east roomblock (16.2 percent). North roomblock floors have more bone in general, and the greater abundance combined with more alteration suggests somewhat different modes of abandonment or post-abandonment histories.

Artiodactyl Body Part Distribution

Proportions of artiodactyl elements (Tables 55-57) in the three provenience groups are generally similar. By progressively adding the medium artiodactyl, large mammal, then medium to large mammal, these tables provide an idea of which parts are missing and which are better represented. Parts with low representation are the axial elements (cranium, vertebrae, and pelvis). Since these parts are generally considered of high utility and likely to be transported (e.g., Lyman 1994, tables 7.3 and 7.4), their paucity is probably a function of the degree of processing and density of these particular elements. Low density bones are more easily crushed into unidentifiable powder while denser bones may be broken into small but recognizable pieces during processing or by natural mechanism such as sediment overburden (Lyman 1994:249).

Fragments identifiable only as long bones are the most numerous element in all three assemblages. Foot parts are more common in the roomblocks (22.3 percent of the north roomblock and 17.6 percent of the east roomblock) than the pit structures and pits (7.8 percent). Again, this probably results from the nature of the sample. Small foot bones were probably less likely to be collected in the pit structure and pit fill than in the floor and floor-fill-dominated roomblocks.

Given the collection practices at Ormand, it is difficult to say much about artiodactyl procurement. Most parts are represented and those that are missing are the less dense ones that could have been processed or eroded away. The sample size is too small to examine differences between pronghorn and deer. Absolute numbers certainly suggest that deer were either more readily available or more susceptible to the hunting techniques employed by the Ormand residents.

Table 53. Processing by Taxon and Element (specimens with that form of processing)

Taxon/Element	Cuts	Part Removed	Flake	Impact	Spiral	Longit-udinal	Trans-verse	Abrasion	Scoop
Small mammal/bird									
long bone				1	2				
Small mammal									
long bone					3				
Med-lrg mammal									
long bone					1				
rib	1								
Large mammal									
long bone	3		1	7	13				
Cottontail									
humerus				1	1				
femur	1			2	9				
tibia				1	3				
Jack rabbit									
mandible				1					
rib	1								
humerus							1		
radius					1				
femur	1			3	3		2		
Badger									
radius				1					
Medium artiodactyl									
long bone	1			20	18	1			
rib	1			10					
humerus				1	1				
metacarpal				2					
tibia				1		1			
metatarsal	1			6	1			1	
metapodial						1			
Cervid									
antler	2	4							1
Deer									
antler	1	1							
mandible	1								
sternum	4								
humerus	1			1					
radius				2					
metacarpal				1	1	1			
femur				5					
tibia				1					
metatarsal				1					
Pronghorn									
ulna	2								
radioulna					1				
metacarpal				3					

Golden eagle tibiotarsus					1			1	
Totals	21	5	1	71	59	4	3	2	

Table 54. Processing by House and Level (specimens with that form of processing)

House/Level	Cuts	Part Removed	Flake	Impact	Spiral	Longit-udinal	Trans-verse	Abrasion	Scoop
Pit Structure/pits	5			14	10	3	3	1	
General fill	3			11	3	2		1	
Floor fill	1			3	7	1	3		
Floor	1								
North roomblock	7		1	24	19	1		1	
Floor fill	1		1	11	12	1		1	
Floor	6			13	7				
East roomblock	9	5		33	30				1
floor fill	3	5		13	22				1
floor	1			5					
feat. or pot				4	2				
subfloor	5			11	6				
Totals	21	5	1	71	59	4	3	2	1

Table 55. Pit Structures and Pit Artiodactyl and Potential Artiodactyl Body Part Distribution

Body Part	Deer	Pronghorn	Deer, Pronghorn, Medium Artiodactyl	Deer, Prong-horn, Med. Artio., Lrg. Mammal	Deer, Pronghorn, Med. Artio, Lrg. Mamm., Med-Lrg. Mammal
Cranial (except antler)	4.5	66.7	5.9	2.6	2.4
Vertebral					3.0
Pelvis			2.0	.7	.6
Ribs and sternum			13.7	7.3	7.9
Flat and cancellous				13.9	13.9
Front limb	22.7		11.8	4.0	3.6
Front foot	22.7		9.8	3.3	3.0
Rear limb	22.7		19.6	6.6	6.1
Rear foot	13.6		5.9	2.0	1.8
Foot	13.6	33.3	9.8	3.3	3.0

Body Part	Deer	Pronghorn	Deer, Pronghorn, Medium Artiodactyl	Deer, Prong-horn, Med. Artio., Lrg. Mammal	Deer, Pronghorn, Med. Artio, Lrg. Mamm., Med-Lrg. Mammal
Long bone			21.6	56.3	54.5
Sample size	22	3	51	151	165

Table 56. North Roomblock Artiodactyl and Potential Artiodactyl Body Part Distribution

Body Part	Deer	Pronghorn	Deer, Pronghorn, Medium Artiodactyl	Deer, Pronghorn, Med. Artio., Lrg. Mammal	Deer, Pronghorn, Med. Artio, Lrg. Mamm., Med-Lrg. Mammal
Cranial (except antler)	3.8		1.4	.9	1.7
Vertebral					
Pelvis			1.4	.9	.8
Ribs and sternum	23.1		25.7	16.8	16.4
Flat and cancellous				5.3	5.2
Front limb	15.4		12.9	8.0	7.8
Front foot	7.7		2.9	1.8	1.7
Rear limb	3.8		4.3	2.6	2.6
Rear foot	11.5		17.1	10.6	10.3
Foot	34.6		17.1	10.6	10.3
Long bone			17.1	42.5	43.1
Sample size	26	0	70	113	116

Table 57. East Roomblock Artiodactyl and Potential Artiodactyl Body Part Distribution

Body Part	Deer	Pronghorn	Deer, Pronghorn, Medium Artiodactyl	Deer, Pronghorn, Med. Artio., Lrg. Mammal	Deer, Pronghorn, Med. Artio, Lrg. Mamm., Med-Lrg. Mammal
Cranial (except antler)	8.7		1.7	1.2	1.1
Vertebral			2.5	1.9	2.3
Pelvis	4.3		1.7	1.2	1.1
Ribs and sternum			14.2	12.5	13.7
Flat and cancellous				5.6	6.9
Front limb	8.7	36.3	9.2	6.9	6.3
Front foot	4.3	4.5	6.7	5.0	4.6
Rear limb	8.7		5.0	3.7	3.4
Rear foot	21.7	9.1	10.8	8.1	7.4

Body Part	Deer	Pronghorn	Deer, Pronghorn, Medium Artiodactyl	Deer, Pronghorn, Med. Artio., Lrg. Mammal	Deer, Pronghorn, Med. Artio, Lrg. Mamm., Med-Lrg. Mammal
Foot	43.7	9.1	10.0	7.5	6.9
Long bone			38.3	46.2	46.3
Sample size	23	11	120	160	175

Feature and Spatial Distribution

The faunal sample was drawn from 39 separate features with counts ranging from 1 to 125. A good portion of the features (19 or 48.7 percent) have sample sizes less than 10. Since all of the feature samples are relatively small, and assuming that related rooms and the pit structures have some similarity in their use, abandonment, and fill histories, most of the information presented has been by provenience division. Tables 58-60 give the specimen counts for each feature and fill division by these provenience groups.

Activity Areas

The only activity area noted during the analysis was in Feature 41. On the floor near the west wall were four pieces of antler (Fig. 130). One piece also has unusual marks that could be from a large-toothed rodent or could represent some type of human-made mark. Similar chunks of antler were recovered from Kinishba Ruin, a late Mogollon or Western Pueblo site in Arizona and from Grasshopper Pueblo (S. Olsen 1979:346-348, 1980:57-58). Those from Ormand are not ground smooth and have not been treated as tools as they lack any indication of use or manufacture other than being rendered into chunks.

Correspondence Plots

Looking at only those features with sample sizes greater than 10, correspondence analysis was used to visually display relationships and point out features that are relatively distinctive in their faunal composition (Figs. 131 and 132). Faunal counts for each feature were tallied as rodents, small economic taxa (small mammal/bird, small mammal, prairie dog, muskrat, cottontail, and jack rabbit), carnivore (the carnivores and medium mammal), large mammal (medium to large mammal, large mammal, medium artiodactyl, deer, and pronghorn), bird, and fish. Figure 131 plots two axes that account for 64.5 percent of the variance in the faunal composition of these features. Basically, the small and large animal proportions define axis 1 and account for 37.2 percent of the variance while axis 2 has birds and carnivores at one extreme and rodents at the other, accounting for another 27.3 percent of the variance. This produces two clusters; Features 20, 23, and 33 are outliers. The pit structures and pits (n=3) all fall within the group defined by larger proportions of large mammals. The roomblocks are more or less evenly divided between those defined by large and those defined by small mammals.

Table 58. Taxa Percentages for Pit Structures and Pits by Fill Type

Taxon	F. 16 Fill	F. 16 Floor Fill	F. 24 Floor Fill	F. 24 Floor	F. 24 Sub-floor	F. 25 Floor Fill	F. 27 Fill	F. 40 Fill	F. 42 Fill
N	6	3	3	1	5	20	1	43	1
Small mammal/bird									
Small mammal			33.3						
Small to medium mammal									
Medium to large mammal						35.0		2.3	
Large mammal	16.7	66.7	33.3		100.0	15.0	100.0	48.8	
Prairie dog									
Pocket gopher									
Peromyscus									
Woodrat									
Vole									
Muskrat									
Cottontail						5.0			
Jack rabbit			33.3			15.0		9.3	
Medium carnivore						5.0			
Canid									
Badger									
Bobcat									
Medium artiodactyl	33.3					5.0		18.6	
Cervid	16.7							2.3	
Deer	33.0			100.0		10.0		16.3	
Pronghorn								2.3	100.0
Medium bird									
Canadian goose									
Turkey vulture									
Pelican									
Golden eagle									
Prairie falcon									
Phasianidae									
Gambel's quail									
Turkey									

Taxon	F. 16 Fill	F. 16 Floor Fill	F. 24 Floor Fill	F. 24 Floor	F. 24 Sub-floor	F. 25 Floor Fill	F. 27 Fill	F. 40 Fill	F. 42 Fill
Roadrunner									
Burrowing owl									
Flicker									
Jay						5.0			
Meadowlark									
Turtle									
Fish		33.3				5.0			
Minimum # of taxa	1	2	2	1	1	5	1	3	1

Table 58. Pit Structures and Pits, continued.

Taxon	F. 52 Fill	F. 52 Floor Fill	F. 52 Feat. or Pot	F. 76 Fill	F. 76 Floor Fill	F. 76 Floor	F. 84 Floor	F. 153 Fill
N	4	1	1	52	39	34	1	3
Small mammal/bird								
Small mammal					2.6			
Small to medium mammal				1.9				
Medium to large mammal				11.5				
Large mammal			100.0	25.0	51.3	82.4	100.0	100.0
Prairie dog								
Pocket gopher					2.6			
Peromyscus								
Woodrat								
Vole								
Muskrat								
Cottontail					5.1			
Jack rabbit	25.0			13.5	15.4	14.7		
Medium carnivore								
Canid					2.6			
Badger								
Bobcat								

Taxon	F. 52 Fill	F. 52 Floor Fill	F. 52 Feat. or Pot	F. 76 Fill	F. 76 Floor Fill	F. 76 Floor	F. 84 Floor	F. 153 Fill
Medium artiodactyl				25.0	5.1			
Cervid	25.0			3.8	2.6			
Deer	25.0	100.0		11.5	2.6	2.9		
Pronghorn					2.6			
Medium bird								
Canadian goose								
Turkey vulture								
Pelican								
Golden eagle	25.0			3.8				
Prairie falcon								
Phasianidae								
Gambel's quail								
Turkey								
Roadrunner				3.8				
Burrowing owl								
Flicker								
Jay								
Meadowlark								
Turtle								
Fish					7.7			
Minimum # of taxa	3	1	1	4	6	2	1	1

Table 59. Taxa Percentages for the North Roomblock by Fill Type

Taxon	F. 7 Floor	F. 8 Floor	F. 10 Floor Fill	F. 10 Floor	F. 15 Roof Fall	F. 15 Floor Fill	F. 17 Floor Fill	F. 18 Floor Fill
N	12	2	4	34	2	4	5	5
Small mammal/bird								
Small mammal				5.9				
Small to medium mammal								

Taxon	F. 7 Floor	F. 8 Floor	F. 10 Floor Fill	F. 10 Floor	F. 15 Roof Fall	F. 15 Floor Fill	F. 17 Floor Fill	F. 18 Floor Fill
Medium to large mammal	8.3	50.0						
Large mammal	41.7		25.0	17.6				
Prairie dog	16.7							
Pocket gopher							20.0	
Peromyscus				2.9				
Woodrat								
Vole								
Muskrat								
Cottontail	8.3			35.3		50.0	20.0	20.0
Jack rabbit			25.0	8.8			20.0	20.0
Medium carnivore								
Canid								
Badger								
Bobcat								
Medium artiodactyl	16.7			17.6	50.0		20.0	20.0
Cervid			25.0			25.0		
Deer	8.3	50.0	25.0	5.9		25.0	20.0	20.0
Pronghorn								
Medium bird								
Canadian goose					50.0			
Turkey vulture								
Pelican								
Golden eagle								
Prairie falcon								
Phasianidae								
Gambel's quail								
Turkey								
Roadrunner								
Burrowing owl								
Flicker								
Jay								

Taxon	F. 7 Floor	F. 8 Floor	F. 10 Floor Fill	F. 10 Floor	F. 15 Roof Fall	F. 15 Floor Fill	F. 17 Floor Fill	F. 18 Floor Fill
Meadowlark				2.9*				
Turtle								
Fish				2.9				
Minimum # of taxa	3	1	2	4	2	2	4	3

* includes a nearly complete skeleton counted as one element

Table 59. North Roomblock , continued.

Taxon	F. 19 Floor Fill	F. 19 Floor	F. 20 Floor Fill	F. 20 Floor	F. 21 Floor Fill	F. 22 Roof Fall	F. 22 Floor Fill	F. 22 Sub-floor
N	3	20	11	23	4	7	66	3
Small mammal/bird		15.0						
Small mammal			9.1	4.3				33.3
Small to medium mammal							3.0	
Medium to large mammal			9.1					
Large mammal		20.0	18.2	21.7	50.0		21.2	33.3
Prairie dog							3.0	
Pocket gopher				8.7			4.5	
Peromyscus								
Woodrat								
Vole				21.7				
Muskrat							3.0	
Cottontail	33.3	5.0	18.2	13.0	25.0	14.3	21.2	
Jack rabbit		5.0		8.7		14.3	1.5	33.3
Medium carnivore								
Canid								
Badger							6.1	
Bobcat						14.3		
Medium artiodactyl	33.3	35.0	9.1	17.4		14.3	18.2	
Cervid			9.1			14.3		
Deer		20.0	27.3	4.3		14.3	9.1	

Taxon	F. 19 Floor Fill	F. 19 Floor	F. 20 Floor Fill	F. 20 Floor	F. 21 Floor Fill	F. 22 Roof Fall	F. 22 Floor Fill	F. 22 Sub-floor
Pronghorn								
Medium bird							3.0	
Canadian goose								
Turkey vulture							1.5	
Pelican								
Golden eagle	33.3							
Prairie falcon						14.3	3.0	
Phasianidae								
Gambel's quail							1.5	
Turkey								
Roadrunner								
Burrowing owl								
Flicker								
Jay								
Meadowlark					25.0			
Turtle								
Fish								
Minimum # of taxa	3	3	2	5	3	5	10	2

Table 59. North Roomblock , continued.

Taxon	F. 23 Floor Fill	F. 23 Floor	F. 23 Feat. or Pot	F. 57 Floor Fill	F. 57 Floor	F. 63 Roof Fall	F. 63 Floor Fill
N	6	8	1	1	3	1	4
Small mammal/bird							
Small mammal							
Small to medium mammal							
Medium to large mammal							
Large mammal		25.0		100.0			
Prairie dog	16.7	12.5					
Pocket gopher							

Taxon	F. 23 Floor Fill	F. 23 Floor	F. 23 Feat. or Pot	F. 57 Floor Fill	F. 57 Floor	F. 63 Roof Fall	F. 63 Floor Fill
Peromyscus							
Woodrat							
Vole							
Muskrat							
Cottontail		12.5			33.3		
Jack rabbit	16.7		100.0				
Medium carnivore							
Canid							
Badger							
Bobcat							
Medium artiodactyl	33.3	25.0					50.0
Cervid						100.0	
Deer	16.7				66.7		25.0
Pronghorn							
Medium bird							
Canadian goose							
Turkey vulture							
Pelican	16.7						
Golden eagle							
Prairie falcon							
Phasianidae							25.0
Gambel's quail							
Turkey		12.5					
Roadrunner		12.5					
Burrowing owl							
Flicker							
Jay							
Meadow lark							
Turtle							
Fish							
Minimum # taxa	4	5	1	1	2	1	2

Table 60. Taxa Percentages for the East Roomblock by Fill Type

Taxon	F. 29 Floor Fill	F. 29 Floor	F. 29 Feat. or Pot	F. 29 Sub-floor	F. 30 Floor	F. 31 Floor Fill	F. 31 Floor	F. 33 Floor Fill	F. 34 Floor Fill
N	21	1	12	65	3	34	3	16	3
Small mammal/bird						2.9			
Small mammal								6.3	
Small to medium mammal									
Medium to large mammal	4.8		16.7	6.2		5.9			
Large mammal	4.8			6.2	33.3	2.9	66.7	6.3	
Prairie dog						2.9			
Pocket gopher	4.8								
Peromyscus									
Woodrat						2.9			
Vole									
Muskrat									
Cottontail	23.8		16.7	13.8	33.3	41.2		56.3	
Jack rabbit	14.3			9.2		5.9		6.3	66.7
Medium carnivore									
Canid									
Badger									
Bobcat									
Med. artiodactyl	38.1		33.3	44.6		26.5		12.5	
Cervid				1.5					33.3
Deer	9.5	100.0	8.3	9.2		8.8	33.3		
Pronghorn			25.0	9.2	33.3			6.3	
Medium bird									
Canadian goose									
Turkey vulture									
Pelican									
Golden eagle									
Prairie falcon									
Phasianidae									

Taxon	F. 29 Floor Fill	F. 29 Floor	F. 29 Feat. or Pot	F. 29 Sub-floor	F. 30 Floor	F. 31 Floor Fill	F. 31 Floor	F. 33 Floor Fill	F. 34 Floor Fill
Gambel's quail									
Turkey									
Roadrunner									
Burrowing owl									
Flicker									
Jay									
Meadowlark									
Turtle								6.3	
Fish									
Minimum # of taxa	4	1	3	4	2	5	1	3	2

Table 60. East Roomblock , continued.

