Tuzigoot National Monument: a winter scene.
THE TUZIGOOT SURVEY
AND THREE SMALL
VERDE VALLEY PROJECTS

Archeological Investigations in the Middle Verde Valley, Arizona

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Frontispiece: Photograph of Tuzigoot National Monument by Doug Von Gausig.
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ABSTRACT

This report presents the results of the TUZI 86A archeological project, whose main objective was the inventory of cultural resources within Tuzigoot National Monument and a proposed land acquisition area adjacent to the monument. It states the results of the survey, presents a summary of previous work in the project area, and discusses the cultural history and natural setting of the region. This is followed by site descriptions, artifact analyses and results, interpretations of the subsistence patterns and external relationships of the sites, and the chronology of the area. The archeological survey of the monument and adjacent land identified eight sites, all of which are Southern Sinagua sites (A.D. 1100-1450). This includes the Tuzigoot pueblo and one additional site within Tuzigoot National Monument. A discussion of two nearby pueblos not in the survey area but important to the archeology of the valley is also included.

In addition to the Tuzigoot survey, three additional small, unrelated archeological projects in the middle Verde Valley are reported on. These are two projects carried out during TUZI 86A, and a third project completed in 1983 but never published. During the Tuzigoot survey, the author and two other archeologists also excavated a child burial which had been on display in Montezuma Castle (MOCA 86B--Chapter 7), and surveyed a small section of land near Montezuma Well which identified three additional Southern Sinagua sites (MOCA 86A--Chapter 8). In 1983, A. Trinkle Jones monitored installation of drains in the Tuzigoot pueblo; this resulted in the recovery of an infant burial below a room floor (TUZI 83A--Chapter 6). This report is included here since it also deals with the archeology of the Verde Valley and was previously unpublished. The environmental and background information in the first part of this report applies also to these three small projects and is not repeated.
Part 1

THE TUZIGOOT SURVEY
Chapter 1

INTRODUCTION

An archeological survey of Tuzigoot National Monument and a section of privately owned land surrounding the monument was undertaken in March 1986 by archeologists from the Western Archeological and Conservation Center (WACC). The objective was to locate, record, and evaluate all archeologically significant cultural resources within the boundaries of the project area (Tagg 1986). Tuzigoot National Monument was placed on the National Register of Historic Places with the signing of the Historic Preservation Act of 1966, as were all other known historic areas in the National Park Service system, even though the area had never been totally surveyed and a National Register form is only now being prepared. Previous archeological work in the monument focused almost exclusively on the excavation and stabilization of the Tuzigoot pueblo. Recently, the National Park Service has proposed acquiring privately owned land adjoining the monument, to help preserve the historical and interpretive integrity of the monument by creating a buffer zone against future development (National Park Service 1975a:9). Only a small portion of the area of this proposed land acquisition had been surveyed, and records for this work were incomplete. The Natural and Cultural Resources Management Plan for Tuzigoot National Monument (National Park Service 1975b:1) recognizes the need for an archeological survey of the monument and surrounding area and the development of an archeological base map.

The archeological survey of Tuzigoot National Monument and adjacent lands (Pkg. 113) (Fig. 1.1) was undertaken to provide the monument with a current inventory of cultural resources for use in future management planning, and to assess the archeological significance of land that may be acquired in the near future. An updated archeological base map will be a useful management tool for archeologists and monument personnel, providing a cost-effective means of assessing the impact of future projects and making it possible to plan ground alteration projects so that they will avoid sites and receive clearance unless subsurface material is found. The survey addresses the congressional mandates and fulfills the inventory requirements of Section 106 of the National Historic Preservation Act as amended in 1980, which asks for cultural resource inventories of all federal properties for management purposes. The survey also provides complete records useful for compiling the National Register of Historic Places form for Tuzigoot National Monument.
Figure 1.1 The TUZI 86A project area and vicinity.
Research Topics

Although the purpose of this project was an inventory of cultural resources, the fieldwork was approached from the perspective of several research topics of significance to the Tuzigoot pueblo and Verde Valley archeology. These topics relate to suggestions made by Fish and Fish (1977:27-29) for future research in Verde Valley national monuments. The research topics, although quite general, were addressed in both the survey and in this report.

1. What is the nature of the archeological resource base at Tuzigoot National Monument and the surrounding project area, and how does this compare to what is known of the Verde Valley?

2. Can the discovery of the location of different site types provide us with land use or resource exploitation patterns? Also, can relationships be established between small outlying sites and the large Tuzigoot pueblo with respect to these activities?

3. Is there any temporal difference in the various site types? Can demographic events, such as population growth, be identified through time using this site information?

4. Is there evidence of influence from cultures centered in other regions such as the Salado, Hohokam, or Anasazi? In what form is this influence seen?

5. Does evidence of agriculture such as canals or checkdams remain, and can this help interpret prehistoric agricultural practices in the Verde Valley and the utilization of the surrounding lowlands by the inhabitants of the Tuzigoot pueblo?

The application of the recovered survey data to a consideration of these topics, and the examination and evaluation of previous work in the Verde Valley, allows discussion of the prehistoric use of Tuzigoot National Monument and vicinity, and illustrates the role and importance of the resources to our understanding of Verde Valley prehistory.

Previous Research

Archeological work within the project area has been sporadic at best, focusing almost exclusively on the excavation and stabilization of the Tuzigoot pueblo. Archeological remains in the Verde Valley were mentioned as early as 1583 by Espejo (Hammond and Rey 1929:106); again in the mid-1800s by Sitgreaves, Palmer, Whipple and others; and later in the Wheeler survey (Fewkes 1912:186; Schroeder 1960:12). However, the
first archeological investigations did not take place until the late 1800s (Mearns 1890:745-763; Mindeleff 1896; Fewkes 1898, 1912), and the Tuzigoot pueblo was not officially recorded until Earl Jackson (1933:16) resurveyed the middle Verde in 1932 and 1933 (Sudderth and others 1976:11; Fish and Fish 1977:5). Around this time several large masonry sites were excavated in the valley, including Tuzigoot. Under the administration of Byron Cummings of the University of Arizona, Caywood and Spicer (1935) directed a U.S. Civil Works Administration (CWA) project that resulted in the nearly complete excavation of the pueblo, including 86 ground floor rooms, 3 refuse areas, and 411 burials (429 individuals). Caywood and Spicer named the pueblo "Tuzigoot," the Tonto Apache name for Pecks Lake that means "crooked water." After the excavation, seven rooms in the Group 4 block were reconstructed, but were later dismantled and restored to their post-excavation condition (Richert 1953:9-15; Hartman 1976:41-43; Sudderth and others 1976:11). Caywood and Spicer also apparently directed the excavation of portions of the Tuzigoot Extension Ruin on the ridge just south of Tuzigoot, and the Hatalacva pueblo to the west of Tuzigoot, but records on this work other than a few photographs in the Tuzigoot National Monument photo files have not been found.

Stabilization has been an ongoing project at the Tuzigoot pueblo since it was established as a monument in 1939. This consisted mostly of maintenance and small stabilization jobs carried out by monument staff (see Voll 1964, for instance) but also includes four major stabilization projects (Cotter in 1940 [Neilson 1980:16]; Richert 1953; Shiner 1961; and Mayer and Waggoner 1968). The stabilization resulted in repairs throughout the pueblo, and also uncovered an occasional undisturbed burial or pot cache, indicating the presence of undisturbed deposits still remaining within the pueblo (Hartman 1976:41; Neilson 1980:16-26). An occasional burial was also exposed by erosion and weathering through the years, both in the pueblo (Smiley 1940), and in the refuse slopes (Schroeder 1967).

Since that time, archeological work in the monument has consisted mainly of small clearance surveys and test excavations within the monument boundaries (Fig. 1.2). Peck (1959) excavated a 70 foot stratigraphic test trench along the east slope of Tuzigoot hill to establish vertical and horizontal stratigraphy for the pueblo; his results did not differ significantly from those of Caywood and Spicer. Cummings provided clearance for the National Park Service employee residences, water tank, access road, and utility lines in 1964, and a borrow pit for the access road in 1966. He mentioned a Yavapai camp just outside the limits of the pit, which was not disturbed by the project (Hartman 1976:45). In 1973 Henderson (1973) provided clearance for a buried telephone cable off the eastern slope of the Tuzigoot ridge after excavating five test trenches. One of the trenches revealed a definite cultural horizon with charcoal and artifacts, and a second exposed definite profiles of two irrigation ditches: these were not investigated further. In 1976 WACC conducted a List of Classified Structures (LCS) survey in the monument which investigated the Tuzigoot pueblo. The survey recommended a regular maintenance schedule to preserve the ruin, development of a better drainage system, and further studies to define the pueblo (Sudderth and others 1976:26-28).
Figure 1.2 Previous archeological research at Tuzigoot National Monument (from Hartman 1976:29, Fig. 6). Map also includes TUZI 86A-2 recorded by this project.
In response to the LCS recommendations and prior to the installation of a subterranean drainage system in the pueblo, Hartman (1976) did a study of Tuzigoot that resulted in an archeological overview. The known archeological investigations were reviewed and a map, including possible undisturbed cultural deposits in the pueblo, was prepared. A total of 110 rooms were estimated for the pueblo, considering exposed rooms and the presence of walls and refuse accumulation beneath floors of excavated rooms (Hartman 1976:42). The drainage system was postponed until 1983, when Jones (see Chapter 6, this report) monitored the installation of the new system in 20 rooms of the pueblo. This study uncovered an undisturbed infant burial and some cultural trash deposits, and redefined some of the undisturbed room deposits reported by Hartman. It was suggested that the undisturbed cultural deposits which remain are very limited, consisting of a few features and several inches of cultural fill, and that the probability of unexcavated rooms remaining in the pueblo is low.

The only known archeological work in the portion of the project outside monument boundaries is Gumerman's (1973) survey of a portion of Phelps-Dodge land around Tuzigoot that was offered to the National Park Service in exchange for areas to be utilized in proposed mining operations. The exact area surveyed is not known, but apparently consisted of the high mesa top on the eastern boundary of the present project area, and farm and marsh land just north and east of Tuzigoot (Fish and Fish 1977:6). Two small sites, consisting of from three to eight rooms each, were recorded on the terrace edge (AZ N:4:1 and AZ N:4:2, Prescott College). Gumerman noted that one site was vandalized so completely that little data remained, and the other site was badly eroded. Both sites were classified as Southern Sinagua sites with pithouse and pueblo architecture. Arizona State Museum and Coconino National Forest records show no sites in the project area.

In Fiscal Year 1986, funding was approved for the archeological survey of Tuzigoot National Monument and adjacent privately owned land proposed for acquisition by the National Park Service. The purpose of the survey was a complete cultural resource inventory of the monument and proposed land acquisition property, to upgrade resource data to current standards, to provide recommendations for resource preservation and management, and to update National Register forms.

Methods

The field survey was conducted from March 18 through March 27, 1986, by a crew of three archeologists, for a total of 24 man-days in the field; 6 man-days were spent on other small archeological projects at Montezuma Castle National Monument not related to the Tuzigoot survey (see chapters 7 and 8, this report), and another 6 man-days were spent on archival research at Tuzigoot National Monument and recording Hatalacva and the Tuzigoot Extension Ruin. Survey methods were those used previously by the author (Tagg 1985:7-9). There was 100-percent systematic coverage of the terraces that make up most of the project area, excluding three areas (Fig. 1.3): 6
Figure 1.3 TUZI 86A project area with unsurveyed sections.
1. Tavasci Marsh and the agricultural fields to the south and west, because the area has been drastically disturbed by over 70 years of cattle grazing and farming.

2. The Phelps-Dodge tailings pond, because no original ground surface remains in that area, which features from 20 to 60 feet of tailings debris.

3. The current floodplain of the Verde River, because natural disturbance and thick vegetation have covered or destroyed any cultural remains.

The steep, flat-topped mesa edge, dissected by steep canyons, that makes up the eastern boundary of the project area was treated differently. Here, linear transects were used to cover the mesa top and canyon bottoms, using natural terrain as survey boundaries. All cliff faces with potential for cave sites, and flat areas with potential for open sites, were inspected. Those ridge slopes that were too steep to be safely surveyed were not inspected; in any case, there is a low probability of site occurrence in such areas. The crew walked linear transects, with approximately 15 m between each crew member. It was felt that this coverage would permit detection of most sites. Transect bearings varied due to the topography of the area, with transects generally paralleling definable landmarks, such as boundary fences and roads.

Cultural resources located were classified either as sites or isolated finds (IF). Sites consisted of features and associated artifacts, or concentrations of more than 15 artifacts. Isolated finds consisted of clusters of less than 15 artifacts not in association with a feature or site, or isolated features, such as checkdams or small rock cairns with no associated artifacts. Sites were given field numbers 1 through 8, preceded by TUZI 86A-, which identifies the park, project year, and job sequence within the park that year. Each site was recorded on a WACC site form. Sketch maps were made showing site boundaries, features, artifact concentrations, and disturbed areas. Black-and-white photos and color slides were taken of each site to further document features and illustrate the site environment. A piece of rebar with an attached metal tag bearing the site field number served as the site datum and was left in place. Temporally or culturally diagnostic artifacts, including a grab sample of sherds and all projectile points, were collected. On small sites, artifacts not collected were inventoried using simple formal designations and material-type categories, such as "basalt trough metate" or "chert flake." Isolated finds were designated IF-A to U. Flaked stone debitage and cores were not recorded as isolated finds because they were lightly scattered over the entire survey area. No IFs were collected.
Sites and isolated finds were plotted on the U.S. Geological Survey 7.5 minute Clarkdale, Arizona, topographic map and on an aerial photograph (#ETB-16-203, 8/17/68) of the area. Site records, maps, photographs, field notes, and collected artifacts are housed at WACC in Tucson, Arizona. Copies of site forms are also on file at the Arizona State Museum and at Tuzigoot National Monument in Clarkdale, Arizona.
Chapter 2

PHYSICAL AND ENVIRONMENTAL SETTING

Location

Tuzigoot National Monument is a 58.68 acre parcel of land, and the proposed acquisition includes another 710 acres of adjoining land, for a total of approximately 769 acres (311.3 hectares or 1.2 square miles) in the project area (see Fig. 1.1). The project area is located in northeastern Yavapai County, Arizona, along Alternate Highway 89 approximately 1 mile east of Clarkdale, Arizona, and 35 miles southwest of Flagstaff, Arizona, the closest town of any size (Fig. 2.1). It lies just north of the Verde River, in the middle Verde Valley, and includes Township 16N, Range 3E: the southwest 1/4 of Section 15; the northwest 1/4 and the north 1/2 of the southwest 1/4 of Section 22; the southeast 1/4 and approximately half of the southwest 1/4 of the southeast 1/4 of Section 16; and the northeast 1/4, north 1/2 of the southeast 1/4, southeast 1/4 and east 1/2 of the northeast 1/4 of the northwest 1/4, and the northeast 1/4 of the southwest 1/4 of Section 21 (Gila and Salt River baseline and meridian). The monument boundary is marked by a barbed wire fence; the northern and eastern boundaries of the project area are marked by Coconino National Forest boundary markers, the western boundary is bounded almost completely by the Pecks Lake picnic area road, and the northern boundary is basically the Verde River.

Geography and Geology

The project area is located in the northwestern portion of the middle Verde Valley, one of a series of large intermontane basins in central Arizona. This portion of Arizona, between the Colorado Plateau physiographic province and the Basin-and-Range physiographic province, has been labeled the Transition zone, separating the mountains and the plateaus to the north and east from the deserts to the south and west (Tagg 1985:11). Elevations range from about 3,400 feet (1,036.6 m) in the vicinity of the monument, to 3,600 feet (1,097.6 m) along the eastern boundary of the project area.

The Verde River valley, containing one of the few permanent streams in Arizona, is itself geologically divided into three areas. The upper Verde, beginning in the Chino Valley, flows east through narrow canyons with steep limestone cliffs to Sycamore Canyon. Here, the basin broadens out for a maximum width of 20 miles and becomes the middle Verde as the river turns south for approximately 35 miles. Near the Mazatzal Mountains, where the East Verde converges with the Verde, the river enters another series of narrow canyons and becomes the lower Verde which flows on to join the Salt River. The Verde Valley is more or less a closed basin, bounded to the north and east by the Mogollon...
Figure 2.1 The Verde Valley, in the Mogollon Rim area, including Tuzigoot National Monument and vicinity (from Twenter and Metzger 1963:2, 6; Figs. 1 and 2).
Rim and Coconino Plateau, while the Black Mountains line the south and west (Sudderth and others 1976:4; Fish and Fish 1977:7; McGuire 1977:1).

Geologically, the Verde Valley is a down-faulted, sediment-filled basin and range trough between uplifted mountain ranges (Fig. 2.2). The Black Mountains, characterized by steep slopes with vertical cliffs and incised by deep walled canyons, is block-faulted and mostly composed of Precambrian metamorphic formations. The middle Verde Valley was once the bed of a Tertiary lake formed when the Verde River was blocked by lava flow from Squaw Peak. Deposition of sandstone, limestone, and conglomerates from the surrounding Yavapai group, Kaibab limestone, Coconino sandstone, Supai formation, and Redwall limestone, as well as lava, continued on the lake bed for thousands of years during the late Pliocene or early Pleistocene. The river eventually cut a new outlet, forming the middle Verde Valley. The deposited sediments, known as the Verde formation with sandstone, siltstone, and clay lenses, is the major geologic formation; it covers an area of about 325 square miles and is 15 miles wide, 35 miles long, and up to 1,500 feet thick. The action of the river and its tributaries, which drain Coconino Plateau, eroded the more resistant limestone to form canyons pocked with shelters and cavities of all sizes. These caves and shelters were used extensively by the prehistoric inhabitants of the region (Twenter and Metzger 1963:46-56; National Park Service 1975b:12; Sudderth and others 1976:4; Hartman 1976:21).

The valley floor, where the canyon walls of the Verde are farthest from the river, includes an active floodplain and broad flat terraces and rolling foothills formed by the exposure of lake or playa sediments deposited during the formation of the valley. Tuzigoot sits on one of these open hill tops. On the middle Verde floodplain, erosional remnants exist as mesas or buttes (Sudderth and others 1976:4; Fish and Fish 1977:7). While the formations of the Verde Valley are predominantly white sedimentary limestones and sandstones, igneous materials (mainly basalts), and metamorphics are also locally available. Modern and ancient terrace and wash gravels provide basalt, limestone, chalcedony, chert, jasper, quartzite, and small quantities of obsidian for knapping (Fish 1974:6). Tabular chert was also available in the limestone deposits. Stone for building purposes was available as boulders on the floodplain, and eroding caprock suitable for more formal masonry has been noted by Schroeder (1960:20) on mesas or buttes, or along the hills and cliffs lining the valleys (Fish and Fish 1977:7).

The fertile valley floodplain containing the project area was formed by recent river deposits which consist of unconsolidated gravels, sand, silt, and clay from older rocks. A soil map of the Verde Valley shows that unconsolidated streamwash, semi-consolidated sedimentary rocks, and thick limestone of the Verde formation make up the project area (Twenter and Metzger 1963). Soil analysis from Tuzigoot Hill revealed a high quantity of water soluble salt (Norcross 1940). It is possible that erosion from the ridge produced a high salinity in the surrounding flat lands (Twenter and Metzger 1963:60; Hartman 1976:21). Evaporative salts, found as deposits of salt, calcite, and gypsum were mined prehistorically near Camp Verde (E. Morris 1928). Red argillite was also mined near Dewey (Bartlett 1939) and Perkinsville (Fish 1974),
Figure 2.2 A geologic cross section of the Verde Valley and vicinity (from Seuse 1958:16).
and copper ores and their derivatives in the Black Hills near Jerome have furnished materials for pigments found prehistorically (Fish and Fish 1977:8).

Tuzigoot National Monument sits on an erosional remnant of layered rocks of the Verde formation, consisting of thin to medium beds of limy sandstones and siltstones, sandy and silty limestones, and some pure limestones. The hill is capped by a stream-laid, caliche cemented cobble-boulder layer (Fig. 2.3). These layers are similar to, but not identical to or at the same elevation as, other ridges in the valley (Wachter 1975:2-3). The remainder of the project area is predominantly the active Verde floodplain and broad, flat terraces, bordered on the east by the steep, heavily dissected, southwest edge of a large mesa.

**Climate and Hydrology**

The climate of the middle Verde Valley, typical of central Arizona, is classified as semiarid and characterized by hot, dry summers and mild winters (National Park Service 1975b:11; Tagg 1985:19). Annual mean temperature for the valley floor is 61.9 degrees F, with the highest recorded temperature being 114 degrees F and the lowest 5 degrees F. Summer highs average 110 degrees F and winter lows average 20 degrees F. The mean frost-free growing season at Cottonwood is 210 days (Sellers and Hill 1974:174; National Park Service 1975b:11; McGuire 1977:2), with the average date of first frost October 31 and the average last frost April 4 (National Park Service 1975a:14).

The mean annual precipitation for the region averages 11 to 12 inches, but varies from as little as 4 inches (in Cottonwood, 1956) to as much as 26 inches (1965) (Sellers and Hill 1974:174). Typically, there is winter and summer precipitation and a dry spring and fall. Wet seasons occur from mid-June or July through August, and from December through the beginning of March. Precipitation is summer dominant, with most rain falling from localized cloudbursts (Green and Sellers 1964:9-11; Fish and Fish 1977:3; McGuire 1977:1-2). Rain makes up almost all of the moisture received at Tuzigoot. Snow may occasionally fall, but it seldom stays on the ground more than a day or two, although a freak snowstorm in 1967 dropped 12 inches at the monument (National Park Service 1975b:11; Hartman 1976:21).

The Verde River, one of the few perennial streams in Arizona, is one of the major drainage systems in central Arizona and is a significant factor influencing growth and development of the valley. The flow of the Verde has been dependable since at least the Late Cretaceous. The area of initial perennial flow in the river is about 5 miles northwest of Perkinsville; upstream from there, the Verde and its tributaries are intermittent streams. The river flows from there, 65 miles through the valley, collecting water from several perennial tributaries, then flows another 60 miles below the valley until it enters the Salt River near Phoenix (Twenter and Metzgar 1963:13). Major tributaries all flow into the Verde from the Mogollon Rim to the east, and include Sycamore, Oak, Beaver, Clear, and Hackberry creeks (Sudderth
Figure 2.3 Generalized geologic cross section of Tuzigoot Hill (from Wachter 1975:Pl.2).
and others 1976:4; Fish and Fish 1977:7). The monthly average base flow of the Verde, maintained chiefly by springs and seeps (the discharge of ground water), ranged from 240 cubic feet per second (cfs) in February to 90 cfs in June; the average base flow was 170 cfs. The average discharge for the Verde is 470 cfs, ranging from 1,790 cfs in March to 90 cfs in June (Twenter and Metzgar 1963:14).

There are also over 50 springs and 200 wells in the valley. The ground water on which these sources depend issues from permeable sedimentary rocks in the Verde Valley ground water base. This ground water sustains the perennial flow of the Verde River and its tributaries through spring flow. The chief means of recharge to this aquifer is by direct penetration of water from precipitation on the Colorado Plateau. Spring flow is the most intensively utilized source of ground water, with springs in the valley averaging from 10 gallons per minute (gpm) to more than 10,000 gpm (Twenter and Metzgar 1963:66-94).

Pecks Lake, an ancient oxbow of the Verde River approximately 3 miles long, lies just outside the northwest boundary of the project area. Located in another old oxbow of the Verde, Tavasci Marsh is about a half mile long and occupies about 35 acres in the northeast corner of the project area. It is watered by several springs around Shea Spring, and drainage from Pecks Lake. The marsh represents one of the few present-day marsh habitats within Arizona, although extensive marshes were reported in the valley when it was first settled by Euro-Americans (Fish 1974:5). Drainage from the lake and marsh reenters the Verde River in the southeast corner of the project area, through a tributary that parallels the western edge of Tavasci Marsh before running south to the river. No other natural surface water channels are located in the vicinity (National Park Service 1975b:12).

### Flora

The project area is best characterized as being in the plains and desert grassland biotic community of the Upper Sonoran life zone (Lowe 1964), but can be classed as an upland Sonoran Desert transition zone of semidesert shrub grasslands (U.S. Department of the Interior n.d.:8). Components of the riparian deciduous forest, chaparral-oak woodland, and Sonoran desertscrub (Arizona upland subdivision) life zones are also represented in areas with favorable environmental conditions. The semidesert grassland community (consisting of a mix of plains and desert grassland and Sonoran desertscrub) is found mainly on broad, gently sloped alluvial fans, and on broader ridgelines and southern slopes in the lower lying hills, and extends from the river benches above the floodplain to approximately 3,800 feet (Fig. 2.4). At higher elevations it begins to grade into a chaparral community (Fish and Fish 1977:9; McGuire 1977:3-4). The ground cover consists of grama grasses mixed with woody shrubs and cacti which are expanding their range. Trees such as mesquite and juniper are also recent invaders of areas of former grasslands. The most prevalent grasses are blue grama (Bouteloua gracilis), black grama (B. eriopoda), sideoats grama (B. curtipendula), tobosa grass (Hilaria mutica), three-awn grass (Artistada
Figure 2.4 Typical upland Sonoran Desert transition zone of semidesert shrub grasslands in the project area.

Figure 2.5 The rich riparian deciduous forest zone along the Verde River, with the tailings pond, Tuzigoot Pueblo, and the large mesa in the background.
sp.), and beargrass (Nolina microcarpa). Burrow-weed (Franseria sp.) and snakeweed (Gutierrezia sp.) are now abundant, but are a historic invasion. Other shrubs present include creosote bush (Larrea tridentata), palmilla (Yucca elata), sotol (Dasylirion wheeleri), velvet mesquite (Prosopis juliflora varutina), catclaw (Acacia greggi), yucca (Yucca sp.), amaranth (Amaranthus sp.), desert holly (Atriplex hymenelytra), winter fat (Euraysia lanata), graythorn (Candelia sp.), and Mexican crucillo (Condalia spathulata). Grassland cacti include buckhorn, cholla, and prickly pear (Opuntia sp.) (U.S. Department of the Interior n.d.; Lowe 1964:42; Hartman 1976:25; McGuire 1977:4).

At higher elevations, the desert-grassland ecotone begins to grade into a chaparral community (Lowe 1964). The chaparral is prevalent on north and east slopes in the uplands, between about 4,000 feet and 6,000 feet. It is recognized by relatively dense growths of shrubby evergreen plants. Scrub oak (Quercus turbinella) is by far the dominant species of this environment, occurring in almost pure stands in many areas. Other conspicuous species include manzanita (Arctostaphylos sp.), sugar sumac (Rhus ovata), squawbush (R. trilobata), mountain mahogany (Cercocarpus sp.), California Fremontia (Fremontodendron californicum), and mock-locust (Amorpha californica). There are no grasses that are peculiar to the chaparral, but a number of grass species are present, such as grama, desert fluff, bush muhly, and three-awn grasses (Lowe 1964:48-50; Hartman 1976:23-24). Chaparral is present on the top and slopes of the mesa along the eastern edge of the survey area.

The drainages and floodplains of the Verde River support a rich riparian deciduous forest association composed of broadleaf, winter deciduous trees (Fig. 2.5). The major species, supported by the rich alluvium deposited by the river, include cottonwood (Populus fremontii), willow (Salix sp.), sycamore (Platanus wrightii), ash (Fraxinus sp.), and walnut (Juglans major). Other associated flora includes Texas mulberry (Morus microphylla), elderberry (Sambucus sp.), alder (Alnus sp.), chokecherry (Prunus sp.), boxelder (Acer negundo), maple (Acer sp.), and Arizona grape (Vitis arizonica). Introduced plants such as tamarisk and tree-of-heaven can also be observed, but are believed not to have been present prehistorically (Hartman 1976:22). Willows and cottonwoods are seen around the springs associated with Tavasci Marsh, which supports a lush growth of cattails (Typha sp.), sedge (Cyperus sp.), bulrush (Scirpus sp.), and watercress (Rorippa sp.) (Western Archeological and Conservation Center n.d.; National Park Service 1975a:12).