Taxon	F. 34 Floor	F. 35 Floor Fill	F. 36 Floor Fill	F. 37 Floor Fill	F. 37 Floor	F. 38 Floor Fill	F. 38 Floor	F. 41 Floor Fill	F. 41 Floor
N	4	12	20	10	2	8	5	22	1
Small mammal/bird									
Small mammal						25.0		13.6	
Small to medium mam.									
Medium to large mam.	25.0		15.0						
Large mammal		16.7	45.0	20.0		25.0		4.5	
Prairie dog								4.5	
Pocket gopher			5.0						
Peromyscus									
Woodrat				10.0					
Vole									
Muskrat									
Cottontail		8.3	10.0	30.0		12.5		13.5	
Jack rabbit		25.0	5.0	20.0	50.0	12.5		18.2	100.0
Medium carnivore									
Canid									

Taxon	F. 34 Floor	F. 35 Floor Fill	F. 36 Floor Fill	F. 37 Floor Fill	F. 37 Floor	F. 38 Floor Fill	F. 38 Floor	F. 41 Floor Fill	F. 41 Floor
Badger									
Bobcat									
Medium artiodactyl	75.0	33.3	10.0	20.0		25.0	100.0	9.1	
Cervid								18.2	
Deer		16.7	5.0		50.0			9.1	
Pronghorn									
Medium bird								9.1	
Canadian goose									
Turkey vulture									
Pelican									
Golden eagle									
Prairie falcon									
Phasianidae									
Gambel's quail									
Turkey									
Roadrunner									
Burrowing owl									
Flicker									
Jay									
Meadowlark									
Turtle									
Fish			5.0						
Minimum # of taxa	1	3	4	4	2	3	1	5	1

Table 60. East Roomblock , continued.

Taxon	F. 41 Feat. or Pot	F. 44 Floor	F. 48 Floor Fill	F. 48 Floor	F. 79 Floor Fill	F. 79 Floor	F. 83 Floor Fill	F. 89 Floor Fill	F. 97 Floor Fill
N	2	2	2	15	9	1	30	8	7
Small mammal/bird									14.3
Small mammal	50.0								

Taxon	F. 41 Feat. or Pot	F. 44 Floor	F. 48 Floor Fill	F. 48 Floor	F. 79 Floor Fill	F. 79 Floor	F. 83 Floor Fill	F. 89 Floor Fill	F. 97 Floor Fill
Small to medium mammal									
Medium to large mammal				13.3					
Large mammal				6.7	11.1		20.0	37.5	42.9
Prairie dog									
Pocket gopher									
Peromyscus									
Woodrat									
Vole									
Muskrat							3.3		
Cottontail				26.7	33.3		43.3		14.3
Jack rabbit				6.7	22.2	100.0	10.0		
Medium carnivore									
Canid									
Badger									
Bobcat									
Medium artiodactyl	50.0	50.0	50.0	20.0	33.3		13.3	12.5	
Cervid				13.3			6.7	37.5	
Deer				13.3			3.3	12.5	14.3
Pronghorn									
Medium bird									
Canadian goose									
Turkey vulture									
Pelican									
Golden eagle									
Prairie falcon									
Phasianidae									
Gambel's quail			50.0						
Turkey									
Roadrunner									
Burrowing owl									14.3

Taxon	F. 41 Feat. or Pot	F. 44 Floor	F. 48 Floor Fill	F. 48 Floor	F. 79 Floor Fill	F. 79 Floor	F. 83 Floor Fill	F. 89 Floor Fill	F. 97 Floor Fill
Flicker		50.0							
Jay									
Meadowlark									
Turtle									
Fish									
M Minimum # of taxa	2	2	2	3	3	1	4	3	3

Figure 132 looks at only the small mammals, large mammals, and birds. In this plot, which accounts for all of the variability (100 percent), the basic division is large and small mammals ([illegible] percent of the variance) with birds producing some outlying cases. Features 23 and 33 are still outliers with only one room (Feature 20) switching from the predominately small mammal group to the large mammal.

The outlying features are relatively easily explained. Feature 20 has the largest number of rodent bones (n=7), including five that are from the same rodent, probably a burrow death. When rodents are removed from the plot, it fits well with the large mammal group. Feature 23 has a fairly small sample and birds make up a good portion of that. It is also the room with the pelican, turkey, and roadrunner. Feature 33 has an array of scorched and burned bone, although there is no indication the room was burned. Between three and five pieces of this bone are probably from the same cottontail cranium and mandibles, which, in a small sample such as this, overwhelms the other taxa.

Ubiquity

Another way of comparing the provenience divisions is through ubiquity or the number of feature divisions where a taxon occurs. Each column in Tables 58 through 60 is treated as a unit of analysis. The presence of a species is tallied and the unknown taxa tallied only when there is no species or less inclusive taxon that could account for that specimen. For example, the sample from Feature 10 floor fill in Table 59 has a sample of four, a large mammal, a jack rabbit, a cervid, and a deer bone. Jack rabbit and deer would be tallied and large mammal and cervid would not since both of the latter could have come from a deer. Feature 21 floor fill in the same table has two large mammal, a cottontail, and a meadowlark specimen. All three are tallied because neither the cottontail or meadowlark can account for the large mammal bones. Table 61 gives these indices for each taxon by provenience group and the site as a whole.

From this perspective, deer, which is the third most common species numerically, is the most ubiquitous or is found in more provenience divisions in all three area groups and the site as a whole. How much of this is due to collection practices where large bones are more likely to be collected is difficult to determine. Collection bias may also influence the rabbit ubiquity. Jack rabbit, which is less numerous than cottontail in all but the pit structure and pit group, has a larger index overall and the indices are the same in the east roomblock assemblage.

Diversity

The north roomblock has a more diverse or rich fauna, mainly birds (Table 62). Considering that the east roomblock has a larger sample (318 compared to 229), that richness (the number of taxa that contribute to a faunal assemblage) is highly correlated with sample size (Grayson 1984:132), and that the two roomblocks presumably underwent the same kind of collection bias, this difference may be significant. Residents of the north roomblock may have had a greater interest or use for birds. Differential distributions of bird bone have also been noted at Grasshopper Pueblo where there is a marked association between ceremonial structures and the remains of birds (usually wing and leg bones) with dark feathers (J. Olsen 1990:79-80).

Species Utilization

Little is known about subsistence practices in the Gila area, and still less about the Salado. According to Lekson (1989:F73-74), Classic Mimbres and immediate post-Classic or Animas phase sites are less abundant in the Gila than the Mimbres Valley while Salado sites are a minor occupation of the Mimbres Valley but are large, numerous, and were occupied later in the Gila Valley, suggesting a demographic shift between the two valleys motivated by cyclic exhaustion and regeneration of floodplain resources. The abundance of corn in flotation samples, changes in ground stone assemblages, and a preponderance of mealing facilities all suggest a heavy reliance on corn agriculture (Lekson 1989:96).

Lekson's statements suggest a number of implications that can be evaluated using the Ormand faunal data. An increase in the population of the Gila Valley over previous periods could have led to animal resource depletion and dependence on more distant or less desirable resources. If floodplain resources were so important to the Salado, fauna dependent on these resources should be well represented in the collection. Finally, if corn agriculture was important to the Salado, the faunal composition should resemble those in other areas with a high dependence on agriculture.

The second of these implications is relatively easily addressed, the other two require a closer examination of the data. Few of the species recovered from Ormand are considered riverine resources. Muskrat, Canadian goose, turtle, and fish comprise only 1.6 percent of the site assemblage, hardly enough to demonstrate a dependence on riverine resources. The scarcity of migratory water fowl and the few fish suggest that, while aware of the potential of the river, the Ormand residents chose not to exploit these resources to any great extent.

Overall specimen counts (Tables 44 and 45) indicate that cottontail rabbits, jack rabbits, deer, and perhaps pronghorn were exploited on a regular basis. Cottontail is the most numerous species (15.2 percent) followed by jack rabbit (10.2 percent), deer (9.7 percent), and pronghorn (1.8 percent). Ubiquity ranks the taxa somewhat differently. Deer are found in the most proveniences followed by jack rabbit, cottontail, then pronghorn. When summarized (Table 63) as rodent, small economic mammal (small mammal/bird, small mammal, prairie dog, muskrat, cottontail, and jack rabbit), carnivore (carnivore, canid, badger, and bobcat), artiodactyl/large mammal (medium to large mammal, large mammal, medium artiodactyl, cervid, deer, and pronghorn), bird (medium bird and the bird taxa), and other (fish and turtle), artiodactyls comprise the largest group in all three provenience divisions and at the site as a whole. Small mammal is the only other group that contributes considerable numbers. While collection biases make it difficult to determine the relative utilization

Table 61. Taxon Ubiquity

Taxon	Pit Structure/ Pits		North Roomblock		East Roomblock		Site Total	
	N	U	N	U	N	U	N	U
Small mammal					1	.04	1	.01
Large mammal	7	.41	3	.13			10	.15
Prairie dog			3	.13	2	.07	5	.07
Pocket gopher	1	.06	3	.13	2	.07	6	.09
Peromyscus			1	.04			1	.01
Woodrat					2	.07	[illegible]	[illegible]
Vole			1	.04			1	.01
Muskrat			1	.04	1	.07	3	.04
Cottontail	2	.12	14	.61	15	.37	31	.46
Jack rabbit	7	.41	11	.48	15	.37	33	.49
Medium carnivore	1	.06					1	.01
Canid	1	.06					1	.01
Badger			1	.04			1	.01
Bobcat			1	.04			1	.01
Medium artiodactyl			3	.13	8	.30	11	.16
Cervid			1	.04			1	.01
Deer	9	.53	15	.65	14	.52	38	.57
Pronghorn	3	.18			4	.15	7	.10
Medium bird					1	.04	1	
Canadian goose			1	.04			1	.01
Turkey vulture			1	.04			1	.01
Pelican			1	.04			1	.01
Golden eagle	2	.12	1	.04			3	.04
Prairie falcon			2	.09			2	.03
Phasianidae			1	.04			1	.01
Gambel's quail			1	.04	1	.04	2	.03
Turkey			1	.04			1	.01
Roadrunner	1	.06	1	.04			2	.03
Burrowing owl					1	.04	1	.01
Flicker					1	.04	1	.01

Taxon	Pit Structure/ Pits		North Roomblock		East Roomblock		Site Total	
	N	U	N	U	N	U	N	U
Jay	1	.06					1	.01
Meadowlark			2	.09			2	.03
Turtle					1	.04	1	.01
Fish	3	.18	1	.04	1	.04	5	.07
Number of Proveniences	17		23		27		67	

Note: Number of proveniences in which it occurs and ubiquity or the number of proveniences with that taxa ÷ total number of proveniences x 100

Table 62. Diversity of Taxa by Provenience Group (number of species)

Taxon	Pit Structures/ Pits	North Roomblock	East Roomblock	Site Total
Rodent taxa	1	3	4	4
Small economic mammals	2	4	4	4
Carnivores	1	2	0	3
Artiodactyls	2	1	2	2
Birds	3	10	3	13
Other	1	1	2	2
Total species	12	21	15	28

Significance tests:
provenience groups: rodent v. other X^2=1.7657 df 2 p=.4136
small economic v. other X^2= .4764 df 2 p=.7880
carnivore v. other X^2=1.4730 df 2 p=.4788
large mammal v. other X^2=1.3587 df 2 p=.5070
bird v. other X^2=3.5036 df 2 p=.1735

Table 63. Summary of Faunal Counts (cervid not included)

Taxa Group	Pit Structure/Pit		North Roomblock		East Roomblock		Site Total	
	N	%	N	%	N	%	N	%
Rodents	1	.5	12	5.3	4	1.3	17	2.3
Small economic mam.	33	15.6	77	34.4	117	38.4	227	30.6
Carnivores	2	.9	2	.9			4	.5
Artiodactyl/lge mam.	165	77.8	117	52.2	177	58.0	459	61.9
Birds	6	2.8	15	6.7	5	.3	26	3.5

Taxa Group	Pit Structure/Pit		North Roomblock		East Roomblock		Site Total	
	N	%	N	%	N	%	N	%
Other	5	2.3	1	.4	2	.7	8	1.1
Sample size	212	100.0	224	100.0	305	100.0	741	100.0

Significance tests:

provenience groups:
small v. large: X^2=33.9109 df 2 p=.0000
small v. large v. bird X^2=45.0762 df 4 p=.0000
large v. bird X^2=12.9817 df 2 p=.0015
small v. bird X^2= 9.7793 df 2 p=.0075

for the primary food animals, all measures indicate that deer and the rabbits were the most important.

Reviewing the faunal data from the Gila Valley, LeBlanc and Whalen (1980:230) found information on three Classic sites. In the faunal assemblage from LA 5356, fish bones were the most common, followed by those from cottontails, jack rabbits, turtles, gophers, birds, and deer. The two other sites have very small samples, a single identified bone (a deer tooth) from one and a sample of 19 where jack rabbit and cottontail were the most common taxa. LA 5356 is quite close to Ormand, on the east side of the Gila River, yet has a very different faunal composition, more than can be accounted for by collection bias. Riverine resources played a greater role and artiodactyls a lesser one than at Ormand. Prevalence of cottontail over jack rabbit may suggest similar small mammal procurement strategies or may simply indicate that cottontails were the more abundant of the two rabbits in the general area.

Salado subsistence practices are better known in the Mimbres Valley where frequencies of large game species increase over previous periods and cottontails are more abundant than in samples from earlier periods. Fish, bird, and amphibian bones are rare. Nelson and LeBlanc interpret these findings as resulting from low human population densities and a shift away from agricultural dependence. They maintain that because the human population was sparse, large game herds were relatively unaffected by hunting, and that a reduction in field areas allowed cottontails to increase in number (Nelson and LeBlanc 1986:235-239). One problem with this explanation is that these same patterns appear at Cliff (i.e., Ormand), viewed as the population center for this period (Nelson and LeBlanc 1986:118), where increased agriculture was necessary to support the population. In the Ormand sample, both the overall large mammal verses small mammal counts and ubiquity indicate deer was the most utilized species supplemented by cottontail and jack rabbit. Compared to LA 5356, deer was far more important than earlier. Furthermore, Nelson and LeBlanc's assertion that cottontail densities decrease when floodplains were cleared for fields (Nelson and LeBlanc 1986:236) is not supported by studies that find cottontails flourish and extend their range when crude agriculture is practiced as well as in abandoned and fallow field areas (Chapman et al. 1982:99).

Turning to the other two implications, there is no evidence that population density forced the Ormand residents to rely on resources from more distance areas or on less desirable food animals. Nor is there evidence that rodents were utilized to any extent, assuming some evidence would have survived the collection bias, and none of the economic taxa are strictly woodland species indicating they went further in search of food resources. Instead, species that favor grasslands or those that concentrate near or prey on species that concentrate near agricultural fields predominate. Deer are found in all habitats and it may be that their habits, which are more suited to small group hunting (e.g., Linskey 1975:257) made deer an attractive resource. Pronghorn prefer open areas and congregate so that they are more effectively hunted through communal drives (Linskey 1979:258). A good number of the species recovered from Ormand could have been taken from field areas. Prairie dogs can devastate crops planted near their burrows. Muskrats relish corn and can damage crops near watercourses. Both cottontails and jack rabbits increase rapidly in field areas and can do considerable damage. Badgers not only rely on burrowing rodents, such as prairie dogs for food, but also enjoy corn in their fall diet. Deer and pronghorn both eat agricultural crops. Most of the bird species will either feed in field areas or prey on rodents that inhabit these fields. This suggests that the strategy at Ormand was one that either took advantage of the animals concentrated around their fields or defended their crops by taking whatever species were encountered, supplemented by an individual or small group strategy of hunting deer.

Worked and Utilized Bone

Bone tools and pieces of worked or utilized bone are listed in Table 64. The sample is small but includes a range of functional types as well as ornaments and a possible gaming piece. Few are extensively modified and most are fragments. The most abundant type is unknown tool, used for fragments of objects that could not be identified (Table 65). Fine-point awls (Fig. 133) are more numerous than perforators with coarse points (Fig. 134, top). The ornaments or possible ornaments (Fig. 134, bottom) include a disc-shaped pendant, a piece of perforated antler, and a pendant blank or gaming piece without hatches.

Pieces of antler with multiple holes were found at Grasshopper and at Kinishba Ruin. Their purpose is uncertain. Much effort goes into their manufacture, thinning the antler and drilling the holes with no evidence of wear. Olsen notes that these objects have a very restricted range, generally in Late Mogollon or prehistoric Western Pueblo sites (S. Olsen 1979:349-350, 1980:62). None were reported for Salado sites in the Mimbres Valley (Nelson and LeBlanc 1986:197-201).

Bone with edges that have small flakes and rounding that could result from use (Fig. 135, top) are classified as bones with use wear. None have evidence of manufacture and appear to be pieces of bone that were utilized because their size and shape suited a purpose. Carnivores produce similar edges on bone (e.g., Binford 1981, figs. 3.22 and 3.52), yet the Ormand specimens lack the pitting that generally characterizes bone chipped by carnivore teeth. Another object (Fig. 135, bottom) placed in this group is a deer innominate with two edges that have marks resembling rodent gnawing but are quite large and could be human alteration.

Most of the worked bones are from floor fill and could represent roof-top activities (Table 65). Formal tools are rarely complete. Complete formal tools include a medium-point awl from the floor of Feature 49, fine-point awls from the fill and floor fill of Feature 52, and a coarse-point awl from the fill and a gaming piece or ornament blank from floor fill in Feature 76. Bones with possible use-wear are relatively restricted in distribution. Three are from floor fill in Feature 76 and the other from floor fill in Feature 22.

Table 64. Worked Bone Attributes

Feature-FS-Lot	Taxon/Element/Portion	Tool Type and Fragmentation	Modification	Wear/Use
7-11-3 floor	large mammal; long bone; shaft fragment	unknown; spatulate end fragment	moderate shaping; ground/polished	facet on tip with stria; random shallow scratches; polish
8-18-2 floor	deer; metacarpal; proximal	unknown; probably the butt end of an awl	moderate shaping; polish and diagonal stria	unknown
10-44-2 floor fill	large mammal; long bone; shaft fragment	very coarse point awl; distal end	distal moderate shaping; polish and grinding	polish; diagonal cuts or scratches; transverse stria
22-11-3 floor fill	artiodactyl; tibia; shaft fragment	use wear; complete?	none	polish and step fractures
22-11-4 floor fill	artiodactyl; long bone shaft fragment	very coarse point awl; proximal damaged or missing	moderate shaping; polish and grinding	transverse stria; step fractures; polish
23-4-2 floor fill	deer; metatarsal; distal fragment	unknown; probably the butt end of an awl	moderate to extensive shaping; polished and ground	unknown
24-12-2 floor fill	large mammal; long bone; shaft fragment	unknown; edge fragment	burned; well shaped	transverse striations; especially on edge
27-5-1 fill	large mammal; long bone; shaft fragment	pendant; about half	heavily modified; polished and ground	n/a; hole diameter 5.2 mm
31-17-4 floor fill	deer; innominate; acetabulum and ischium	tool?	portions removed proximal and midshaft - possibly very large rodent gnawing	none apparent; polish
38-16-3 floor	artiodactyl; long bone; shaft fragment	awl; tip and butt end missing	moderate shaping; polished and ground	transverse and random stria
40-26-7 fill	artiodactyl; long bone; shaft fragment	use wear; complete?	none	flakes/spalls on edge
48-19-1 floor	deer; ulna; proximal end	medium point awl; complete but broken	tip is moderately ground and polished	polish
48-25-1 floor	large mammal; long bone; shaft fragment	spatulate tool; end fragment	end well shaped; polished and ground	end facet with stria; polish
52-13-1 fill	golden eagle; humerus; shaft	fine point awl; complete	tip moderately polished and ground	polish
52-35-1 floor fill	deer; metacarpal; proximal and shaft fragment	fine point awl; complete	moderate to extensive modification; polished and ground	polish

Feature-FS-Lot	Taxon/Element/Portion	Tool Type and Fragmentation	Modification	Wear/Use
52-36-1 fill	deer; accessory metapodial	fine point awl; complete	slight modification distal; polish and diagonal stria	polish
52-54-1 floor feature	large mammal; long bone; shaft fragment	awl; proximal and distal ends missing	moderate modification; heavily striated - diagonal and longitudinal	unknown
63-5-1 roof fall	Cervid; antler tine	flaker?; distal end	slight modification on tip	facet and stria on tip; polish
63-37-1 floor fill	artiodactyl; ulna; proximal fragment	unknown; fragmentary	slight modification at proximal end	unknown
76-16-1 fill	medium to large mammal; long bone? shaft fragment	fine point awl; distal and shaft fragment	moderate modification shaft and distal; polish	polish; transverse stria
76-31-1 fill	Cervid; antler	perforated antler; ornament? fragment	face well ground; holes drilled throughout	n/a
76-32-1 fill	artiodactyl; long bone; shaft fragment	coarse point awl; complete?	moderately ground	polish; random stria; small spalls
76-33-1 fill	large mammal; long bone; shaft fragment	fine point awl; distal and shaft fragment	completely modified	polish; few transverse stria
76-35-1 fill	Cervid; antler tip	flaker? distal	bifacially beveled at tip; stria	polish; slight spalling; deep pit
76-48-3 floor fill	large mammal; long bone;' shaft fragment	gaming piece or ornament blank; complete	moderate grinding on edges	n/a
76-50-1 floor fill	Cervid; antler tip	flaker? distal	none	polish; spalls/abrasion
76-58-12a floor fill	large mammal; long bone; shaft fragment	use wear; complete	flaked? edge	spalls or flakes on edge; tip polished with stria on face
76-58-12b floor fill	large mammal; long bone; shaft fragment	use wear; complete	flaked?	polish; diagonal stria
76-58-13 floor fill	large mammal; long bone shaft fragment	use wear; complete	flaked?	polish; few stria
79-28-8 floor fill	artiodactyl metatarsal; shaft fragment	unknown; midsection	moderate grinding	unknown
83-9-10 floor fill	jack rabbit; femur; shaft fragment	fine point awl; distal and shaft fragment	minimal modification; edge polish and stria	polish; transverse stria; small rounded spalls
83-11-6 floor fill	artiodactyl; long bone; shaft fragment	unknown; midsection	moderate modification; polish and grinding	unknown

Feature-FS-Lot	Taxon/Element/Portion	Tool Type and Fragmentation	Modification	Wear/Use
84-12-1 floor	large mammal; long bone; shaft fragment	awl?; near distal end	moderate modification; polished and ground	unknown
89-16-6 floor fill	Cervid; antler; tip	flaker? distal	none	random deep stria
97-14-1 floor fill	deer; tibia; distal fragment	awl? butt end	moderate modification; ground and polished	unknown

Table 65. Summary of Fill and Tool Types

Fill or Tool Type	Pit Structure/Pit	North Roomblock	East Roomblock
General fill	9		
Roof fall		1	
Floor fill	9	5	4
Floor	1	2	3
Feature	1		
Fine point awl	5		1
Coarse point awl	1	2	1
Spatulate-end tool		1	1
Ornament	2		
Gaming piece	1		
Antler flaker	2	1	1
Tool fragments	5	3	3
Utilized bone	4	1	
Totals	20	8	7

A relatively narrow range of taxa were used for tools, mostly large forms: medium to large mammal (n=1), large mammal (n=12), artiodactyl (n=7), cervid (n=5), and deer (n=8). The exceptions are awls made from an eagle humerus and a jack rabbit femur.

Missing from the assemblage are tubes and beads, commonly found in Southwestern bone tool assemblages and decorated objects known as hairpins. The absence of beads could be due to collection practices, where small objects may have been missed. Some of the Ormand coarse-point awls or tool fragments could conceivably be hair pins. Otherwise, the types of objects are consistent with those found in either the Mimbres Salado sites (Nelson and LeBlanc 1986) or Late Mogollon sites in Arizona (S. Olsen 1979, 1980).

Figure 130. Antler from Room 41, floor.

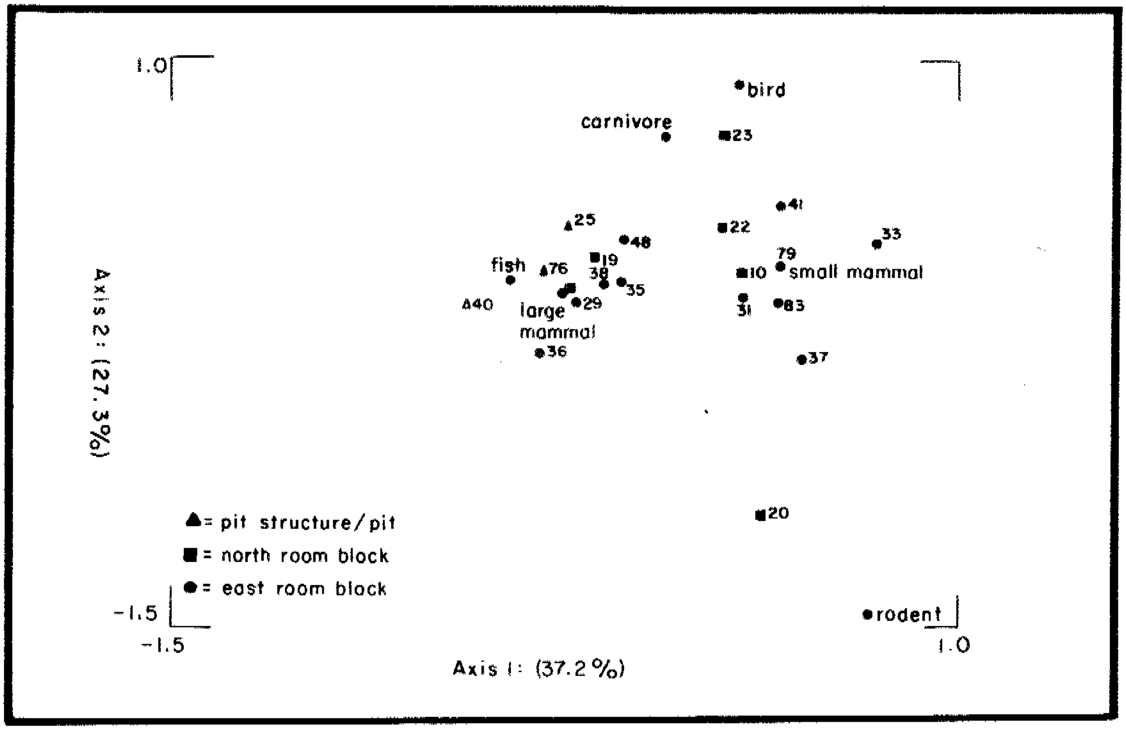

Figure 131. Correspondence plot of rodents, small mammals, carnivores, large mammals, birds, and fish.

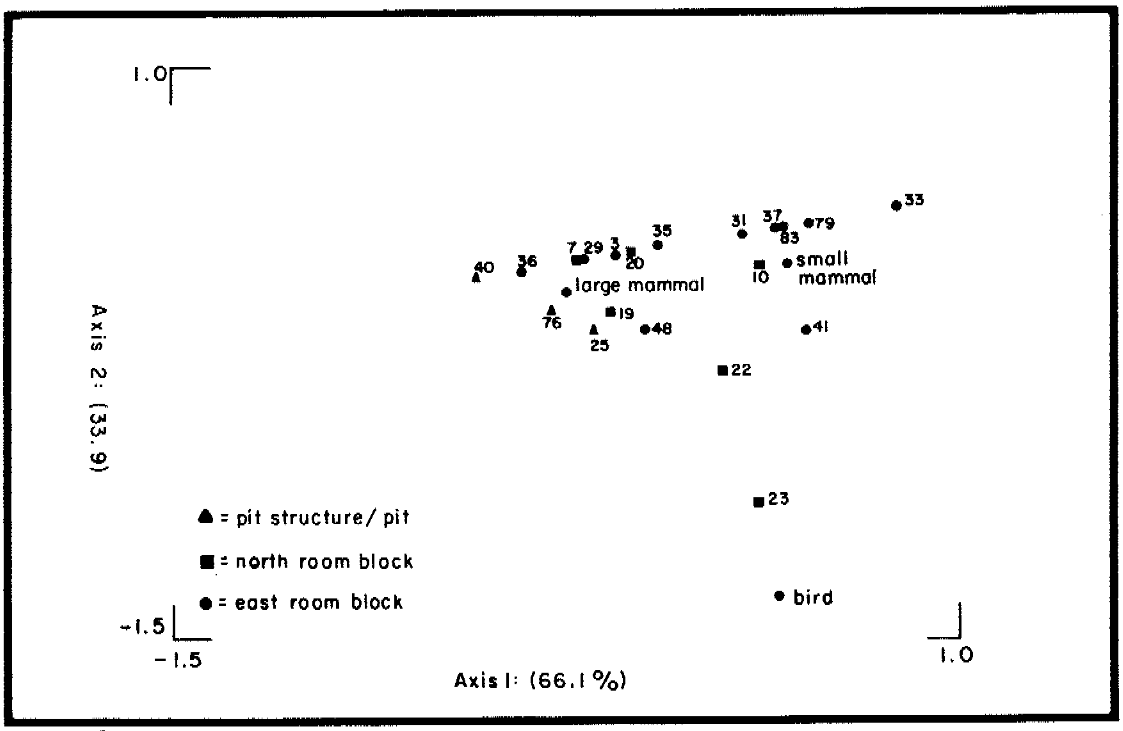

Figure 132. Correspondence plot of small mammals, large mammals, and birds.

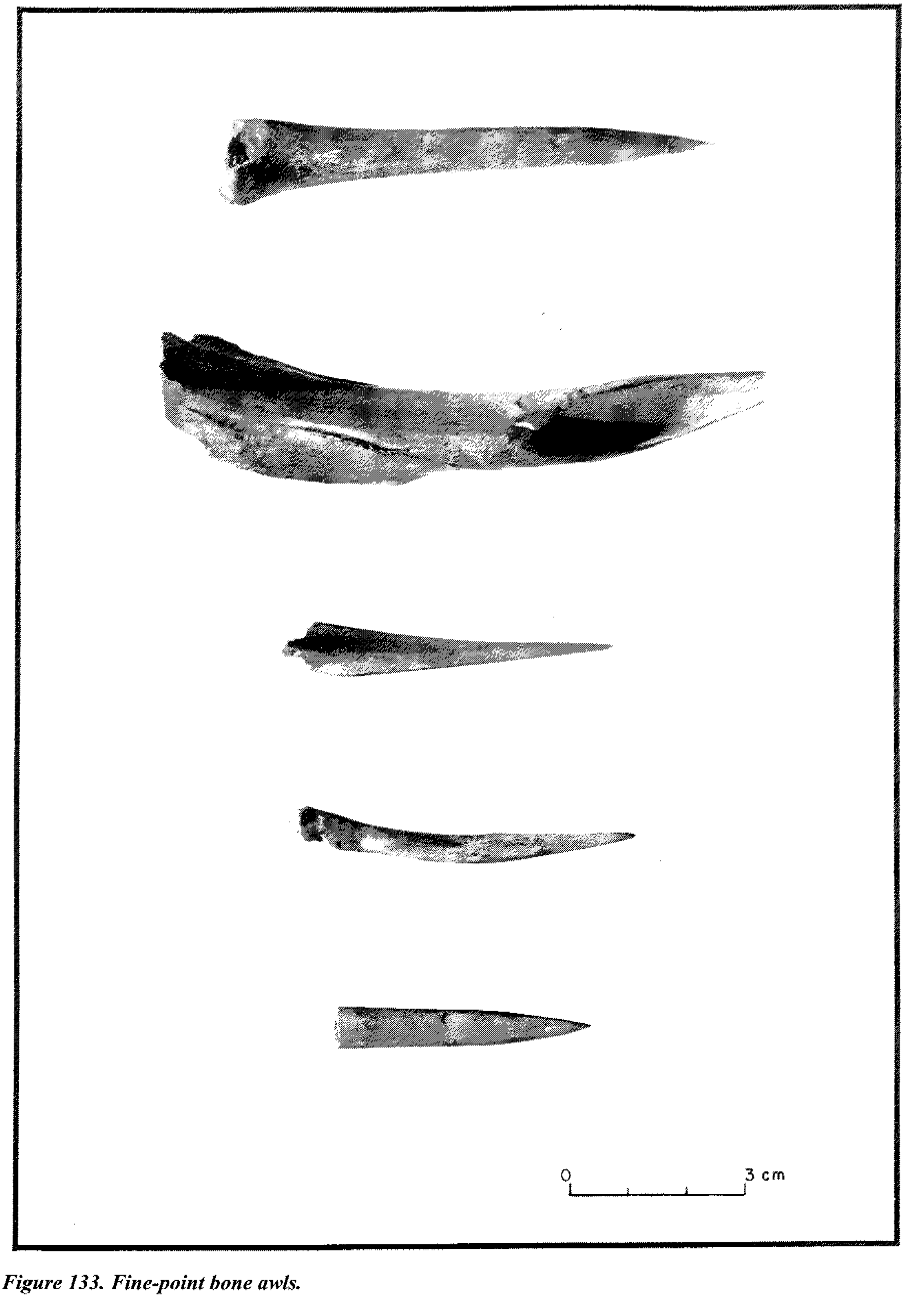

Figure 133. Fine-point bone awls.