Other vegetation is present in the Verde Valley outside the project area. The juniper-pinyon woodland and montane conifer forest plant communities occur within 6 miles of the Tuzigoot pueblo (Hartman 1976:23-24). Plants in these communities include emory oak, pinyon, juniper, ponderosa pine, sagebrush, bracken fern, wild raspberry, gooseberry, buck-brush, Arizona rose, snowberry, and ocean spray. A number of tree species grow in the Black Hills, including fir, pine, oak, madrono, locust, maple, and aspen (Hartman 1976:23-24; McGuire 1977:5)

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The present-day distribution of plants cannot be assumed to correspond to that of the prehistoric environment. Years of destructive overgrazing and erosion have significantly changed the makeup of the plant communities. Erosion along the Verde and the changes from a deeper, slower flow to the present shallow and faster river, may be related to the present dominance of cottonwoods, mesquite, and acacia. Grazing has played an important role in the drastic invasion of the grasslands by woody shrubs such as snakeweed, mesquite, catclaw, and graythorn. These factors, as well as possible climatic variation and an upward movement of the plant ranges, make projection of prehistoric conditions impossible without paleoenvironmental data. The few paleoenvironmental studies that have been done in the Verde Valley point towards a short mesic period, but then very little variation from modern conditions (Fish and Fish 1977:8-10; McGuire 1977:2-5).

Fauna

The mammalian population reflects the semidesert conditions of the Tuzigoot area. Small rodents predominate, and are generally nocturnal and seldom seen. This includes two species of squirrel (Citellus sp.), kangaroo rat (Dipodomys merriami), pocket gopher (Thomomys bottae), cottontail (Sylvilagus audubonii), and jackrabbit (Lepus californicus). Other small mammals include muskrat (Ondatra zepthicus) and the Mexican free-tailed bat (Tadarida mexicana). Medium and large mammals include the coyote (Canis latrans), bobcat (Lynx rufus), raccoon (Procyon lotor), Gray fox (Urocyon cinereoargenteus), badger (Taxidea sp.), and mule deer (Odocoileus hemionus) (National Park Service 1975b:13). Black bear and mountain lion are occasionally seen in the chaparral plant zone, and may have ranged lower in the past. Javelina are also occasionally seen, but are thought to be a recent invader (McGuire 1977:5). Mindeleff (1896:179-180) reported pronghorn in the grassland areas in the late 1800s. Bighorn sheep and elk probably occurred in the Woodland community before Euro-American hunting of these animals, and beavers are thought to have been active on the Verde River (Fish and Fish 1977:9-10).

Because the Verde Valley lies in a transition zone between the Upper Sonoran life zone of the Kaibab Plateau and the true Sonoran Desert, it is frequented by many migrant bird species. Of the 180 bird species noted in the area (Sutton 1971), only 23 percent are classified as year round residents, 39 percent are casual residents, 15 percent are summer residents, 11 percent are winter residents, and 12 percent are rare visitors (National Park Service 1975a:13). The most common species are redwing blackbird, robin, meadowlark, desert sparrow, green-tailed towhee, gray-headed junco, house finch, Oregon junco, Coopers hawk, sharp-shinned hawk, belted kingfisher, horned lark, Western mockingbird, marsh hawk, California gull, common flicker, yellow warbler, mourning dove, killdeer, bank swallow, rock wren, and red-tailed hawk (National Park Service 1975b:13). Gambel's quail and wild turkeys are also present (McGuire 1977:4-5). Reptiles commonly seen include the banded gecko, Clark's swift, diamondback rattlesnake, king snake, Arizona bullsnake, red racer, and
the banded sand snake (National Park Service 1975b:13). Arthropods are very common, especially during the warm months. The scorpion and tarantula are frequently seen. The permanently flowing Verde River provides a home for many of Arizona's aquatic and semiaquatic animal species. Fauna present includes water shrews, beavers, raccoons, river otters, garter snakes, mud turtles, and tree frogs. Associated with this is a wide variety of fish species, including carp and channel catfish, freshwater shellfish, and a diverse group of aquatic insects (National Park Service 1975a:13; Hartman 1976:22; Fish and Fish 1977:9).

As with plants, the present-day distribution of animals may not be an accurate parallel to that of prehistoric times. Concomitant changes in the animal population have followed changes in vegetation, as mentioned earlier. Wild animals have also been heavily trapped and hunted or pressured by competition from domestic animals and a shrinking territory (Fish and Fish 1977:8).

Aboriginal Use of the Environment

The middle Verde Valley is a rich area, with five different microenvironments in a 10-mile radius. The alluvial bottomlands and low terraces were well suited for agriculture, while the riverine environment of the river, Pecks Lake, and Tavasci Marsh offered diverse and abundant faunal and floral resources. The steeper slopes and mesa tops contained stands of oak, pinyon, juniper, and agave, as well as a population of large mammals as an available resource.

A variety of cultural groups are known to have inhabited the Verde Valley region. Those most commonly associated with Tuzigoot National Monument are the prehistoric Southern Sinagua, and possibly the Hohokam, who were sedentary agriculturalists; however, preceramic Archaic groups and the historic Apache and Yavapai, migratory hunters and gatherers, were also present. As the lifestyles of these groups differed, so did their exploitation of the local environment. The Sinagua and Hohokam lived in large, permanent villages, depending on agricultural crops for their survival and supplementing them with locally available wild plant and animal foods. The Archaic people and Apache and Yavapai lived in temporary camps, exploiting seasonally available resources and then moving on. Evidence of prehistoric agricultural use of the local environment is based on a number of archeological excavations in the Verde Valley and surveys by Coconino National Forest archeologists; the hunter-gatherer lifestyle is documented by ethnohistorical studies of the Apache and Yavapai (E. Gifford 1936; Goodwin 1942). Unfortunately, there is little direct evidence of the subsistence pattern at Tuzigoot because Caywood and Spicer made only limited mention of food remains. Therefore, many of the prehistoric activities are inferred from ethnohistoric data; these inferences may not be valid in all cases.

The primary food source at Tuzigoot was probably provided by agriculture. Caywood and Spicer briefly mention only corn and beans, but squash, cotton, and perhaps gourds were also cultivated in the Verde
Valley (Cutler and Kaplan 1956:98). Little discussion also is devoted to the agricultural techniques employed by the pueblo. Dry farming was probably used by the first agriculturalists in the valley and continued later in the upland areas (Pilles 1981a:15; Fish and Fish 1984), but by Tuzigoot times, irrigation and floodwater farming were undoubtedly utilized. There are approximately 1,200 acres of Verde bottomland in the vicinity of the pueblo (Hartman 1976:26-27, Fig. 5), most of which has also been farmed historically. At the time of the Tuzigoot excavations, all the surrounding bottomland was farmland; at present, the Phelps-Dodge tailings pond covers a large area, obliterating any remains of prehistoric agricultural fields. Henderson (1973) uncovered two superimposed ditches in a test trench near the eastern boundary of the monument, at least one of which may be prehistoric (Hartman 1976:26). Historic canals are still visible in the old fields east of the pueblo, and may have been built by renovating in prehistoric canals: these canals connect the Verde with the farmlands. Hartman (1976:26) also mentions prehistoric waffle gardens east of the pueblo, but these could not be relocated.

Wild plant foods and animals probably supplemented agriculture. Caywood and Spicer (1935:93) mention only wild grasses and a few meat sources such as antelope, deer, cottontail rabbit, bear, muskrat, mallard duck, and Canadian goose, but the rich riparian zone immediately surrounding Tuzigoot undoubtedly contributed wild plants and animals used for many purposes, including food, medicine, and construction material (Hartman 1976:31). Limited samples from sites on the Copper Canyon-McGuireville Project (McGuire 1977:89), Perkins Pueblo (Alger 1968), Exhausted Cave (Hudgens 1975), and from the Perkinsville Valley (Fish 1974:10-11, Table 1), indicate a reliance on small game, including jackrabbit, cottontail, woodrat, packrat, pocket gopher, muskrat, skunk, beaver, porcupine, rock squirrel, raccoon, and weasel. The Apache and Yavapai communally hunted many small animals such as rabbits, prairie dogs, and woodrats (E. Gifford 1936:266). Other game included ground squirrel, badgers, and cactus rats. Game birds included wild turkey, pigeon, quail, dove, oriole, and jay, as well as numerous smaller species (Fish 1974:11; Hartman 1976:24-26; Fish and Fish 1977:9). Fish, turtle, freshwater mollusk, and water fowl could also be obtained from the river, Pecks Lake, or the marsh. Five variety of fish were recovered from the Perkins Pueblo (Minckley and Alger 1968). Elk, mountain sheep, deer, and pronghorn were available at higher elevations, where the Yavapai concentrated their hunting efforts since deer were more abundant there (E. Gifford 1936:264). All of these large game animals could be hunted by individuals or by groups, and were probably taken occasionally (Fish and Fish 1977:9). Bones from deer, pronghorn, and mountain sheep, as well as one from a mountain lion, were recovered by McGuire (1977:89).

The five ecological zones provided a vast quantity of wild plant foods. The riparian environment yielded walnuts, grapes, and various types of berries. Historically, the Tonto Apache "semicultivated" the mulberry, Virginia creeper, cottonwood, willow, and grape, and the Northeastern Yavapai were known to collect walnuts, grapes, mulberries, and elderberries. The juniper-pinyon woodland was exploited by the Apache for mescal, pinyon nuts, and prickly pear fruit. The chaparral
environment was utilized by the Yavapai, but apparently not by the Apache. Squawbush berries, manzanita berries, juniper berries, and sunflower seeds were collected, and a few small plants, such as chia, were used for greens. The conifer forests supplied acorns (a staple for the Apache), and wild lupine for greens. The grassland environment provided palmilla, mesquite beans, cactus fruit, yucca fruit, devil's claw pods, and palo verde seeds. Amaranthus and chenopodium seeds, mesquite beans, yucca seeds and fiber, juniper seeds, prickly pear seeds, wild fergumes, grape seeds, catclaw, saltbush, netleaf hackberry, Rocky Mountain beeweed, sedges, walnuts, acorns, mormon tea, and buffalo gourd were exploited prehistorically (Hartman 1976:22-26; Fish and Fish 1977:16; McGuire 1977:89).

Houses, tools, and decorative items could also be made from locally available materials. The majority of support posts in the Tuzigoot pueblo are of juniper, and juniper and pinyon wood was a major source of firewood (Hartman 1976:23). As mentioned earlier, stone for building materials and tools was derived from terrace and wash boulders and gravels, and eroding caprock. Salt, red argillite, and copper ore derivatives were mined or collected for trade resources, decorative items, and paint pigments (Fish and Fish 1977:7-8). Clays for pottery making occurred locally (Schroeder 1960:8). Intrusive macaw bones and seashells have been recovered archeologically (Caywood and Spicer 1935; Jackson and Van Valkenburg 1954). The Sinagua were also master craftsmen and weavers. Agave and yucca fiber, and cotton were used extensively for sandals, clothing, matting, blankets, and other personal and household items (Kent 1954).

This section provides only a brief summary of the environmental resource exploitation of the lush Verde Valley by its aboriginal inhabitants, as documented by various references. Other more in-depth studies of aboriginal use of the environment (see Tagg 1985) illustrate a wide range of resources available in the middle Verde, all of which were probably exploited by the Sinagua, Apache, and Yavapai. Let it suffice to say that, although it is known that the Sinagua traded with cultural groups from other areas for items such as shell, and the Apache and Yavapai migrated over great distances, both groups could have been completely self reliant with the resources available to them within the valley. These included reliable water sources and rich arable soils for agriculture, and five ecological zones from which to procure food, medicinal plants, architectural material, and tool material. There is every reason to believe that, like other better documented prehistoric groups in the Southwest, the Southern Sinagua took full advantage of their environment.
Chapter 3

CULTURAL BACKGROUND

Prehistory

The Verde Valley is one of the richest river valleys in Arizona. Located between two of the major prehistoric population centers, the area was a natural contact zone between various prehistoric peoples and is rich with evidence of the prehistory of Arizona. The cultural resources of the Verde Valley were reflected in the adaptive strategies used by a variety of cultural groups that successfully inhabited a lush environment for over 11,000 years. While the project area represents only a small portion of the Verde Valley, it may have been exploited by any of the permanent or transient inhabitants of the area. Figure 3.1 illustrates the cultural chronology most often used for the Verde Valley and surrounding regions, as well as the chronological divisions used in this report. The Salt-Gila Basin Hohokam, Anasazi, and Northern Sinagua chronologies are presented for comparative purposes.

Paleo-Indian (10,000 to 7500 B.C.)

The Paleo-Indian complex represents the first well-documented occupation of Arizona, and is part of a big-game-hunting tradition that exploited now-extinct fauna in a grasslands environment over a wide area of North and South America during the late Pleistocene (Willey 1966:87). The best evidence indicates human occupation no earlier than 10,000 or 9000 B.C.; the Clovis or Llano tradition best represents this time period in southern Arizona and consists of certain artifacts associated with extinct mammals, mainly mammoth (Sellards 1952; Huckell 1984a:134). These people were nomadic, traveling in a seasonal round hunting such large game as mammoth, horse, bison, and camel, and gathering wild foods such as grass and seeds (Willey 1966:37-51). Fluted Clovis projectile points are diagnostic elements of the complex, but small, unfluted points, scrapers, hammerstones, and crude bone implements are also recognized (Haury and others 1959:22). Although the Clovis complex was centered on the southern High Plains, sites with Clovis artifacts in primary context have been investigated in the San Pedro Valley of southeastern Arizona, and as of 1980, there were 19 Clovis points reported throughout Arizona (Huckell 1982:3, Fig. 2).

While there are no known Paleo-Indian sites in central Arizona, an isolated Clovis point base was found on a high terrace in the upper Verde, associated with a few flakes (Fish and Fish 1977:11). This represents the only evidence of early man in the Verde Valley. Remains of Pleistocene megafauna have been found, including horse, mastodon, and mammoth, but none have been found with associated cultural remains (Brady and Seff 1959; Twenter 1962). This absence of well-documented
Figure 3.1 Culture chronology proposed for the Verde Valley, with corresponding chronologies.
Paleo-Indian remains is not surprising, since deep, recent alluvial remains in the Verde bottomlands precludes identification of Paleo-Indian remains in Late Pleistocene deposits (Fish and Fish 1977:11). Since geologic studies indicate that 10,000 years ago the Verde Valley was lush, with ponds of water, supporting a variety of big game animals (Pilles 1981:6), it seems probable that the Clovis hunters utilized the area.

Archaic Period (8000 B.C. to A.D. 1)

There is evidence that by approximately 8000 B.C., southern Arizona was occupied by hunter-gatherers who differed from the preceding Paleo-Indian groups by their use of ground stone tools and different styles of projectile points. The Archaic tradition most widely accepted in southern Arizona is the Cochise culture, first defined by Sayles and Antevs (1941) in the San Pedro, Sulpher Spring, and San Simon valleys of southeastern Arizona. Similar styles of projectile points found in central Arizona suggest that this Archaic tradition was widespread throughout Arizona. Huckell (1984a, 1984b) recently proposed a simple phase system—Early, Middle, and Late Archaic—to describe this period. In general, the Archaic people occupying the Southwest were small, highly mobile groups operating within defined territorial ranges, continually moving to locations where hunting and gathering would be most productive (Huckell and Huckell 1984:36).

The Early Archaic (about 8000 to 5000 B.C.) corresponds in time to the Sulphur Springs/Cazador stage of the Cochise culture: it is poorly represented in Arizona. The assemblage generally attributed to this period include diagnostics such as the long, tapering-stemmed Lake Mohave and Jay points, and the shorter-stemmed Silver Lake point. Simple leaf-shaped bifacial knives, well-made scrapers of various form, and ground stone milling tools are abundant (Huckell 1984b:205-206).

The succeeding Middle Archaic period (about 5000 to 1500 B.C.) corresponds to the Chiricahua stage of the Cochise culture. Identification of these sites is based generally on the presence of Pinto Basin (Campbell and Campbell 1935) and contracting-stemmed points similar to Gypsum Cave (Harrington 1933) projectile points. Also part of this assemblage are shallow basin metates and accompanying handstones, bifacial percussion-flaked tools, and various bone tools. Middle Archaic sites include large base camps, small specialized activity areas, quarry sites, and possibly burials (Huckell 1984a:138).

The Late Archaic (about 1500 B.C. to A.D. 1) corresponds to the San Pedro stage of the Cochise culture. Notched dart points, especially the side-notched or side-to-corner-notched San Pedro points (Sayles and Antevs 1941) are the hallmark of the period. Also present are triangular, concave-based points (Cattanach 1966) and the recently named, corner-notched Cienega points found by Bruce Huckell of the Arizona State Museum. Other artifacts include pressure-flaked tools, deep basin metates, and large handstones (Huckell 1984b:208). Sites of this time period include pithouses, burials, bell-shaped pits, hearths,
and roasting pits. A factor distinguishing Late Archaic sites in Arizona from sites of this period elsewhere in the Southwest, where migratory lifestyles continued into historic times, is the increased reliance on agriculture permitted by favorable climatic conditions. By 2,000 years ago, staples such as corn, beans, and squash appear, and the settlement pattern based on seasonal exploitation of wild foodstuffs by a mobile population begins to break down. The introduction of domesticates is compatible with the trend towards semi-sedentary villages with cemeteries (Huckell 1984b:209; Huckell and Huckell 1984:36-38). The varied microenvironments of the Verde River and its associated wildlife, and conditions well-suited to agriculture, would have attracted more permanent settlements.

Only a few Archaic sites have been investigated in the Verde Valley, with most evidence in the form of poorly documented projectile points in various museums and private collections (Fish and Fish 1977:11). Fornby (1969:6-8) reported large amounts of Archaic material around Henderson Flats in the upper Verde, and collected Pinto Basin, Gypsum Cave, Amargosa, and San Pedro style points, typical of the Middle and Late Archaic periods. Breternitz (1960a:19) mentions extensive lithic sites along Coffee and Spring Creeks which appeared to be Archaic; surface remains resembled tools of the Middle Archaic period, which roughly corresponds to his Dry Creek phase (2000 B.C to A.D. 1) (see Fig. 3.1). Fish (1974:16) described five sites located on Pleistocene benches overlooking the Verde River in the Perkinsville area, and interpreted them as temporary camps with Middle and Late Archaic points, faceted one-handed manos, basin metates, and a variety of scrapers.

The most extensive published work on a Verde Valley Archaic site are excavations by Shutler (1950) at Dry Creek, near Sedona. Two hearths were excavated, and the artifact assemblage was characterized by crude leaf-shaped projectile points, scrapers, knives, round and oval handstones, and basin metates. The site was dated between 1500 and 2000 B.C on geological evidence, placing it in the Middle Archaic period. It was apparently a short-term campsite. A site near Oak Creek similar to the Dry Creek site was also excavated (Fish and Fish 1977:12), and Pinto Basin points were recovered from beneath a ceramic period site (AZ 0:5:12, ASM) excavated during the Copper Canyon-McGuireville Project (McGuire 1977:40-41). Other investigations at Dry Creek phase sites includes work at NA13,669 near Sedona (Etchieson 1980), the Verde Valley School Road Site (Powers 1978), the Marsland Site (Dosh 1979), AZ 0:5:6 (NAU) (Ambler and Sant 1979), and sites along Boynton Canyon Road (unpublished).

Finally, Breternitz (1960a:19-21) excavated two pithouses which yielded neither diagnostic artifacts nor ceramics, on which he based the Squaw Peak phase (A.D. 1 to 700). The houses were oval or round and had large bell-shaped pits, plastered floors, and formal hearths. Associated artifacts included oval manos, handstones, grinding slabs, flaked stone knives and scrapers, and bone tools. Although the evidence is sparse, and the houses were on a later site, it is possible that this represents a Late Archaic village, since the houses are similar to other Late Archaic pithouses in southern Arizona (Huckell and Huckell 1984).
Few sites of this type are known in the Verde Valley, although numerous San Pedro and Basketmaker II and III projectile points have been noted in private collections (Fish and Fish 1977:12).

Both Middle and Late Archaic period occupation is documented in the middle Verde Valley, although little work has been done on these sites. Fish and Fish (1977:12) and Pilles (1981:8) suggest that different exploitative activities characterize the upland and lowland sites. Large numbers of projectile points from upland sites in the upper Verde may indicate more emphasis on hunting activities, while core, plane, and ground stone tools from the middle Verde lowlands may relate to plant processing and eventually agriculture. It seems possible though, that both kinds of activities were present at the sites in various locales, and that the sites represent temporary visits in a single seasonal round. Projectile points made from nonlocal lithic material also suggest temporary use of the area by people from outside the valley, or an extended territory for local inhabitants. It has been suggested that towards the end of this time period people lived in small, scattered pithouse villages along the foothills below the Mogollon Rim. While hunting and gathering continued as a way of life for some time into the Squaw Peak phase, a shift to agriculture and settled village life was underway. Late in this period, intrusive ceramics appear, indicating contact with the Kayenta Anasazi to the north, and the Hohokam to the south. At the time of this contact, or soon after, the first definite signs of agriculture are seen (Pilles 1981:8).

Ceramic Period (A.D. 1 to 1450)

The Verde Valley is part of what has been defined as the northern Hohokam periphery (Weaver 1980), which portrays the Hohokam regional system as a core area centered on the Salt-Gila Basin along with a series of peripheral areas in the mountainous uplands and secondary river valleys that surround the basin (Wood 1985:Fig. 1; see also Doyel and Plog 1980). The core area is the origin of the Hohokam tradition and the center of its development, while the peripheries represent either territorial expansion or the effect of contact with the Hohokam on indigenous populations (Doyel and Plog 1980; Fish and others 1980; Wood and McAllister 1980). Several explanations in terms of population pressure and resource availability have been advanced to account for the Hohokam expansion during this time period (Wood and McAllister 1980).

The change in lifestyles from hunting and gathering to agriculture has been attributed to two different patterns of origin. The first postulates an indigenous (possibly Archaic, or Hakataya as suggested by Schroeder [1960]) population occupying the valley, becoming assimilated by the Hohokam colonists who moved into the lowlands bearing irrigation based agricultural technology, and becoming part of the Hohokam. This group was later joined by a migration of Sinagua from the Flagstaff region who gradually took control or became assimilated, and eventually became the Southern Sinagua. Alternatively, it has also been
suggested that small groups of Hohokam came into the valley to obtain salt, argillite, and copper for trade, and their influence on an already established Southern Sinagua population stimulated a new way of life based on agricultural and trade-based economy to augment hunting and gathering (Pilles 1981a:8-10).

In either case, Hohokam contact in the northern periphery apparently began near the end of the Hohokam Snaketown phase (A.D. 300 to 500) of the Pioneer period, and including at least the early part of the Gila Butte phase (A.D. 500 to 700) of the Colonial period. Ceramics characterizing this time period, called the Hackberry phase (A.D. 700 to 800) by Breternitz (1960a), include Snaketown Red-on-gray, Gila Butte Red-on-buff, Lino Gray, and Lino Black-on-gray, which date between A.D. 300 and A.D. 700. Sherds of this type have been found on a number of sites, but their cultural context is poorly known. This phase is not well understood and is based on a level of artifacts at the base of a trash mound (Breternitz 1960a:11) and the excavation of a slab-lined pithouse (Shutler 1951) (Breternitz 1960a:21-22; Fish and Fish 1977:12; McGuire 1977:8).

By the Cloverleaf phase (A.D. 800 to 900), including the end of the Gila Butte phase and the Santa Cruz phase (A.D. 700 to 900), a Hohokam influence in the Verde Valley is obvious. Both small and large sites dating to this time period have been identified in the middle Verde, with upland villages tending to be small and compact, while villages along the river are larger and more open. Established villages are evident: some appear very large, such as the Cloverleaf Ranch Site (Breternitz 1960a:22) and AZ N:4:12 (ASU) (Fish 1974:17), although others reflect a dispersed rancheria type of settlement (Breternitz 1960a:27; McGuire 1977:10-12). Village layouts do not seem to be planned or ordered and houses appear randomly oriented and spaced. Pithouses are larger than in the previous phase, and both Hohokam and Sinagua architectural style pithouses are recognized in single sites. Artifact assemblages indicate that hunting and gathering were still important pursuits, but numerous irrigation ditches appear to date to this period, as do dry-farming devices such as terraces, rock-cleared areas, and rock-outlined waffle gardens, so that agriculture seems to have been an integral part of subsistence technology. Local pottery production is first apparent around A.D. 700, with the introduction of Verde Brown and other fine-pasted plainware types (McGuire 1977). Diagnostic decorated intrusives for this time period include Santa Cruz Red-on-buff, Kana-a Black-on-white, and Deadmans Black-on-red. Trough metates and two-hand manos replace the basin metate and handstone, and carved items of both stone and shell are seen (Breternitz 1960a:22-23; Pilles 1976:113-114; Fish and Fish 1977:12-13; Fish and others 1980:166; Pilles 1981a:10-11).

The Camp Verde phase (A.D. 900 to 1100/1125), which corresponds to the Hohokam Sacaton phase, represents the last and best known phase with pithouse architecture. Settlement patterns and site layout correspond to the previous phase in the middle Verde with the addition of public architecture consisting of adobe-capped mounds, ball courts, and possible communal structures (Fish and others 1980). Both mounds and ball courts appear to be associated with larger sites, and communal
structures, defined on the basis of their large size, appear on sites of any size. The Camp Verde phase pithouse at Montezuma Well is a good example of the latter (Breternitz 1960a:5, Figs. 4 and 7). Both cremation and inhumation style burials are seen. Some new pithouses used partial masonry construction, but most retained the size and shape of earlier times. Canal-aided irrigation becomes the dominant form of agriculture in the valleys, and agriculture becomes the main focus of lowland sites. Hohokam influence reaches its peak at this time, with Hohokam-style pithouses, ball courts, cremation burial, ornaments, and adobe-capped mounds on larger sites, although local variation on these traits is seen. However, Hohokam traits become restricted to the middle Verde, while in the upper Verde, where small scattered sites and isolated houses with increased dry-farming devices become the norm, Anasazi trade goods dominate. Specialization on wild food resources and exploitation of more diverse locales are suggested by the numerous recorded roasting pits and flaked mescal knives in these upland areas. Aboveground masonry fieldhouses also appear in the upland areas. Excavated sites include work on predominantly small sites by Caywood and Spicer (1935:5-6), Wasley (1957), Pierson (1959), Breternitz (1960a:3-7), and McGuire (1977). Verde Brown continues as the main utility ware with the addition of Tusigoot Plain late in the phase (around A.D. 1050). Intrusives change with the appearance of Tusayan Corrugated, Black Mesa Black-on-white, Sosi Black-on-white, Holbrook Black-on-white, Padre Black-on-white, Chevelon Black-on-white, Tusayan Black-on-red, and Sacaton Red-on-buff (Breternitz 1960a:23-24; Pilles 1976:114; Fish and Fish 1977:13-14; McGuire 1977:8; Wells 1981: 138; Pilles 1981a:11-12).