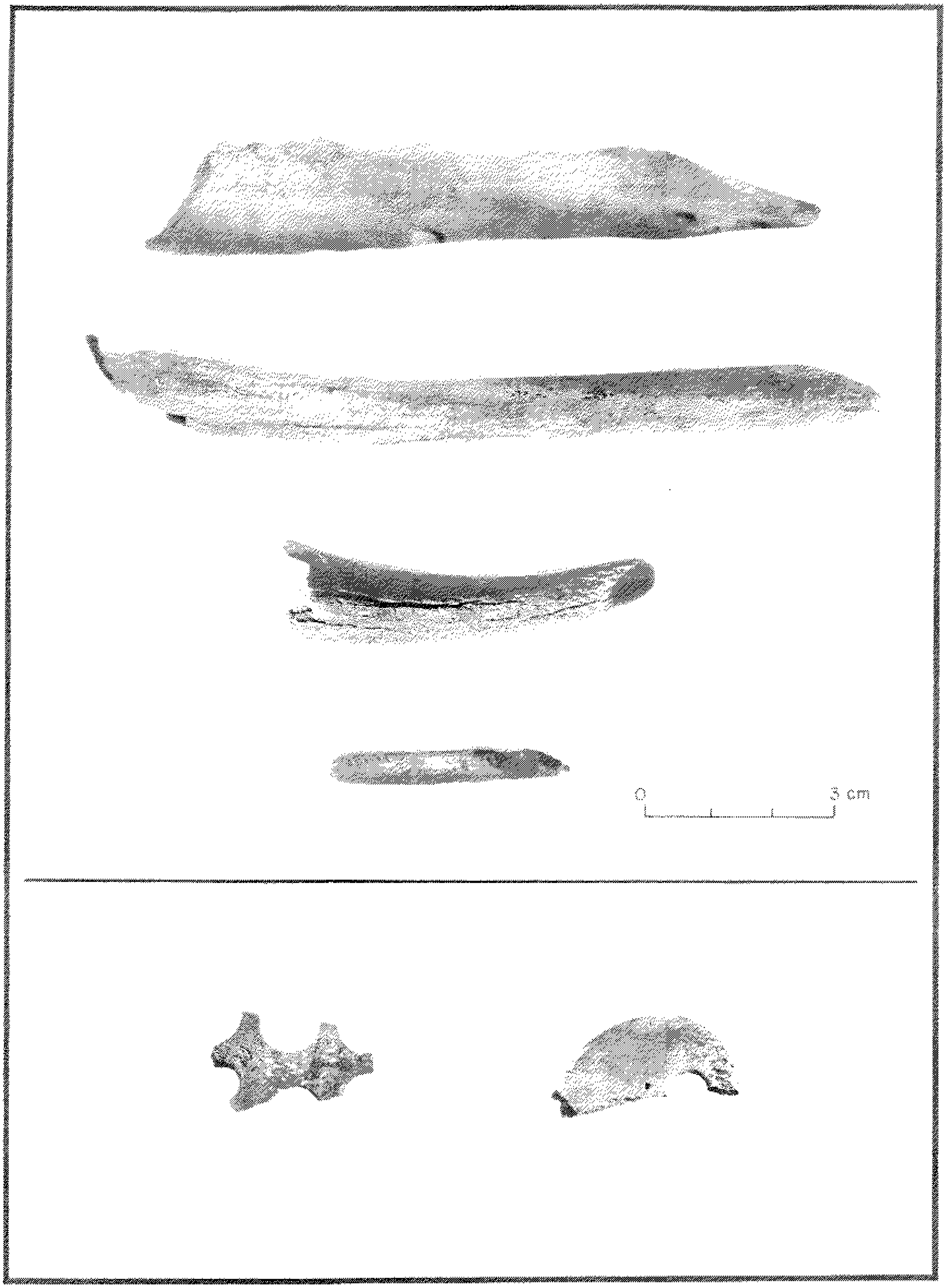

Figure 134. (top) Coarse-tipped bone tools; (bottom) bone ornaments.

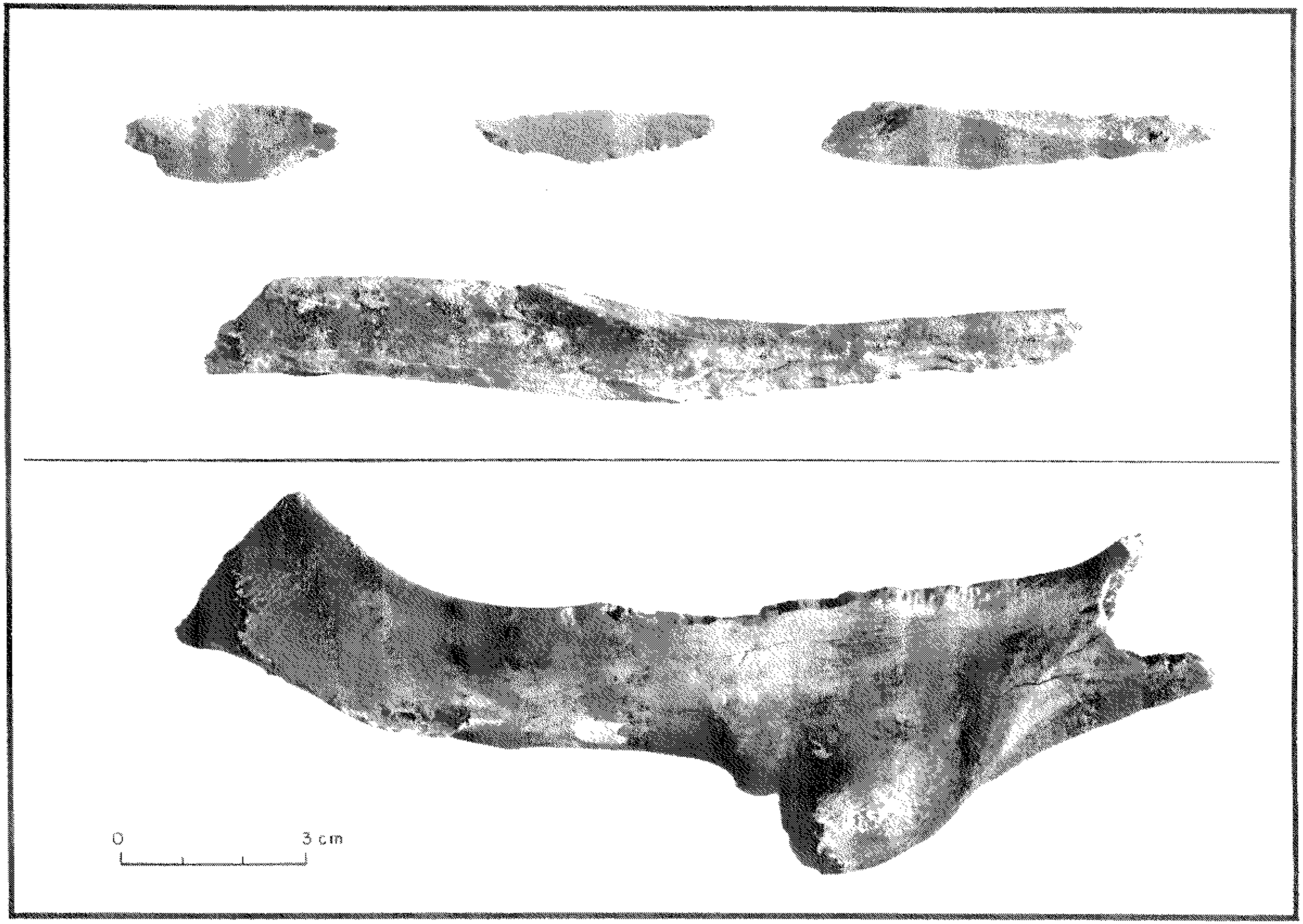

Figure 135. (top) Ormand bone with use-wear; (bottom) deer innominate with unusual alteration.

FLOTATION AND MACROBOTANICAL REMAINS

Pamela J. McBride and Mollie S. Toll[1]

Introduction

The Ormand Village is about 1.6 km south of Cliff, New Mexico, in a semidesert grassland biotic community. Mesquite, found growing in pit structure depressions, grows along with oak and cactus on south-facing slopes of the rolling hills to the west of the site, while juniper grows on the north-facing slopes. The site is on the first terrace of the Gila River, which is only 32 m east of Ormand. The site occupants had access to arable land in the lowlands of the Gila River Valley along with three nearby creeks for irrigation.

Botanical remains from the Ormand site have languished in basement storage more than 30 years, awaiting analysis. Ormand lacks the catastrophic, smothering burn that preserved remarkable quantities of plant debris at LA 5407, an early Pithouse period site approximately 145 km to the northwest (Toll and McBride 1996), and at Point of Pines, contemporary with Ormand and about the same distance to the west (Bohrer 1973). At both of these sites, recognizable corn, beans, and squash, and whole vessels full of tiny wild seeds clued excavators to collect many of the archaeobotanical artifacts. Excavation at Ormand in 1965-1966 predated the first mainstream publication suggesting the routine collection of soil samples for recovery of small cultural plant debris by flotation (Struever 1968). Though carbonized corn cobs were recorded in the Ormand field notes, only one *Zea mays* cob fragment from Room 57 was located in the state repository collection. All other macrobotanical specimens were wood or charcoal (Table 66). Additional botanical information comes from anatomical traits of roofing material cast in adobe. One ex post facto flotation sample was derived from soil matrix that accompanied a large dendrochronological sample from the burned roof fall of Room 15.

Methods

All available macrobotanical remains were examined, identified, and measured where appropriate (Tables 67 and 68). Specimens were weighed on a digital, top-loading balance with .01 g accuracy. Specimens were identified to taxon and part by comparison with modern reference specimens. Where necessary, fragile specimens were repackaged in acid-free tissue or polyester fiber, in hard containers, to protect them from further breakage.

The single flotation sample was processed at the Museum of New Mexico's Office of Archaeological Studies by the simplified "bucket" version of flotation (see Bohrer and Adams 1977). The 6.5-liter sample was immersed in a bucket of water, and a 30-40 second interval allowed for settling out of heavy particles. The solution was then poured through a fine screen (about 0.35 mm mesh) lined with a square of "chiffon" fabric, catching organic materials floating or in suspension. The fabric was lifted out and laid flat on a coarse mesh screen tray, until the recovered material had dried. The sample was sorted using a series of nested geological screens (4.0, 2.0, 1.0, 0.5 mm mesh),

[1]Ethnobotany Lab Technical Series #45

Table 66. LA 5793 Macrobotanical Plant Remains

Feature	North Roomblock							East Roomblock			Other	
Context	Room 15 Roof Fall Assoc. with Ceramics	Room 15 Roof Fall, SW Quad	Room 19 Final Floor Cleaning	Room 20 Floor Fill	Room 22 Floor Fill	Room 57 Floor Fill	Room 63 Floor Fill	Room 31 Floor Contact	Room 34 Floor Fill	Room 37 Floor Fill	Pit Structure Trash Fill	Ceremonial Structure Floor
DOMESTICATES: *Zea mays* maize						1 cob frag./.10						
OTHER: Unknown												1 uncharred unknown plant part
CONIFER WOOD: *Juniperus* juniper	3/.64				2/.11			1/.41				
Pinus pine									1/.01			
Pinus edulis piñon									15/1.09			
Indeterminate conifer											5/1.0 uncharred	
NONCONIFER WOOD: *Populus/Salix* cottonwood/willow		artifact 1/15.64	3/.08	2/.07	4/.37		22/5.65			4/.88		
Quercus oak			3/.38									
Unknown							1/0					
TOTAL TAXA	1	1	2	1	2	1	2	1	2	1	1	1

Note: plant remains are recorded as actual count/weight in grams.

Table 67. LA 5793 Room 15 Roof Fall Full-Sort Flotation Analysis Results

Taxon	Actual Count/Count per Liter
CULTURAL ANNUALS: Cheno-am	5*/.76*
Portulaca (purslane)	4*/.6*
DOMESTICATES: *Lagenaria* (gourd)	2r*/.3r*
Zea mays (maize)	c+*; 5k* frags./.76k* frags.
GRASSES: Gramineae (grass family)	4*/.6*
OTHER: Cucurbitaceae (cucurbita family)	3r*/.46r*
Unidentified	4*/.6*
NONCULTURAL ANNUALS: *Amaranthus* (pigweed)	17/2.6
Chenopodium (goosefoot)	204/31
Oenothera albicaulis evening primrose	12/1.8
Portulaca (purslane)	171/26
Talinum (flame flower)	3/.46
OTHER: Boraginaceae (borage family)	4/.6; 1f/.15f
Compositae (composite family)	2/.3
Euphorbia (spurge)	5/.76
TOTAL TAXA	13

Key: * = charred; c = cupule; f = fruit; k = kernel; r = rind.

Table 68. LA 5793 Species Composition of Flotation Sample Wood Charcoal

Taxon	Actual Count	Weight (in grams)
CONIFERS: *Juniperus* (juniper)	10	3.2
NONCONIFERS: *Populus/Salix* cottonwood/willow	1	0
Quercus (oak)	5	.2
cf. *Rhamnus* (buckthorn)	3	.1
Unknown	1	.1
TOTAL TAXA	5	3.6

Note: cf. = compares favorably.

and then reviewed under a binocular microscope at 7-45x. The material from the 0.5 mm screen size was subsampled, as it contained large numbers of uncharred seeds. Twenty-five percent by weight of the 0.5 mm screen was actually examined, so if one *Portulaca* seed was counted, this would be multiplied by four to calculate the estimated count and added to the number of *Portulaca* seeds encountered in other screen sizes. Actual numbers of plant parts encountered (or estimated for the whole sample, in the case of the 0.5 mm screen) are recorded in Table 66, as well as an adjusted seeds per liter of soil.

Table 69. Roof Impressions from LA 5793

	Smaller Adobe Chunk	Larger Adobe Chunk
Stem diameters in mm	3.0	6.0
	2.5	4.2
	5.6	8.2
	3.0	8.0
	2.6	4.8
		5.5
	mean = 3.3 n = 5	mean = 6.1 n = 6
Maximum stem length	35 mm	67 mm

A sample of 20 pieces of charcoal was identified from the flotation materials in the 4 mm screen size. Each piece was snapped to expose a fresh transverse section, and identified at 45x. Low-power, incident light identification of wood specimens does not often allow species- or even genus-level precision, but can provide reliable information useful in distinguishing broad patterns of utilization of a major resource class.

Results

North Roomblock

One flotation sample and seven macrobotanical samples were examined from the north roomblock. Juniper, oak, and cottonwood/willow wood were identified in macrobotanical samples (Table 66). A maize cob fragment (consisting of two consecutive cupules) was recovered from the floor fill of Room 57. One cottonwood/willow artifact, shaped like a large clothespin, was recovered from the roof fall of Room 15. Its function remains unknown.

Cultural remains that were identified from the flotation sample from Room 15 roof fall include charred cheno-am and purslane seeds, a maize kernel and cupule fragments, grass seeds, and both *Cucurbita* family (three fragments measuring 0.4 mm, 0.8 mm, and 0.9 mm in thickness) and gourd rind (Table 67). Eight uncharred seed taxa (probably representing modern contaminants) were also identified. Possible buckthorn was the only wood charcoal taxon recovered in the flotation sample that was not present in the macrobotanical samples.

East Roomblock, Pit Structure, and Ceremonial Structure

Juniper, pine, piñon, and cottonwood/willow woods were identified in macrobotanical samples from the east roomblock. Uncharred indeterminate conifer wood was recovered from the pit structure trash fill. An uncharred, unknown plant part was recovered from the floor of the ceremonial structure. The plant part resembles a wrinkled prickly pear fruit, but lacks the aeroles or glocchid stubs that would distinguish the specimen as a cactus fruit.

Two chunks of adobe were saved from Feature 34, a room in the center of the east roomblock. The adobe contains multiple parallel impressions of small diameter stems, reasonably interpreted as possible roof closing materials in place (Table 69). Parallel striations (spaced at very regular 0.4 to 0.5 mm intervals) are visible on nearly every stem specimen, very clearly on the larger stem casts of the larger adobe piece. No nodes are present on any of the 11 specimens. These attributes point to a monocot species, either lacking nodes or with a node interval greater than 67 mm (the longest span present among the impressions). Stem diameters are smaller on the smaller adobe piece, perhaps simply because these specimens do not represent a full hemi-circumference.

The prominent striations and average stem diameter correspond reasonably with horsetail (*Equisetum* sp.) but lack of nodes is a problem (*Equisetum* nodes should appear as a beaded ring, but possibly at longer intervals than 67 mm, especially in robust specimens). There are some large sedges (such as *Scirpus acutus*) which are a possibility, though the striations don't match as well in definition and regularity. Rush (*Juncus* sp.) stems have even fainter and more irregular striations, while reedgrass (*Phragmites sp.*) stems are very smooth. Striations on corn or *Zea* stems are too angular and irregular, and those on cattail (*Typha* sp.) are too fine and closely spaced (averaging 0.2 mm spacing).

Discussion

The Ormand archaeofloral collection available for study is a very incomplete selection of the array of botanical artifacts of fourteenth-century Salado subsistence behavior preserved in the site at the time of excavation. We know this from excavation notes that describe the presence of corn and the collection of pollen samples (that either never were or no longer are part of the Ormand collections), and by comparison with archaeobotanical assemblages from other fourteenth-century Salado sites. Point of Pines was excavated almost as long ago as Ormand, and hence lacks systematic collection of flotation or wood samples. Nevertheless, remarkable preservation from a catastrophic smothering burn of a block of rooms occupied during the Maverick Mountain phase resulted in preservation of substantial quantities of visible and recognizable food materials in primary contexts of storage and processing (Bohrer 1973). Village sites from the Mimbres Valley, by contrast, chiefly contained elusive microscopic subsistence remains, materials that escaped through spillage and loss from their context of primary usage. Systematic flotation and wood sampling have provided an intimate view of the more meager remains at these sites (Minnis 1986).

Viewing these assemblages side by side (Tables 70 and 71) gives some appreciation of differences in preservation and data collection, and of variability in resource use due to local availability. The recovery of 22 plant taxa from the Mimbres Valley sites as compared to 6 from the Ormand site may be entirely due to sample size variation. Only one flotation sample and 12 macrobotanical samples were analyzed from Ormand, while 52 flotation samples were analyzed from the Mimbres Valley sites. Agricultural plants at Ormand include only small amounts of corn and gourd rind (specimens of *Cucurbita* rind fall in a thickness range [0.4 mm -0.9 mm] that could belong to either domesticated or wild squash; Cutler and Whitaker 1961:479; King 1985:91-92). Gourd rind was the only plant remain identified at Ormand that was not recovered from the Mimbres Valley samples. Cotton and beans found at higher-elevation sites in the Mimbres Valley and Point of Pines are likely missing from the Ormand assemblage by dint of preservation and sampling factors.

Table 70. Species Composition of Charcoal: Ormand and Three Sites in the Mimbres Valley

Taxa	Ormand		Mimbres Valley Sites: Disert, Janss, and Stailey (Minnis 1986)	
	Fuelwood (Macrobotanical Wood from Fill and Trash)	Construction (Flotation and Macrobotanical Wood from Roof fall; Tree-Ring Samples)	Fuelwood (Flotation and Macrobotanical Wood from Fill and Trash)	Construction (Tree-Ring Samples)
Conifers: Juniper *(Juniperus)*	5% [n=3]	27% [n=33]	24% [n=153]	36% [n=87]
Piñon *(Pinus edulis)*	26% [n=15]	17% [n=14]	2% [n=13]	15% [n=36]
Ponderosa pine *(Pinus ponderosa)*	-	-	<1% [n=3]	26% [n=62]
Pine (*Pinus* sp.)	1% [n=1]	2% [n=1]		
Riparian/Floodplain: Cottonwood/willow *Populus/Salix*	60% [n=35]	38% [n=32]	25% [n=154]	8% [n=19]
Others (box elder, ash, walnut, sycamore)	-	-	11% [n=68]	
Other nonconifers: Oak *(Quercus)*	5% [n=3]	14% [n=12]	21% [n=133]	2% [n=5]
Others (rose family, rabbitbrush, saltbrush)	-	3% [n=3]	15% [n=97]	13%[3] [n=30]
Unknown or unidentifiable	2% [n=1]	1% [n=1]	2% [n=10]	
TOTAL	[n=58]	[n=84]	[n=631]	[n=239]

[1]Minnis 1986, table 11.3; [2]Minnis 1986:Table 11.4; [3]This category may include some floodplain nonconifer taxa

Table 71. Comparison of Food Plants Recovered at Ormand Village, Mimbres Valley Sites, and Point of Pines

Taxa	Ormand	Mimbres Valley Sites: Disert, Janss, Stailey (Minnis 1986)	Point of Pines (Bohrer 1973)
CULTIGENS: corn [*Zea mays*]	1 cob fragment [m]; cupules and kernel fragments [f]	240 cob fragments, 35 kernel fragments [f]; 10 cob fragments, 40 kernels [m]	partial inventory: "25 bushels of burned maize were estimated to be in one room" (nearly 900 liters); Room 86 contained 19 full jars of cob corn, 1 jar of shelled corn (p.434)
squash [*Cucurbita*]	rind fragments [f]	1 rind fragment [f]	seeds (unspecified quantity; p.425)
gourd [*Lagenaria*]	rind fragments [f]	NONE	small unknown seeds were found on and around gourd rind fragments (p.434)
common bean [*Phaseolus vulgaris*]	NONE	12 beans [m]	20 jars of beans in Room 86 (p.434)
cotton [*Gossypium*]	NONE	111 seed fragments [f]	approximately 200 ml plus 104 seeds; p.426)
WILD PLANTS: small-seeded weedy annuals	cheno-ams, purslane[f]	cheno-ams, purslane, morning glory, pepper-grass, tansymustard [f]	about 13 ml cheno-am seeds (p.429), 90 ml winged pigweed seeds (p.429), 8 ml doveweed seeds (p.431), more than 50 ml stickleaf seeds (p.431), 3.7 liters buckwheat seeds (most associated with vessels; p.429)
cacti	NONE	13 hedgehog cactus seeds [f]	a jar of cholla buds and joints in Room 71; immature prickly pear pads and stems in Room 86 (p.432-433)
grasses	grass family caryopses [f]	2 dropseeds, 2 grama grass seeds [f]	(reedgrass and grass stems as matting)
perennial nuts and fruits	NONE	25 juniper seeds [f],	33 juniper berries (p.427), 2250 ml plus 22 walnuts (p.428), 1 acorn (p.429), 150 ml mesquite pods on Room 110 floor (p.431)
MISSING?	cotton, beans a wider variety of economic annuals cacti walnuts, acorns, piñon nuts, mesquite, agave	gourd cholla and pricklypear walnuts, acorns, piñon nuts, mesquite, agave	(A wider variety of economic annuals likely would have been recovered with flotation) Piñon nuts, agave

f = found in flotation samples; m = collected as macrobotanical samples [All Point of Pines materials were collected as macrobotanical samples]

Charred purslane and cheno-am seeds comprised the weedy annual assemblage at Ormand. Both taxa are commonly encountered in archaeobotanical assemblages from all time periods, throughout the Southwest. Purslane and members of the goosefoot and pigweed families have two advantages over many other plants. In addition to being economically useful, they proliferate in the disturbed areas in and around human habitation sites, making them convenient resources to exploit. Purslane and cheno-ams were present in the Mimbres Valley sites, along with tansymustard, peppergrass, and a member of the morning-glory family. In addition to cheno-am seeds, doveweed and stickleaf seeds, and a sizeable cache of buckwheat seeds were identified at Point of Pines.

Grasses were limited to one seed at Ormand. Two dropseed and two grama grass seeds were identified in the Mimbres Valley flotation samples. Grass and reedgrass matting was recovered from Point of Pines, but no grass parts related to food use. Although many species of grass would have been available for use, few actually showed up in the archaeobotanical record from each of the three sites.

To the archaeobotanist's frustration, food products of perennial species tend to be underrepresented in assemblages from open sites. Potential, locally available perennial crops such as cholla and prickly pear cactus, walnuts, acorns, piñon nuts, mesquite, and agave are missing, not only from barely sampled Ormand, but also from carefully examined sites in the Mimbres Valley. Juniper seeds, often considered a famine food due to their high resin content, were recovered from the Mimbres Valley sites, along with some hedgehog cactus seeds. By contrast, special burn conditions at Point of Pines netted a rich array of perennial food products, including juniper berries, walnuts, an acorn, mesquite pods, immature prickly pear pads and stems, and a jar of cholla buds and joints. Though the assemblages are very different at the three project areas, we expect that the list of food taxa consumed was much the same (and that it probably included piñon nuts, missing at all three). Differences probably obtained in relative amounts consumed of various taxa, according to local availability, but gross differences in preservation, leave such subtleties out of our reach.

Both Ormand and Mimbres Valley wood assemblages show distinct taxonomic differences between wood selected for fuel wood, and wood chosen for construction purposes. In each case, riparian woods were emphasized in fuel contexts, and coniferous woods were preferred for construction (Table 70).

Among the 152 pieces of wood charcoal identified in Ormand samples, 44 percent were riparian, and 56 percent nonriparian taxa. In the much larger sample (n=860) examined by Minnis (1986), a distinctly greater disparity in the occurrence of floodplain taxa vs. taxa that grow in the mountains and terraces is evident (28 percent vs. 72 percent). Minnis (1978) suggested this disparity reflected a holdover from denuding of floodplain vegetation for intensive and widespread farming during the Classic Mimbres period. Later, a successional stage of more diverse floodplain vegetation emerged, with decreasing pressure on the riparian habitat. In the Salado period, riparian wood charcoal included cottonwood/willow, box elder, and walnut, along with small percentages of sycamore, ash, and alder.

A different scenario is suggested at Ormand. Here, the only floodplain arboreal taxon identified is cottonwood/willow, comprising 60 percent of fuel wood and 38 percent of construction wood (Table 70). The Mimbres Valley pattern of diverse floodplain species showing up in Salado period archaeological samples is not apparent in samples from the Ormand site. Along with Ormand's higher percentage of riparian wood in the Salado period samples, this pattern suggests that extensive clearing of floodplain for agricultural purposes did not take place in the Upper Gila River Valley. The

Upper Gila River Valley is broad and flat (9 miles long and 1 mile wide; Lekson 1990:1) while the Mimbres Valley is narrow, perhaps a determining factor in the extent of the land that needed to be cleared. Elevational differences may also be contributing to the differences in wood assemblages between the two sites. Given abundant availability relative to population pressure, conifer wood may be preferred for a variety of uses. Characteristics of durability and hardness give conifers an advantage for construction material, and higher heat load furnishes better fuel. Mimbres sites (at elevations averaging about 1,800 m) had easier access to conifer woods, and the wood from Mimbres Salado sites is more highly weighted to coniferous types. At 1,370 m, wood use in the Upper Gila River Valley is geared more to floodplain wood, for both fuel and construction purposes. We infer population pressure on wood resources in *both* areas, demonstrated by the selection of preferred coniferous wood for building.

Summary

A limited record of both agricultural and wild plant use was obtained at the Ormand site. This is most surely a reflection of small sample size, and not an accurate record of subsistence. Ormand crop plants included corn, gourd, and probably squash; recoveries of common beans and cotton seeds at contemporary Salado sites to the south and west suggest these taxa were part of the Ormand farming scene. Recovery of small quantities of widely utilized cheno-ams and purslane constitutes our record of wild plants in the Ormand subsistence regime. These are probably a tiny slice of the spectrum of plants actually used. Systematic flotation sampling (Minnis 1986) and unusual preservation conditions (Bohrer 1973) reveal utilization of many other annuals (peppergrass, tansymustard, doveweed, stickleaf, and buckwheat), as well as grasses (dropseed), and perennials (juniper berries, walnuts, mesquite, and possibly acorns).

Fast-growing riparian wood species were favored for fuel wood at Ormand, while more durable conifer wood was preferred for construction material. A similar pattern of wood selection is indicated in the Mimbres Valley. The impact of population pressure on wood resources in both areas is inferred from this pattern. However, Ormand lacks the archaeobotanical evidence for extensive floodplain clearing of the Upper Gila River Valley, as seen in the wood charcoal assemblage from sites of the Mimbres Valley.

EXAMINING THE ORMAND SALADO

Laurel T. Wallace

The interpretation of a site as Salado demands, of necessity, discussion on the history of the term and present usage. Thankfully, so many authors have described in detail the beginnings, development, and ongoing research around the Salado issue that only a general overview will suffice here. The reader is directed to a few of the best described histories, such as Crown (1994) and Doyel (1976) for detailed information. Over the years, researchers have continually referred to the "Salado Problem" (Crown 1994; Doyel 1976; Gumerman and Weed 1976; Lekson 1992a, 1992d; Nelson and LeBlanc 1986). The problem, simply put, is that Salado polychrome pottery is perceived as the only stylistic marker for this horizon, unifying a wide area of the prehistoric Southwest, but also masking broad and varied cultural remains (Stark and Elson 1995:37). To some, this renders the term "Salado" meaningless, with a less than stable empirical definition (Nelson and LeBlanc 1986:1-3).

Additional confusion over the term stems from its initial description tied to a particular location, called the "heartland." The Salado "heartland" has traditionally been associated with the Tonto Basin and Globe/Miami region of central Arizona (Hohmann 1992; Lekson 1992c; Doyel 1976, 1992). Specific traits from this area were designated as "ur"-Salado; platform mounds are cited as one trait defining the Salado presence, although this attribute is unique to the Tonto Basin (Franklin 1980:51). With the contributions of the Roosevelt Lake project, our understanding of Tonto Basin archaeology and the Salado horizon have progressed substantially (Elson et al. 1995). Variability was seen as a deflating aspect of any unified Salado culture concept, and yet within the very "heartland" of the Salado, the same kind of variability has been documented similar to other communities within the total range defined as Salado (Clark 1995:384). This challenge to the "heartland" hegemony has clarified some old arguments, provided support for previous research in "peripheral" areas, and made room for new interpretations.

The Salado phenomenon has most recently been viewed as a large, dynamic regional adaptation to a changing environment and enforced movement of populations (Crown 1994; Elson et al. 1995; Lekson 1992c). Older definitions tying migration to the Salado phenomenon (DiPeso 1958; Gladwin and Gladwin 1935; Haury 1958; Hawley 1932; McGregor 1965; Schroeder 1953) are in the process of reinterpretation in the wake of overwhelming evidence of population upheavals correlated to the "Great Drought," circa A.D. 1275 (Crown 1994). Population movements have long been applied to the concept of Salado communities along the Upper Gila River (Fitting 1972a; Hammack et al. 1966; LeBlanc and Nelson 1976; Lekson 1978b; Martin 1979; Mills and Mills 1972; Wormington 1947), and for Salado communities located along the Middle Gila River and tributaries south, in southeastern Arizona (Brown 1973; Franklin 1980; Franklin and Masse 1976; Mills and Mills 1969).

Aside from recent research interests, such as migration (Lindsay 1987), ideology (Crown 1994), and warfare (Wilcox and Haas 1994), a broad conceptual split is noted between those who ascribe to the "northern model" versus the "southern model" of the origin and development of the Salado phenomenon (Crown 1994:13-15). The "northern model" traces the origin and development of Salado polychromes to population upheavals following the "Great Drought," with Kayenta-Tusayan groups moving south below the Mogollon Rim and commingling with Mogollon groups in the Point of Pines region (Crown 1994; Haury 1958; Lindsay 1987). Architectural features and distinctive ceramic design elements blending attributes from previous Kayenta polychromes with local ceramic traditions support this hypothesis (Crown 1994:203-208; Lindsay 1987). The "southern model" argues that the origin and distribution of Salado polychromes is tied to the site of Casas Grandes (Paquimé) in northern Chihuahua (DiPeso 1974; LeBlanc 1989; LeBlanc and Nelson 1976; Lekson 1992a, 1992d, n.d.; Nelson and LeBlanc 1986). Salado polychrome pottery was thought to be produced around A.D. 1060 at Paquimé. The pottery technology or people who produced the pottery moved northward after this point. Recent reinterpretations of the dating of Paquimé (Dean and Ravesloot 1993), and the lack of Chihuahuan traits at northern sites with Salado polychromes has weakened this model's argument; at present the northern model shows the best support (Crown 1994:13-15). To more clearly understand how the Ormand Village site fits into these arguments, issues such as migration, core-periphery relationships, descriptions of frontier communities, and testing of the "southern" and the "northern" models will be addressed. To focus this examination, a summary of the Ormand Village data will initiate discussion.

The Ormand Village Example

Within the larger and multivaried constellation of traits associated with the Salado phenomenon, the Ormand Village pattern reflects similarities to other Salado sites and some differences. The Salado "signature" at Ormand includes:

1. Four roomblocks (approximately 100 rooms) situated at rough cardinal points around a central plaza.
2. A large, rectangular ceremonial surface structure in the west-center of the central plaza.
3. Locally made pottery (Hill, this volume; Wilson, this volume) with two distinct design traditions (Maverick Mountain Polychrome-Tucson Polychrome and Salado polychromes). Salado polychromes represented 10 percent of the total ceramic assemblage.
4. Two distinct secondary cremation cemeteries on the extreme west and east edges of the site, outside of the habitation areas.
5. A late Puebloan chipped stone assemblage with many small, triangular projectile points that were side-notched and unnotched. "Agave knives" were found, all with chipped edges along the use edge. Agave knives are closely associated with Salado sites in southeast Arizona, and appear to be part of the adaptive strategies for life in the upper Chihuahuan ecozone (Franklin 1980).
6. A ground stone assemblage with strong evidence of intensive corn processing, and very few ornaments or objects from long-distance trade or procurement. Serpentine from the Redrock, New Mexico, source were made into arrow-shaft straighteners and possibly "ceremonial" axes.
7. An extensive trash deposit of unknown depth and dimension was found around the two excavated roomblocks and in the central plaza, containing about two-thirds of the artifacts from the 1965-1966 excavation.
8. The occupation at Ormand may have extended over several generations, as suggested by several remodeling episodes, extensive trash deposits, intensive corn processing, location on the first terrace above excellent and abundant farmland, and the construction of a large communal ceremonial structure.
9. No obvious storage rooms were noted, following a pattern for this horizon. Storage could have been in living spaces, much like ethnohistoric accounts of Western Pueblos (Dohm 1992; Fleming and Luskey 1986; Fowler 1989; Gaede 1986; Judd 1925).
10. Roof activity was intensive, including hearths, food-processing equipment, bone tools, and

ceramic vessels used for storage.
11. The Ormand site was abandoned peacefully, with nearly all whole grinding equipment removed. Some ceramic vessels were left on roofs and floor areas.

Discussion

Architecturally, the pattern of aggregated roomblocks enclosing a plaza has many similarities to other Salado sites in the Cliff Valley (Kwilleylekia, LA 4937; "Hilltop" ruin, LA 39261; and LA 34774; Lekson n.d.), in the Mimbres Valley (Nelson and LeBlanc 1986), and in the Redrock, New Mexico, area at Dutch Ruin (LA 8706, Lekson n.d.). Aggregated roomblocks are also noted along the Middle Gila River and tributaries south (DiPeso 1958; Franklin 1980; Franklin and Masse 1976; Gerald 1975), some with "transitional" traits (Brown 1973; Franklin 1980:47). Sites in east-central Arizona present a compelling originating pattern for this architectural style, but tend to be much larger than sites to the south and east (Lindsay 1987; Lowell 1988; Hohmann and Adams 1992; Reid 1989). Aggregated pueblos have been proposed as a strong contrast to compound architecture and platform mounds found in the Tonto Basin (Doyel 1976:10; Nelson and LeBlanc 1986:3), although recent investigation in this area found a high degree of variability in architecture and other attributes (Clark 1995:374-384; Elson 1996:137; Stark and Elson 1995:37). Aggregated and compound architecture is found interspersed throughout southeastern Arizona (Bronitsky and Merritt 1986:202-229; Brown 1973; Franklin 1980), perhaps supporting the proposed multi-ethnic dimension of the Salado phenomenon. Social modules seem to structure how larger pueblos aggregate; integrated structures are actually "piles" of smaller household units or social groups (Johnson 1989:381). This aggregation of smaller units may again be evidence of adapting to multi-ethnic cohabitation.