Some time around A.D. 1100, in the Honanki phase (A.D. 1125 to 1300) changes occurred in the Verde Valley that produced sites and assemblages that varied from earlier times. Colton (1946:302-305) explained this as a migration of Sinagua groups from the north and expulsion or absorption of local Hohokam populations. These groups supposedly brought with them and subsequently modified traits diagnostic of the Southern Sinagua such as aboveground cobble masonry architecture, extended burials, and new ceramic types. This interpretation has been questioned (Fish and Fish 1977:17; Fish and others 1980; Pilles 1981a:13-14), and other explanations for these changes have been proposed, centered on altered trade relationships and changes in population densities. It seems likely that the Southern Sinagua represent an in situ development from the earlier Hohokam-influenced phases, paralleling Classic period changes elsewhere in the Southwest. Differences between the Southern Sinagua and cultural groups in other areas were probably the result of local environmental differences, innovation in subsistence strategies in response to environmental stress, different roles in trade relationships, temporal lag, variability in local raw materials, and proximity to puebloan populations in the Flagstaff, Winslow, and Prescott areas. This seems especially likely, considering traits such as aboveground masonry had been developing in the Verde for hundreds of years, and the "new" ceramic types fit easily into the local Verde ceramic sequence (Pilles 1976:121; Fish and Fish 1977:17; Pilles 1981a:13).
The Honanki phase saw consolidation and possible increase in population, with sites clustering to form communities, particularly around good farmlands and water sources. Contiguous masonry pueblos are introduced, but pithouses are still seen, often on the same sites. Pueblos average five rooms per site, and rooms are small. Settlement patterns change, with sites trending away from the lower terraces, towards elevations above the river such as rolling foothills at the valley edges and the cliffs overlooking open canyons. Domestic architecture is typified by numerous and dispersed small pueblos and cliff dwellings (with extensive use of caves, including small pueblos and one-room habitation and storage units). Near the end of this phase, the Sinagua built "forts" in the uplands overlooking canyons: some occur on the tops of very high hills while others occupy mesa ends. Community rooms or kivas are found at some of the larger sites, and numerous storage units are seen in the canyon cliffs. Utility ceramics are dominated by Verde Brown, Verde Gray, and Verde Black-on-gray, with small increments of Tuzigoot Brown and Tuzigoot Red. Intrusive pottery types illustrate trade primarily with the Northern Sinagua in the Flagstaff area, Kayenta Anasazi to the north, Winslow Anasazi to the northeast, and the Prescott Branch to the southwest. Ceramics from Winslow are most common and indicate a shift of focus, since trade with the Hohokam had virtually ceased. Dominant pottery types include Flagstaff Black-on-white, Walnut Black-on-white, Tusayan Black-on-white, and Tusayan Black-on-red. Tsegi Orange, Jeddito Black-on-orange, and Tusayan Polychrome are also present. Other characteristics of this phase include masonry structures, T-shaped doorways, inhumation burials, and full-grooved axes (Schroeder 1960:51; Fish 1974:19; Pilles 1976:115; Fish and Fish 1977:15-16; Pilles 1981a:13-14; Wells 1981:139).

This time period has received more attention than any other in the middle Verde, with work at many different sites and investigations of entire villages. Excavated sites include the early phases of Tuzigoot (Caywood and Spicer 1935) and Montezuma Castle (Jackson and Van Valkenburg 1954), Hidden House (Dixon 1956), Kings Ranch Ruin (Spicer and Caywood 1936), Fitzmaurice Ruin (Spicer and Caywood 1936, Barnett 1974), Kittredge Ruin (Shutler 1951), Perkinsville (Fish and Whiffen 1967), Swallet Cave (Ladd 1960), Richards Cave (Pierson 1956), and Exhausted Cave (Hudgens 1975) (Fish and Fish 1977:15). Other well-known sites include the earlier part of Clear Creek Ruin and the Cornville Ruins group, and cliff dwellings such as Honanki and Palatki (Pilles 1981a:13).

The concentration of population into fewer but larger sites culminates in the Tuzigoot phase (A.D. 1300 to 1400/1450), the last currently recognized expression of the Southern Sinagua. The dispersed population occupying smaller pueblos during the previous phase consolidated into about 50 major pueblos, some surrounded by smaller satellite pueblos of up to 6 rooms, extensive farming areas, and fieldhouses, to define substantial communities. Well-known sites such as Tuzigoot, Montezuma Castle, Montezuma Well, Sacred Mountain, and Clear Creek Ruin are characteristic of this time period. Major pueblos average 35 rooms, and are composed of contiguous and sometimes multistory roomblocks, occasionally around a plaza. Most are situated on hilltops or other eminences overlooking arable land. The pueblos
usually occur alone, but occasionally form clusters that suggest a single community, such as those around Camp Verde, Tuzigoot, and Beaver Creek. Fieldhouses and small, single-story pueblos occur as isolated features and as clusters of dwellings. The forts documented in the Honanki phase continue to be present. Most of the large pueblos have kivas and community rooms, and Sacred Mountain has a ballcourt. Room size is smaller than in the previous phase, with the large rooms of the Honanki phase often divided in half to create two rooms; other pueblo features include small roof hatchways, loopholes, parapet walls, sealed outside doorways, and small granaries (Fish and Fish 1977:18; Pilles 1981a:14).

Along certain streams, large pueblos are regularly spaced about 1.7 miles apart, with large surrounding lowland areas cultivated by means of canal irrigation, suggesting political control of the territory. There is a secondary spacing pattern throughout the valley where two large sites cluster within a quarter-mile of each other, which is seen with Tuzigoot and the Tuzigoot Extension Ruin. Peter Pilles, Coconino National Forest archeologist, indicates that the reasoning for the spacing of large pueblos is not certain, but might indicate arable land carrying capacity, extent of ability to manage certain-sized population, or possibly linked communities. Dry-farming fields continue to occur along the foothills, including an extensive rock-bordered field system associated with the Sacred Mountain complex, but hunting and gathering remains important in these upland areas (Pilles 1976:115; Pilles 1981a:14-15; Fish and Fish 1984:147, Figs. 2-4). Ceramics from Tuzigoot phase pueblos suggest active commerce with people in the Hopi, Winslow, and Chavez Pass areas. A "very old" trail that runs from the Hopi Mesas to Winslow, through Chavez Pass, past Stoneman Lake, along Beaver Creek, and into the Verde Valley may have been used in late prehistoric times. Pottery types characteristic of this phase include Tuzigoot Brown and Tuzigoot Red as the dominant utility wares, with small increments of Verde Brown remaining, and Kayenta Black-on-white, Homolovi Polychrome, Winslow Orange, Jeddito Plain, and Jeddito Black-on-yellow. The latter two types extend into the protohistoric period on the Hopi mesas. It is interesting that Salado polychromes common in sites to the south and east of the valley are only seen in very small numbers at Verde Valley sites (Pilles 1976:119; Fish and Fish 1977:17-18; Pilles 1981a:15; Wells 1981:140).

Some time around A.D. 1425, following the rise and growth of complex settlements, the Verde appears to have been abandoned. This trend is seen in many other cultural centers in the Southwest, such as the Salt-Gila area to the south and the Tonto Basin to the east. Various causes have been proposed such as drought, waterlogging of the soil, disease, warfare, invasion, dissolution of trade networks, or perhaps a combination of these and other factors. The abandonment of the Verde and other areas is not fully understood, but was probably the result of a number of complex factors that are as yet unidentified. It is generally accepted that at least some of the Southern Sinagua joined the pueblos of Nuvakwewtaqa in Chavez Pass, and the Homolovi pueblos near Winslow. There is even a possibility that some groups remained in the valley to become the Yavapai; however, these and other theories have yet to be proven (Pilles 1981a:16, 1981b:172-176).
Historic Period (A.D. 1500[?] to Present)

Yavapai and Apache

The Verde Valley lies within the known territory of the Tonto Apache and Northeastern Yavapai Indians. The Yavapai are an upland Yuman group and the Apache are a southern Athabascan-speaking group: both trace their origins to Montezuma Well (Stein 1981:18). The Yavapai are considered the principal group inhabiting the region, with secondary occupation by displaced Apache and Navaho in the 1860s (Schroeder 1974; Fish and Fish 1977:18).

Ties between the Yavapai and prehistoric Sinagua are a matter of speculation. Schroeder (1960:62) sees similarities in ceramics and house types between the two groups, as well as Sinagua parallels in Yavapai legends. E. W. Gifford (1936:252) points out evidence of cultural discontinuity, noting that the Yavapai had a separate designation for past inhabitants of Verde ruins, and considered some of the ruins homes of supernatural beings. The latter seems accepted by many archeologists who believe that the Northeastern Yavapai moved into Arizona from the Colorado River area to the west as early as A.D. 1300, although they were not encountered by Spaniards until 1583. Yavapai territory embraced almost 20,000 square miles, ranging in historic times from low desert country near the Gila River to the high Bradshaw and Mazatzal mountains to the north. Estimates for populations of the Northeastern Yavapai range between 500 and 600, indicating a sparse population over a large territory (Fish and Fish 1977:19; Pilles 1981a:16).

The Yavapai and Tonto Apache were traditionally bands of nomadic hunter and gatherers who supplemented their diet of wild food with domesticated plants. Winter home camps consisted of caves and mud-and-pole wickiups, with small, extended family group bands most common. Stored supplies made up much of the winter diet. In the spring and summer, the bands gathered various plant resources. Each band had a vast seasonal range, encompassing up to 2,000 square miles and including various environmental zones. It was not unusual for a group to cover 20 miles or more a day. Some overlap was tolerated, and bands might come together in areas with abundant resources. Hunting was important, but the cycle of ripening plants determined movement from zone to zone. Small animals were most commonly hunted, and were occasionally caught in snares or by communal drives, but larger game was also hunted. A wide variety of plants and animals was exploited for food, clothing, medicine, and tools. Agriculture was occasionally practiced, with plants left to ripen untended. Both groups are well known for their pitch or clay-sealed baskets. As with baskets, much of the material culture of the Yavapai and Apache included perishable, light-weight items. Tizon Brown pottery, with a distinctive wiped finish, and small, Desert Side-notched points appear as common Yavapai artifact types (Fish and Fish 1977:19-21; Stein 1981:18-19; Pilles 1981b:168-170, Figs. 1-4; Wells 1981:142).
Occasional contact with Spaniards in the late 16th and early 17th centuries marked the beginning of the decline of the traditional way of life of the Yavapai and Apache. Today, most able-bodied Indians work off the reservation, and few follow old traditions (Stein 1981:21-23).

**Euro-Americans**

The Spanish began exploring the southwest in the 1530s, and first entered Arizona in 1540s. For the next 300 years they explored and mined the region, transecting many areas in Arizona. In 1583 the Spanish entered the Verde Valley on a mining expedition, led by Antonio de Espejo. In 1598 another mining expedition, led by Marcos Farfan de los Godos, visited the valley but spent little time there. In 1604, Don Juan de O'Rate crossed the Verde River en route to the Colorado River, but little attention was given to the area. In the nearly 300 years to follow, the valley was visited by explorers, trappers, mountain men, and prospectors who roamed in the area up until the 1860s. Local Indians were encountered, but were left relatively undisturbed (Twenter and Metzger 1963:9; Munson 1981:25; Stein 1981:21-23).

The discovery of gold on the Hassayampa River and Lynx Creek in 1863 and the establishment of the new Arizona territorial capital at Prescott brought settlers to the fertile Verde Valley to provide produce to both Prescott and the Lynx Creek mines. By 1865, a small farming settlement was started near the confluence of the Verde River and West Clear Creek. The camp was later moved up to the confluence of Beaver Creek, and was named Camp Lincoln. Conflict with local Indians came as settlers disrupted the traditional hunting and gathering areas; this brought soldiers to the valley that same year, and Camp Lincoln was made into a military garrison. The camp was renamed Camp Verde in 1868. By 1870, Indian depredations worsened, and a new military post was built in 1871 to accommodate the growing number of troops: it was named Fort Verde. During this time, many Yavapai were placed on a reservation near Prescott, and another reservation north of Camp Verde was established. Conflict continued and between 1871 and 1873 General George Crook launched a military campaign that killed hundreds of Indians and placed approximately 1,500 on reservations by 1873. The surrender of renegade chief Chalipin in April of that year all but ended tribal resistance. By 1875, most Yavapai and Apache were removed to the San Carlos Reservation, where they farmed and raised cattle. Around the turn of the century, some families moved back to the Verde Valley, and in 1910 the Camp Verde Reservation was established (Munson 1981:25-32; Stein 1981:21-23).

Ranching and farming prospered without Indian harassment, and the mining town of Jerome was started in 1876 with the discovery of ore in that area. Indian problems recurred in 1882, and movement of troops to fight in the Geronimo campaign kept Fort Verde in use for some time, but by 1891 it was abandoned. Some of the last troops to man the fort were 10th cavalry "Buffalo Soldiers" (Twenter and Metzger 1963:10; Munson 1981:25-32).
By the turn of the century, mining activity had increased rapidly and the towns of Jerome and Cottonwood were prospering: Jerome had a population of 15,000 in 1929. By 1918, smelters were built in Clarkdale and Clenenceau, and Sedona was established. The Great Crash of 1929 hampered the mining industry, but Phelps-Dodge Corporation bolstered it with activities in 1935, and a portion of the project area was used as a tailings pond for smelting operations. The boom continued until 1953 when most mining activity ceased. The greatest boon to the economy of the valley since that time came with the building of the Phoenix Cement Company plant in Clarkdale. The towns that best survived the economic changes are those along the Verde River with prime ranching and farming country; some 10,000 acres of land were irrigated in 1960. Although these two pursuits have comprised the main activities in the valley for some time, along with some small-scale mining operations, tourism has been the dominant economic base for the region since the 1960s (Twenter and Metger 1963:10; National Park Service 1975a:78; Hartman 1976:39; Munson 1981:25-32).

A result of the increasing Euro-American use of the Verde Valley has been the destruction of many of the archeological resources. Early settlers often robbed ruins for stone, built over ruins, reused prehistoric canals, and pothunted sites for private collections. Mearns (1890:757), Mindeleff (1896:244), and Fewkes (1912) mention the use of rocks from sites for construction, and the digging in ruins by local ranchers and tourists in the late 1800s and early 1900s. Historic accounts report that the first building constructed at the original farming community in the valley was built in a Sinagua ruin (Munson 1981:25). Schroeder (1960:13) indicates that the Apache and Yavapai supplemented their reservation subsistence by digging in ruins and trading pots for groceries. This long history of vandalism continues today with the casual pothunting of sites by local inhabitants of the valley. According to John Reid, Tuzigoot National Monument ranger, many reports of people digging in the nearby Hatalacva pueblo are received, and recent disturbance of the site was noted by the author. It is hoped that stronger laws to prosecute pothunters, and public awareness of the problem, will end this wanton destruction of nonrenewable cultural resources (Pilles 1981a:16).

Tuzigoot National Monument and the Project Area

Archeological resources in the Verde Valley were recorded by early investigators (Mearns 1890:4), and it seems likely that they knew of Tuzigoot. It was, however, not officially recorded until 1933. The Archaeological Committee of the Yavapai County Chamber of Commerce at Prescott, Arizona, sought to provide prehistoric materials for display at the Smoki Museum in Prescott, and chose Tuzigoot as a promising site for excavation. The site, then on the property of the United Verde Copper Company, was totally excavated and partially stabilized in 1933 and 1934 by Louis R.Caywood and Edward Spicer, under the guidance of Dr. Byron Cummings of the University of Arizona. The excavation had a crew of 48, and was funded by Federal Emergency Relief funds and the U.S. Civil Works Administrative program for the State of Arizona.
In 1936 a museum was built adjacent to the ruins to house the collection of artifacts recovered during excavation (National Park Service 1958a:3).

The monument area was deeded to School District 29 by the mining company, and was then transferred to the federal government. Tuzigoot National Monument was established by Franklin D. Roosevelt in 1939 (Presidential Proclamation #2344). The monument initially comprised 43.67 acres, and was set aside to preserve the pueblo, "one of the largest in the area." The museum was included in this parcel, and was originally manned by a custodian furnished by the Phelps-Dodge Company, successor to the United Verde Copper Company. It is one of the few original monument visitor centers still in use in the Southwest and is itself a historic structure. An additional 15.1 acres of land was added in 1966 as a right-of-way for the construction of a new approach road. Development from that time forward includes a modern duplex residence built during the "Mission 66" program of the National Park Service (Western Archeological and Conservation Center n.d.:4; Peck 1956:18; National Park Service 1975a:3; National Park Service 1975c:29, 52; Sudderth and others 1976:5).

In 1975, the Natural and Cultural Resources Management Plan proposed an archeological survey of the Tuzigoot pueblo sustaining area (TUZI-A-3), including the monument, proposed addition to the monument, and other areas most probably used for farming, gathering, and hunting within a 2-mile radius of the pueblo. The emphasis was to be on reliable farmlands that could have been irrigated by the Tuzigoot inhabitants, as well as local contemporaneous population centers such as the Tuzigoot Extension Ruin and Hatalacva pueblo (National Park Service 1975b:A-3 [1]). Also in 1975, the Environmental Assessment Master Plan for Montezuma Castle and Tuzigoot (National Park Service 1975a) proposed the acquisition of some 672 acres of private land adjacent to the monument to serve as a buffer zone against future development (1975a:9). Also to be included in this land acquisition proposal was the transfer of 40 acres of Coconino National Forest land to Park Service supervision. The majority of the private land is owned by Phelps-Dodge (641.38 acres), which has proposed an exchange for National Forest Service and Bureau of Land Management property elsewhere, needed to support their mining operations. The remainder of the property is privately owned and was to be purchased, including land owned by Clarkdale Realty Company (27.45 acres), George T. Giesler (1.25 acres), and Von Gausig, Mayberry (1.52 acres). There was no development on any of these lands at the time of the proposal, although Phelps-Dodge leased land around the marsh to the Tavasci brothers who ran about 60 head of cattle on the property (Gumerman 1973:3; National Park Service 1975a:9-10). One family currently lives at the ranch, which was settled as early as 1877 by the Ruffners, a prominent family in Prescott today, according to Peter Pilles, Coconino National Forest archeologist.

Between 1975 and 1977, a residence was built on the 1.52 acre Von Gausig, Mayberry land, beside the Tuzigoot Extension Ruin. Don Morris (1977) investigated the ruin and indicated that, since it had been previously excavated by Spicer and Caywood and the residence was built on the trash mound, the site was no longer significant from an
archaeological standpoint. The property was dropped from the proposed land acquisition plan.

These developments left the project area, including the Forest Service land and the monument, at 769 acres, which was the area surveyed during the TUZI 86A project. The National Park Service Environmental Assessment Master for Tuzigoot National Monument suggests that acquisition of the Phelps-Dodge land would help preserve Tavasci Marsh by eliminating grazing, and would add the tailings pond (consisting mainly of iron, sulphur, and copper) as an interpretive exhibit. The acquisition of the private land would decrease the development pressures of the surrounding area that could impair the integrity of the monument (National Park Service 1975a:23-24).
Chapter 4

SURVEY RESULTS

At the completion of the survey, approximately 512 acres (66.6 percent) of the project area had been surveyed and 257 acres (33.4 percent) were disregarded because they were in the marsh, badly disturbed by cultivation, under the tailings pond, or in the current Verde River floodplain. A total of 8 archeological sites and 21 isolated finds were recorded, including 2 sites and 2 isolated finds within Tuzigoot National Monument boundaries. The remainder of this report will deal with the recovered information. The cultural resources located will be discussed first, followed by a section on the analysis and interpretation of associated artifacts. Chronological placement of the sites will be attempted using the results of the artifact analysis as well as previous research, and survey results will be compared to other recorded information about sites in the Verde Valley. Finally, subsistence and settlement patterns and external relationships will be discussed in the light of the survey and analysis, and a summary of the prehistoric use of Tuzigoot National Monument will be presented.

Site Descriptions

A total of eight archeological sites were recorded during the Tuzigoot survey (Fig. 4.1). This included the Tuzigoot pueblo, two sites previously recorded by Gumerman (1973), and five sites recorded for the first time. A Yavapai camp described by Cummings as being just outside the limits of a borrow pit for the access road (Hartman 1976:45) was not relocated. There are no descriptions or records of this site available. Because so few sites were recorded, individual site descriptions will be presented. Sites are discussed by field number designations; Table 4.1 lists site types, previous designations, and ASM site numbers. The Tuzigoot Extension Ruin and Hatalacva pueblo were recorded also and are discussed briefly, even though they are not in the project area. Site dates and artifact analysis results are presented in the chapters following the site descriptions.

TUZI 86A-1

This site is Tuzigoot, a large pueblo with 86 ground floor rooms and 15 possible second-story rooms in one main roomblock and four smaller noncontiguous roomblocks (Fig. 4.2). The second-story rooms are in the central portion of the main, and largest, roomblock. The pueblo is constructed of native river boulders of basalt, sandstone, and limestone, as well as irregular blocks of limestone from outcrops on Tuzigoot Hill, and adobe mortar. The main pueblo area is approximately 150 m long and 30 m wide on a north/south axis, and is built in a terrace-like fashion to conform to the contours of the hill. A plaza
Figure 4.1 The TUZI 86A survey area with site locations.
Table 4.1
LIST OF TUZI 86A FIELD NUMBERS, SITE TYPES, ASSOCIATED ASM SITE NUMBERS, AND PREVIOUS REFERENCES TO THE SITE

<table>
<thead>
<tr>
<th>TUZI 86A-</th>
<th>ASM N:4:</th>
<th>OTHER REFERENCES</th>
<th>SITE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>Tuzigoot, NA2733</td>
<td>Large pueblo</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td></td>
<td>2-5 room masonry site</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>Artifact scatter</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>21</td>
<td>AZ N:4:1 (Prescott College)</td>
<td>2-5 room masonry site</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>AZ N:4:2 (Prescott College)</td>
<td>8-10 room masonry site</td>
</tr>
<tr>
<td>6</td>
<td>23</td>
<td>2 fieldhouses</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>24</td>
<td>Fieldhouse</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>Artifact scatter</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>Hatalacva, Verde 5:42</td>
<td>Large pueblo</td>
</tr>
<tr>
<td>26</td>
<td></td>
<td>Tuzigoot Extension Ruin</td>
<td>Large pueblo</td>
</tr>
</tbody>
</table>

area lies between the main roomblock and northern block of rooms. Three building sequences were noted, but the pueblo has no recognizable layout plan other than utilization of all available flat areas on the hilltop and slopes. Roof entrances seem most common. Adults were commonly buried in trash deposits on the ridge slopes, and infants were buried beneath room floors.

Caywood and Spicer (1935) excavated all 86 rooms and recovered 429 burials between 1933 and 1934. The rooms were grouped in six arbitrary blocks during the excavation: Group I (n=13); Group II (n=5); Group III (n=18); Group IV (n=7); Group V (n=33), and Group VI (n=10). An additional two rooms lies 100 m south of the main pueblo that are not mentioned by Caywood and Spicer. They appear on the NPS 1958 archeological base map of the site as Group 7, and are illustrated by Hartman (1976:29, Fig. 6) on her map of excavations by Caywood and Spicer. The rooms have been excavated and possibly stabilized and one room still has a metate on the floor like those exhibited on room floors in the main pueblo. It is unknown when this roomblock was excavated,
Figure 4.2 The Tuzigoot (TUZI 86A-1) site map.
but it is now considered part of the site. A tremendous amount of artifactual material was recovered during the excavation of the site, including flaked and ground stone, ceramics, bone, shell, and some perishable items such as basketry, textiles, and wood. Ceramics consisted mainly of plainwares such as Verde Brown, Prescott Gray, and Tuzigoot Red. Dominant decorated types were all intrusives, and included Jeddito Black-on-yellow, Walnut Black-on-white, Flagstaff Black-on-white, Prescott Black-on-gray, and Homolovi Polychrome and related wares. These pottery types, along with a series of tree-ring dates ranging from A.D. 1085 to 1386 obtained from roof beams, indicate occupation in the Honanki and Tuzigoot phases (around A.D. 1125 to 1400).

The site lies on the crest and southern end of Tuzigoot Hill, an isolated ridge remnant rising about 120 feet above the floodplain, at an elevation of 3,440 feet. The hill overlooks the Verde River approximately 100 m to the south, and is surrounded by flat, lower terraces adjacent to the river. Figure 2.3 illustrates the geologic makeup of the hill. Vegetation consists of a very sparse cover of plains and desert grassland plants dominated by various grasses, but also including occasional sagebrush, saltbush, and catclaw. Prior to excavation the site had been actively pothunted. Since the excavation most of the pueblo has been rebuilt and stabilized. A paved trail encircles the main roomblock, and an old road cut runs below the easternmost roomblock. The isolated two or three room unit at the far southern end of the hill has not been maintained and is not part of the pueblo exhibit. For more detailed information on Tuzigoot, see Caywood and Spicer (1935) and Hartman (1976).

TUZI 86A-2

This site, also situated within the monument boundaries, is a 9 m by 3 m concentration of basalt and limestone boulders that represents from two to five masonry rooms (Fig. 4.3). No definable walls remain, but at least two, perhaps three rooms are represented by aligned rocks in an L-shaped arrangement. A second set of one or two rooms may be indicated by an amorphous concentration of boulders 2 m to the south. Two depressions in the main roomblock and the disarray of cobbles suggest that the site has been excavated or vandalized in the past, making interpretation impossible. A moderate cover of artifacts lies among the rooms and downslope to the east, consisting mainly of flaked stone debris and ceramics. A metate fragment and handstone are in the northern roomblock. Seven sherds were collected for identification.

TUZI 86A-2 sits in a flattened area on the east slope of Tuzigoot hill, about 20 m below the crest at an elevation of 3,360 feet. The site overlooks Tavasci Marsh 300 m to the northeast, and the flat terrace and floodplain of the Verde to the east. Vegetation is the same as that of TUZI 86A-1, with a dense, low cover of grasses covering the site, and a few scattered sagebrush, saltbush, and
Figure 4.3 Site maps of TUZI 86A-2 and TUZI 86A-3.
catclaw. A game trail runs along the western boundary of the site, and the monument fence is 30 m to the east.

TUZI 86A-3

This is a moderate scatter of artifacts in a 35 m by 33 m area (see Fig. 4.3). The artifacts consist mainly of flaked stone debris and ceramics, with two manos, two hammerstones, and three metate fragments. A 7 m by 5 m dense concentration of artifacts is in the east half of the site and a very light scatter of artifacts extends beyond the site for almost 40 m to the east. Two projectile points and two sherds were collected for identification. There is no evidence of structures or other features.

The site is situated on a flat bench at the end of a small ridge extending out from the large mesa which dominates the eastern edge of the project area. The bench sits at an elevation of 3,440 feet, but drops off drastically into the floodplain 15 m to the southwest of the site boundary, and rises steeply towards the mesa top starting at the northern edge of the artifact scatter. Limestone outcrops mark the edges of the bench, which is isolated from other ridges by steep cut drainages on both sides. Because the bench is flat, heavy deposition has occurred. Vegetation is typical semidesert grassland with a cover of various grasses, creosote, mormon tea, and saltbush. Juniper and scrub oak occur just upslope from the site. The site overlooks a small drainage running off the mesa top, and Tavasci Marsh is only 300 m to the northwest. The boundary line between Coconino National Forest and the project area bisects the site.

TUZI 86A-4

This site consists of a two (possibly three) contiguous masonry room structure with a possible fourth noncontiguous structure nearby (Fig. 4.4). The main structure is rectangular, 7 m by 4 m, with a retaining wall extending from the southeast corner of the structure that may be another room or a ramada. The walls are dry-laid basalt and limestone boulders and blocks that stand three courses high in places. Large boulders and limestone outcrops have been incorporated into the structure. Relatively dense wall fall surrounds the roomblock. The second pile of rock rubble is in a clear area between rock outcrops, and may be another room: it lies 9 m to the east. A very light scatter of artifacts is in and around the rooms, but most trash lies downslope to the south and west. Artifacts include flaked stone debris, ceramics, and four pieces of shell. Three sherds were collected for identification.

The site lies on the southern tip of a ridge finger extending off the high mesa bordering the project area at an elevation of 3,360 feet. The structures occupy the only flat area on the ridge tip among outcrops of limestone and a jumble of large boulders. The ridge
Figure 4.4 Site maps of TUZI 86A-4 and TUZI 86A-5.
This site consists of a one-room fieldhouse and an associated room or ramada area (Fig. 4.5). The fieldhouse is a three-walled structure, 3.5 m by 2.5 m in area, open to the west, and constructed of a single course of limestone and basalt boulders. Artifacts are concentrated in a 15 square meter area around the structure, and are
Figure 4.5 Site map of TUZI 86A-6.
especially noticeable in deflated areas. A concentration of artifacts lies just southwest of the structure. A second L-shaped cobble foundation lies 20 m south of the fieldhouse, representing a second room or a ramada area. It is similar to the fieldhouse in construction, with artifacts scattered in a 20 square meter area around it. A concentration of artifacts is in a blowout 5 m southwest of the structure. A light concentration of flaked stone, ceramics, and ground stone is present between features, and scattered as much as 50 m from the structures. Four sherds were collected for identification.