The ceremonial structure at Ormand is a rare example of ritual architecture at Salado sites (Doyel 1988:289; LeBlanc 1989:196-197). At present, it represents the only known ceremonial structure within the Cliff Valley, suggesting that Ormand held particular significance within the settlement area. Maverick Mountain Polychrome and Tucson Polychrome pottery was associated with floor and fill deposits in this structure, suggesting construction during the initial occupation of the Salado. The life span of this structure remains enigmatic. Unlike other subterranean ritual structures from Salado horizon sites (Brown 1973; DiPeso 1958; Duffen 1937; Johnson and Thompson 1963; Smiley 1952), the Ormand ceremonial structure was built on the surface. Other Salado sites with possible ceremonial surface rooms have been noted within household units at the Reeve Ruin (DiPeso 1958:30), the Kuykendall site (Mills and Mills 1969), and possibly at the Point of Pines Pueblo (Wendorf 1950:75-76). Two rectangular, freestanding surface structures at the Point of Pines Pueblo look remarkably like smaller versions of the Ormand ceremonial structure, but have been interpreted as domestic habitation (Wendorf 1950:32, 115).

The ceramic signature at Ormand includes two distinctive, locally produced (Hill, this volume; Wilson, this volume) decorated traditions with origins to the west, in areas of east-central and southeastern Arizona (Crown 1994; Franklin 1980; Lindsay 1987; Wilson, this volume). Maverick Mountain Polychrome and Tucson Polychrome pottery was found in the earliest construction phases on site, and imply an initial occupation circa A.D. 1270 to 1300. The lack of Pinto polychrome weakens this assignation, suggesting initial occupation sometime after A.D. 1300. The technology for all of the locally produced types, utility and decorated wares, developed from access to volcanic clays, and population movements in areas supporting this particular technology (Wilson, this volume). The ceramic signature most strongly supports a migration movement from the Point of Pines region, down into southeastern Arizona, and on into the upper reaches of the Gila River. This migration may have extended over generations, with the Ormand Village representing a middle stage in the Salado development.

Clear Saladoan mortuary practices at Ormand Village included two distinct secondary cremation cemeteries on the extreme west and east edges of the site, outside of plaza and habitation areas. The east cremation area was investigated in 1966, and contained several inhumations along with more numerous secondary cremations. The 1975 inventory at the Maxwell Museum included a total of 39 cremated individuals: 21 adults (4 males, 1 female, and 16 indeterminate), 5 adolescents, 1 child, and 12 infants. Cremations typically were placed in a polished red-slipped jar with a plain brown ware bowl inverted as a cap on top. Inhumations in this area were semiflexed with no mortuary furniture. It remains unclear if these burials were Saladoan or from earlier pithouse occupations on site. If the Salado at Ormand did use both mortuary practices, it would not be unlike other Salado practices in the Tonto Basin (Doyel 1976; Stark and Elson 1995) and in southeastern Arizona (Brown 1973; DiPeso 1958; Doyel 1976; Franklin 1980; Mills and Mills 1969; Tuthill 1947). Flexed inhumations were also found within the east cemetary and elsewhere on site (n=18), but remain temporally enigmatic.

Saladoan chipped stone assemblages are remarkably similar across southeastern Arizona and southwestern New Mexico (Franklin 1980). Small triangular projectile points dominate in the formal tool category. Material use and frequency varies from region to region, with a general preference for cherts (Bronitsky and Merritt 1986). Local material sources are also preferred. Chipped stone assemblages reflect typical, late Puebloan lithic technology that include "expedient" flake tools and specialized formal tools. Faunal consumption from several sites indicates a greater use of larger game, especially deer (Bronitsky and Merritt 1986; Stuart and Gauthier 1981:209). While this has been interpreted in the Mimbres valley as evidence of a combined hunter-gatherer and agriculturalist lifeway akin to earlier pithouse occupations (Minnis 1986; M. Nelson 1986), there is equal support for greater availability of resources, particularly in areas with a twelfth-century population hiatus, such as the Cliff Valley (Akins, this volume). Ground stone assemblages reflect intensive corn processing activities. Most Salado sites are located on the first terrace above river floodplains (Franklin 1980). Corn agriculture was a major foundation structuring Saladoan life, from settlement patterns to material culture. The apparent self-sufficiency of the Ormand Village experience is also seen in the rarity of exotic materials. Marine shell and turquoise were found in very low frequencies at Ormand, typical for sites in southwestern New Mexico (Nelson and LeBlanc 1986:204). No use beyond personal adornment was indicated. The numbers for "exotic" imports increases somewhat in southeastern Arizona (Franklin 1980; Bronitsky and Merritt 1986), but does not suggest a different use pattern beyond personal adornment.

An extensive trash deposit was found at Ormand, of unknown depth and extent around roomblocks and in the plaza area. The initial occupation of the north roomblock produced a trash sheet of at least 28 cm in depth, as recorded underneath Room 29 in the east roomblock. Other Salado sites with trash deposits in plaza areas include the Second Canyon Ruin (Franklin 1980), and the Reeve Ruin (DiPeso 1958), both located within walled site edges. The Salado sites in the Mimbres valley lacked trash deposits, suggesting short-lived communities (Nelson and LeBlanc 1986:250).

Obvious storage rooms, inferred by a lack of interior room features, was missing at Ormand. This lack of storage accompanies a general nonspecialized room function for Salado sites (Bronitsky and Merritt 1986; LeBlanc 1989:197; Nelson and LeBlanc 1986:11). Since the number of corn processing stations was high at Ormand, and the ground stone assemblage showed intensive use, storage of corn must have taken place. Photographic documentation of historic Hopi shows corn storage in living spaces (Judd 1925), and some form of this practice must have operated at Ormand Village.

Rooftops were important activity areas at Ormand and at Salado sites in the Mimbres Valley (Nelson and LeBlanc 1986). Ormand Village rooftops contained hearths, bone tools, manos and metates, and many ceramic vessels, presumably used for storage. It has been argued for the Mimbres Valley Salado that roof activity signifies a "defensible" strategy, offering a "quick retreat" during an attack (Nelson and LeBlanc 1986). Why a "defensible" strategy would place villages on easily accessed terraces is not discussed, nor the lack of evidence for conflict. Roof use was an important aspect of spatial function for these communities, perhaps similar to ethnohistoric documentation of historic Hopi and Zuni roof use, where roofs tops were used for drying and preparing food and as space for many craft activities (Dohm 1992; Fleming and Luskey 198[illegible]; Fowler 1989; Gaede 1986).

While several rooms in both Ormand roomblocks had evidence of burned roofing, this appeared to be tied to planned abandonment processes (Cameron 1990:28), not to hostile aggression. Grinding implements were removed from all corn processing stations, and rooms were cleaned of other tools before abandonment. Storage jars, most originating on the roof, were left behind. Whatever the cause of abandonment, it appeared to have been peaceful and orderly. The Salado horizon has been proposed as a time of great conflict and warfare (Gladwin 1957; Wilcox and Haas 1994). Clear evidence for this exists in the Tonto Basin, but not in southeastern Arizona (Franklin 1980:46, 228), or at the Ormand Village site.

The Salado presence in southeastern Arizona and southwestern New Mexico share some distinct behavioral characteristics. A strong environmental preference for the upper Chihuahuan Desert and upper Sonoran grassland river valleys is noted (Brown 1973; Franklin 1980:223). Across an even broader region, Salado site locations are found on the first terrace above the floodplain (Brown 1973; Doyel 1978:209; Franklin 1980; Shelley and Altschul 1996). There is also a distinct lack of connection to other culture areas. Ceramic trade contacts are not seen between late Mogollon, Hohokam, or Chihuahuan cultures (Franklin 1980:226; Wilson, this volume). This is generally true for the Ormand site, but apparently not so for the Mimbres Valley Salado, who had stronger ceramic ties to the El Paso area, and by implication the "Casas Grandes interaction sphere" (LeBlanc 1989:192-196; Nelson and LeBlanc 1986:246-247).

Most of the similarities with other Salado horizon sites for Ormand can be found to the west, in areas of east-central and southeastern Arizona. Some authors consider southeastern Arizona the true "core" area of the Salado, since the percentage of Salado polychrome pottery per ceramic assemblage is highest here, typically over 10 percent (Franklin 1980; Lange 1992:328). The Salado presence in southwestern New Mexico represents an influx of peoples into an area abandoned for at least 150 years (LeBlanc and Whalen 1980; Lekson 1992d). Although the Ormand Village was initially conceived as a migrant community (Hammack 1966), no systematic effort to investigate this proposal has been undertaken, owing much to the history of anthropological inquiry, and the difficulty in funding archaeological research.

A Renewed Look at Migration

Anthropological theory in the early twentieth century accepted migration and the culture area concept as part of mainstream discussion. Migration was viewed as population waves radiating from a common point of origin, a theory stemming from European scholarship (Veit 1989). Changes in material culture were seen as evidence of cultural replacement, with migrating groups displacing or absorbing indigenous populations. This paradigm was criticized with the advent of processualist archaeology in the early 1960s. Although critique of this flawed model was needed, it did not lead to a refined replacement, but a total rejection of migration as a research topic (Clark 1995:370). The importance of migration as an agent in cultural change was never denied (Anthony 1990:895), but even in clear cases of long-distance residential relocations in the archaeological record, migration was dismissed as part of the explanation. The processualist paradigm viewed culture as a means of adaptation, and culture change as an internal and systemic process (Steward 1955). By the late 1970s, this "perverse refusal" to consider migration theory as a research topic was acknowledged (Adams et al. 1978:523), and with the critique of the processualist paradigm, there have been recent attempts at modeling migration (Ammerman and Cavalli-Sforza 1979, 1984; Collett 1987; Gmelch 1980; Kearney 1986; Konigsberg 1988).

Migration in a strict definition describes residential relocation that requires more than a day's journey and is not part of a scheduled round or cycle of movement. Residential relocations within local settlement systems or cyclical movement of groups on a regular basis are therefore excluded from this definition. Migration in its strictest sense was still probably a frequent occurrence in prehistory, with many migrations difficult or impossible to detect archaeologically. Major episodes of large and distinctive groups moving into new areas remain the most visible examples (Clark 1995:370).

Motives for Residential Relocation

Long-distance residence relocations involve considerable risk, and the motives for resettling must outweigh these risk factors (Clark 1995:371). Discrete migrating units can be modeled as "jumps" from optimal zone to optimal zone, with previous successful moves conditioning future efforts (Anthony 1990:902-903). Frontier areas adjacent to unoccupied or sparsely occupied areas would have to provide environmental factors able to support the prevailing subsistence strategy of the group (Clark 1995:371-372).

The "Great Drought" around A.D. 1275 disrupted many settlements in the Anasazi region, and coincides with evidence of relocating populations into the Tonto Basin (Elson et al. 1995), and movement of populations into established settlements in the Mogollon Highlands (Crown 1994; Haury 1958; Lindsay 1987), and down into southeastern Arizona (DiPeso 1958; Franklin 1980). Migrant groups do not appear to move randomly or evenly into new locations, but follow established routes of communication or trade (Anthony 1990:902; Cameron 1995). New locations are scouted or established from previous contact with indigenous populations. Relations between migrant groups and indigenous populations, whether hostile or cooperative, must have been an important factor in resettlement (Clark 1995:372).

Increasing evidence of conflict during the late thirteenth and early fourteenth centuries attests to the social stresses inherent in deteriorating environmental conditions and population movements across the prehistoric Southwest (Clark 1995:372). Defensive settlement location and architecture, along with evidence of violent death have been noted in northeastern Arizona (Wilcox and Haas 1994:236). The sudden and widespread appearance of arrow-shaft straighteners has been mentioned as evidence of endemic warfare (Lange 1992:331). Uneven power relations between migrant and indigenous groups were also possible, with one group forced into a more marginal environment (Barth 1969). The success of cooperative or domineering efforts of an immigrant population would of course determine the outcome of settlement patterns. Migration operated along a trajectory towards target destinations, but temporary visitations, or even return migrations were possible (Anthony 1990:904).

Earlier Migration Models for the Salado Phenomenon

A specific set of criteria or test expectations were postulated by Rouse (1958) for inferring migrations from archaeological remains. These included: (1) identifying the migrating people as an intrusive unit in the region, (2) tracing this population back to its homeland, (3) determining that all occurrences of the unit are contemporaneous, (4) establishing the existence of favorable conditions for migration, and (5) demonstrating that some other hypothesis such as independent invention or diffusion of traits better fit the facts of the situation. These criteria have been applied to several Salado communities in the Safford Valley and San Pedro Valley (Brown 1973:129-130; Franklin 1980; Franklin and Masse 1976:53-55), and to the Point of Pines region (Haury 1958), all with positive results.

The Ormand Village Evidence for Migration

Several factors appear to support evidence of migration for the Ormand Village Salado. Following Rouse's criteria (1958), the Ormand site will be discussed in detail.

Criteria 1. Identifying the migrating people as an intrusive unit in the region.
Absolute dates from Upper Gila River sites show a clear population hiatus during the latter twelfth and early thirteenth centuries A.D., with the Cliff valley "largely or wholly" depopulated (Lekson 1990:87, n.d.; LeBlanc 1989; LeBlanc and Whalen 1980). The Mogollon Highlands and the Rio Grande region have been proposed as "reserve" areas purposely kept as a wild resource for hunted and gathered resources. Encroachment into these areas happened coincidentally with the abandonment of the Four Corners (Lekson 1992d:20-21). Pottery analysis clearly shows a 150-year gap between the Mimbres Mogollon occupation in the Cliff Valley and the later settlements of Salado horizon peoples.

The Salado occupation at Ormand introduced several new cultural adaptations to the Cliff Valley. The ceramic tradition shows clear ties to a larger Salado pottery technology (Wilson, this volume) and no ties to preceding ceramic traditions (Lekson 1992a, 1992c, n.d.). Recent Ormand ceramic characterization indicates a migration from the west, originating from areas in east-central and southeastern Arizona (Wilson, this volume), supporting the northern model of the origin and diffusion of Salado polychromes (Crown 1994; Lindsay 1987). Two decorated ceramic traditions were maintained at Ormand; the Maverick Mountain Polychrome-Tucson Polychrome tradition and the Salado polychrome tradition. These two technologies signal a distinct Tusayan-Kayenta variant of the Salado, reflecting gradual movement of Puebloan groups into previously abandoned areas of the Southwest. Immigrant groups developed a new and long-lived ceramic tradition well suited for volcanic clays found in the mountainous regions of the Southwest. The spread of Salado polychromes and associated populations producing this pottery tradition settled into areas with "brown ware" clay sources (Wilson, this volume).

Ormand architecture signals a new cultural adaptation as well. Aggregated, adobe-constructed roomblocks were placed around a plaza area with a large ceremonial structure in the center, perhaps signifying cooperative religious activities between multi-ethnic groups (Adams 1989). Most rooms appeared to have general, all-purpose functions. The lack of overt storage space is a distinctive trait of this architectural style (Nelson and LeBlanc 1986).

Criteria 2. Tracing this population back to its homeland.
Ceramic analysis clearly indicates a strong connection to pottery traditions developed to the west, in areas of east-central and southeastern Arizona pottery traditions (Brown 1973; Crown 1994; Franklin 1980; Lindsay 1987; Wilson, this volume). The best supported model for the origin and development of Salado polychromes is the northern model, with a developmental "homeland" area in the Point of Pines region of east-central Arizona (Crown 1994:13). Maverick Mountain Polychrome pottery is also associated with this dynamic period of multi-ethnic commingling, and Tucson Polychrome is seen as a direct evolutionary link in the development of this distinct tradition (Lindsay 1987). Ormand appears to be part of a dynamic movement of people south and eastward, presumably following the Gila River into its upper reaches.

Criteria 3. Determining that all occurrences of the unit are contemporaneous.
Roughly one-fourth of the Salado occupation of the Ormand Village site was excavated by the Cliff Highway Salvage Project. Most of the roofing timbers sent to the Laboratory of Tree-Ring Research in 1967 did not date (Dr. Jeffrey Dean, pers. comm. 1995); only one sample from Room 31 in the east roomblock yielded a 1244-1342 vv date (timber cut for use at some time after A.D. 1342). It is unclear to what extent the north and east roomblocks are contemporaneous. Portions of the north roomblock appear to predate the east roomblock construction. Below the east roomblock on the north and northwest edge was a trash deposit with a high concentration of Maverick Mountain Polychrome and Tucson Polychrome pottery. This trash sheet was interpreted in the field as part of a trash deposit associated with the north roomblock. Portions of each roomblock were possibly contemporaneous, but the original core of north roomblock rooms predated the east roomblock construction.

Dating for the ceremonial structure places it with the initial building of the north roomblock, judging by the presence of similar high concentrations of Maverick Mountain Polychrome and Tucson Polychrome pottery in floor and fill proveniences. Two other roomblocks, the remaining half of the north roomblock, and remaining two-thirds of the east roomblock are unexcavated. This factor alone negates a total understanding of site contemporaneity.

Criteria 4. Establishing the existence of favorable conditions for migration.
The Cliff Valley was a favorable environment throughout prehistory; nearly every prehistoric cultural adaptation is represented (LeBlanc and Whalen 1980; Lekson 1990, 1992d). The Mimbres Mogollon in the Mimbres Valley used extensive irrigation to maintain highly productive corn agriculture. A clear population hiatus is noted for the latter twelfth and early thirteenth centuries in the region, and it has been suggested that this area was kept as a wild "reserve" for hunted and gathered resources (Lekson 1992d:20). The Salado influx into the Cliff valley occurred after a 150-year period without obvious human intervention.

Analysis of the faunal remains at Ormand (Akins, this volume) and at Mimbres Valley Salado sites (Minnis 1986), indicates a high use of large game animals, especially deer. Freshwater clams (*Anodonta californiensis*) were also found at Ormand, and apparently were a food source available prior to modern water use in the Southwest (Bequart and Miller 1973). The ground stone assemblage suggests intensive corn processing, further supported by the high number of corn-processing stations within household units. The site location on the first terrace above the Gila River floodplain offered easy access to excellent and abundant agricultural land. The Cliff Valley is well suited to agricultural pursuits; it is flat, wide, and the river does not cut too deeply below the floodplain. By several accounts, the Cliff Valley was an ideal place for settlement, offering abundant wild game, easy access to water resources, and a topography well suited for agriculture.

Criteria 5. Demonstrating that some other hypothesis such as independent invention or diffusion of traits better fits the facts of the situation.
The Cliff Valley was an unoccupied area for at least 150 years prior to the Salado occupation at Ormand (Lekson n.d.). Architecture and ceramic analyses indicate new cultural adaptations to this area, with developmental ties to the west, in areas of east-central and southeastern Arizona. Close examination of the Salado phase pottery at Ormand (Wilson, this volume) shows differences between Mogollon and Anasazi ceramic technologies, particularly in the shape, size and form of vessels, supporting the idea of a distinct ceramic technology developing from a multitude of influences that spread to other areas.

Conclusions

The Ormand Village example fits four out of the five criteria for determining an immigrant group (Rouse 1958), with strong traces to the west and north, in areas of east-central and southeastern Arizona. While this migration may not have been *en masse* to the site, exhibiting a total contemporaneity of roomblock construction, important features of the site were established from the beginning. The construction of the ceremonial structure within the initial building period on site suggests plans for engaging a larger community in ritual, perhaps incorporating other Salado communities in the valley.

While the Mimbres Valley Salado have been tied to the Casas Grandes "sphere of interaction" (LeBlanc 1989; Nelson and LeBlanc 1986), and a large area as far north as Pottery Mound on the Rio Grande has been discussed as a Chihuahuan desert adaptation revolving around Paquimé (Lekson n.d.), the Ormand Village site has no material or architectural evidence supporting the southern model of Salado development. Very little imported pottery was found at Ormand, at under 1 percent of the total. Of this, just one Chihuahuan polychrome (Ramos Polychrome) sherd was noted out of 23,805 sherds analyzed. The distinctive architectural features associated with Chihuahuan-influenced sites in the bootheel section of New Mexico and further south into Chihuahua, Mexico, are not seen at Ormand or at Salado sites in the Mimbres Valley (Nelson and LeBlanc 1986). The Dutch Ruin to the south of Ormand, in the Middle Gila River box, and by extension the Cliff Valley, has been linked to Paquimé because of its location to a well-known serpentine source near Redrock, New Mexico (Lekson 1992a:19-20, n.d.). This suggestion is tenuous at best. Although Paquimé did have many objects from this serpentine source location, including stockpiled serpentine in unworked form, it is unclear how this material was obtained and what role the Salado presence along the Gila River had to do with it (Douglas 1995:252). Dutch Ruin was not literally next to this source (Lekson 1992a), but several miles to the west. There is at present no clear understanding of how trade relations worked between prehistoric societies, although it is certain that simple explanations of control, manipulation, and "influence" do not stand under closer scrutiny (Douglas 1992). Exotic items cached at Paquimé were reserved for a small portion of the population as an expression of wealth, and did not appear to be used for exchange (Bradley 1992:137; Minnis 1989). Suggestions of *pochteca* outposts throughout the Southwest, with Paquimé as a trading center (DiPeso 1974), have not been supported by the archaeological record (Bradley 1992:129). The density of "Casas Grandes habitation sites" falls off within a 130-km radius beyond Paquimé (Minnis 1989:291), a limit also noted through investigation of NMCRIS records by this author. Until known sources of Paquimé production, such as copper bells and macaws (Minnis 1989), as well as a stronger presence of Chihuahuan ceramics, are found at Ormand or other Upper Gila Valley Salado sites, the southern model for the origin and development of the Salado phenomenon does not hold for this region.

This detailed examination of the Ormand Village data supports earlier hypotheses on the movement of Salado people into southwestern New Mexico (DiPeso 1958; Haury 1958) and strongly supports the northern model of the origin and development of the Salado phenomenon to the Point of Pines region and migration south into southeastern Arizona (Crown 1994; Franklin 1980; Lindsay 1987).

Characterizing the Cliff Valley Salado Migration

Migration has been used to describe the Salado phenomenon for decades, but from several different perspectives. Perhaps the oldest and most residual hypothesis for the Salado migration postulates a "core and periphery" relationship. The "core" in this instance is the proposed Salado "heartland" of the Tonto Basin (Gladwin and Gladwin 1935), still argued as a valid locational definition for the Salado (Hohmann 1992; Wood 1992). Very little was actually known about the "heartland" area until the Roosevelt Lake Project (Elson et al. 1995). Core and periphery discussion relies on distinguishing an area of "higher civilization," with exterior areas viewed as "pale reflections" of, or reactions to the core. Core and periphery relationships cover a multitude of cultural, sociopolitical, ideological, and economic interpretations that focus on the core as a developed entity compared to underdeveloped or impoverished peripheral communities. Inherent in this discussion is the assumption that core areas are dynamic and peripheral areas passive, with core areas initiating change in peripheral communities (Schortman and Urban 1994:401-402).

Salado sites outside of the Tonto Basin have long been viewed as peripheral populations, even with the lack of known detail about "heartland" patterns. Early Salado research focused on defining a "heartland" culture group associated with specific traits seen in burial practices, architecture, and ceramics (Cartledge 1976; Gladwin 1957; Gladwin and Gladwin 1935; Weaver 1976). Migrating populations out of northern Arizona were an important factor in the development of the Salado phenomenon, and in particular, of the dissemination of Salado Polychrome pottery (Crown 1994:203-209). As evidence of this pattern of migration unfolded during the excavation at the Point of Pines Pueblo in east-central Arizona (Haury 1958; Lindsay 1987), other Salado occupations in the Southwest were interpreted as further migrations out from the core area. These peripheral areas were not described as Salado "frontiers," although a population viewed as peripheral to a "heartland" is exactly that; a community pushing the boundaries out from a center core. The Ormand Village Salado occupation has long been viewed as part of a Cliff Valley peripheral community. Did the Cliff Valley Salado represent a frontier population?

Definition of Frontier Settlements

The idea of a frontier represents a geographical location as well as a process (Boyer et al. 1994:62). As a geographical location it is an outer edge of an expanding society adapting to a new environment and adjusting to little contact with the homeland (Lewis 1977:153). It is importantly conceived of as part of a whole system, albeit a part ahead of the hinterland (Kristof 1959:269-270). As a process, a frontier presents a new set of adaptations to ecological, social, and economic relations (Casagrande et al. 1964:282). Frontiers are not boundaries, but areas for mutual exchange between natives and colonists, with an "outer oriented" focus (Kristof 1959:270-273). Boundaries focus inward, towards well-established political limits, and represent that outer line of control for a centralized government (Kristof 1959:272-277). The relationship between the parent heartland and the offshoot frontier population cannot be underscored; although the frontier focuses outward, it is by definition less complex than the heartland (Doolittle 1973:32; Lewis 1973:94, 1977:155; Gilpin 1982:558). The level of connection to the parent heartland describes two distinctive frontier societies. A "colonial" frontier society is completely dependent on the parent culture for economic and technological support, while a "pioneer" frontier society is primarily self-sufficient (Doolittle 1973:33). Frontiers are zones of transition and sociocultural assimilation, between the frontier and heartland, and between the frontier and native population (Boyer et al. 1994:65).

Certain conditions should be met to relate archaeological evidence to the frontier perspective. Two concepts head expectations: mobility and rapid change. For mobility, it is expected that sites representing the initial years of occupation should be more numerous than later sites during established periods. Seasonal mobility is also expected between sites, as adjustments are made adapting traditional subsistence pursuits to a new environment. Early sites may have relatively short occupations, or be placed near resources supporting long-term occupation. It is expected that rapid changes in settlement patterns will be seen until establishment of the area. Changes between developmental stages will become longer as the area becomes more established, and ties become closer to the heartland (Boyer et al. 1994:65). Once the frontier is established, several settlement patterns can be expected to appear. Basic settlement types include: (1) a community that is a connecting link back to the heartland, (2) a frontier town that is a supply center and social, economic, political, and religious focus for surrounding portions of the frontier, (3) a nucleated settlement that serves as a socially and politically linked cluster of households near a frontier town, (4) a seminucleated settlement lacking integration, and (5) a dispersed settlement of scattered households (Casagrande et al. 1964:311-314).

Requirements to examine these concepts archaeologically include accurate chronometric data of site occupation and abandonment in a region, regional settlement patterns and developments, artifactual analyses examining assemblage diversity and material use through time, and an examination of subsistence efforts determining the dependence of the frontier society on the heartland (Boyer et al. 1994:66-71).

Was the Cliff Valley a Frontier Settlement?

Regional information is sparse to nonexistent on the numerous Salado sites found in the Cliff Valley, and the Ormand Village site alone cannot address the nature or extent of the valley settlement pattern. The Cliff Valley, including a nearby side drainage called Duck Creek, contains from six to eight "large" adobe pueblos, ranging from an estimated 100 to 200 rooms (Lekson n.d., fig.2). These sites are described as following a "regular" spacing pattern, with 20 to 25 km between each site (Nelson and LeBlanc 1986).

Several tantalizing facts surface in consideration of this issue: recent ceramic characterizations suggest a possible initial occupation at Ormand perhaps as early as A.D. 1300, stemming from the presence of Maverick Mountain Polychrome and Tucson Polychrome pottery in the earliest construction phases on site. At least one other Salado site in the Cliff Valley had this same ceramic presence (Villareal II, Lekson 1978b), suggesting some measure of contemporaneity with Ormand. Other Cliff Valley sites with known dates include Kwilleylekia Ruins (two tree-ring dates at A.D. 1380 r), LA 39261 (possibly "Duck Creek Ruin", two tree-ring dates of A.D. 1243cG), and LA 106003 ("Dinwiddie," two archaeomagnetic dates, A.D. 1330 $\pm$13, and A.D. 1240-1355, Lekson n.d., fig. 2). If these Cliff Valley sites were initially occupied in the early fourteenth century, then the immigrant population was substantial. Contemporaneity between Salado sites in this area seems highly possible, but the lack of chronometric accuracy and information leads only to provocative conjecture. The first data requirement of accurate chronometric information cannot be met by the present knowledge of the Cliff Valley Salado.

The Ormand Village site itself offers intriguing hints for understanding the settlement patterns within the valley. Ormand appeared to have been a functioning community through several generations, perhaps one of several residential bases within the Cliff Valley, cycled between every 20 to 75 years as suggested for the Mimbres Valley Salado (Nelson and Anyon 1996). Roomblocks were remodeled extensively, built perhaps as early as A.D. 1300, with another construction sequence sometime after A.D. 1342 (tree-ring date from east roomblock), and a final remodeling episode perhaps in the late fourteenth or early fifteenth centuries. The large, centrally located ceremonial structure was built along with the earliest roomblock construction. The ceremonial structure appears to be unique to the Cliff Valley, and suggests that Ormand was a center of communal ritual in the valley. Faunal remains from the north roomblock showed a high variety of bird taxa, from elements typically used for religious paraphernalia (fans and *pahos*, see Akins, this volume). Household units tended to be larger in the north roomblock, with more one-room households found in the east roomblock. The use of aggregated architecture with nondifferentiated rooms, may signify different ethnic groups rather than implying social hierarchy or complexity (Whittlesy and Ciolek-Torrello 1992:318). The Ormand pattern may reveal how dynamic and multilayered this population movement was, with groups aggregating and splintering as needed over time.

Artifactual analyses are unknown for other sites in the Cliff Valley. The Ormand Village site was remarkably self-sufficient, and in this regard best fits a "pioneer" society within the frontier model (Doolittle 1973:33). Petrographic analysis shows that pottery was locally made, including both of the decorated traditions (Salado polychromes and Maverick Mountain Polychrome-Tucson Polychromes), and the utility styles (Hill and Wilson, this volume). The homogeneous designs and treatments for the Salado polychromes does suggest a short span of production, and may indicate that the site was relatively short-lived, or perhaps cut off from newer innovations (Wilson, this volume). Chipped stone and ground stone materials were locally available, and no developmental changes were noted within each assemblage. The use of "agave knives" seems to follow this desert grassland adaptation throughout southeastern Arizona and southwestern New Mexico, and may signify a form of cultivation of agave (Fish et al. 1985). No evidence of agave roasting was found at Ormand, but few extramural pits were discussed in detail.

Recent extensive investigation of Salado Polychrome pottery (Crown 1994) has suggested that Salado designs reflect a "Southwestern regional cult" focused on the earth and fertility, created in response to demographic movements, large-scale abandonments, and the disruption of kin relationships. The situation in the late thirteenth and early fourteenth centuries was ideal for the acceptance of a cult that stressed the well-being of the community greater than the local village, promoting exchanges of goods, information, and people across ethnic boundaries. Most importantly this cult could coexist with other beliefs promoting political leadership or ancestor worship (Crown 1994:214-215). Salado polychrome pottery was not associated with a fixed burial custom nor socially restricted in any way, and does not have formal similarities to Mesoamerican icons (Crown 1994:221-223). Acceptance of this larger world belief united many communities across the prehistoric Southwest, and can account for the wide variety of architectural styles and material culture associated with the Salado phenomenon.

The utility wares at Ormand show strong similarities to utilitarian pottery types found throughout a broad area of the prehistoric Southwest, at least as large as the area associated with Salado polychromes. Perhaps most striking for this technology is the fact that potters over a very wide area used the same firing techniques and similar clay resources to produce a uniform pottery style, most easily recognized in the painted Salado polychromes. Accompanying the Salado polychrome tradition was another distinctive painted pottery tradition, originating as Maverick Mountain Polychrome and developing into Tucson Polychrome pottery. This distinctive tradition has been consistently found in assemblages with high frequencies of Salado polychromes at Salado sites in the San Pedro Valley, the Tucson Basin, the Safford Valley, the Point of Pines region, and in the Upper Gila. The decline of this pottery type through time at Ormand and other Salado sites may reflect a gradual decline of a regional style (Wilson, this volume).

Accurate chronometric data hampers any definitive characterization of the Cliff Valley as a frontier, or even as a peripheral community. The few dates that do exist are suggestive but not inclusive enough. While factors such as shared ideology through pottery, aggregated architecture, plazas, chipped stone and ground stone technologies, and a dependence on corn agriculture suggest a potential area of origin and eventual dissemination, the core and periphery model, and by extension the frontier model, do not seem to explain the complex and dynamic movement of Salado peoples across the Southwest. To view one area, such as the Tonto Basin, as a prime mover in the Salado phenomenon confuses spatial units with human dynamics; it cannot, as a single geographic provenience, explain the complex social and environmental changes that occurred in the fourteenth and fifteenth centuries (Lekson 1992c:336). As a heuristic device, the core-periphery model has some utility, but it does not offer an explanation explaining the complexity behind the Salado phenomenon.

Other Possible Explanations

Aside from lacking the data to prove or disprove a core and periphery relationship, the archaeological record has not been kind to the "heartland" model. Recent investigations in the Tonto Basin by the Roosevelt Lake Project have concluded that the amount of variation noted across the whole Salado range can be found within a 5 km area of the basin (Elson et al. 1995; Stark and Elson 1995). Earlier complaints that Gila Polychrome offered a "lowest common denominator" (Nelson and LeBlanc 1986) between Salado sites have been transformed by a conceptual shift examining why such a connection exists (Crown 1994). With the possibility that Salado polychromes signify the process of adopting a larger, unifying ideology, simple power relationships do not seem to address the complexity and dynamic interchange that describes the Salado presence in the Southwest.

Other explanations for this phenomenon fall into two conceptual categories investigating mobility and boundaries. The idea of mobility has taken on more subtle and dynamic inferences in recent years. In the Mimbres Valley, the Salado population was interpreted as "wandering agriculturalists," perhaps moving from site to site within the valley after occupations of no more than 10 to 15 years. This hypothesis stems from the lack of trash deposits at these sites, and a perceived architectural pattern built "for the short run" (Nelson and LeBlanc 1986:250). This may have been an important strategy even in the relatively longer-lived sites in the Cliff Valley, like Ormand. The number of sites found in the Cliff vicinity may represent occupations of short duration, with people moving between residential bases in the valley. Several topographical differences between these two valleys should be noted: the Mimbres Valley is much narrower, particularly in the northern reaches, and not as conducive to agriculture (Minnis 1986). Mobility may have been a higher environmental demand in the Mimbres Valley. The Cliff Valley offers a remarkably fertile agricultural setting, with wide, flat floodplains, and terraces just high enough to protect households from any disaster flooding. This view of mobility on a small, locational scale shows how complex settlement patterns can be within a region. Whether the idea of "wandering agriculturalists" can be used to describe the larger migratory phenomenon of the fourteenth and fifteenth centuries A.D. has yet to be determined, but a "medium term" level of mobility may have been the primary mechanism for coping with environmental changes (Douglas 1995:251).