The site lies on a broad, flat terrace overlooking the Verde River, approximately 100 m to the south. Vegetation is moderately dense, consisting of various grasses, cholla, sotol, and mesquite. Creosote and mormon tea are nearby. The terrace has been heavily sheetwashed, and a dirt road is just 10 m south of the ramada feature. Heavy recreational use of the Verde River and floodplain has also caused considerable disturbance of this lower terrace.

**TUZI 86A-7**

This site consists of a concentration of limestone and basalt boulders that appear to represent a one-room masonry fieldhouse (Fig. 4.6). The rock rubble is one course high and covers a 3 m by 2 m area. Recent disturbance makes interpretation of the feature impossible. A light to moderate scatter of flaked stone and ceramics extends from the structure to about 30 m downslope and to the north. Five sherds were collected for identification. The site lies on the southern edge of a broad, flat terrace, at an elevation of 3,384 feet, overlooking the Verde River floodplain. Less than 5 m south of the structure the terrace drops off steeply to the Phelps-Dodge tailings pond, formerly a part of the lower terrace overlooking the Verde River, 0.4 mile to the south. Vegetation is sparse, consisting of a cover of burrow-weed, clumps of catclaw and saltbush, and one small mesquite. The area is heavily sheetwashed and eroded; two small drainages cut through the site. A barbed-wire fence bisects the site, paralleling the terrace edge.

**TUZI 86A-8**

This site consists of a moderate scatter of flaked stone, ceramics, and ground stone in a 100 m by 70 m area (see Fig. 4.6). No structures are apparent, but abundant boulders in the site area may indicate their presence. Seven sherds were collected for identification. The site lies on a broad, flat terrace, at an elevation of 3,340 feet, overlooking the Verde River 180 m to the south. Mesquite and catclaw dominate the vegetation, with an interrupted cover of various grasses. Tamarisk, cottonwood, and sycamore are in the floodplain of the Verde, 100 m away. The area is badly disturbed by sheetwash and erosion, with major erosional channels cutting through the site. Numerous dirt roads and a historic drainage ditch cut through the
Figure 4.6 Site maps of TUZI 86A-7 and TUZI 86A-8.
Little is known about the Hatalacva pueblo and Tuzigoot Extension Ruin even though Caywood and Spicer worked on these sites. For this reason, and due to their proximity to the project area, both sites were recorded and are described here.

Tuzigoot Extension Ruin

The Tuzigoot Extension Ruin is a series of rock-aligned, cobble masonry walls and excavated areas in an 80 m by 70 m area. Caywood and Spicer (1935:14) mention the site, and apparently directed excavations in at least nine rooms in it during the Tuzigoot excavations, but little is known of the work other than photographs in the Tuzigoot National Monument photo files. The site is laid out in the typical rambling fashion terraced with the ridge slopes. From the remaining wall alignments and excavated areas that probably represent rooms, the pueblos appear to be in two distinct roomblocks (Fig. 4.7). Only five rooms are relatively distinct, being square and 5 m by 4 m in area. The main roomblock has evidence of approximately 25 rooms and is roughly rectangular in a 40 m by 25 m area. The rooms are constructed of unshaped, cobble masonry and some walls remain five courses high. The second roomblock lies 25 m to the northeast and consists of at least five rooms in an "L" shape. Natural bedrock outcrops have been incorporated into the room construction and many rooms use the ridge as a back wall. Rock rubble between the roomblocks and below the main roomblock may indicate the presence of more rooms. A flat area to the northeast of the pueblo may represent a plaza. Trash appears to have been deposited on the east slope below the site. Burials of adults were found in the trash, and infant burials were found subfloor (Peck 1955).

Apparantly a fair amount of artifacts were recovered from the site, consisting of ceramics, flaked and ground stone, shell and stone jewelry, bone tools, and vegetal material (Peck 1955). Ceramics consisted of locally made Tuzigoot Red, Tuzigoot Plain, and Verde Brown, and decorated intrusives such as Sacaton Red-on-buff, Kayenta Black-on-white, Flagstaff Black-on-white, Deadmans Black-on-red, Bidahochi Polychrome, and the Jeddito series (Peck 1955). These pottery types indicate that the site was occupied primarily during the Hananki and Tuzigoot phases (A.D. 1125 to 1400).

The site lies on the crest and northern end of a ridge extending out to the Verde River, directly across the river from the Tuzigoot pueblo. The roomblocks cover the top of the ridge, and extend down the eastern slope, at an elevation of 3,400 feet. The river is 100 m to the north, and a large expanse of flat floodplain extends to the east. South of the site, the ridge rises into a series of low hills on the

Additional Sites

The area sees heavy recreational use due to the closeness of the Verde.
Figure 4.7 The Tuzigoot Extension Ruin.
mesa top. Vegetation consists of a sparse cover of grasses and foxtails, with scattered saltbush, catclaw, mesquite, and creosote. As mentioned above, some of the site was excavated in 1934, and many rooms are visible as rectangular depressions since the site does not appear to have been backfilled. Many of the exposed walls have collapsed because of this, and are disturbed by erosion. Don Morris (1977) said the Von Gausig house was built on the trash deposits of the site, but Von Gausig said construction did not disturb the site, and trash on the ridgetop is not consistent with other pueblos that generally have trash deposits on the slopes below the site. Von Gausig also said that the house was built to stop pothunters from vandalizing the site. The present patio of the house runs up the southernmost pueblo wall, but the house does not appear to disturb the site, and archeological deposits probably still remain at the site.

Hatalacva

Hatalacva consists of a large pueblo covering an area 110 m by 50 m. The pueblo is constructed of coursed masonry walls of unshaped limestone sandstone, and basalt boulders and blocks. Exposed walls are heavily plastered with adobe, and reach as high as 5 feet. The site consists mainly of mounds of wall fall rubble. The pueblo occupies the flat top of a ridge crest and is roughly rectangular. The definite roomblock is 90 m north-south by 50 m east-west, with minimal rubble extending from the northeast corner that may represent more rooms. In the central part of the roomblock, a high mound (18 m by 10 m) indicates second-story rooms, and adjacent to it is an 18 m by 12 m low area void of rubble that probably represents a plaza (Fig. 4.8). At least one row of rooms encloses the plaza and there is a break between rooms that may be an entry. Only two rooms are totally distinct; they are rectangular in shape and are 8 m by 4 m, and 7 m by 4 m in size. If the remainder of the rooms in the pueblo are comparable in size, the main roomblock could hold as many as 70 to 75 ground floor rooms, with at least 5 second-story rooms. If an additional 20 to 25 rooms are included in the possible room area to the northeast, an estimate of 100 rooms would not be out of line; the site appears to be the same size as Tuzigoot. The ridge remains flat to the north of the pueblo, and may represent a use area, but there is little artifactual evidence to support this. Peck (1955) indicates the presence of rooftop entries and unpaved mud-capped roofs. Trash appears most heavily deposited on the eastern slope below the pueblo, in the possible secondary room area. Burials are also present in this trash, as well as in the rooms of the main pueblo.

Artifacts recovered from the site include flaked and ground stone, ceramics, stone and shell ornaments, bone tools, wooden objects, and plant remains. Ceramics consist of Tuzigoot Red, Tuzigoot Plain, Verde Brown, Prescott Black-on-gray, Kayenta Black-on-white, and Jeddito series sherds (Peck 1955), and indicate occupation in the Honanki and Tuzigoot phases (A.D. 1200-1450).
Figure 4.8 The Hatalacva pueblo.
Hatalacva is situated on the southern edge of the crest of a ridge trending north-south. The pueblo is constructed almost entirely on the flat crest, with few rooms terraced off the slopes. With the exception of the northern end of the site, the ridge drops off steeply at the edge of the outer rooms of the pueblo, making further building impossible. Limestone outcrops are exposed along the edge of the flat crest and were often used in room construction. The site lies at an elevation of 3,600 feet, dropping off to the south toward the ridge tip, and rising slightly to the north towards the mesa top. The ridge overlooks Pecks Lake 200 m to the east, and the Verde River 100 m to the west. Vegetation consists of a moderately dense cover of creosote and winter fat, with annual grasses and foxtails. The site, named by Caywood and Spicer (1935:14) after the Yavapai name for Pecks Lake, was first recorded by Jackson (1933:15-16). Caywood and Spicer directed some excavation at the site in 1934 as evidenced by photographs in the Tuzigoot National Monument photo files, exposing some rooms and recovering at least one slab-lined burial. The site was rerecorded during a road survey by Hammack (1972) who mentioned a second roomblock on the ridge tip to the south (AZ N:4:3 [ASM]). Inspection of this area revealed artifacts and a few potholes, but no evidence of masonry architecture. The site was placed on the National Register of Historic Places in 1974 (Henderson 1974). Hatalacva has been vandalized extensively by pothunters. Almost every room has holes in it, and numerous burials have been uncovered on the northeastern slope in the trash deposits. Much of this area is where Caywood and Spicer excavated also, and except for recent digging, it is hard to distinguish pothunted areas from Caywood and Spicer’s work. Most of the vandalism appears to be old, with only minimal recent disturbance noted, and much of the site remains intact. Minimal erosion and deposition is present, especially in disturbed areas.

**Canals**

The lowland areas adjacent to Tuzigoot Hill were investigated for evidence of prehistoric canals and other agricultural features. This was not possible west of the pueblo, where the Phelps-Dodge tailings pond has covered the area where any remains may have existed. Canals that exist today were roughly plotted in the area east of the hill (see Fig. 5.1). Unfortunately, this area has been farmed historically as late as the 1960s, and there is no evidence that any of the remaining canals were used prehistorically. It is well known that prehistoric canals were often modified and used historically, and the cultivation of this area probably would have destroyed any other prehistoric agricultural features. Henderson (1973) found two superimposed subsurface ditches at the base of the eastern edge of Tuzigoot Hill while investigating the shallow ditch that parallels the eastern boundary fence. Little was said about these ditches, but they may be prehistoric, and indicate the possibility of undisturbed canals below historic ones. Finally, Hartman (1976:36) mentions prehistoric waffle gardens east of the pueblo, but these were not relocated. A few square, flattened areas were seen in the fields, but these do not resemble the waffle gardens associated with the Sinagua (Fish and Fish
The canals that exist in the field today consist of shallow ditches less than 1 m wide and 50 cm deep, bordered by slight berms. All of the ditches have silted in from disuse. These are not unlike prehistoric canals recorded in the valley by Mindeleff (1896: 238) whose description of prehistoric agricultural devices in 1896 still stands as the definitive work for the Verde Valley.

Isolated Finds

A total of 21 isolated finds were recorded in the project area. As mentioned earlier, this does not include flaked stone debris, which was found throughout the entire area. The abundant flakable cobbles in the washes and terrace gravels were apparently utilized extensively by the local inhabitants of the valley, as evidenced by this continuous scatter of flaked stone. Table 4.2 lists the isolated finds with a brief description of each, and Figure 4.9 illustrates their location. The majority were nondiagnostic aboriginal artifacts probably associated with one of the many sites scattered throughout the area. There was a moderate scatter of historic trash in the vicinity of Tavasci Ranch, but this was not recorded. The rock piles (IF-C, M, R, T, and U) are probably historic occurrences associated with fence lines or telephone lines; a recent telephone pole was noted with a similar rock cairn surrounding its base. This is especially likely for IF-R, T, and U, which are in line, and evenly spaced from each other. IF-K and P, historic trash scatters, probably represent isolated trash dumping episodes: the area has a moderate scatter of recent trash in it, including numerous concentrations of clear glass milk bottles from the Clarkdale Milk Company.

Artifact Analysis

All surface artifact assemblages were inventoried as described in Chapter 1. These data, and sample counts from the large sites, provide the basis for the following discussion of the material culture of the recorded sites. A total of 33 artifacts were collected and analyzed. These artifacts—primarily ceramics—were the main criteria for the cultural and temporal placement of sites. Artifacts recovered during the excavation and stabilization of the Tuzigoot pueblo are not included in this discussion. For more information on those artifacts, see Caywood and Spicer (1935).

Flaked Stone

Flaked stone was by far the most numerous artifact class and was present on all sites. Most of these artifacts were debitage produced during core reduction and tool manufacture, and were not collected. Material type was identified in the field, and three projectile points were collected for further analysis.
<table>
<thead>
<tr>
<th>IF NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Basalt basin metate fragment and basalt handstone fragment</td>
</tr>
<tr>
<td>B</td>
<td>Chert core hammerstone</td>
</tr>
<tr>
<td>C</td>
<td>2 m by 1 m rock pile of large cobbles</td>
</tr>
<tr>
<td>D</td>
<td>Approximately 7 plainware sherds and a chert flake in 2 square meter area</td>
</tr>
<tr>
<td>E</td>
<td>Vesicular basalt mano fragment</td>
</tr>
<tr>
<td>F</td>
<td>Approximately 40 small plainware sherds in 2 square meter area; probable potbreak.</td>
</tr>
<tr>
<td>G</td>
<td>Vesicular basalt mano fragment</td>
</tr>
<tr>
<td>H</td>
<td>1 plainware sherd</td>
</tr>
<tr>
<td>I</td>
<td>Basalt chopper</td>
</tr>
<tr>
<td>J</td>
<td>Chert scraper</td>
</tr>
<tr>
<td>K</td>
<td>Light scatter of historic glass and cans in large area, mainly postdating World War II, but including some sun-colored amethyst (SCA) glass and solder-seam cans.</td>
</tr>
<tr>
<td>L</td>
<td>1 plainware sherd</td>
</tr>
<tr>
<td>M</td>
<td>One 2 square meter rock pile of large cobbles</td>
</tr>
<tr>
<td>N</td>
<td>2 plainware sherds</td>
</tr>
<tr>
<td>O</td>
<td>Chert scraper</td>
</tr>
<tr>
<td>P</td>
<td>Historic trash scatter of cans and bottles that mostly postdate WW II. A few SCA glass fragments and solder-seam cans.</td>
</tr>
<tr>
<td>Q</td>
<td>Chert hammerstone</td>
</tr>
<tr>
<td>R</td>
<td>2 square meter rock pile of large cobbles</td>
</tr>
<tr>
<td>S</td>
<td>Chipping station with over 100 flakes of gray chert and black limestone in a 5 square meter area.</td>
</tr>
<tr>
<td>T</td>
<td>2 square meter pile of large cobbles</td>
</tr>
<tr>
<td>U</td>
<td>2 square meter pile of large cobbles</td>
</tr>
<tr>
<td>V</td>
<td>Sandstone basin metate</td>
</tr>
<tr>
<td>W</td>
<td>2 basalt handstone fragments</td>
</tr>
</tbody>
</table>
Figure 4.9 The TUZI 86A survey area with locations of isolated finds.
Lithic debris was the most common artifact type at the sites. Other than noting its presence and material type, no other attributes were recorded. Without additional data such as flake type, flake size, cortex, or platform type, the types of reduction represented by the site assemblages could not be assessed; however, a few general observations were made. The assemblages appeared to consist of medium or large complete flakes with little or no cortex. These are characteristics common in flaked stone assemblages of ceramic period sedentary agriculturalists in Arizona (Tagg 1985:107). All material types noted are locally available in cobble form and include chert, basalt, siltstone, obsidian, jasper, limestone, and quartzite. Chert is by far the dominant lithic material used, as noted by Jones (see Chapter 6, this report) with a limited sample from Tuzigoot. Caywood and Spicer (1935:73-76) mention the dominance of black obsidian for stone tools at Tuzigoot. Obsidian was present at five of the seven sites, but only in small quantities.

Retouched pieces, hammerstones, and cores were inventoried using traditional stone tool types that could be easily recognized and recorded in the field. This procedure permitted rapid inventory with few collections. Only 17 were recorded. This included seven scrapers, three projectile points, three hammerstones, two choppers, and one biface. No cores were recorded on the sites. TUZI 86A-7 and TUZI 86A-8 had the most retouched pieces, with six and five respectively. Two hammerstones, two scrapers, and a chopper were also recorded as isolated finds.

**Projectile Points**

Three projectile points were collected from the sites, comprising two from TUZI 86A-3 and one from TUZI 86A-1. The points from TUZI 86A-3 are an obsidian and a basalt specimen. The obsidian point (Fig. 4.10b) is triangular with a concave base. It is 2.3 cm long, 1.5 cm wide, and 0.3 cm thick and has one tang broken and a damaged tip. This point is a shorter and broader version of a style found at NA3528 by Breternitz (1960a:16, Fig. 31b) which was assigned to the Camp Verde phase (A.D. 900-1100), but is more similar to those recovered from Winona and Ridge Ruins in the Flagstaff area (McGregor 1941:184-185, Fig. 64e-f). These points are most common in the Elden phase (A.D. 1100-1200) of Northern Sinagua prehistory, but were also recovered in lesser numbers from the Winona phase (A.D. 1066-1100). The basalt point is a small triangular, serrated specimen with a square base and side notches (Fig. 4.10a); the side notches may have been produced as part of the deep serrations. The point is 1.9 cm long, 1 cm wide, and 0.2 cm thick, is missing one tang, and has an unserrated, reworked tip. This point is most similar to a style located at NA3528 that is associated with the Camp Verde and Honanki phases (Breternitz 1960a:16, Fig. 31e). This same point style, recovered from the Winona and Ridge Ruins (McGregor 1941:185, 187, Fig. 64o), is associated with the Padre and Elden phases (A.D. 1066 to 1200).
Ceramics

With the exception of the three projectile points, ceramics represented the only temporally and culturally diagnostic artifacts recorded. Ceramics were noted at all sites, and only a sample was collected for further analysis. Susan Wells (WACC), John Madsen (ASM), and Anne Trinkle Jones (WACC) identified the ceramics; the following sections present their findings.

The final point is a small, triangular, slightly serrated, obsidian specimen with deep side notches and a concave base (Fig. 4.10c). The point is 1.5 cm long, 1 cm wide, and 0.2 cm thick, and has a missing tang. The serrations are very shallow, and the square tangs are very well defined from the side notches and concave base. It was recovered from the east slope of Tuzigoot (TUZI 86A-1), where trash deposits are located. Paul Fish, Arizona State Museum (ASM), suggested that this is probably a Tuzigoot phase point style; similar Desert Side-notched style points were recovered from Tuzigoot (Jones, Chapter 6, Fig. 6.6 a-d, this report) and from another late pueblo site in the valley (Alger 1968). Obsidian was the common projectile point material at Tuzigoot (Caywood and Spicer 1935:73). The point is also similar to protohistoric Yavapai points (Pilles 1981b:170, Fig. 4; Wells 1981:125-126, Fig. 7.1), which are also Desert Side-notched-like. According to Peter Pilles, unserrated Desert Side-notched points occur frequently on Yavapai sites, although some are serrated such as those recovered from Orme Ranch Cave just west of the Verde Valley (Breternitz 1960b:32, Fig. 4).

Ceramics

With the exception of the three projectile points, ceramics represented the only temporally and culturally diagnostic artifacts recorded. Ceramics were noted at all sites, and only a sample was collected for further analysis. Susan Wells (WACC), John Madsen (ASM), and Anne Trinkle Jones (WACC) identified the ceramics; the following sections present their findings.

A total of 30 sherds was collected from the surfaces of seven sites during the archeological survey of Tuzigoot National Monument and the vicinity (Table 4.3). It is not known whether Gumerman (1973) made collections from the two sites he recorded. If so, these collections could not be located. All of the recovered ceramics were plainwares, although two sherds were probably undecorated portions of a decorated vessel. As illustrated in Table 4.3, the majority (n = 21, 70 percent) of the sherds were locally made plainwares, including Verde Brown, Tuzigoot Plain, and Tuzigoot Red. These three types have been classed
by Colton (1958a) as Alameda Brown Wares, the principal utility and service ware of the Sinagua. Specifically, these three types were locally made in the Verde Valley, and were the utility wares of the Southern Sinagua. The remainder of the collection was intrusive, representing five types generally associated with four different cultural groups.

**Verde Valley Types**

**Verde Brown**

Verde Brown is the most common type identified (n = 12), and was noted at five of the seven sites. This is a paddle-and-anvil produced
brownware tempered with 30 to 50 percent medium particles of angular quartz and feldspar, round sand, and an occasional mica flake (Colton 1958a). The type seems to appear in the Verde around A.D. 700 and although it becomes less abundant after A.D. 1150, it persists until A.D. 1400 in small amounts. In the 12 sherds collected, 1 jar and 1 bowl rim were present.

Tuzigoot Plain

Tuzigoot Plain is the second most common type (n = 8), recovered from four sites. It is a paddle-and-anvil brownware with a very fine quartz sand paste, and is occasionally polished (Colton 1958a). This type forms a continuum with Verde Valley plainwares, appearing at the upper end of the quality spectrum. It appears in the Verde Valley around A.D. 1050, and becomes the dominant plainware by A.D. 1150. All of the Tuzigoot Plain sherds recovered were body fragments.

Tuzigoot Red

Tuzigoot Red is very similar to Tuzigoot Plain, with the addition of a brick-red slip and polishing. It is often smudged (Colton 1958a; Schroeder 1960:140). Temporally it parallels Tuzigoot Plain. Only one Tuzigoot Red body sherd was recovered.

Intrusive Types

Aquarius Orange

A total of four body sherds from one site (TUZI 86A-7) were tentatively identified as Aquarius Orange, a Prescott Gray Ware type associated with the Prescott Branch in the neighborhood of Prescott, Arizona (Colton 1958b). It is a paddle-and-anvil orangeware with a coarse opaque quartz, feldspar, and mica temper. The type is a variety of Verde Black-on-gray, and ranges temporally from about A.D. 1000 to 1100.

Rio de Flag Brown

Two body sherds of Rio de Flag Brown, an Alameda Brown Ware associated with the northern Sinagua of Flagstaff, were recovered from TUZI 86A-3. This is a paddle-and-anvil type with a temper of opaque angular fragments of grain quartz or feldspar. It is occasionally polished. The type has been temporally located between A.D. 700 to about A.D. 1100, but seems to be dominant around A.D. 1000 to 1065 (Colton 1958a).
Wingfield Plain

A single bowl rim of Wingfield Plain was recovered from TUZI 86A-2. This type is a utility ware from the northern Hohokam periphery, although it occurs in high frequency in many areas around Arizona, and Peter Pilles suggests that several cultural groups made this pottery wherever abundant mica schist was available. It is characteristically tempered with a very coarse crushed mica schist. It has been dated between A.D. 700 through A.D. 1450, but is generally confined to the period after A.D. 1066 (Colton 1941:46; Breternitz 1966:31).

Tusayan Gray Ware

A single bowl rim of an unidentifiable Tusayan Gray Ware was recovered from TUZI 86A-8. Trinkle Jones suggests that it is a Lino style sherd. Tusayan Gray Ware includes the utility cooking and storage pottery of the Kayenta Anasazi of northern Arizona. It is a coil-and-scrape pottery type with abundant fine to very coarse quartz sand with occasional feldspar. The sherds are usually pitted with conspicuous scrape marks. Tusayan Gray Ware dates between around A.D. 500 and A.D. 1300. Most of the pottery types in this ware are plain or corrugated (Colton 1958c).

San Juan Red Ware

A single sherd from TUZI 86A-2 was tentatively identified as a San Juan Red Ware. San Juan Red Ware is associated with the Anasazi along the San Juan River and its tributaries in northern Arizona. It is a coil-and-scrape pottery with rock or sand temper and a dark gray core. It is usually polished but rarely slipped. Pottery types in this ware can be black-on-orange, black-on-red, or polychrome. San Juan Red Ware is temporally placed around A.D. 700 to about A.D. 1140 (Colton 1958d).

Ground Stone

A total of 23 pieces of ground stone was noted: 16 specimens from 5 sites and 7 isolated finds. This consisted entirely of manos and metates. As with the flaked stone, the inventory of ground stone was based on a classification of the artifacts using traditionally defined types that could be easily recognized and recorded. On the sites, metate fragments were most common with 10 recorded: only 1, a trough metate, was large enough to identify as to type. Two-handed manos were the second most common ground stone type, with five noted. One handstone, or one-handed mano, was also seen. Three handstones, two manos, and two basin metate fragments were recorded as isolated finds. Locally available vesicular basalt was used almost exclusively for ground stone production: only one specimen each was made of quartzite.
and sandstone. The ground stone implements recorded on the Tuzigoot survey sites are common tools used for processing food. Trough metates and two-hand manos are most commonly associated with the prehistoric Southern Sinagua, but handstones and basin metates were also used to a lesser extent. All of these artifact types were present throughout the Sinagua occupation of the Verde Valley.

Shell

Four pieces of unmodified freshwater mollusk shell were recorded on TUZI 86A-4. It is likely that these represent food remains rather than decorative items. Freshwater shellfish can be found in the permanently flowing Verde River, and are known to have been utilized prehistorically (see Fish and Fish 1977).
Chapter 5

DISCUSSION

Interpretations

After reviewing the survey results and analyzing the data on recovered artifacts, it is possible to place the recorded sites temporally and culturally, and to determine some general settlement patterns and external relationships of the sites discussed in this report.

Temporal and Cultural Placement

Wherever ceramics are found, they are generally the most useful criteria for the temporal and cultural placement of archeological sites. Ceramics were recovered from all of the sites, but only undecorated ceramics with long temporal spans, which are less specifically diagnostic. Therefore, data on projectile points and architectural styles were also relied upon heavily. All of the sites are associated with the ceramic period, specifically the Southern Sinagua occupation of the middle Verde Valley. This is indicated by sites with rock masonry surface architecture, locally made ceramics, or both. There is no evidence of earlier or later use of the area.

Camp Verde Phase (A.D. 900 - 1125)

The earliest evidence of occupation in the project area is a possible Camp Verde phase use of TUZI 86A-3. The only ceramics from this site are two Rio de Flag Brown sherds, which date from around A.D. 700 to 1100. The two projectile points recovered are very similar to two styles recovered from Camp Verde phase sites in the Verde Valley, and from Winona and Elden phase sites in the Flagstaff region. These artifacts, dating between A.D. 700 to 1100, plus the lack of aboveground masonry architecture at the site, suggest a Camp Verde, or perhaps earlier, occupation of this site. Camp Verde phase sites characteristically have pithouse architecture, so there would be no surface indications of a structure. The deep-seated soil on the bench would be an ideal place for pithouse construction.

Pithouses of this phase are extremely variable, but are generally oval or rectangular with a well-defined entryway in one side. They have central plastered hearths and a variety of posthole patterns, and some have floor grooves and internal storage pits (McGuire 1977).
Honanki/Tuzigoot Phase (A.D. 1125 - 1425)

The remainder of the sites can be placed in the Honanki and Tuzigoot phases. Excavation results from the three large pueblos--Tuzigoot, Hatalacva, and Tuzigoot Extension Ruin--indicate early and late occupations. The early occupations begin in the Honanki phase, with the later, and major, occupation in the Tuzigoot phase; at Tuzigoot, approximately 8 rooms were occupied in the Honanki phase and approximately 92 in the Tuzigoot phase (Caywood and Spicer 1935:38-40). From survey results alone, the remaining small sites could not be more securely dated other than broadly within the two phases, since many of the ceramic types and architectural styles were common to both phases. Aboveground masonry is present at all but one of the sites (TUZI 86A-8), and its presence, notably at those sites with contiguous rooms, is a trait ascribed to the Honanki phase in the Verde Valley (Fish and Fish 1977). Sites of this time period averaged 5 rooms, which expanded to an average of 35 rooms by the Tuzigoot phase. Larger pueblos had completely coursed masonry rooms with log and brush roofs. Walls were one to two courses wide, often with rubble and mortar fill as a core (Richert 1953:5-6). Rooms characteristically had a central firepit and central postholes, and occasionally storage pits and floor grooves are seen. Interiors of rooms are usually plastered (Caywood and Spicer 1935). Smaller sites, especially fieldhouses, more typically exhibited masonry foundations from one to five courses high that probably supported perishable superstructures of wattle-and-daub (Shutler 1951:4). The recovery of Tuzigoot Plain and Tuzigoot Red at four of the sites also suggests a late occupation, since these types are generally considered to occur in higher frequencies beginning around A.D. 1150.