Boundary investigations, or the search for discrete "cultural entities" has a much longer history, but with ever-changing developments. Core and periphery discussions emanate from this general concept, as do discussions of a "Casas Grandes interaction sphere" (LeBlanc 1989). Investigations of exchange and interaction in many ways provoke new conceptual shifts in understanding how items enter and leave a culture sphere. The greatest concentration of intellectual energy focused on exchange in southwestern New Mexico looks to Paquimé (Bradley 1992; Douglas 1992, 1995; LeBlanc 1989; Lekson 1992a, n.d.; Minnis 1988, 1989). More amorphous arguments that see "influences" across a large area outside of this city center rely heavily on two interpretations. The first assumes that the southern model of the origin and development of Salado polychromes defends and upholds the very reason for Paquimé's scale and existence, supporting its premier "core" status (DiPeso 1974; Lekson n.d.; Nelson and LeBlanc 1986). With the recent redating of Paquimé (Dean and Ravesloot 1993), much of the support for this hypothesis is eroded. As a concept, the Paquimé hegemony hinges on suggestions that the presence of Salado pottery in warehouselike proveniences proves that Gila Polychrome was "stored and treated like a bulk imported commodity," traded north to Casa Grande in the Tonto Basin (Lekson n.d.).

A second argument connecting Casa Grande (near Phoenix) and Paquimé (or Casas Grandes in Chihuahua, Mexico) takes a very different perspective. Relationships among "small-scale regional systems" were described as a "peer polity interaction," with systems of equal or comparable scale establishing trade alliances. One positive aspect of a peer polity model is that different types of interactive and integrative processes can be taken into account (Minnis 1989:301-303). Unlike other exchange theories, which focused on power structures, such as the *pochteca* or world systems models, peer polity does not assume dominance by one area over another. In addition, this model encourages an open investigation of the real nature between societies, with the assumption that polities are autonomous (Bradley 1992:130). Although Paquimé represents one of the most highly centralized pueblos in the prehistoric southwest, its greater influence and power did not appear to extend beyond a 130-km radius, in an area contained within northwestern Chihuahua. The peer polity interaction is discussed as a relationship between adjacent polities (Minnis 1989:301-305), but no obvious material culture exchanges took place with Ormand Village.

One of the most cogent critiques of past exchange models for Paquimé and the greater Southwest comes from Douglas (1992:20) in which he states:

> Studies that analyze exchange as an abstract process risk reifying our "networks" at the expense of closer examinations of the archaeological record and our theoretical precepts. Southwestern archaeologists need a more dynamic view of exchange, one that deals with variability in social, political, economic, and ecological factors. An adequate model must also deal squarely with the very real barriers to exchange among nonstate societies.

Exchange and social theory have tended to conceive of "social interaction" as an "entity," removed from ". . . historic context, specific human goals, and possibly contradictory aims." Exotic goods may be powerful items in a local setting, because they are difficult to acquire, and not because they came through exchange networks (Douglas 1992:2).

Warfare, strife, and dissent color other interpretations of the Salado phenomenon, and have been linked to peer polity models (Minnis 1989:305). Evidence of violence and defensive settlement location and architecture are noted in northern Arizona (Wilcox and Haas 1994), and at Paquimé (Minnis 1989), but are absent in the Cliff Valley, and only a possibility in valleys in southeastern Arizona (Brown 1973; Franklin 1980).

Perhaps the most intriguing recent theoretical development suggests that a "balkanization" of groups occurred in the Southwest, where small autonomous areas dotted the fourteenth-century landscape. Independent groups are noted by ceramic, architectural, and settlement pattern data throughout the international Four Corners area (Shelley and Altschul 1996:155). The recent examination of the Tonto Basin echoes this view on a microregional scale, where "tribalization" between villages is noted (Stark and Elson 1995:37).

We have yet to know how the Salado settlement in the Cliff Valley fits larger patterns seen in the archaeological record of the fourteenth and fifteenth centuries. Clearly, Ormand was a migrant community with strong ties to the west, in areas of east-central and southeastern Arizona. The Ormand Village was self-sufficient for all of its subsistence and material needs. This self-sufficiency apparently extended into lack of access to exotic goods, although this was a typical pattern for sites in southwestern New Mexico (Nelson and LeBlanc 1986:204). Imported pottery was very low, at 1 percent of the total of 23,805 sherds analyzed. Ceramic imports reflected exchange with populations to the east with the presence of El Paso Polychrome, but very minimal exchange with populations to the south. Just one Chihuahuan sherd was found in this analysis. By all accounts, the northern model of the origin and development of the Salado is upheld by the Ormand evidence. What is not clear is how the Ormand Salado related to its points of origin. Were the Ormand Village and other Salado communities in the Cliff Valley an independent "balkanized" area? Does the maintenance of Salado Polychrome production prove that this community was tied to a "homeland"? This examination of the Ormand Village has provided some answers to old questions and clarified the need for further research in new orientations.

Suggestions for Future Research

Several very distinct research problems are revealed by this examination of the Ormand Village site. These research issues touch on local, regional, and large-scale issues on the nature of the Salado horizon. Very little is known about small sites and their relationship to large sites during the Salado period (Stuart and Gauthier 1981:210). Ceramic signatures bearing the presence of Maverick Mountain Polychrome-Tucson Polychrome pottery need to be made known, and a major effort on this issue is underway (Alexander Lindsay, pers. comm.1996). We do not understand how prehistoric peoples shared natural resources, and simple explanations of autonomy or dependency concerning "exchange relations" need refinement to account for the complexity and inherent difficulties of social relations (Douglas 1995:253). Refinements in theoretical discussions about "influence" and "control," and large-scale regional phenomenon also need to be developed (Douglas 1995; Doyel 1988:291, 1992; Johnson 1989; Whittlesey and Ciolek-Torello 1992:313).

Systematic botanical collection has not been done for many Salado sites in southwestern New Mexico and southeastern Arizona, and would provide an important window into subsistence practices suggested by ground stone assemblages and site location. Smaller scale mobility, proposed as "medium term" mobility, "short-term sedentism," "wandering agriculturalists," or the "fallow-valley pattern" (Douglas 1995; Nelson and Anyon 1996; Nelson and LeBlanc 1986) needs to be addressed on the local, regional, and horizon scale. Investigating the lack or presence of trash deposits will aid in determining duration of settlements. We do not know how Salado communities interacted with one another, within small regions to large-scale interaction. Accurate chronometric data are needed to establish contemporaneity between sites and to determine levels of mobility within a locality.

Most of these topics read like a wish list for any archaeological inquiry. What has become clear with the Salado phenomenon is that attention to detail is the key to informing the nature of the larger Salado picture.

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APPENDIX 1. CLAY SAMPLES COLLECTED AROUND THE ORMAND SITE

Clay Sample 1
Soil Clay Exposure Just North of Ormand Site
Thin layer between alluvial soil and alluvial deposits. Thin exposure about 2 m below surface. Layer about 10 to 20 cm thick.
Good plasticity
Fires soft
Sparse tuff inclusions
Natural color 7.5YR 5/4 (Brownish)
Refired color 5YR 6/6 (Yellow Red)

Clay Sample 2
North of Buckhorn
4.5 m
Directly below soil level
Fair plasticity, very white and sticky
Fires soft and light, suitable for slip clay only
Natural color white
Refired color 10YR 8.2

Top Alluvium

Ash

Alluvium

Ash

Clay Sample 3
Very plastic (3 m)
Thick fine clay alluvium north of Buckhorn
Plastic reddish clay
Clay sample
Thick white ash level, top most level
Finely weathered, powdery
Natural color 5YR 5/6 (Reddish Brown)
Refired color 2.5YR 6/8
Inclusions sand and tuff

Clay Sample 4
Thick ash near Buckhorn, uppermost level
Fires soft but good slip clay
Natural color white
Refired color 10YR 8/4 (Buff)

Clay Sample 5
Thick ash near Buckhorn, thick lower layer level
Tuff
Plastic
Fires slightly soft but much harder than slip clays
Natural color green
Refired color 7.5YR 6/6

Clay Sample 6
Alluvial soil sample near Ormand
Some tuff, very sandy
Natural color green
5YR 6/6

Clay Sample 8
Fine clay from alluvial north of Silver City on mine road
Extremely high quality
Very fine tuff
Natural color 10YR 8/4
Refired color 2.5YR 6/6

Clay Sample 9
Alluvial clay along river near Ormand site
Fine tuff inclusions
Natural color 10YR 8/3
Refired 5YR 6/6

Clay Sample 10
High iron clay with lots of sand and gravels near Silver City
Sorted sand and tuff inclusions
10R 6/6

APPENDIX 2. LISTS OF ANALYZED PROVENIENCES FROM THE ORMAND VILLAGE

(by feature, field specimen number, lot number)

Floor Ceramics:
6-7, 7-8, 8-7, 10-17, 10-23, 10-24, 10-25, 10-26, 10-27, 10-28, 10-29, 10-50, 10-51, 10-55, 10-57, 10-61, 10-62, 10-64, 10-70, 10-72, 10-90, 15-43, 16-3, 19-27, 20-8, 20-9, 20-33, 20-35, 21-5, 21-16, 22-26, 23-7, 23-8, 23-9, 23-11, 23-16, 23-17, 23-18, 23-19, 23-23, 24-2, 24-5, 29-19, 29-20, 29-21, 29-22, 30-5, 30-22, 31-19, 31-20, 31-26, 31-27, 31-36, 31-37, 33-18, 33-19, 34-14, 34-15, 34-24, 34-26, 34-27, 34-38, 35-10, 35-11, 36-13, 36-14, 37-20, 38-31, 41-21, 41-23, 44-22, 48-16, 48-24, 48-25, 48-26, 48-27, 48-41, 57-21, 57-26, 57-27, 57-28, 57-29, 63-31, 63-48, 76-63, 79-39, 79-41, 79-42, 79-43, 83-17, 83-21, 84-14, 89-21, 89-22, 89-23, 89-24, 89-25, 89-26

Ceramics lining mealing bins in floors:
19-23, 19-24, 20-4, 23-12, 29-35, 29-36, 29-41, 30-4, 30-14, 30-15, 30-21, 31-34, 33-20, 33-21, 37-20, 38-38, 41-18, 89-40

Floor fill/Fill ceramics:
7-22, 7-24, 8-19, 8-29, 10-13, 10-14, 10-15, 10-18, 10-19, 10-20, 10-21, 10-22, 10-52, 10-60, 15-19, 16-1, 16-3, 16-4, 16-5, 16-7, 16-8, 16-10, 16-11, 17-11, 18-10, 18-25, 19-6, 19-9, 19-20, 20-2, 20-3, 20-6, 20-7, 20-31, 20-34, 21-4, 22-7, 22-8, 22-9, 22-10, 22-11, 22-12, 22-13, 22-14, 22-18, 22-20, 22-21, 22-22, 22-29, 22-31, 23-3, 24-1, 24-6, 24-9, 24-12, 24-13, 27-3, 27-16, 29-11, 29-16, 29-18, 29-40, 30-2, 30-6, 30-11, 30-16, 31-2, 31-4, 31-5, 31-6, 31-7, 31-17, 31-21, 31-24, 31-30, 33-4, 33-22, 33-34, 34-22, 34-51, 35-1, 35-8, 36-5, 36-6, 36-10, 37-9, 37-18, 37-19, 37-21, 37-29, 37-31, 37-32, 37-33, 38-5, 38-7, 38-26, 41-1, 41-7, 41-12, 41-24, 41-36, 41-42, 41-48, 44-1, 44-2, 44-3, 44-23, 48-8, 48-52, 50-3, 50-4, 50-8, 52-14, 52-31, 52-32, 57-15, 57-18, 57-19, 58-9, 63-16, 63-37, 63-38, 63-40, 68-7, 68-20, 76-1, 76-2, 76-3, 76-4, 76-8, 76-9, 76-10, 76-11, 76-14, 76-47, 76-48, 79-27, 79-28, 79-49, 83-10, 83-11, 83-18, 89-20, 97-9, 97-14, 97-15, 97-18, 97-19, 97-20

Roof fall ceramics:
15-4, 15-9, 15-11, 15-12, 15-20, 15-21, 15-23, 15-24, 15-43, 18-29, 18-30, 22-30

Subfloor ceramics:
19-37, 20-39, 22-35, 22-36, 24-17, 24-18, 24-19, 30-25, 31-38, 36-18, 41-49, 41-50, 41-52, 44-26, 48-56, 68-29

Floor Chipped Stone:
6-7-(1-3), 7-8-1, 7-11-(1-4), 7-20-1, 8-6-1, 8-7-(1-11), 8-18-(1-3), 8-22-1, 10-17-(1-2), 10-25-(1-2), 10-26-(1-2), 10-42-1, 10-51-1, 10-55-(1-29), 10-62-(1-2), 10-64-(1-8), 10-90-(1-5), 10-91-1, 19-27-(1-8), 19-36-1, 20-8-(1-22), 20-15-1, 20-16-1, 20-33-1, 20-35-(1-2), 21-16-(1-3), 22-12-(1-29), 23-7-(1-17), 23-9-(1-7), 23-19-(1-2), 24-2-(1-4), 29-41-1, 30-4-(1-13), 30-5-(1-2), 30-24-1, 31-26-(1-6), 31-27-1, 31-39-1, 34-24-1, 34-26-1, 34-38-2, 35-10-(1-2), 35-11-(1-3), 36-7-1, 36-8-1, 36-11-1, 36-14-1, 38-31-(1-3), 41-19-1, 41-21-1, 41-25-1, 44-22-1, 57-21-(1-4), 57-29-(1-4), 58-16-1, 63-31-(1-2), 76-73-(1-2), 83-16-1, 83-17-(1-3), 83-21-1, 84-13-1, 97-17-(1-2)
TOTAL: 242 items

Floor Fill Chipped Stone:
7-22-(1-2), 8-19-1, 10-13-(1-2), 10-14-1, 10-15-1, 10-20-1, 10-22-1, 10-47-1, 10-52-1, 10-60-1, 10-70-(1-5), 17-11-(1-2), 19-5-(1-9), 19-9-(1-2), 19-20-(1-6), 20-6-(1-4), 20-7-(1-6), 21-4-(1-5), 22-8-1, 22-9-(1-7), 22-10-(1-6), 22-11-(1-7), 22-13-(1-17), 22-17-1, 22-21-(1-1-2), 22-23-(1-7), 22-25-1, 22-29-(1-2), 22-31-(1-8), 23-4-(1-2), 24-1-(1-2), 29-11-1, 29-15-1, 29-16-(1-3), 29-18-(1-5), 30-11-(1-2), 30-12-1, 30-16-(1-22), 31-4-(1-26), 31-7-(1-12), 31-14-1, 31-17-1, 31-24-1, 33-22-(1-20), 33-27-1, 34-15-(1-8), 34-20-1, 34-22-(1-2), 34-51-1, 35-1-(1-43), 35-8-(1-24), 36-6-(1-37), 37-9-(1-40), 37-19-(1-2), 37-21-(1-4), 38-7-(1-28), 38-18-1, 38-19-1, 38-26-(1-9), 40-23-1, 41-12-(1-14), 41-24-(1-6), 48-8-(1-8), 48-23-1, 48-44-1, 48-54-1, 57-14-1, 57-18-(1-2), 57-19-(1-13), 63-34-1, 63-37-(1-3), 63-38-1, 68-7-(1-3), 68-9-1, 68-11-1, 68-16-1, 68-24-1, 68-25-1, 68-26-1, 68-27-1, 76-48-(1-2), 76-53-1, 76-58-1, 76-61-1, 79-21-1, 79-23-1, 79-27-(1-7), 79-28-(1-15), 79-49-(1-2), 83-10-(1-2), 83-18-1, 89-20-(1-3), 97-14-(1-15), 97-15-(1-3)
TOTAL: 532 items

Floor Ground Stone:
6-9-1, 7-10-1, 7-11-(1-2), 8-6-1, 8-7-1, 10-40-1, 10-42-1, 10-50-1, 10-92-1, 16-3-1, 17-8-1, 20-8-1, 20-32-1, 23-19-1, 23-24-1, 29-23-1, 29-24-1, 29-27-1, 29-51-1, 30-10-1, 30-18-1, 30-19-1, 33-7-1, 34-31-1, 34-34-1, 34-35-1, 34-38-1, 35-7-1, 38-31-1, 48-20-1, 48-53-1, 57-29-1, 57-35-1, 57-37-(1-2), 58-14-(1-3), 58-15-(1-2), 68-10-1, 68-30-1, 76-66-1, 76-67-1, 79-35-1, 79-37-1, 79-45-1, 79-46-1, 83-15-1, 83-16-1, 83-19-1, 83-20-1, 84-14-1, 89-29-1, 89-30-1, 89-31-1, 89-32-1, 89-35-1, 89-36-1, 97-5-(1-12), 97-25-1, 97-26-1, 97-28-1
TOTAL: 75 items

Floor Fill Ground Stone:
10-18-1, 10-19-1, 10-21-1, 10-48-1, 10-49-1, 10-87-1, 19-4-1, 21-19-1, 22-13-1, 22-27-1, 23-21-1, 29-7-1, 29-12-1, 29-18-1, 31-7-1, 31-10-1, 31-22-1, 33-16-1, 33-17-1, 34-17-1, 34-21-1, 35-1-1, 37-12-1, 37-14-1, 37-29-1, 38-27-1, 41-5-1, 41-8-1, 41-9-1, 41-12-1, 48-23-1, 48-46-1, 48-55-1, 57-16-1, 57-32-1, 58-12-1, 63-40-1, 68-18-1, 68-21-1, 76-52-1, 76-68-1, 79-20-1, 79-31-1, 79-34-1, 79-53-1, 79-56-(1-2), 79-57-1, 83-8-1, 89-8-1, 89-11-1, 89-12-1
TOTAL: 53 items