Settlement Patterns

With such a small survey area and extremely small number of sites, very little can be said about settlement patterns. However, a short description of how the large pueblos fit into the middle Verde Valley prehistory, and the relations of the smaller sites and agricultural fields to Tuzigoot is warranted.

Hatalacva and Tuzigoot are two of about 50 major pueblos that were occupied in the middle Verde Valley during the Tuzigoot phase, a time of population consolidation. These two pueblos belong to a chain of large pueblos located on prominent geological features overlooking fertile farmland, situated at about 1.7-mile intervals along the Verde River. In the immediate vicinity of the monument there is NA5227 near the Tapco Substation, Hatalacva, Tuzigoot, NA1259, NA1260, and the Bridgeport Ruins. This chain begins much farther upriver, and extends beyond the Bridgeport Ruins to the south. This spatial division of major pueblos strongly suggests political control of territory, which probably includes the arable land needed to sustain the large pueblo communities (Pilles 1981a:14).
The large pueblos usually occur alone, since they are built close enough to the agricultural fields so that fieldhouse systems are not needed for tending crops. However, some of the large pueblos do have smaller pueblos and fieldhouses scattered throughout the region around them that were probably part of the same community, as seen at Sacred Mountain (Fish and Fish 1984). This is suggested by the results of the Tuzigoot survey. As illustrated in Figure 5.1, there are a series of small sites surrounding Tuzigoot that appear contemporaneous. Figure 5.1 also illustrates what Hartman (1976:26-27, Fig. 5) has called Tuzigoot's sustaining area—"that region immediately surrounding the pueblo which provided most of the subsistence for the population." This included four distinct environmental areas: (1) the pueblo and Tuzigoot Hill with limited resource potential; (2) approximately 1,200 acres of farmland in the floodplain and lower terraces in the immediate vicinity of the pueblo; (3) the riparian habitat of Pecks Lake, Tavasci Marsh, and the Verde River with its diverse faunal and floral resources; and (4) the desert grassland in all nonriparian areas that were not suitable for farmland, with limited floral but abundant faunal resources.

It is generally accepted that agriculture provided the primary food source of the late prehistoric occupants of pueblos such as Tuzigoot. It is assumed that the layout of communities would be compatible with working these fields, as is seen in the Beaver Creek field system near Sacred Mountain (Fish and Fish 1984:149-152, Figs. 1-2). This is a series of rock-lined fields, gardens, canals and fieldhouses thought to be associated with a large pueblo. This same pattern can be discerned to a lesser extent in the area of the Tuzigoot survey. Figure 5.1 illustrates the relationship of the small sites to Tuzigoot and the most likely farmlands. A 100-acre plot of farmland with some historic canals remaining lies just east of Tuzigoot. This land is easily accessible to the pueblo, but also has four small sites on its corners, spaced 500 m to 700 m apart: TUZI 86A-2 at the northwest, TUZI 86A-4 to the northeast, TUZI 86A-5 at the southeast, and the Group 7 roomblock of TUZI 86A-1 at the southwest corner. The four small sites are all located on the lower slopes of higher hills or ridges, just above the fields, and it seems likely from their locations that they are associated with the tending of those particular fields.

West of Tuzigoot, including the current tailings pond, is another 200 acres of bottomland ideal for farming. Once again, it is easily accessible to Tuzigoot, and also has a series of small sites associated with it: TUZI 86A-7 is situated on its northeast corner, Group 7 roomblock of TUZI 86A-1 covers the southeast corner, and TUZI 86A-6 and TUZI 86A-8 are along the southern edge. No sites were recorded along the western boundary of the field, but much of that area is not in the survey area or is badly disturbed. Sites within this second group are spaced between 300 m and 500 m apart. Two of the sites are down on the lower terrace in the fields, and two are above the fields on promontories.

Finally, to the south of Tuzigoot and across the Verde River is another 100-acre plot of farmland, as well as a narrow strip running along the river towards the west that could have been farmed. These fields are not as easily accessible to Tuzigoot because of the river,
Figure 5.1 The distribution of Honanki/Tuzigoot phase sites around the Tuzigoot pueblo, including canals, arable land, and prominent natural features.
but are overlooked by the Tuzigoot Extension Ruin, the second largest site in the cluster. No small sites associated with this field are known, since the area has not been surveyed. The land is currently farmed. The location of this large site so close to Tuzigoot may be in response to the inaccessibility of these fields from the pueblo due to the river.

Fish and Fish (1984:157) estimated the size of individual holdings per fieldhouse unit for the Sacred Mountain complex, assuming that each fieldhouse represented a household group of some sort. A figure of about 1 acre per household was calculated by dividing the irrigated field area by the number of fieldhouses. However, this system is unlike that at Tuzigoot, since the area around Sacred Mountain is more rugged, more dry-farming techniques were used, and the field system is about 1.5 km from the main pueblo. At Tuzigoot, it is not clear how much of the labor invested in tending the fields came from the pueblo itself, and how much was done from the secondary structures. Fish and Fish (1984:157) suggest that fieldhouses were occupied continually for waterflow manipulation in plots, prevention of loss to pests, and other day-to-day agricultural activities. This would not have been necessary at Tuzigoot, since the pueblo is adjacent to the fields. The small sites may represent household groups, or fieldhouses occupied to work the fields, or they may represent sites occupied prior to the large pueblo at Tuzigoot, whose occupants eventually moved to the larger site. Moderate artifact densities at all of the sites suggest more than casual use.

In any case, the Honanki/Tuzigoot phase sites appear situated to manipulate agricultural fields. No sites from this time period were found on the edge of the mesa away from the fields, as would be expected for specialized activity sites for hunting and gathering. This may be a sampling error, since much of the survey area is in prime farming areas, or it may indicate that hunting and gathering activities were carried out from the permanent habitation sites. Location near arable land is a trend common to many of the known Tuzigoot phase sites. During the Honanki phase, settlements tended increasingly to appear on higher ground, away from the lower terraces.

The Camp Verde phase site (TUZI 86A-3) does not follow the locational trend of the later small sites, which are situated low on the high ridges and close to the field. This site is located high up on the ridge away from the bottomlands, and may be a specialized-use site for hunting and gathering rather than a farmstead site.

External Relationships

The trading relationships of the Southern Sinagua in the Verde Valley are relatively well documented, with strong Hohokam influence in the pre-1100 period and more contact with the Anasazi after that time. The Verde Valley was rich in trade materials, especially argillite, copper derivatives, and salt, which would have been sought after by other cultural groups. The Southern Sinagua were also in an ideal
position to serve as middlemen in the trade network between the Hohokam in the south and the Northern Sinagua and Anasazi to the north. Excavations at Tuzigoot revealed a variety of intrusive artifact types, mainly ceramics, that appear to illustrate trade with the Hohokam, Winslow and Kayenta Anasazi, Northern Sinagua, Cohonina, Salado, and early Zuni (Caywood and Spicer 1935). It has been suggested that many of these intrusive types may have originated in Hohokam and Anasazi colonies in the Verde Valley rather than being traded in (Fish 1974:17). Nonceramic trade items included shell from the California coast or Gulf of Mexico and macaws that probably came from the Hohokam. The Southern Sinagua depended on outside sources for their decorated ceramics, and a total of 80 percent of the intrusive pottery types at Tuzigoot were from northern Arizona, specifically the Chavez Pass and Winslow areas.

There is very little evidence of these trade relationships in the sample from the Tuzigoot survey. Locally available lithic material was used exclusively for flaked and ground stone artifacts, and the only shell noted was a freshwater mollusk available in the Verde River. Locally made plainwares dominated the ceramic collections, with only nine intrusives recovered for identification. These few intrusives indicate possible trade relationships with the Northern Sinagua, Kayenta and San Juan Anasazi to the north, the Prescott Branch to the west, and the Hohokam to the south. It is not clear, however, from this small sample of surface artifacts, what the mechanisms or magnitude of these contacts were, and whether they represent formalized trade networks or simple reciprocal exchange.

**Summary and Conclusions**

The archeological survey of Tuzigoot National Monument and the adjacent land exchange area resulted in the recording of 8 sites and 21 isolated finds, including 2 sites and 2 IFs in the monument. It documented the use of the area by the prehistoric Southern Sinagua for about 400 years during the 11th through the 14th centuries. The earliest evidence of occupation is one site (TUZI 86A-3) from the Camp Verde phase (A.D. 900 to 1125) which consists of an artifact scatter on the high mesa along the eastern boundary of the survey area. There may be more remains from this time period, and earlier occupations covered by later ones that consequently could not be found by the survey.

The most extensive use of the area occurred during the Honanki/Tuzigoot phases (A.D. 1125 to 1425), which is represented by the remaining seven sites, as well as the nearby sites of Hatalacva and the Tuzigoot Extension Ruin. All of the sites, with the exception of the heavily disturbed TUZI 86A-8, were cobble masonry surface structures, including one-room fieldhouses, two- to five-room structures, small pueblos with from 10 to 30 rooms, and large pueblos of around 100 rooms. The large pueblos consisted of contiguous rock masonry rooms, and the small sites consisted of cobble masonry foundations up to five courses high that probably supported perishable jacal or wattle-and-daub superstructures. Associated artifact scatters are moderate to heavy. Tuzigoot and Hatalacva are two in a series of many large pueblos spaced
approximately every 1.7 miles apart along the Verde River. The small sites around Tuzigoot may form at least in part a community cluster, although it is unknown which, if any, of the sites are contemporaneous. Inhabitants of the smaller Honanki phase sites may have abandoned them to create larger pueblos in the Tuzigoot phase. Excavation at Tuzigoot and Tuzigoot Extension Ruin both show early and later occupations, so it seems likely that many of the smaller sites were occupied simultaneously and were related to the larger pueblos in internally diversified communities.

From the locations of the seven smaller sites in relation to Tuzigoot, it seems possible that they represent fieldhouses or small pueblos situated for tending the various agricultural plots that surround the pueblo. Even though the pueblo is adjacent to the fields, smaller sites may still have been utilized for this purpose, although extensive field systems as seen in less lush farmland areas such as Sacred Mountain were not necessary. The area investigated in this survey is about 1 square mile, with the pueblo in the center surrounded by agricultural fields and associated fieldhouses, and a secondary pueblo across the river, perhaps to control farmland not so easily accessible to Tuzigoot because of the river. There was no evidence of sites in nearby environmental zones which would have been used for exploitation of wild flora and fauna, suggesting that hunting-and-gathering expeditions were probably carried out from the pueblos. There is also no remaining evidence of prehistoric agricultural fields in the plots surrounding Tuzigoot; historic agriculture and the tailings pond would have destroyed or covered such evidence. However, it seems likely that those areas farmed historically were also farmed prehistorically.

The artifacts recovered from the recorded sites indicated use of locally available materials almost exclusively for stone tools, and a dominance of locally made plainware pottery. The few intrusive ceramics recovered indicate the influence of, or contact with, the Northern Sinagua, Anasazi, and the Hohokam.

The results of the Tuzigoot survey fit easily into what is known of the Tuzigoot phase in the middle Verde Valley. The period is typified by large pueblos built in a rambling and terraced fashion on the tops and slopes of prominent hilltops and ridges overlooking prime farmlands and surrounded by small, supporting fieldhouses and pueblos. The survey also illustrates the probable frequency of unrecorded small sites in heavily used areas. The continued destruction of such sites by construction and vandalism indicates a real need for more surveys such as this to further our knowledge of the prehistoric use of the Verde Valley while it is still possible to do so.

Management Recommendations

The survey of Tuzigoot National Monument has provided a complete inventory of cultural resources within the monument boundaries, thus fulfilling the inventory requirements of the National Historic
Preservation Act as amended in 1980. This will allow for efficient clearance evaluations of future ground alteration projects. It is important that future construction projects within the monument be designed to avoid direct impact to the additional recorded cultural resources; this procedure has been successfully carried out when dealing with the Tuzigoot pueblo (see Chapter 6, this report). This eliminates both the need for additional archeological projects and the delay required to redesign projects when it becomes recognized that they would disturb archeological sites. In any case, plans for future ground-alteration work should be forwarded to WACC for evaluation, thus preventing unintentional destruction of archeological sites within the monument.

The survey of the additional land adjacent to the monument has provided a complete inventory of cultural resources that may be acquired by the National Park Service and added to Tuzigoot National Monument. Six archeological sites were recorded in this survey, all considered significant to the interpretation of the Tuzigoot pueblo and the inhabitants' use of the area around the monument (see Fig. 4.1). No direct evidence of prehistoric agricultural features was noted, but previous work has indicated the possibility of subsurface remains in the fields east of the monument. Limiting future agriculture to those areas already farmed, and prohibiting processes such as deep plowing, will preserve any subsurface remains or features that may have escaped destruction up to this point. Because of the current condition of the three sites on the mesa edge on the eastern boundary of the project area, they are not likely to be disturbed; restricting traffic on the present Dead Horse State Park Road would lessen that possibility even further.

One site was recorded that overlooks the tailings pond, just west of the monument entrance road. Although this site, TUZI 86A-7, is already disturbed by a fence line, it still remains relatively intact and may include undisturbed subsurface remains. Preservation of this site, and the land north of the site from the terrace edge overlooking the tailings pond to the northern project area boundary, and the project area to the north and east of the monument, would help preserve the visual integrity of the monument as well as a portion of its sustaining area.

Archeologically, the tailings pond is not significant, and has covered any cultural resources that may have at one time existed there. It is not significant as an archeological feature, and without the restoration of this area to its original condition, it is not considered necessary for preserving the integrity of the Tuzigoot pueblo. An additional two sites were recorded between the tailings pond and the river. Both sites are considered significant to the interpretation of Tuzigoot, although one site (TUZI 86-8) is so badly damaged, as is most of this strip of land, by the heavy recreational use of the area, that it is doubtful whether any significant remains still exist at the site. TUZI 86A-6, on the other hand, appears relatively intact and may still contain significant remains. Prohibiting recreational traffic on the series of secondary roads that crisscross this area would help preserve what information remains at these two sites.
In addition to the sites recorded in the monument and adjacent land acquisition area, investigations were also carried out at the Tuzigoot Extension Ruin and Hatalacva pueblo, since they are considered significant to Tuzigoot. The Tuzigoot Extension Ruin was initially included in the original land acquisition on the Von Gausig, Mayberry property (National Park Service 1975a), but was excluded when Don Morris (1977) suggested that the site was no longer significant. The recording of the site during this project indicates that although the site has been highly disturbed by both authorized excavations and vandalism, undisturbed deposits still remain and the site does indeed have archeological significance in relation to Tuzigoot. Acquisition of the land with a residence on it is possible with a life-lease option to the owner, and it is also possible to get a conservation easement as allowed by the new State Act, but it appears that the current residents plan to preserve the site, and so it will be protected.

Hatalacva, often called the "sister ruin" of Tuzigoot, was recorded during TUZI 86A because of its obvious significance in the interpretation of the Tuzigoot pueblo. This site exemplifies a problem that is rampant in the southwest, but especially noticeable in the Verde Valley—the vandalism of archeological sites by relic hunters. This problem has affected Tuzigoot and TUZI 86A-2 in the monument, and none of the large pueblos in the valley have escaped partial destruction, starting in the mid-1800s but increasing in recent years. Hatalacva is very similar to Tuzigoot archeologically, and even though it has been vandalized, there is still a good portion of the site that has not been disturbed. Preservation of these large pueblos is critical to the understanding of the prehistory of the Verde Valley, since there are many questions remaining unanswered on the lifestyle and eventual downfall of the Southern Sinagua. Caywood and Spicer's (1935) excavation of Tuzigoot is the only one of its kind, but their techniques used in 1935 are now outdated and considerable information was not recorded; much more could be learned with modern and more formal techniques. The proximity of Hatalacva to Tuzigoot National Monument and the proposed land acquisition area, and the possibility of land exchanges with the Phelps-Dodge Corporation who own the site are favorable factors in the situation. Since Tuzigoot National Monument was created to preserve the Tuzigoot pueblo, it seems appropriate to try to preserve another similar pueblo. Acquisition of Hatalacva instead of a portion of the current land exchange, or in addition to the current acreage, would be the first step in the protection of the site by placing it under National Park Service jurisdiction.

It is clear that patrolling a piece of land not contiguous to the monument would be financially and logistically difficult, but fortunately it is also unnecessary. A large percentage of the site is readily visible from the Tuzigoot Visitors' Center, and most illegal activity could be seen from there, or from the road below the ridge on which the site lies. According to John Reid, head ranger at Tuzigoot, many pothunting activities at the site are reported to the visitors' center, in which case action could be taken. Construction of a fence with National Park Service signs on it would also be a deterrent. Susan Wells, a WACC archeologist who recently did a survey of Saguaro National Monument, noted that the National Park Service boundary fence appeared
to keep people from vandalizing sites; many times sites outside the boundary fence were disturbed, while those just inside the fence were not. It seems clear that the addition of this parcel of land would not add appreciably to the monument's staff work load, and would begin much needed preservation to another large pueblo site which will soon be destroyed if it is not protected. It would also add an additional interpretive feature to those already at the monument.
Part 2

THREE SMALL VERDE VALLEY PROJECTS
Chapter 6

MITIGATION OF THE IMPACTS OF THE TUZIGOOT DRAINAGE PROJECT; REASSESSMENT OF THE ARCHEOLOGICAL POTENTIAL OF TUZIGOOT RUIN

by

Anne Trinkle Jones

Introduction

In 1983, funding became available to install a new subterranean drainage system (Pkg. 103) in 20 rooms at Tuzigoot Ruin. According to the original archeological field notes, Caywood and Spicer (1935) excavated only two of these rooms down to sterile soil. Field notes on the other 18 rooms were ambiguous or lost (Hartman 1976:69-80). Hartman observed that of the remaining rooms under consideration, one had a possible undisturbed subfloor wall and floor; two had possible undisturbed subfloor refuse; and nine had other possible undisturbed deposits (Fig. 6.1). No information was available for six of the rooms.

Original plans for the drainage system were designed to avoid subsurface disturbance (Sogge 1982) by installing the system in a 4-inch thick layer of soil placed over the original fill. However, because of the logistical problems of obtaining and transporting that amount of soil up the hill to the rooms, an alternate plan was devised.

I was engaged by the Western Archeological and Conservation Center (WACC) to monitor excavation of the trenches into the original fill and to map previously undisturbed deposits (Project No. TUZI 83A). This work took place from May 23 to June 7, 1983. Coring, to facilitate emplacement of soil moisture probes in the rooms, also was monitored. The coring operation was conducted on July 27 and 28. Both excavation and mapping were limited, but the information gained can be used to supplement earlier assessments of the archeological potential of the site (Hartman 1976), and to help mitigate the possible adverse impacts of the project. The methods used and the information gained during both phases of archeological work are described in this chapter.

Field Methods

Trench Excavation

Excavation of the trenches was accomplished from May 22 to June 7, 1983 (30 person-days total). I was assisted by Gregory T. Weldon and Jerry Sansom, hired by George Chambers, WACC, Division of Structure Conservation, for both the archeological monitoring and drainage system installation phases of the project.
Figure 6.1 Potentially undisturbed deposits, Tuzigoot Ruin (from Hartman 1976:11-12).
The rooms in which the drainage systems were installed are located on four levels on the east side of the main room block at Tuzigoot (see Fig. 6.1). Trenching began in the upper rooms towards the center of the ruin for safety reasons, and because the vegetation cleared from the rooms could be thrown down to the next level. The outside edges of the trenches were marked by string around metal spikes placed 6 inches from the corners and walls. Trench width was approximately 9 inches, the width of the flat blade shovels used. Trench depth varied from 4 inches to 8 inches below the present ground surface (BPGS), depending on the depth of bedrock. All possible features were excavated using trowels and whiskbrooms, and trench profiles and floors were squared-off using trowels.

Where possible, backdirt from the trenches was placed in the room center. However, several rooms (I-1, I-9, I-12, I-13, and V-33) were so narrow and small that some of the backfill had to be shoveled into the rooms immediately below. Thus, some artifacts from deposits in the upper rooms may inadvertently have been removed from their original provenience. However, because of mixing caused by past excavation, stabilization, and maintenance projects and the lack of stratigraphy evident in most rooms in the current project, the probability that in situ artifacts were disturbed and relocated is low.

To determine artifact density and types, fill from one of the four trenches in each room was screened with 1/4-inch mesh wire screens. Most often, the south or north trench was screened to obtain a good cross section through the room fill from the eroded upper (west) side to the silt-filled lower (east) side. These artifacts were inventoried in the field and collected. In addition, diagnostic sherds and projectile points or fragile objects, such as shell bracelet fragments, were provenienced and collected.

The artifacts visible in the fill of the remaining trenches were not collected. Large or unusual artifacts, such as metate fragments, manos, rubbing stones, abraders, axes, hammerstones, and a pick, were provenienced, measured, and described but were not collected. Due to time constraints in the field, plainware ceramics were classified only into gross categories of redware, brownware and grayware. However, if possible, decorated sherds were typed on the basis of the ceramic typology defined by Colton (1958b, 1958c, 1958d).

All proveniences were measured from the wall at the south end of the trench if in the east or west trench, and from the wall at the west end of the trench if in the north or south trench. Depth measurements were made from the present ground surface. English units (feet and inches) were used throughout to conform with prior research and with project specifications.

Notes for each rooms were kept on a form with space provided to report depth of level, soil type and color, size and density of charcoal and rock, as well as rock type, artifact density, and varieties and degree of disturbance. The latter includes rodent or insect burrowing, prior stabilization, or erosion. Profiles of trench walls were drawn for the south and west trenches adjacent to the infant burial in Room 77.
I-10 and for the west trench of Room I-5. After trenches in each room were finished, room dimensions were remeasured, as a check of those given by Hartman (1976). At the same time, the actual length of each trench was measured.

Additional work in rooms I-1, I-10, I-11, III-6, III-10, III-13, and III-16 was required to deepen the trenches to contain larger perforated pipe, and consisted mainly of removing bedrock conglomerate cobbles, limestone bedrock blocks, and the cement around drains. However, on June 3, in the process of removing cobbles from the southeast corner of Room I-10, numerous cranial fragments were encountered. Further exploration to determine the exact location and species, revealed the left clavicle, scapula, and humerus of a human infant. The orientation of the infant was north/south along the axis of the trench. The trench floor was only about 1/2 inch above the skeleton, and the deposits were extremely soft. Because further work during the project would probably disturb or fragment the burial, Project Director Don Morris and I decided to document and remove it.

Documentation and results of the burial and other archeological monitoring are presented below. Field notes, bag sheets, and artifact analysis forms, as well as the trip report, are archived in the Division of Archeology at the Western Archeological and Conservation Center. The artifacts and photographs are curated by WACC also (see Project No. TUZI 83A).

Mapping

The mapping accomplished two tasks. First, horizontal and vertical location (+0.1 foot) of the undisturbed archeological deposits and sterile soil—exposed during trench excavation were recorded; and second, the base map produced by the Museum of Northern Arizona (MNA) (Hartman 1976) was tied into existing benchmarks and the state coordinate system, so it could be used more accurately in future projects.

A professional survey firm, Mingus Associates (1114 East Mingus Avenue, Cottonwood, Arizona 86326), was hired. All points of interest, including the location of the infant burial and the intersection of sterile soil and bedrock within the trenches were flagged prior to the arrival of the survey crew. David Lay and Ron Halstaff, the surveyors, and I spent 15 hours doing the map fieldwork.

The Electronic Distance Monitor (EDM) was set up over the benchmark, NPS T-2, on the west side of the ruin. Shots were taken to three U.S. General Land Office benchmarks, one on the west slope of the ruin below the trail, and two across the Verde River on the opposing ridge to the south. The horizontal and vertical locations of five building corners (Fig. 6.2) were taken to facilitate tying the MNA base map into the state coordinate system and to allow orientation of the map for the present study. Fifty-five points in 17 of the 20 rooms were
Figure 6.2 Mapping and coring points, Tuzigoot Ruin.
recorded. Notes on the general location and significance of each point were taken.

Coring

The second phase of monitoring, the coring operation, was conducted in conjunction with members of the Division of Structure Conservation, WACC, on July 27 to 28. Elvia Niebla and Barbara Daboll directed Bruce McIntosh and Joe Salvetti in drilling a total of 10 cores, about 2.5 inches in diameter, to allow the emplacement of a 2-inch diameter PVC pipe (see Fig. 6.2). Fast Neutron probes inserted periodically allowed soil moisture in the fill to be monitored. Cores ranged in depth from 12 to 57 inches deep.

A motorized auger with a hollow diamond bit was used for the drilling. Because it was air-cooled, the fine sediment of the core was blown out of the coring tube; thus, no core samples were retrieved. However, drilling depths were measured from the surface to abrupt color and texture changes, such as when bedrock or sterile orange silt was reached.

Measurements of core hole locations were made perpendicular from the two nearest walls to the center of the core. Pipes visible to the public were cut off flush with the ground surface. At those locations, a hole, 4 inches deep and 8 inches in diameter, was excavated around the core to allow space for the probe cap.

Results

Data from the trench excavation and coring work are presented for each room. The room numbers used are those assigned by Caywood and Spicer (1935) during the original excavation. General results of the mapping are also described.

Only one prehistoric feature, the infant burial from Room I-10, was encountered during the project. No burial goods were found in situ, and most of the artifacts recovered during the project appeared to be either out of their original context or part of a very homogeneous fill. The fill and profile descriptions which follow, support this conclusion. Further, all artifacts were very small so that in most cases, identifications, particularly in the field, could not be made with any confidence. The nominal data seemed to add nothing new to previous descriptions (Caywood and Spicer 1935) of Tuzigoot phase ceramics. Rather the density data of a larger sample, derived from combining counts from all the trenches, seemed a better indicator of the presence or absence of cultural deposits, the discovery of which was a primary goal of the project. Thus, detailed descriptions of all artifacts found, including wares and types for the ceramics collected from the screened trenches, are not given here, but may be found in the artifact analysis sheets and field notes (on file, WACC archeology archives).
Trench Excavation and Coring

Room I-1

All trenches were excavated to a depth of 6 inches below grade. The fill was a loose, light brown silt with harder, orangish clay areas. A few small chunks and flecks of charcoal were found dispersed throughout the fill. Many caliche-covered pebbles and larger cobbles, constituents of the conglomerate bedrock capping the ridge, were found in the west trench and on the west side of the north and south trenches. In the northeast corner of the room, rodent activity was heavy. Chunks of purplish soil cement were found to a depth of 6 inches in the northeast corner and along the west trench.

Relatively few artifacts were encountered. The shorter north and south trenches only had a total of two brownware sherds. The silty east trench had seven vesicular basalt metate fragments, about 1.5 inches thick, probably all from the same metate. Also found was a granodiorite single blade, 3/4-groove axe, 5.5 inches long by 2.75 inches wide by 1.75 inches thick, similar to those described by Caywood and Spicer (1935). A bifacial, sandstone handstone was 4.5 inches long, 3.5 inches wide, and 2 inches thick. Twenty-seven brownware sherds, two redware sherds, and three chert lithics were noted. Twenty-one redware and brownware sherds, two Prescott Gray Ware sherds, four obsidian flakes, and six chert flakes were recovered from the screened fill of the west trench. Caywood and Spicer (1935) probably excavated the room to the bedrock conglomerate, and windblown silt and fill from later stabilization work has filled in the lower (east) side.

Room I-2

The trenches in Room I-2 were excavated to a depth of 6 inches. Two strata were visible in the trench profiles. A loose, light brown silt, with a few flecks of charcoal, lay on top of sterile orange silt, which was visible in all four trenches. A soft, sandy limestone bedrock outcropped in sections of the north, west, and south trenches, and, in several places, the west wall rests directly on bedrock. A black plastic sheet was found 2 to 6 inches below the surface along the east and north walls, but did not cover the northeast corner. The plastic extended 36 to 60 inches out from the walls. This was laid by Mayer and Waggoner (1968) during stabilization efforts in 1968. Chunks of soil cement were found in the southwest corner. A number of rodent burrows were also found in each trench.

Most of the artifacts were recovered from beneath the plastic along the east wall and from the screened fill of the south trench. Some were burned. A total of 476 sherds (228 brownware, 229 redware, 13 grayware, 5 Jeddito Yellow Ware, and 1 unidentifiable polychrome) were noted. The 46 lithics included 25 chert, 2 basalt, and 19 obsidian
A shell fragment and a small chunk of turquoise-colored ore were also recorded.

The room probably was excavated to a sterile level in most places, but was not systematically cleaned out; pockets of cultural material in the uneven bedrock and sterile silt may remain. One such pocket in the southwest corner resembles the one in Room I-10 from which the infant burial was recovered during this project.

Room I-3

Room I-3 was not trenched for the drainage system; however, because of soil moisture evident on the west wall, a core was placed in the northwest corner. A metamorphic cobble formed the base of the core 31 inches below the present ground surface. A hole, 8 inches in diameter and 4 inches deep, was excavated to allow the core pipe to be cut off and capped flush with the surface. Soil cement, 1 inch thick, was placed around the 4-inch diameter pipe. Damp, loose, light brown, sandy silt was evident in the hole, and sterile orange silt was never reached. Probably backfill made of cultural material was used to level this area for the sidewalk, or undisturbed remains may exist adjacent to a ledge in the bedrock.

Room I-4

The trenches in Room I-4 were excavated to a depth of 6 inches, with holes caused by the removal of cobbles as deep as 8.5 inches. The black plastic laid by Mayer and Waggoner (1968) was encountered 4 to 7 inches deep along the north and east walls, and was 60 inches wide on the north side and 36 inches wide on the east side. The sterile orange silt was visible at the base of trenches along most of the west wall, in the northeast corner, and in one patch at the center of the south trench. The silty, light gray-brown fill on top appeared cultural, but no difference could be seen between the silt above and below the plastic. The fill was uniform throughout but did include a few flecks and small chunks of charcoal and a few small limestone rocks and gravel. A few insect burrows were evident along the west wall, but most disturbance (rodent burrows and ant dens) was in the deeper brown silt of the south and east sides. A large chunk of cement was removed from the southwest corner.

Most artifacts were found in the south (screened) and east trenches, many of them on top of the plastic. A total of 69 sherds (26 brownwares, 35 redwares, 5 graywares, 2 black-on-gray, and 1 unidentifiable black-on-red) was found. Twelve lithics (2 obsidian and 10 chert) were found. Three unburned bone and 2 shell fragments were too small to identify.

A core was placed in the northwest corner of Room I-4. The final depth was 23 inches. The upper 6 inches of the fill was a light, orangey-brown loose silt. Below that, sterile orange silt and white
limestone rock was encountered. A hole, 8 inches in diameter and 4.7 inches deep, was excavated around the core pipe and was much cleaner than the usual light brown silt and trash. This room was probably excavated to a sterile level by Caywood and Spicer (1935) and has subsequently filled in with windblown silt, backfill, and stabilization materials.

Room 1-5

All trenches in this room were excavated to a depth of 6 inches. Stratigraphy was evident in the west trench (Fig. 6.3) where the loose, light brown silt is underlain by a caliche layer, 0.8 to 2.4 inches thick. Beneath this are patches of darker brown and denser cultural deposits between sections of sterile caliche and limestone rocks. Chunks of soil cement were found in the northeast and northwest corners to a depth of 4 inches below present ground surface, but above the caliche. A few insect burrows and casings were noted in the sterile silt.

Most of the artifacts were found in the screened south trench and in the east trench. Ninety-four sherds (56 redware, 31 brownware, 4 grayware, 1 Tusayan White Ware, and 2 Flagstaff Black-on-white) were found. Nine lithics (six chert, two obsidian, and one basalt) were found, along with an irregular-shaped basalt cobble. Two mammal bones, including a metatarsal fragment and a rib bone from a human infant (collected), were noted in the disturbed fill on the surface.

The southwest corner of this room is consistently in sterile deposits. In other areas a few pockets of undisturbed cultural deposits, at least 4 to 8 inches thick, may be seen in the trench wall.

Figure 6.3 Profile, west trench, north face, Room I-5.
Room I-6

In the 6-inch deep trenches in this room, sterile orange silt was reached along all four walls. Sandy limestone bedrock was encountered in the southwest corner. Only a few flecks and small chunks of charcoal were noted in the light brown silt above this. Chunks of soil cement were found at the base of trenches in the northwest corner and on the surface near the south wall.

Relatively few artifacts were noted. Fifty-four sherds (26 brownware, 23 redware, and 5 grayware) and 2 gray chert lithics were found, mostly in the screened fill of the south trench.

Room I-7

In this room, sterile orange silt was found in all of the 6-inch deep trenches in but the east one. The sterile orange to reddish silt was noted from the northwest corner along the west and south walls. Limestone bedrock was evident in the northern half of the west trench. Along the east wall, a caliche layer was visible 4 inches to 6 inches below present ground surface, above which was light brown sandy silt, and below which was a darker brown silt with more cultural material. This was similar to the stratigraphy in Room I-5 (see Fig. 6.3).

Grass roots were visible in all the trench profiles, and ash, probably from weed burning, was heaviest in the southeast corner. The softer cultural deposits from the east trench showed the most disturbance—several ant dens, an abandoned rodent hole on the north end, and a cement drain pad near the northeast corner, which we removed.

Most of the artifacts were located in fill from the southwest corner from the screened fill of the south trench and from a pocket adjacent to the bedrock in the west trench. A total of 98 sherds (66 brownwares, 28 redwares, 3 graywares, and 1 Tusayan Black-on-white) and 17 lithics (14 chert, 2 obsidian, and 1 quartzite) were noted. A vesicular basalt mano fragment, 3.75 inches wide by 4.5 inches long by 1.75 inches thick, was found also. One shell and five bone fragments were recorded. Some of the sherds and the bone were burned.

Possibly several inches of undisturbed deposits remain on the east side of Room I-7 and in small pockets throughout the room. However, in the southwest half, sterile deposits were reached within 6 inches of the surface.

Room I-8

The trenches in Room I-8 were 8 inches deep. Sterile light orange silt was recorded 6 inches to 8 inches deep along the length of the north and west walls, as well as in the southwest corner. Limestone
bedrock was visible in two sections of the west trench. A few flecks and small chunks of charcoal were found in the light brown silt on the surface, probably the result of the annual burning of vegetation from the ruin. Few artifacts were noted. Less than 45 sherds and lithics, a few of them burned, were found. Twenty of these were in the screened fill from the south trench. Two vesicular basalt metate fragments were also recorded.

A core was drilled in the alcove in the southeast corner of the room. Light brown silt and rock cobbles were present down to the base, at 16.9 inches. From the available data, it is difficult to discern whether the deposits are undisturbed or the result of more recent activities. It is likely that at least the northwest half of the room was excavated to a sterile level by Caywood and Spicer (1935), and subsequently was filled in with windblown silt and fill from stabilization work.

Room I-9

The trenches in Room I-9 were 6 inches deep. In only one section of the west trench was the sterile orange-red silt encountered. The rest of the fill was light brown silt that was very fine and loose. A darker brown soil on the east end of the north trench was either a rodent hole or a trash pit that was not fully excavated in the 1930s. Most of the artifacts from the trench were found there. Rodent burrows were also found at the east end of the south trench and in the west trench. The narrowness of the trenches prevented further definition of these features. A damp area indicating inadequate drainage was noted north of the drain.

As usual, most of the artifacts were found in the fill of the east trench, and most of those from the north trench (screened) were found in the dark stained area on the east side. A total of 75 sherds (49 brownware, 21 redware, 3 grayware, 1 Homolovi Polychrome, and 1 Walnut Black-on-white with a mending hole) were counted. Fifteen lithics (11 chert and 4 obsidian) and 1 worked deer bone, as well as an unfinished granodiorite pick (9.5 inches long by 3.25 inches wide by 2 inches thick), were noted.

Sterile soil is very close to the surface along the west wall. It is difficult to discern from the present data whether the remaining brown silt is backfill and eolian silt, or trash deposited by the original inhabitants to level the room floor. No cores were placed.

Room I-10

The 6-inch deep trenches in Room I-10 were dug with great difficulty because the cobble conglomerate which caps the ridgetop (Fig. 6.4a and b) was encountered only 2 to 3 inches below the surface in the
Figure 6.4 (a) Profile, south trench, west corner, Room I-10; (b) profile, west trench, south corner, Room I-10.
fill of the north, west, and south trenches. The interstices of the conglomerate are filled with sterile sandy soil and caliche. In general, a layer of loose gray-brown silt (3.9 to 4.3 inches thick), filled with a few artifacts and flecks of charcoal, rested on top of a narrow (0.9 inch) band of caliche in the south trench and on several lenses of light orange sandy silt and of light brown silt in the west trench. The caliche and lenses seem to represent an unconformity between (1) undisturbed basal deposits and (2) superimposed eolian and colluvial silt, which is disturbed by stabilization, maintenance, and prior excavation.

During excavation, concentrations of cobbles in the south and west trenches were recorded about equidistant from the southwest corner, and the corner was filled with a harder orange silty clay. A similar phenomenon was recorded on the surface in the northwest corner, but was not visible at 4 to 6 inches deep.

An infant burial was located 6.5 inches (17 cm) below the present ground surface in the pocket in the southwest corner. The burial (Fig. 6.5) was complete and undisturbed, except for an insect casing between the left forearm and rib cage. The infant appeared to have been interred in a pit dug into the bedrock. The southernmost cobble in the west trench (see Figs. 6.4b and 6.5) was partially upright along with another red sandstone cobble, and both had settled on the

Figure 6.5 Photograph, infant burial, Room I-10; trowel oriented True North; scale 6 inches.
cranium and crushed it. The skeleton was 14.6 inches long, oriented south/southwest (194 degrees) along the axis of the west trench, and appeared to be a neonate primary burial with no grave goods. This burial resembled others recovered from prehistoric sites in the Verde Valley (see Chapter 7, this report). Because the deposits were very loose and easily disturbed by further work, the remains were removed. Further details of the burial are in Appendix A.

Many rodent holes were noted in the northeast corner, as well as ant dens along the east wall and soil cement chunks along the west. Annual grass burning was evidenced by a thin layer of charcoal flecks in the east trench fill, 2 inches below the surface.

The two cores placed in the center of both the north and south sides of Room I-10 confirmed the stratigraphy described above. In the north core, the conglomerate was encountered at 4.7 inches below the surface; in the south core, at 7.1 inches. In the holes (8 inches in diameter and 4 inches deep) dug around the core pipes, light to medium brown silt, with only a few charcoal flecks and two artifacts, was recorded.

Relatively few artifacts were found, most in the fill of the east trench and the screened west trench. Eighty-one sherds consisted of 46 brownwares, 34 redwares, and 1 Tuwiuca Black-on-orange. Four obsidian lithics, including one small triangular projectile point and one side-notched, concave base point (Fig. 6.6a, b), and nine chert lithics were counted. A shell bracelet fragment and a handstone (5 inches long by 4 inches wide by 1.25 inches thick) were recorded as well.

This room probably was excavated to a sterile level. However, pockets of cultural material, such as the pit in the bedrock in which the burial was found, were missed. Further features of this type are unlikely in this room.

![Figure 6.6 Obsidian projectile points from Tuzigoot (WACC Project TUZI 83A): (a, b) Room I-10, (c) Room I-11, and (d) Room III-16.](image)
Room I-11

The trenches in Room I-11 were excavated a depth of 6 inches. The bedrock conglomerate was encountered along most of the north and west walls, except in the northwest corner, where a pocket of a fine, light brown silt was visible. This appeared similar in plan view to that of the infant burial in Room I-10; thus, it is possible that there is another burial below the trench base in this corner; however, the remaining deposits appear to be extensively disturbed by prior excavation and stabilization.

Many rodent holes were detected in the soft fill of the east, south, and west trenches and around the drain. When the fill of the west trench was screened, a sherd concentration was associated with one of these rodent holes.

Many of the artifacts were recovered from the screened fill from the east or lowest side of the room. A total of 138 sherds (67 brownware, 68 redware, and 3 Prescott Black-on-gray), 4 lithics (1 obsidian tertiary flake, 1 obsidian multiside scraper, 1 obsidian side-notched projectile point [see Fig. 6.6c], and 1 basalt flake), and 2 pieces of weathered glass were noted.

Room I-12

The trenches were excavated to a depth of 6 to 7.5 inches deep in this small room. Sterile orange silt was noted in small spots in the southeast corner, and sandstone bedrock was visible at the drain. However, most of the fill was a loose, light brown silt, with numerous chunks of soil cement and rodent holes throughout. Little charcoal and few rocks were noted in the fill. Most of the artifacts, many of them burned, were found in the screened fill of the south trench. The charcoal may be the result of the annual vegetation removal. A total of 200 sherds (91 brownware, 88 redware, 14 grayware, 1 Tsegi Orange Ware, 3 Flagstaff Black-on-white, and 3 unidentifiable Tusayan White Ware) were counted. The 20 lithics consisted of 5 obsidian and 14 chert flakes and 1 banded chert core. One worked shell fragment was also noted.

Room I-13

The trenches in Room I-13 were 6 inches deep. A weathered, reddish sandstone was encountered in the center of the west wall and is probably bedrock. Large, hard chunks of soil cement were noted throughout the rest of the fill in all the trenches and was more abundant in the corners. Old rodent burrows were numerous also. Relatively few artifacts were noted, even from the screened fill of the south trench. No lithics and only 46 sherds (44 brownware and
2 redware) were recorded. A shaped sandstone slab and a vesicular basalt metate fragment were also noted.

Trenching in the room revealed much disturbance from stabilization and rodent activity. Although bedrock was encountered along the west wall, further reconnaissance is necessary to determine if undisturbed cultural deposits are still present.

Room III-6

The trenches in this large room were excavated to a depth of 6 inches. Along the west, south, and north walls, the gravelly, sandy bedrock conglomerate was overlain by a light brown, sandy silt. Soil cement was found in the fill from the southeast corner. Two plastic pipes, 4 inches in diameter, cross the south trench, and one crosses the west trench, the result of previous stabilization efforts. Ash and darker soil from the north and west trenches are probably from the annual burning of vegetation. Few artifacts were visible, even in the screened west trench fill. Only eight sherds and three obsidian lithics were noted.

Chances of locating undisturbed deposits in Room III-6 seem slight. The bedrock is not more than 6 inches below the surface over much of the room, and likely, all cultural deposits were removed during the original excavations.

Room III-10

The trenches in this room were excavated to a depth of 6 inches. The surface was previously modified by efforts to increase the drainage. A layer of pea gravel, 1-inch thick, was placed over the old surface and was covered with black plastic. Near the walls, an additional layer of plastic was placed, and a layer of concrete, 0.5 inch to 1.5 inches thick and 8 to 10 inches wide, was added from the base of the walls. Plastic pipes, 1 inch and 1.5 inches in diameter, ran through the fill to the drain. Moisture sensors were placed in the gravel at the southwest corner. A loose, light gray-brown silt was noted 4 to 6 inches below the present ground surface and probably was extensively disturbed. Only a few artifacts were located, even in the screened fill of the south trench. Only 14 sherds (7 brownware and 7 redware), 1 obsidian lithic, 1 basalt handstone, and 2 small abraded powdery hematite chunks (probably paint pigments) were recorded.

Room III-13

The trenches in Room III-13 were excavated to a depth of 6 inches. Most of the fill was a light brown silt with few artifacts, but an ashy area was noted along the east wall, perhaps from the annual
burning of vegetation. The cement drain pad was removed from the southeast corner. In this exposure of the wall, the basal courses were resting on the bedrock conglomerate. In the northeast corner, a light caliche layer, 0.4 to 0.8 inches thick, was visible 5 to 6 inches below the surface. An uneven layer of dark silt, less than 1 inch thick, rested beneath this and may represent undisturbed cultural deposits; however, the wall visibly rests on the bedrock here also (Fig. 6.7).

Very few artifacts were noted, even from the screened fill of the south trench. An artifact concentration was found in the southeast corner adjacent to the drain pipe, and may be due to drainage in the room. There, 13 sherds (3 brownware, 9 redware, and 1 grayware), 6 obsidian flakes, and 7 nonrodent bone fragments were recovered. Other artifacts from the fill were 31 sherds (11 brownware, 16 redware, 3 grayware, and 1 Jeddito Yellow Ware) and 6 lithics (3 obsidian and 3 chert). Little chance of finding undisturbed cultural deposits in this room exists. Only small pockets could be left in the near-surface bedrock conglomerate.
Room III-16

The trenches along the walls of Room III-16 were excavated to a depth of 6 inches. The conglomerate was encountered in the north half of the room. In the south half, heavy rodent activity was noted in the soft, light brown soil. A large rodent hole, 12 inches in diameter, was noted along the east wall.

Most of the artifacts were located in the fill of the east half of the north trench. However, a grayish ash deposit above the bedrock in the west trench near the north wall had five nacreous shell fragments and a small piece of malachite. A total of about 100 artifacts included 43 sherds (27 brownware, 14 redware, 1 grayware, and 1 Jeddito Black-on-yellow), 1 small side-notched obsidian projectile point (see Fig. 6.6d), 1 obsidian flake, a handstone, and a fragmentary abrading stone (4.8 inches long by 1.8 inches wide by 0.5 inch thick).

This room was probably excavated to bedrock by Caywood and Spicer (1935). However, some trash deposits used by the prehistoric inhabitants to level the floor may remain in the east half. Much of that is probably disturbed by rodents.

Room V-26

The trenches in this room were excavated to a depth of 6 inches. The sterile orange silt and sandy limestone were encountered in the west half of the room. A light brown sandy silt on the surface and at the base of the east trench had a few artifacts. Less than 45 were noted. From the screened fill of the south trench, 18 sherds (6 brownware, 10 redware, and 2 grayware) and 4 lithics (1 obsidian and 3 chert) were recorded. In addition, a basalt handstone and a small cobble hammerstone were visible. Probably little remains of the original cultural deposits.

Room V-30

The trenches in Room V-30 were 6 inches deep. The sterile orange silt was visible only at the center of the north trench. Otherwise, the fill was similar to the light brown silt on the surface of other rooms. A concentration of charcoal flecks in the southeast corner probably was due to ash left from vegetation burning, that washed towards the drain in the southeast corner. Less than 25 artifacts were counted, including a two-hand basalt mano, a basalt slab metate fragment, and a worked sandstone slab fragment (possibly a ceramic jar cover). In the fill of the screened south trench, 16 sherds (11 brownware, 4 redware, and 1 unidentifiable black-on-red) and 6 lithics (2 obsidian and 4 chert) were located.
The data indicate that undisturbed cultural deposits still may exist in Room V-30. However, the sandstone bedrock is probably not far below the present surface.

Room V-31A

The trenches in this room were 6 inches deep. The bedrock conglomerate was encountered in the western 7/8s of the room, in all but the east trench. Chunks of soil cement were found in the light brown silt which filled the north, east, and west trenches. Red ant dens were encountered along the south wall.

A number of artifacts were noted, including two fragments of a Glycymeris shell bracelet and a thin, worked, buff sandstone slab. A total of 155 sherds (64 brownware, 80 redware, and 11 grayware) and 11 chert lithics were also recorded. No concentrations were noted, but the east trench had a lower proportion of artifacts than in other rooms.

During the 1930s excavation (Caywood and Spicer 1935), a subfloor room was excavated. With the evidence of bedrock in much of the room, there appears to be little chance of discovering additional undisturbed cultural deposits.

Room V-33

The trenches in Room V-33 were 6 to 7 inches deep. Loose, light brown silt was removed, and no bedrock or sterile soil was reached. Charcoal was light, but almost 100 artifacts were recorded, including 3 small thin sandstone slab fragments, 2 cobble hammerstones, a diorite 3/4-groove axe, a small cobble polishing stone, and a wedge-shaped sandstone "rubbing stone" (Caywood and Spicer 1935). Artifacts from the screened fill of the south trench included 31 sherds (15 brownware, 12 redware, 2 grayware, and 2 Flagstaff Black-on-white) and 7 lithics (3 obsidian and 4 chert).

As Hartman (1976) suggests, this room was probably used for trash and never for habitation. Since bedrock or sterile were not reached, stratified trash deposits may remain.

Rooms III-5 and III-12

To monitor drainage on the west side of the main roomblock, three cores were drilled. In Room III-5, the core, 13 inches deep, was placed in the northwest corner. The sediment color changed from a damp, medium brown silt to a light brown silt with white rock chips at 5.5 inches below the surface. This probably indicates bedrock not far below the surface. Hartman (1976) (see Fig. 6.1) indicates possible undisturbed deposits, but surrounding rooms were excavated to a sterile
level, and it seems unlikely that much remains. In Room III-12, the core, 56 inches deep, was placed in the west center of the room. No color changes were noted in the sediment, and bedrock was not reached. However, in a hole, 8 inches in diameter and 4 inches deep, dug around the core, the deposits appeared nearly sterile. Almost no charcoal and only one brownware sherd were found. In addition, Hartman (1976) determined that the room was dug to sterile soil in the 1930s.

Unnumbered Room (between rooms III-9 and II-1)

The final core on the west side of the ruin was placed in an area just above the trail between rooms III-9 and II-1. The core was 57 inches deep, and a hole, 10.6 inches in diameter and 4 inches deep, was dug around the pipe. Only one brownware jar rim and one redware sherd were noted. The deposits were a medium brown silty clay, with several angular limestone and basalt rocks near the surface. At 24 inches below the surface, a damp, decaying, reddish sandstone and silt was encountered.

Because the deposits were wetter than those tested in other parts of the ruin, Niebla and Chambers decided to place a single trench (24 feet 11 inches long) along the length of the room for the installation of a drainage pipe and gravel. The trench was placed 6 inches east of the west wall, and was graded downslope 4 to 9 inches deep from south to north. The fill from the trench was like that described for the core above, but many charcoal flecks and small chunks were recorded, as well as a number of artifacts. A total of 61 sherds (9 brownware, 42 redware, 8 grayware, 1 Jeddito Yellow Ware, and 1 Holbrook Black-on-white) and 8 lithics (5 chert, 1 obsidian, 1 basalt, and 1 quartzite) were noted. A concentration of sherds, charcoal, and ash about 16 inches long was visible.

The deposits were homogeneous except for this lens, and may be backfill. Chunks of soil cement were found near the surface, and Hartman (1976) determined that the area had been excavated to sterile soil by Caywood and Spicer (1935).

Mapping

The methods used for mapping were described in a previous section. The points were plotted on mylar in relationship to the state coordinate system and the National Park Service benchmark (NPS T-2) and to a scale consistent with the MNA base map. The mylar sheet was laid over the base map, and field notes on point location were used to check the accuracy of the base map. Because only one aerial photo had been used to produce the MNA map, some distortion was expected. Indeed, only three of the five building corners plotted could be lined up at once. If aligned in either of the two possible ways, the north arrow azimuth on the base map is 19 to 20 degrees off. Most of the points fall in the correct position on the north end of the main roomblock, but distortion
appears towards the south end where points there fall 8 to 9 feet from their expected positions. Field inspection also shows wall thicknesses not to be as uniform as apparent on the map. Room shapes are distorted even if they are assumed to be the correct size, and distortion increases from the north to the south end as the elevation decreases. Thus, the MNA base map is useful to work from and shows the correct relationship of the rooms, but room sizes and alignments are not accurate. On-the-ground survey or a better set of aerials is necessary to produce an accurate map.

Conclusions and Management Recommendations

The data from the trenching and mapping were extrapolated to construct Figure 6.8. The shaded areas represent sections of the rooms where sterile deposits and/or bedrock were encountered. This roughly correlates with the geologic map (Fig. 6.9) of the hilltop produced by Wachter (1975:Plate I). Sterile deposits of bedrock conglomerate on the ridgetop, and of sandstone or sandy limestone beneath were encountered in all but one of the 20 rooms examined. Fill with charcoal and cultural material was still visible at the base of trenches in the areas left unshaded. In most cases, this was located on the east or downslope side of the room. Two possible explanations for this can be noted. First, the uneven ledges and slopes of the natural ridge could have been leveled for floors by filling in with trash, and undisturbed deposits may remain. Second, the trenches were less than 8 inches deep, and it is more likely that what is visible in the profiles is fill from backdirt, stabilization work, and windblown silt that has washed downslope. However, if undisturbed cultural deposits are present, their extent is probably small.

Two areas where features, such as the infant burial in Room 1-10, can be expected (see Fig. 6.6) are the northwest corner of Room 1-11 and the southwest corner of Room 1-2. Miscellaneous features have been noted at Tuzigoot during many stabilization projects (Mayer and Waggoner 1968; Smiley 1940). Caywood and Spicer (1935) probably intended to excavate all rooms to sterile soil, but the inexperience of the laborers and the size of the project precluded monitoring to ensure that all features in the floors were uncovered and recorded properly.

The undisturbed deposits which remain are very limited and may consist only of a few isolated features and several inches of homogeneous subfloor refuse. Because of the slight possibility of undisturbed deposits, an archeologist will need to monitor all future stabilization and drainage projects which entail subsurface disturbance. An alternative plan is to fund data recovery to remove the limited cultural deposits and to update excavation notes from the 1930s. Archeological assessment is difficult when profiles are only 6 inches deep and trenches only 9 inches wide. More data can be recovered and the oversights of earlier excavations rectified from larger exposures of the deposits. Stabilization and drainage will frequently be of
management concern in future years. Data recovery conducted in conjunction with a large management project will be less costly and more efficient than continual archeological monitoring.
Figure 6.8 Reconstruction of sterile deposits.
Figure 6.9 Geologic map, Tuzigoot Ridge (from Wachter 1975:Plate I).
Chapter 7

EXCAVATION OF A CHILD BURIAL IN MONTEZUMA CASTLE

Introduction

The burial of a child was removed from Montezuma Castle, Montezuma Castle National Monument, in March 1986 by archeologists from the Western Archeological and Conservation Center (MOCA 86B). Superintendent Glen Henderson requested the removal of the burial to prevent its destruction during unlawful entries in the castle, which have occurred recently. This project involved the excavation and recording of a burial that had been exposed in situ for the past 47 years, and protected by a cement box with a wood cover. While at the monument, the archeologists were also requested to survey a small plot of land adjacent to the sewage lagoons for proposed leach field construction. A 2.5-acre parcel was surveyed and marked with flagging tape (Fig. 7.1). A few isolated sherds, flakes, and a ground stone fragment were noted, but not considered archeologically significant, and clearance was granted for construction of the leach field within the designated area. The remainder of this report will deal with the removal of the burial from Montezuma Castle.

Setting and Background History

Montezuma Castle is located in a cliff face overlooking Beaver Creek, in the middle Verde Valley (see Fig. 2.1). The site (NA1278) is located in the Montezuma Castle section of Montezuma Castle National Monument, a 520-acre monument established to preserve the ruin (Fig. 7.1). The castle is a five-story, 17-room pueblo built in a terraced fashion in a south-facing cave exposed 150 feet above the ground in a vertical limestone cliff at the southeastern edge of the White Hills (Figs. 7.2 and 7.3). Elevations on the pueblo run from 3,250 feet to 3,310 feet. The cavity containing the site was formed by river action eroding out the softer lenses in the more resistant limestone during the valley formation. The dominant life zone at the monument is the Arizona Upland subdivision of the Sonoran desertscrub with typical plants including mesquite, catclaw, saltbush, creosote bush, and various cactus species. Beaver Creek, a major tributary of the Verde River, supports a lush riparian deciduous forest community typified by cottonwood, sycamore, walnut, and hackberry (Western Archeological and Conservation Center n.d.:3-4; Sudderth and others 1976:6).

Montezuma Castle was constructed of limestone blocks and boulders and mortar, with plastered walls and floors. Roofs were constructed of juniper logs and willow with a covering layer of mud. The site was first occupied in the Honanki phase (A.D. 1125 to 1300), and the fifth floor was apparently the first to be constructed. The main occupation occurred during the Tuzigoot phase (A.D. 1300-1425),
Figure 7.1 Montezuma Castle National Monument with Montezuma Castle and survey area locations.
with the consolidation of the local population into large pueblos. Montezuma Castle is one of about 50 major pueblos known in the Verde Valley from this time period and is part of the Beaver Creek series. This consists of major pueblos spaced about 1.7 miles apart along certain streams; the Beaver Creek series includes Cosner Canyon Ruin, Sacred Mountain, Montezuma Well, Jackson Ranch, Montezuma Castle, White Cone, AR-03-04-57, and AR-03-04-58 (Western Archeological and Conservation Center n.d.:12-13; Mindeleff 1896; Jackson 1933; Schroeder and Hastings 1958:21; Pilles 1981a:14).

The earliest dated scratched inscription in Montezuma Castle is 1880, although it is known that the ruin was visited by army personnel in the 1860s. The site was first mentioned in Richard Hinton's Handbook to Arizona in 1878, and a detailed account of the castle was written by Dr. Edgar A. Mearns when he was stationed at Fort Verde in 1890. Mearns also "... caused the debris on the floors to be shoveled over..." This accumulation, in the largest room of the top floor, was 4 feet in depth" (1890:755). Unfortunately, no report was written on the excavations, although Mearns described some of the artifacts in his article. In 1897 members of the Arizona Antiquarian Association cleaned up the ruin and performed repairs, including the installation of ladders, iron anchor rods, and corrugated iron roofs (Schroeder and Hastings 1958:31).
Figure 7.3 Plan view and cross section of Montezuma Castle with burial location (adapted from NPS 1958b and Schroeder and Hastings 1958:22-23).
On December 8, 1906, 160 acres were set aside by presidential proclamation to preserve the castle, and on February 23, 1937, an additional 366 acres were added to the area to give better protection to the castle and surrounding area, adding land from Coconino National Forest (Schroeder and Hastings 1958:31-32; Sudderth and others 1976:5).

Since its acquisition, Montezuma Castle has been heavily stabilized to provide safety to visitors, who were allowed access to the ruin until 1951 (Sudderth and others 1976:22). This stabilization included extensive repairs by Pinkley and Jackson between 1923 and 1928 and by Tovrea in the late 1930s, such as restoring roofs, cementing the room floors, building wooden catwalks, and adding iron roof supports (see for instance National Park Service 1958b; Richert and Voll 1964; WACC photo files:Montezuma Castle). During one such stabilization project in April 1939, involving excavation of holes for concrete footing to support steel columns on the third floor of the castle, the burial of a child was uncovered in the southwest corner of Room 2 (Fig. 7.4) (Jackson 1939a:265).

Superintendent Pinkley was informed of the discovery, and decided that the burial should be uncovered and left in situ for public display (Fig. 7.5). Jackson (1939b:456-458) excavated the burial, and submitted a detailed report:

So the southwest corner of the room was excavated, and the burial of a child of about three years of age was uncovered. The body was prone, on its back, and extended, with head to the west, crossed feet to the east. The left foot was crossed over the right one at about mid-tibia. The top of the skull was about 15 inches below the present floor. We did not carry the excavation below the body, and so cannot state whether the lower floor level found in Hole No. 2 extended into the southwest corner or not.

While the feet were partially mummified, the rest of the body had not fared so well. Rats had entered the grave and had scattered the small bones and the arm bones, and had built a nest just west of the skull. It was evident the body had been wrapped in a cotton blanket, for considerable sections of it were well preserved.

There are three or four interesting points about this burial. As I dug down to it from above, the first things I encountered were several large pieces of a broken pottery vessel. No rim or shoulder pieces were found, but the shape of the pieces suggested they were from a large spherical olla, and the amount of carbon on them suggests the vessel had been kept over or by the side of a fire.
Figure 7.4 Sketch of stabilization holes excavated in Room 2 that exposed the burial (from Jackson 1939b:456).

Figure 7.5 The burial as it appeared on display in Montezuma Castle in 1944.
Next, under the broken pottery, was found a large piece of twilled basketry. This piece was a little over two feet long, and 15 inches wide. This covered the body of the baby. Over the west end of the basket were three other fragments of basket matting of similar material and weave. Obviously, when the Indians were burying the baby, they had no complete basket of the right size or shape to cover the body, and so simply used pieces, putting several thicknesses at the point where it covered the head.

After lifting off the basket covering, the body was revealed. It rested, in turn, on a large section of basket which formed a complete bed for the body except that the feet stuck over a couple of inches at the end.

Nothing of any nature was found with the body except for the cotton wrapping and a great quantity, at least a quart, of seeds. These seeds were scattered over the space where the stomach would have been. They were so thoroughly burned that they were partly carbonized. We cannot identify them as yet.

The south wall of the room, of course, formed the south wall of the grave, and the body was placed quite close to it. At a point on this south wall about midway between the feet and head of the body had once been a hole. The hole had been seven inches square, the top of it being seven inches below floor level, making the bottom of it one inch above the level of the top of the skull. This hole had been closed, leaving a pocket three or four inches deep, and a clay shelf had been built sticking out of the bottom of it for two inches. The shelf was in the shape of a shallow bowl, but was nearly two inches thick. The concavity of the shelf, and the hollow in the wall which extended the size of its bowl, made an excellent repository for something, but I saw nothing in it but a fragment of a rat nest (Jackson 1939b: 456-458).

After it was uncovered, Assistant Engineer J. H. Tovrea designed and built a cement box around the two sides of the grave which were not protected by the walls of the room. A glass cover was placed over it and concealed lights, operated by a dry-cell battery buried in the floor, were installed to be turned on or off by a push button. The light would flash on the burial in situ, with the cover mat leaning against one wall (see Fig. 7.5) (Jackson 1939a:265, 1939b:458). The burial was displayed until 1951 when public access into the castle was stopped. A wooden cover replaced the glass cover, and the burial was left as it was found. The years of display apparently did not disturb
the burial: a 1944 photo of it in WACC photo files is identical to the 1939 photograph.

In February 1983, superintendent Glen Henderson requested that the burial be removed to protect it from vandals. WACC archeologist Don Morris examined the burial and, after deciding that there was not time to reexcavate the burial and underlying mat properly, elected to remove the cranium and long bones, leaving the matting, cotton cloth, and small bones for removal later (D. Morris 1983). Later that year, because of a technicality, Steven Sandell (Chief I & RM) put the bones that Morris had removed back in the cement box on the piece of matting that once covered the body. This is how it remained when the cover was lifted for this project.

Methods

The excavation and removal of the burial was conducted on March 24, 1986, by a crew of three archeologists, for a total of 3 man-days in the field. Assistance was provided by Steven Sandell, Montezuma Castle National Monument. The bones removed by Morris were lying on the cover mat on top of the burial. These included the cranium, mandible, mummified right foot, a clavicle, one rib, a few vertebrae, right ulna and radius, left radius, various hand and finger bones, right innominate, left femur, and both tibiae and fibulae; these were removed. The remaining portion of the burial was excavated using an ice pick, dental pick, and fine hairbrush. Flashlights were held on the excavation to provide light for work, since the display lights were not hooked up. Excavation consisted almost entirely of cleaning out loose fill and seeds from around the elements. All loose fill was collected and screened later to recover loose bones and artifacts. A flotation and pollen sample was taken from beneath the lower mat. Before removal, the remains were carefully mapped and photographed. A 20 cm probe was made beneath the bottom mat to test for a floor or bedrock, but none was found. All artifacts, skeletal material, notes, and photographs are curated at WACC.

Results

Figure 7.6 illustrates the remains of the burial excavated during this project. From the excavation, notes by Jackson (1939b), and the 1939 photograph, a relatively complete description of the burial can be given (see Appendix B). The body is extended on its back with head to the west, arms to the side, and legs slightly flexed with knees out so that the left leg crosses the right foot at mid-tibia. The body appears to have been wrapped partially in a blanket, with the head, upper torso, and perhaps the lower left leg uncovered. The wrapped body was lying on a rectangular section of matting with the south side folded up against the wall of the room. A second large piece of matting was placed over the body, along with three small sections of matting over the head. Several large sherds were above the cover mat, but these may
Figure 7.6 Plan view and profile of burial after excavation.
represent trash in the fill instead of burial related goods. The base of the grave was not level, so that the feet were elevated and even with the top of the skull.

The deepest part of the grave, below the upper torso, was 59 cm below the prehistoric plastered floor of the room. The surface beneath the feet was 52 cm deep and the top of the head and feet were 39 cm below the floor. The body lies against the south wall of the room, and the west wall is 10 cm from the western edge of the matting (where the skull would be). A solid jumble of limestone cobbles fills this 10 cm space, and slightly overhangs the skull. A shallow cavity and ledge 20 cm high and 16 cm deep, not unlike a soap dish in a bathtub, is 15 cm above the burial in the south wall. No artifacts were found in this by Jackson, although it does appear to be a receptacle of some type.

As illustrated in Figure 7.2, Room 2 is situated on a slight ledge that begins to drop away to the south. Jackson (1939b:456) describes the north part of the room as solid rock and the south part as rock fill. In excavating the support post holes, bedrock was hit at "25 inches (63.5 cm) below the clay floor" in hole 1, and the fill consisted of "very slight amount of trash." In hole 2 a clay floor was found 25 inches below the present floor, with another 7 inches (17.8 cm) of solid clay to bedrock. The fill above this lower floor contained a great abundance of trash including fragments of cloth, pieces of basketry, corncobs and husks, and undecorated sherds (Jackson 1939b:456). Neither this clay level nor bedrock was encountered in a 20 cm deep probe below the burial. Fill consisted of limestone rubble with a small amount of cultural trash. From the descriptions, it seems apparent that the south half of the room was filled with soil and rocks to level it out to the bedrock floor in the north half of the room. The clay level encountered by Jackson may have been an attempt to stabilize the base of this fill and the south wall of the room. It seems unlikely, considering the layout of the castle, that this represents an earlier floor. In any case it does not extend under the body: the burial was intruded through the upper floor into the fill below. Figure 7.7 presents an idealized cross section of the southern portion of the room with the burial.

The entire skeleton was present except for the left ischium and left and right pubes. Mummified skin remained on the frontal and occipital portions of the cranium, the right scapula, the ribs, and numerous phalanges on both feet. The remains were that of a child aged 3 years, ±12 months, based on metric measurements of the long bones (Johnston 1962) and dental eruption (Schour and Massler 1944). Occipital deformation commonly associated with cradle-boarding was evident. Slight cribra orbitalia was noted (Saul 1986).

The four pieces of matting that were recovered are made of beargrass (Nolina sp.). They are all a plain twill weave that has a uniform over-3 under-3 weave; all of the pieces are fragmentary, but appear to have come from a single large mat that was cut into smaller pieces. The cotton cloth that covers the lower portion of the body consists of two separate pieces sewn together. Both cloths are made of
Figure 7.7 Idealized cross section of burial in room floor.

a plain, single ply weave with a Z-twist. The threads are varying shades of brownish-gray in color (see Appendix C).

Scattered around and below the burial was an assortment of vegetal material and cotton fibers that had been brought in by rodents or was in the fill of the grave when the body was interred. The vegetal material consisted of 4 domesticates and 25 wild plant taxa, including corn, squash, yucca, buffalo gourd, mesquite, common beans, cotton, squawbush (skunkbush), juniper, reed grass, New Mexico feathergrass, wild barley, century plant (agave), Canyon grape, bee-plant, prickly pear, spiderling, knotweed, and western ragweed, all of which are known to have been utilized by prehistoric Indian groups in the Southwest. A number of agave and yucca quids were also recovered (see Appendix C).

Two sherds and one obsidian flake were also recovered in the fill of the burial. The sherds were identified as Verde Brown, a local Southern Sinagua utility ware commonly associated with the Honanki phase (A.D. 1125 to 1300) (see Chapter 4, this report). The sherds were from the body of a vessel, and were badly burned.
Discussion

The typical Verde Valley Southern Sinagua burial is an extended inhumation, often lacking offerings. Adult burials occur in a variety of places, either in cemeteries, patios, or trash deposits, while children were usually buried under room floors or adjacent to the pueblo. Orientation of the grave appears to have been dictated by the slopes or ledges, or the walls along which interment took place. When offerings are present, they usually consist of redware pottery (Schroeder 1960:149).

At Tuzigoot and Clear Creek Ruin, adult burials were placed in trash accumulations on the slopes of the hills or in the flats below, while children were interred beneath room floors: of 171 subfloor burials at Tuzigoot, all but 3 were children. The burial was usually along the east wall or in the southeast corner of the room, but some were found in every corner and even in the middle of the room. Only eight excavated rooms at Tuzigoot did not have subfloor burials, and most rooms continued to be lived in after the burials were made. Subfloor graves averaged 15 cm below floor level. Evidence of mat wrapping was noted in nine cases, and 8 percent had pottery offerings. One child had a small bow (Caywood and Spicer 1935:94-100; Schroeder 1960:148-149: see also Smiley 1940; Jones, Chapter 6, this report). A mummified child at Clear Creek Ruin, in a wood-covered grave, had a cotton G-string and was wrapped in a cotton blanket (Jackson 1933:82). Excavations in five rooms at the Perkins Pueblo uncovered eight subfloor infant burials in five burial pits (Alger 1968). Three of the burial pits were slab-covered, and two infants in one grave may have had two small plainware bowls with them.

At Montezuma Well, adult burials were placed in defined cemeteries in the flats below the pueblos, while children were buried adjacent to the pueblos along the exterior walls. In most cases subfloor burial was impossible since the pueblos were built on bedrock (Schroeder 1960:148). In Castle A at Montezuma Castle, there was no defined cemetery. Burials were found under floors, in caves, and under suitable ledges, always in the vicinity of the dwelling. Of six infants or children recovered from Castle A, three were subfloor, one was in a cave, and two were in cist graves. The three subfloor burials were all wrapped in twilled matting, and had no offerings. One was slab-covered. Skulls revealed some occipital deformation (Jackson and Van Valkenburg 1954:21-24).

Pioneers reported several burials beneath the floors in the main Montezuma Castle (Schroeder and Hastings 1958:18), but as with pueblos at the Well, subfloor burial was difficult since floors usually rested on bedrock or formed the ceiling of the room below, so children were apparently buried adjacent to the outside wall of the structure. Palmer (1940:62-64) reports the excavation of possibly 8 to 10 bodies that were "undoubtedly children" on a ledge adjacent to Room 15 on level 2, and below Rooms 4, 5, and 6 of level 3. They were badly preserved except for one mummified child immediately adjacent to the cliff below the Room 6 doorway. The remains of this 2-year old, oriented east, were
partially wrapped in cloth, and were found with a redware bowl near the head, several sticks on the body, and a well preserved bow and several reed arrows. It was noted that some of the ledge may have broken away and fallen, taking more burials with it. At a site 1 mile south of Montezuma Castle, a slab-covered grave in trash deposits revealed a child with matting, a cradleboard, a bundle of sticks, a ceramic bowl, and a miniature pot filled with olivella shell beads. A second child burial at the same site had turquoise pendants on its chest (Jackson 1933:80-81).

Six additional infant burials have been reported from the Verde Valley. Two mummified child burials were excavated beneath a house floor at the Dyck Site, a rockshelter about 2 miles north of Montezuma Castle. The bodies were extended and wrapped in burial cloths of native cotton. One had a two-strand bead anklet, corn, a small gourd, and a Flagstaff Black-on-white sherd with it, and the second had no offerings. The burials are dated to A.D. 1125 to 1300 based on the sherd (Lundquist 1963:20-21). Two baby burials were found in the same grave in a cliff dwelling near Langdon Ranch. The partially mummified remains were completely wrapped in cotton cloth, with only the heads exposed. Both were fully extended on their backs (WACC photo files:Montezuma Castle Human Remains). Two desiccated infant burials of unknown provenience were examined by Wright (1965) and Wade and Kent (1968). The first was a specimen in the University of Michigan Museum of Anthropology thought to have been collected in the Verde Valley shortly after 1900 by Dr. Leon J. Cole. The 2- to 4-month old infant was extended, fully wrapped in a cotton blanket with only the skull exposed, and lying on two pieces of beargrass matting. Four cotton bands and two cords were wrapped around the individual's chest and legs over the burial cloth and matting to secure it to the body. A wooden headboard was also under the head. The body had 0 blood type. A clay bird effigy and pumpkin seed were associated with the body. The cotton textiles were woven in a plain weave and lacked decoration; the matting was plain twilled weave with a uniform over-3 under-3 weave and the three pieces of cordage (Yucca sp.) were made from two strands twisted together in a counterclockwise Z-twist. The date of the specimen is questionable, but thought to be around A.D. 1120 to 1225 based on the associated bird effigy and similarity to other Verde Valley burials (Wright 1965:109-117).

The second burial was recovered from a small cave on the C. C. Butler Ranch near Camp Verde. The mummified newborn infant was extended, and wrapped in a length of woven cloth tied with narrow strips of cloth to secure the wrapping in place about the body, then encased in a twilled mat so that only the head showed. A small cotton swab consisting of a small piece of cotton twisted around the end of a short length of dried grass stalk was inside the bundle. This body also had O blood type. The cotton cloth, including a small poncho, a large blanket, one cotton strip, and three narrow ties, were all woven in plain weave technique. The cloth is naturally white except for a set of black warps on the poncho. The yucca leaf matting is simple over-3 under-3 twill plaiting (Wade and Kent 1968:148-156).
The interment of newborns or infants in floors or walls, or just outside rooms when internal burials are not possible—as opposed to the burial of adults away from the pueblos—may be related to modern Indian beliefs that the child is still part of the family circle and requires the closeness of the mother. Some modern Pueblo Indians prefer to bury a child near the home, believing that the child's spirit will remain until the death of the mother, who will guide it safely to the hereafter. It is also believed that the child's spirit will return in the next baby to be born in the family (Schroeder and Hastings 1958:18). This stems from the belief that newborns may be offered a second chance by being reborn into the same family since they had not yet "begun their roads, they have not been held up to the Sun Father for him to admire and accept, nor have they been given a name. After that time, the individual had set upon his unretrievable road, whose length is unknown..." In expectation of this, they were often buried under the floor of the family room (Tyler 1972:50-51). Zuni stillborn, premature infants, and infants dying before weaning were buried indoors under house floors, just inside the threshold, "because it would have no place to go." Females were buried near the grinding stone and males near the door (because boys leave home). The spirit of the uninitiated Hopi child lingers about the house until it is reborn to its mother or until she dies (Parsons 1939:71).

Conclusions

The child burial from Montezuma Castle is very similar to others recovered in archeological contexts from the Verde Valley. The burial of a child, wrapped in a cotton blanket and twilled mat in an extended position, and buried beneath the floor of a room is a common pattern for child inhumations in this region. Since much of the Room 2 floor is bedrock, the inhabitants utilized the only part of the room available for the interment. Ethnohistoric accounts of pueblo Indian groups indicate that the burial of infants up to 4-days old beneath living room floors would allow the spirit of the dead child to be reborn into the next child (Tyler 1972:50). Prehistorically, this belief seems to have included children up to 4 or 5 years old, since the mortality rate of infants from various childhood diseases or unsuccessful weaning would have been higher in the past, as indicated by the large number of child burials in prehistoric populations (see Forsberg 1935:112-113; D. Morris 1986:207, for instance).
Chapter 8
A ROAD IMPROVEMENT SURVEY AT MONTEZUMA WELL, MONTEZUMA CASTLE NATIONAL MONUMENT, ARIZONA

Introduction

A small archeological survey at the Montezuma Well portion of Montezuma Castle National Monument was undertaken in March 1986 by archeologists from the Western Archeological and Conservation Center (WACC) to provide archeological clearance for a proposed road widening project (MOCA 86A). This county road rehabilitation project entailed the widening of Beaver Creek Road where it enters the monument on the western end, to its junction with the secondary park road to the well and residential area. Widening would be restricted to the northern shoulder of the road, and would involve cutting back the slope which drops down to the road from the mesa top. The Western Archeological and Conservation Center was asked to survey the area and locate cultural resources which might be disturbed by the proposed construction. While at the Well section of the monument, the archeologists were also requested to survey a small plot of land adjacent to the residential area that might be used for an experimental corn growing plot. A 0.5-acre plot was surveyed with no cultural resources located, so archeological clearance was issued. The remainder of the report will deal with the road survey. Figure 8.1 illustrates the areas surveyed and presents the cultural resources recorded.

Setting

Montezuma Well, a section of Montezuma Castle National Monument, is located along Wet Beaver Creek, one of the major tributaries to the Verde River, in the middle Verde Valley (see Fig. 2.1). The well section was established in 1947, consisting of 278 acres, to preserve a spring-fed lake in a large sink in the limestone formation known as Montezuma Well. Geographically, the area can be divided into two zones: the floodplain and flat terraces surrounding the meandering river, and an area of higher, heavily dissected hills, ridges, buttes, and mesa remnants which are the unevenly eroded surfaces of the Verde Formation. The Montezuma Well region is an area where four natural communities meet. These are plains and desert grassland, Sonoran desertsrub (Arizona upland subdivision), juniper-pinyon woodland, and riparian deciduous forest. Specifically, the survey area includes the southern edge of the mesa top that contains Montezuma Well, and the slopes of the mesa down to a large tributary of Wet Beaver Creek (Fig. 8.1). Elevations range from 3,560 feet to 3,600 feet. Vegetation is
Figure 8.1 Montezuma Well section of Montezuma Castle with MOCA 86A survey area locations.
within the Sonoran desert transition zone of semidesert bunch grasses, consisting mainly of black grama and burro-weed, mesquite, creosote bush, false palo verde, saltbush, and yucca (U.S. Department of the Interior n.d.:7-8; Sudderth and others 1976:6). Climate varies little from that of Tuzigoot, 20 miles to the northwest.

Montezuma Well was first mentioned historically by Espejo, who encountered a friendly group of Indians there who showed him mines at Jerome. Dr. J. J. Hoffman of the Hayden U.S. Geological and Geographical Survey of Colorado and Adjacent Territories also mentioned the well between 1876 and 1878. The area was first brought to public attention in 1878 by Richard J. Hinton's descriptions in Handbook to Arizona. Archeologically, the well has received sporadic attention beginning with Park Archeologist Al Schroeder's casual, off-duty survey of the Beaver Creek area between 1946 and 1950. Investigations following Schroeder's survey included both survey and excavation, most of which went unrecorded. Of importance to this survey is the 1952 and 1953 survey of Montezuma Castle and Montezuma Well by Schroeder, Pierson, Burroughs, and White. A total of 35 sites were recorded at Montezuma Well. The sites were described briefly and an archeological base map (NM-Mont 2102) was prepared, but there is no report on the survey to describe methods or areas covered (Western Archeological and Conservation Center n.d.:26-29). This work has demonstrated a wealth of archeological sites and long history of occupation in the monument, dating from the Camp Verde phase (A.D. 900-1125) through historic Yavapai times (around A.D. 1500-1800).

Methods

The field survey was conducted on March 26, 1986, by a crew of three archeologists, for a total of 3 man-days in the field, with 100-percent systematic coverage of the entire project area. Linear transects, with a 15 m transect interval, were used to cover the mesa top and slopes. Cultural landmarks were used as survey boundaries, including the boundary fence, a telephone line, and Beaver Creek Road. All cliff faces with potential for cave sites were inspected. All cultural resources located were recorded using methods described in Chapter 1. Sites were given field numbers 1 through 3, preceded by project designation MOCA 86A-. All survey records and collected artifacts are on file at the Western Archeological and Conservation Center, and site cards are also at the Arizona State Museum in Tucson.

Prior to the survey, Western Archeological and Conservation Center site files were checked for sites previously recorded in the survey area. The 1953 archeological base map prepared by Schroeder and White showed five sites in the vicinity of the project area (Fig. 8.2). These sites, designated by Museum of Northern Arizona site numbers, include NA4609 C, D, F, G, and H--"a series of boulder rooms and rockshelters on the slopes of a small mesa projecting into the farmlands . . . . all situated a few feet above the prehistoric irrigation ditch leading to the bottomlands. Boulder rooms are composed of unshaped limestone rock walls 1 to 2 feet high. One rockshelter in a
Figure 8.2 Section of the Montezuma Well archeological base map showing sites in and near the survey area.
ledge has a wall 40 feet long and about 3 feet high on its front edge. . . ." (Fig. 8.3) (Schroeder 1960:128, 172a, Fig. 6).

Results

At the completion of the survey, approximately 13 acres of land had been surveyed, and three archeological sites and two isolated finds were recorded (see Fig. 8.1). This includes two sites previously recorded by Schroeder and one site that appears not to have been previously recorded.

Site Descriptions

MOCA 86A-1

This site consists of a two- or three-room masonry structure built against the base of a bedrock cliff face with a slight overhang (Fig. 8.4a). One distinct three-walled room is built under the overhang with the open end on the uphill side. It is approximately 3 square meters in size, is constructed of local limestone boulders, and has dry-laid walls from three to five courses high. Another wall lies 2 m west and parallel to the room, and an L-shaped alignment fronts this wall. The latter two alignments are tied into large boulders that have fallen from the cliff face, and may represent two more rooms. A light scatter dominated by ceramics, with some flaked and ground stone, lies downslope from the structures; the greatest concentrations are 10 to 15 m below the structure, thinning out near the road 100 m to the south. Very few artifacts remain with the structures.

The site is built against a limestone bedrock face exposed just below the top of the mesa, at an elevation of 3,620 feet. Below the structures, the talus slope drops off steeply to the road, eventually leveling out at a large tributary to Wet Beaver Creek about 400 m to the south. Vegetation is within the semidesert grassland plant zone, and consists of a moderate cover of annual grasses, creosote, and saltbush. Junipers are nearby on higher slopes. Javelina have nested in the small overhang in the well-defined room, and a game trail runs along the base of the cliff face. Because of the steep talus slope, erosion and deposition have moved many artifacts downslope, and walls have crumbled. The site was originally recorded by Schroeder (1960) as NA4609F: a "35 feet by 12 feet farm lookout, two-room unshaped limestone slab structure." He identified 75 sherds from the site, predominately plainwares or redwares, and including Verde Brown, Tuzigoot Plain, Tuzigoot Red, Turkey Hill Red, Tusayan Corrugated, and Jeddito Black-on-yellow (1960:169, Fig. 1). No other artifacts were noted. The site was dated between A.D. 1150 and 1250. Twenty-two ceramics were collected and identified during MOCA 86A (Table 8.1).
Figure 8.3 Schroeder's (1970) map of the survey area.
Figure 8.4 Sites recorded at Montezuma Well.
Table 8.1
CERAMICS COLLECTED AT MONTEZUMA WELL

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<tr>
<th>CERAMIC TYPE</th>
<th>MOCA 86A-1 (4604 F)</th>
<th>MOCA 86A-2 (4658 G)</th>
<th>TOTAL</th>
<th>DOMINANT TIME PERIOD</th>
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<td></td>
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<td>Verde Brown</td>
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<td>8 (27)</td>
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<td>19</td>
<td>A.D. 1150-1450</td>
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<td>2</td>
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<td></td>
<td>1</td>
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<tr>
<td>Tusayan Black-on-red</td>
<td>(1)</td>
<td>1</td>
<td>2</td>
<td>(A.D. 1050-1150)</td>
</tr>
<tr>
<td>Winslow Orange Ware</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>(A.D. 1300-1400)</td>
</tr>
<tr>
<td>Hopi Polychrome</td>
<td>1</td>
<td></td>
<td>1</td>
<td>A.D. 1300-1400</td>
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<tr>
<td>Jeddito Yellow Ware</td>
<td>1</td>
<td></td>
<td>1</td>
<td>A.D. 1250-present</td>
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<tr>
<td>(Jeddito Black-on-yellow)</td>
<td>(3)</td>
<td></td>
<td>3</td>
<td>(A.D. 1325-1600)</td>
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<tr>
<td><strong>Cohonina</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deadmans Gray</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>pre-A.D. 700-1150</td>
</tr>
<tr>
<td><strong>Hohokam</strong></td>
<td></td>
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</tr>
<tr>
<td>Wingfield Plain</td>
<td>2 (2)</td>
<td>1</td>
<td>3</td>
<td>A.D. 700-1450</td>
</tr>
<tr>
<td>(Sacaton Red-on-buff)</td>
<td>(1)</td>
<td></td>
<td>1</td>
<td>(A.D. 900-1100)</td>
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<tr>
<td><strong>Tonto Apache</strong></td>
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</tr>
<tr>
<td>Apache Plain</td>
<td>2 (1)</td>
<td></td>
<td>2</td>
<td>A.D. 1750-1875</td>
</tr>
<tr>
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<td>1 (1)</td>
<td>(3)</td>
<td>4</td>
<td></td>
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<tr>
<td><strong>TOTALS</strong></td>
<td>22 (75)</td>
<td>22 (81)</td>
<td>44</td>
<td></td>
</tr>
</tbody>
</table>

* ( ) - parenthesis denote ceramics identified by Schroeder (1960:169, Fig. 1).
MOCA 86A-2

This site is a small rockshelter with from four to six masonry rooms (Fig. 8.4c). The actual shelter is 14 m wide and 8 m deep with one well-defined room and another two possible rooms indicated by rock rubble. The room is 4 square meters and is constructed of dry-laid limestone boulders, with walls up to three courses high. The shelter roof is soot-blackened. A jumbled rock wall fronts the shelter mouth from the well-defined room along the drip line 12 m to another three or four course "retaining wall" that connects to the rock face. This wall encloses a possible room or ramada area. Above the retaining wall is a dense jumble of small boulders that seem to define at least one room outside the shelter, but may also represent a series of retaining walls to stabilize the slope. A 10 m by 18 m flat area fronts the shelter. Artifacts litter the shelter, flat area, and talus slope below the shelter to the road, 20 m to the southeast. Included are ceramics, flaked stone, and ground stone. Dark soil on the talus slope below the flat area indicates a possible midden or trash deposit.

The site is located in a south-facing shelter cut into the exposed limestone bedrock face just below the mesa top. The talus slope drops off steeply from the site towards a tributary of Wet Beaver Creek 350 m to the south. Vegetation is the same as at MOCA 86A-1, with a moderate cover of annual grasses, mesquite, creosote, saltbush, and catclaw. Javelina and rodents have nested in the shelter, causing moderate disturbance. A National Park Service sign is posted at the mouth of the shelter warning against unlawful disturbance of the archeological site. MOCA 86A-2 was previously recorded by Schroeder as NA4609G, a "6 feet by 25 feet four-room farm outlook in cave: walls of unshaped limestone and mortar." A total of 81 sherds were identified by Schroeder (1960:169, Fig. 1) including Verde Brown, Tuzigoot Red, Tuzigoot Plain, Tusayan White Ware, Kana-a Black-on-white, Sacaton Red-on-buff, Black Mesa Black-on-white, Tusayan Black-on-red, Wingfield Plain, Tusayan Corrugated, Sunset Red, Turkey Hill Red, and Apache Plain. The site was dated to A.D. 1150 to 1250 with a post-A.D. 1750 occupation. No other artifact types were noted. Twenty-two sherds were collected during MOCA 86A for identification (see Table 8.1).

MOCA 86A-3

This site consists of a 55 m by 25 m scatter of ceramics, flaked stone, and ground stone artifacts with a possible boulder-outlined structure (Fig. 8.4b). The structure is a 10 m by 5 m, oval alignment of limestone boulders encircling a cleared area. The boulders are one course high and spaced 2 cm apart, with more rubble downslope and to the west. It is possible that this delineates a subsurface structure. Artifacts are scattered to the south and east of the possible structure in the flat bench area.

The site is situated on a flat bench below the mesa slope, overlooking a tributary to Wet Beaver Creek 40 m to the south.
Vegetation is similar to previous sites with a sparse cover of annual grasses, creosote, saltbush, mesquite, catclaw, desert holly, and burro-weed. Junipers are just above the site on the mesa slopes, and a typical riparian assemblage is located along the nearby drainage. A large erosional channel cuts through the southeast end of the site, and deposition can be expected from the steep mesa slopes. A recent drainage ditch and Wet Beaver Road run along the southwest boundary of the site. A few artifacts in the road cut suggest some site disturbance. Thirty-four sherds were collected for identification (see Table 8.1).

It is not known if this site was previously recorded by Schroeder. There are three recorded sites in the general vicinity of MOCA 86A-3. Sites NA4609C and NA4609D are located nearest to the site on the map, but do not match the description: both are described as one- or two-room farm outlooks with as many as three or four courses of unshaped slab masonry, and a photo of NA4609D (Schroeder 1960:Pl. 2) shows a well-defined masonry room. Site NA4609H better fits the description: "a 6 feet by 12 feet outline of unshaped limestone rocks," but is not located correctly to represent MOCA 86A-3. It is possible that without well-defined architecture, MOCA 86A-3 was not recorded earlier, or it may represent one of the three previously recorded sites mentioned here. In any case, at least two, if not three of the previously recorded sites were not relocated on this survey. Since Beaver Creek Road is not on the archeological base map, it is possible that the road destroyed the sites, which are located in its general route. It is also possible that the sites are situated on the south side of the road, out of the survey area.

Isolated Finds

IF-A

Five sherds and a few chert flakes were noted in a 5 square meter area on the mesa top near the entrance road. The sherds were corrugated, black-on-white, and plainware. A few other plainware sherds, flakes, and a mano fragment were also noted in the vicinity, suggesting use of the mesa top by local inhabitants. The artifacts may be related to sites just below the mesa top.

IF-B

A single corncob was noted in a small rockshelter exposed in the bedrock cliff face just below the mesa top. The shelter shows no other signs of occupation, although roof fall has completely covered the shelter floor. The IF is located 90 m west of MOCA 86A-1 and may be related to that site.

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Ceramics were the dominant artifact type at the three sites, and a total of 78 sherds were collected from the three sites, providing the only criterion for the cultural and temporal placement of the sites. The presence of ceramics not collected, as well as flaked and ground stone artifacts, was noted at each site.

Ceramics

The collected ceramics were identified by Susan J. Wells (WACC), John Madsen (ASM), and A. Trinkle Jones (WACC) (see Table 8.1). Only a grab sample of sherds present on the sites was collected, so totals may be biased toward identifiable types. Schroeder (1960:169, Fig. 2) also identified sherds from MOCA 86A-1 and 2; these results are presented in Table 8.1. Locally made plainwares were the dominant type (n = 43; 55.1 percent) present at all three sites. The remainder of the ceramics were intrusive types, including 13 varieties associated with 5 separate cultural groups. Five plainware sherds could not be identified as to type.

Verde Valley Types

Five locally made Verde Valley plainwares were identified, including four prehistoric types and one protohistoric type. The four prehistoric types--Verde Brown, Tuzigoot Plain, Tuzigoot Red, and Beaver Creek Red--are Alameda Brown Wares associated with the Sinagua. Specifically, these types are the utility wares of the Southern Sinagua. The fifth type is Apache Plain, a protohistoric type.

Verde Brown. Verde Brown is the most common type (n = 32), present at all three sites. This is a paddle-and-anvil produced brownware tempered with 30 to 50 percent medium particles of angular quartz and feldspar, round sand, and an occasional mica flake (Colton 1958a). It seems to appear in the Verde around A.D. 700 and although it becomes subordinate to Tuzigoot Plain after A.D. 1150, it persists until A.D. 1400 in small numbers. All of the recovered sherds are body fragments.

Tuzigoot Plain. Tuzigoot Plain is the second most abundant type represented (n = 7), and is also present at all three sites. It is a paddle-and-anvil brownware with a very fine quartz sand paste, and is occasionally polished (Colton 1958a). This type was introduced and used while Verde Brown was still common (around A.D. 1050), but became the predominant type by A.D. 1150. One bowl rim is represented in the sample.
**Tuzigoot Red.** Tuzigoot Red is very similar to Tuzigoot Plain with the addition of a brick-red slip and polishing. It is often smudged (Colton 1958a; Schroeder 1960:140). It is found temporally along with Tuzigoot Plain. Only one body sherd was recovered from MOCA 86A-1.

**Beaver Creek Red.** This is a local variety of Sunset Red, a Northern Sinagua type. It is a paddle-and-anvil produced plainware with a red slip, and is almost always smudged and polished. Temper consists of abundant medium-sized red cinders with occasional white fragments, volcanic glass, or black cinders (Colton 1958a; Schroeder 1960:141). One Beaver Creek Red body sherd was recovered from MOCA 86A-1.

**Apache Plain.** Western Apache Plainware, or Apache Plain, is a very thin, and very dark (brown or black) protohistoric pottery type with rough, unsmoothed or irregularly wiped surfaces on which irregular scratches or wiping marks are often visible (J. Gifford 1980:163-164). Temper consists of abundant small angular quartz fragments. Schroeder (1960:141-142) named the Verde variety of this type Rimrock Plain, with the diagnostic trait a series of vertical fingernail or sharp tool impressions encircling the neck as a band. Apache Plain is poorly dated, but is probably post-A.D. 1750. Two Apache Plain sherds were recovered from MOCA 86A-2. One was a typical Rimrock Plain type with fingernail impressions below the rim (which was missing) (Fig. 8.5h). The second is a poorly made jar rim, which, according to Alan Ferg, is a relatively rare form for Apache pottery.

**Intrusive Types**

The remaining 30 identifiable sherds were intrusives from north or south of the Verde Valley.

**Rio de Flag Brown.** Rio de Flag Brown is an Alameda Brown Ware associated with the Northern Sinagua in the Flagstaff area. One Rio de Flag Brown sherd was recovered from MOCA 86A-2. It is a paddle-and-anvil type with opaque angular fragments of quartz or feldspar, and is occasionally polished. The type has been temporally placed between A.D. 700 and A.D. 1050 (Colton 1958a).

**Sunset Red.** Two Sunset Red body sherds were recovered, one each from MOCA 86A-2 and MOCA 86A-3. This type is also an Alameda Brown Ware associated with the Northern Sinagua of the Flagstaff region. It is a paddle-and-anvil type with black volcanic sand temper and occasional green quartz sand. It exhibits a red slip and is almost always smudged and polished. It has been dated from about A.D. 1065 to about 1200 (Colton 1958a).

**Deadmans Gray.** One Deadmans Gray body sherd was recovered from MOCA 86A-3. This type is a San Francisco Mountain Gray Ware, the utility and service pottery of the Cohonina culture that occupied the area south of the Grand Canyon and north of the San Francisco Peaks. It
Figure 8.5 Ceramics from MOCA 86A: (a-c) Homolovi polychrome, (d-f) Black Mesa Black-on-white, (g) Tusayan corrugated, (h) Apache Plain, and (i) Tusayan Black-on-red. Length of (i) is 5.4 cm.
is constructed by paddling and scraping, and has an abundant angular fine quartz sand temper with occasional black angular fragments. It has been dated from pre-A.D. 700 to 1150 (Colton 1958e).

Wingfield Plain. Three Wingfield Plain body sherds were recovered from MOCA 86A-2 (n = 2) and MOCA 86A-3. This type was a utility ware from the northern Hohokam periphery and perhaps from other areas around Arizona. It is characteristically tempered with a very coarse crushed mica schist. It has been dated between A.D. 700 to 1450, but is generally confined to the period after A.D. 1066 (Colton 1941:46; Breternitz 1966:31). The sherd from MOCA 86A-3 has a crushed red plate-like rock temper that is not schist, but is otherwise Wingfield-like.

Tusayan White Ware. Tusayan White Ware is pottery of the Kayenta Branch Anasazi in northeastern Arizona from the Little Colorado River north to the San Juan River, and west from Chinle Creek to the Colorado and Little Colorado rivers. It is a coil-and-scraped type with abundant fine to medium quartz sand temper and an occasional dark-colored angular fragment. The surface is usually thinly slipped with white as a base for black paint: Tusayan White Ware consists almost entirely of decorated types. It has been dated around A.D. 700 to 1350 (Colton 1958c). Of the five unidentifiable Tusayan White Ware sherds recovered from MOCA 86A-2 (n = 2) and MOCA 86A-3, four have interior black paint (consisting of single and wide lines), indicating fragments from bowls: one is also a rim sherd. All the sherds were too small for identification of type.

Black Mesa Black-on-white. Three Tusayan White Ware sherds from MOCA 86A-3 were identified as Black Mesa Black-on-white. The slip on this type is a dead white, sometimes with a bluish tint, and black decorations consist mainly of straight lines, large solid triangles with dots, and interlocking scrolls. This Pueblo II type dates around A.D. 900 to 1100 (Colton 1958c). Two of the recovered sherds are from jars (including one rim) and one is from a bowl (Fig. 8.5d-f). All of the above-mentioned design elements are present. One of the sherds is a fragment from a sherd disk.

Tusayan Corrugated. Two Tusayan Corrugated sherds were recovered from MOCA 86A-3 (Fig. 8.5g). Tusayan Corrugated is a Tusayan Gray Ware, used mainly for cooking and storage by the Kayenta Anasazi of northeastern Arizona. This type is constructed by coiling, with an abundant, coarse, quartz sand temper. The coils are unobliterated on exterior surfaces and are usually in a fairly regular and carefully executed pattern. It has been dated to A.D. 950 to 1275 (Colton 1958c). The two sherds are both white-slipped with exterior corrugation.

Little Colorado White Ware. Two unidentifiable Little Colorado White Ware sherds were identified at MOCA 86A-3. This type was a utility ware of the Winslow Branch of the Kayenta Anasazi between Holbrook and the San Francisco Peaks. It is a coil-and-scraped pottery with a thin, dead white slip or wash. Most types have black decoration. Temper consists of abundant opaque, angular fragments of sherds. This
type is dated from A.D. 1000 to 1375 (Colton 1958c). Both sherds have interior black design elements, and one is a bowl rim.

**Tsegi Orange Ware.** An unidentified Tsegi Orange Ware sherd was recovered from MOCA 86A-3. It is associated with the Kayenta Anasazi in the Rainbow Plateau area and Hopi country. It is a coil-and-scraped pottery with quartz sand and sherd temper. Surfaces are dull orange, but can be slipped maroon-red. Only one type is unpainted, with most being black-on-red, black-on-orange, red-on-orange, black-on-yellow, or polychrome. This ware is present from around A.D. 1150-1300 (Colton 1958d). The single sherd of this type is a red-slipped, undecorated body fragment, probably from a decorated vessel.

**Tusayan Black-on-red.** One Tsegi Orange Ware sherd from MOCA 86A-3 was identified as Tusayan Black-on-red. The bowl rim sherd is totally red-slipped with a black decoration on the interior side (Fig. 8.5i). The decoration consists of a series of thin lines running diagonally across the sherd. This type has been dated from about A.D. 1050 to 1150 (Colton 1958d).

**Winslow Orange Ware.** Three unidentified Winslow Orange Ware sherds were identified from MOCA 86A-1 (n = 2) and MOCA 86A-2. This is a pottery type of the Winslow Anasazi in the Winslow area of northeastern Arizona. It is a coil-and-scraped type with a predominately quartz sand temper with lesser amounts of soft angular gray, black, and red fragments. It is occasionally polished. Pottery types include plain, orange, black-on-orange, black-on-red, and polychrome. The ware dates from A.D. 1300 to 1400 (Colton 1958d).

**Homolovi Polychrome.** Homolovi Polychrome was the most common of the decorated ceramics, with five sherds recovered from MOCA 86A-1 (n=4) and MOCA 86A-2. Homolovi Polychrome is a Winslow Orange Ware, a pottery type of the Winslow Anasazi in the middle Little Colorado River region near Winslow. It is a coil-and-scraped pottery with a temper of fine quartz sand with black, red, and white angular fragments. The pinkish surface is not slipped, and black paint is applied with thin white borders. Black stripes, hatchures, solid areas and panels outlined in white are common elements. The type is dated to A.D. 1300 to 1400 (Colton 1958d). The five sherds include four interior decorated bowl fragments (1 rim), and an undecorated sherd (Fig. 8.5 a-c). Thick and thin lines, and solid triangular area are represented as design elements.

**Jeddito Yellow Ware.** Jeddito Yellow Ware is a pottery type of the Anasazi/Hopi on the southern part of the Hopi mesas in northeastern Arizona. It is a coil-and-scraped pottery with a fine quartz sand temper with occasional reddish angular fragments. The yellow surface is highly polished, and types consist of plain, stippled, black-on-orange, black-on-yellow, and polychromes. The types is dated from A.D. 1250 to the present day (Colton 1958d). The single Jeddito sherd is an undecorated body fragment.
Flaked Stone

The flaked stone artifacts present on the sites consisted almost exclusively of debitage produced during core reduction and tool manufacture. Material type was noted in the field, but no artifacts were collected. Chert was the dominant lithic material, making up over 90 percent of the individual site assemblages. Basalt, obsidian, and quartzite was present in lesser quantities. All material is locally available. The assemblages are characterized by large complete flakes with little or no cortex. Only two flaked stone tools were seen, a hammerstone from MOCA 86A-2, and a chopper at MOCA 86A-3.

Ground Stone

Ground stone artifacts were present at the three sites in small numbers. MOCA 86A-2 had five pieces of ground stone, including three complete metates (two flat boulder types and one incipient metate), one slab metate fragment, and a mano fragment. MOCA 86A-3 had two fragments from the same trough metate, and MOCA 86A-1 had a mano fragment. Locally available vesicular basalt and basalt boulders and cobbles were utilized for ground stone tools. Both manos and metates were used in food processing activities.

Discussion

The small survey at Montezuma Well located three prehistoric Southern Sinagua sites overlooking the floodplain of a large tributary of Wet Beaver Creek. Schroeder (1960: 172a, Fig. 6) recorded at least two of the sites previously, placing them roughly in the Honanki phase (A.D. 1150 to 1250), and noted an irrigation ditch just below the sites. The placement of these sites overlooking arable land is ideal for use as fieldhouses.

The temporal placement of the sites was accomplished primarily through the collected ceramics and architecture styles of the sites. All three sites had good collections of ceramics, dominated by locally made plainwares such as Verde Brown and Tuzigoot Plain. In addition to these local types, a number of intrusive tradewares were also present. This varied greatly from the nearby Tuzigoot survey, in which only small numbers of plainwares were recovered from the sites (see Chapter 4, this report). These intrusive ceramics illustrate trade relationships known to exist prehistorically, dominated by wares from the Kayenta and Winslow Anasazi to the northeast, with lesser numbers from the Northern Sinagua and Cohonina to the north, and Hohokam from the south.

MOCA 86A-3 has a possible rock-outlined structure, and ceramics consisting almost exclusively of Verde Brown as the local utility ware, and a number of intrusives which date prior to A.D. 1200, such as Sunset Red, Tusayan Black-on-red, Deadmans Gray, Tusayan Corrugated, and Black Mesa Black-on-white. The latter two types are considered as diagnostic
ceramic types for the Camp Verde phase (A.D. 900 to 1125) (Breternitz 1960), and the dominance of Verde Brown over Tuzigoot Plain supports this date. Pithouses with partial masonry construction are found in the Verde during this time period (Fish and Fish 1977), indicating that the possible structure at this site may be a masonry-lined pithouse.

MOCA 86A-1 and MOCA 86A-2 have dry-laid cobble masonry structures, and ceramics consisting mainly of Verde Brown, but with a higher percentage of Tuzigoot Plain. There are also intrusives which date after A.D. 1200, such as Winslow Orange Ware, Jeddito Yellow Ware, and Homolovi Polychrome. These intrusive types are most diagnostic of the Tuzigoot phase (A.D. 1300 to 1425) with a probable late Honanki phase (A.D. 1125 to 1300) occupation suggested by the dominance of Verde Brown over Tuzigoot Plain and the presence of a few earlier ceramics such as Beaver Creek Red. The appearance of surface masonry in the Verde Valley, present at both sites, has been ascribed to the Honanki period, although it had been developing earlier (Pilles 1981a:10; Wells 1981:140). These sites may be associated with the larger pueblos around Montezuma Well, a half mile to the east, which were occupied in late prehistoric times. This places the two sites later than the time period suggested by Schroeder (1960:169, Fig. 1). Two Apache Plain sherds were recovered from MOCA 86A-2, indicating protohistoric reuse of the site after prehistoric abandonment. Dates for this ceramic type fall around A.D. 1700, but are not well documented.

Little can be said about the nonceramic artifacts at the sites. The occurrence of ground stone implements indicates food processing activities to be expected at habitation sites. The limited flaked stone assemblages suggest hardhammer reduction techniques associated with core reduction as opposed to tool manufacture and repair. All of the stone implements were made of lithic materials available in terrace and stream gravels less than a quarter of a mile away from the sites, and architectural material came from the exposed bedrock below the mesa top.

This short survey confirms the known occupation range of sites in the Montezuma Well area, illustrating aboriginal use of the area from the Camp Verde phase through protohistoric Apache times, a span of over 800 years. The inhabitants of the sites exploited their environment for tools and building materials, and had trade relationships with the Anasazi, Northern Sinagua, Hohokam, and Cohonina.

Management Recommendations

The widening of the Beaver Creek Road would have little detrimental effects on MOCA 86A-1, which is well away from the road. However, roadwork may affect trash deposits downslope of, and associated with, MOCA 86A-2, and it would almost certainly impact MOCA 86A-3 which is adjacent to the road. Road widening of these portions of the road should be avoided, unless archeological testing is conducted to determine the extent of damage which would occur. At MOCA 86A-3, a recent drainage ditch cut approximately 1 m from the north edge of the road has already impacted the site; therefore, widening the road at this
point, 1 m from the existing shoulder of the road, would not be detrimental to the site.

From this archeological survey, a conditional clearance for the widening of Beaver Creek Road is suggested, providing the above-mentioned sites are avoided. Clearance is also suggested for the half-acre experimental corn growing plot, where no cultural resources were located.
Appendix A

INFANT BURIAL REPORT, ROOM I-10, TUZIGOOT RUIN

by

Anne Trinkle Jones

1. Burial No.: FS-1
2. Site: Tuzigoot Ruin (AZ N:4:1 [ASM])
3. Excavation Unit: Room I-10, west trench (southwest corner)
4. Location: 29 cm from south wall; 25 cm from west wall to feet
64 cm from south wall; 30 cm from west wall to cranium
5. Depth from Surface: 16.5 cm
6. Depth from Datum Plane: 3,452.1 feet above sea level
7. Stratification: In general, a layer of gray-brown loose silt (10 to 19 cm thick), filled with a few artifacts and flecks of charcoal, rests on top of a narrow (2-cm thick) band of caliche in the south trench profile, and several lenses of light orange sandy silt and light brown silt in the west trench profile. The caliche and lenses seem to mark an unconformity between undisturbed deposits and superimposed material disturbed by stabilization and maintenance, a light brown silt that is primarily eolian and cultural in origin. The basal layer of the profile is the unconsolidated conglomerate bedrock that caps Tuzigoot Hill, the interstices of which are filled with sterile sandy soil and caliche. A softer, gray-brown silt covered the burial. The southernmost cobble on that profile was partially upright, having fallen with another red sandstone cobble on the cranium, thus crushing it. For further details, see enclosed profile (see Fig. 6.4b).
8. Matrix: Loose, light brown-gray silt with some basalt, sandstone, and limestone cobbles resting on top.
10. Bones: 1 right rib; 1 or 2 of left ribs are absent; cranium, vertebral column, and hands and feet very fragmented and not reconstructed; all long bones present.
11. Sex: Unknown
12. Age: Neonate. Marilyn Saul, Arizona State Museum, made this determination on the basis of the spongy textured surface of all bones, the lack of articulation in cranium and long bone epiphyses, the presence of unerupted deciduous teeth, and small size.

13. Pathology: N/A

14. Type of Disposal: Primary burial

15. Position of Body: Extended, lying on back, with knees bowed out slightly.

16. Position of head unknown due to crushing.

17. Orientation (azimuth from head to pelvis): SSW (194 degrees)

18. Size of Grave: Length of in situ remains: 37 cm
   Width: 17.5 cm
   Length of arms: L 12.5 cm
   R 12.5 cm
   Length of vertebral column: 14.5 cm

19. Associated Objects: None

20. Remarks: Crumbly black residue in spots between legs, around proximal end of right femur, under left shoulder area. Probably decayed organic material (that is, muscle tissue). No evidence of underlying matting or other grave furniture.

21. Exposed by: Jerry B. Sansom and A. T. Jones (June 3, 1983)

22. Recorded by: A. T. Jones

23. Photos by: A. T. Jones

24. Sketch by: Wanda Padilla, TUZI

25. Report Date: June 5, 1983
APPENDIX B

CHILD BURIAL REPORT, ROOM 2, THIRD LEVEL, MONTEZUMA CASTLE

by

Martyn D. Tagg

1. Burial No.: N/A
2. Site: Montezuma Castle (NA1278)
3. Excavation Unit: Room 2, southwest corner
4. Location: against south wall; 10 cm from west wall to cranium
5. Depth from surface: 39 cm
6. Depth from datum plane: N/A
7. Stratigraphy: apparently a layer of loose silt and limestone rubble approximately 60 cm thick with an abundance of cultural trash, as described by Earl Jackson, who excavated it. Below the burial, for at least 20 cm, the soil is loose reddish-orange silt with abundant limestone rubble and very little cultural trash: it appears to be sterile fill used to bring the floor up to level.
8. Matrix: loose, reddish-orange silt with abundant limestone rubble
9. Condition: complete, but disturbed in 1983 when Don Morris removed various large bones from it, which were returned the same year by Steven Sandell and replaced on top of the in situ remains. The upper mat fragments were removed in 1939 during the original excavation, and were also no longer in situ. A packrat nest is just above the cranium in the west wall of the room, and much vegetal material in the grave can be associated with rodent activity. The cotton burial blanket has also been unraveled by rodents.
10. Bones: left ischium, left and right pubes absent. All other bones present.
11. Sex: unknown
12. Age: Marilyn Saul, Arizona State Museum, indicated that the burial was that of a child, aged 3 years ± 12 months, based on metric measurements of long bones and dental eruption.
13. Pathology: occipital deformation commonly associated with cradle-boarding, and slight cribia orbitalia.
14. Type of Disposal: primary burial
15. Position of Body: extended, lying on back, with knees bowed out slightly.

16. Position of head: face up

17. Orientation (of head): due west (270 degrees)

18. Size of Grave: Length of in situ remains: 70 cm
   Width 23 cm
   Length of arms: L 22 cm
   R unknown
   Length of vertebral column: 15 cm

19. Associated Objects: two piece cotton cloth (73 cm by 69 cm) with plain, single-ply weave with a 2-twist, covering legs and lower torso; body lying on piece of beargrass matting with a plain twill weave that has a uniform over-3 under-3 weave (63 cm by 55 cm): three pieces of identical matting fragments apparently were covering the body (76 cm by 43 cm, 47 cm by 25 cm, 21 cm by 17 cm); a fourth piece mentioned during initial discovery of grave was not recovered. No evidence of grave furniture, although several large plainware sherds found by Jackson above the body may be associated. Massive amounts of vegetal material around the body that is apparently grave fill or rodent disturbance.

20. Remarks: mummified skin remained on the frontal and occipital portions of the cranium, right scapula, ribs, and numerous phalanges on both feet.


22. Recorded by: Martyn Tagg, Krista Deal, Lynne D'Ascenzo

23. Photos by: Krista Deal

24. Sketch by: Lynne D'Ascenzo

25. Excavated and Removed by: Martyn Tagg

26. Excavation Date: March 24, 1986
Appendix C

ARCHEOBOTANICAL REMAINS FROM MONTEZUMA CASTLE NATIONAL MONUMENT, ARIZONA

by

Lisa W. Huckell

Introduction

The removal of a child's burial from the floor of a room at Montezuma Castle National Monument provided the opportunity for the collection of plant macrofossils and flotation samples from the area around and below the burial. Initial examination of the flotation samples and the excavation records clearly indicated that the burial bundle had been a home to rodents and insects over the years. The collecting and hoarding proclivities of these secondary occupants are well-known, and have acted here to effectively mask the origins of almost all of the associated plant materials. The large quantities of plant remains present in the processed flotation samples and the diverse number of species represented tended to suggest that much of the material probably could be attributed to nonhuman sources. Since the time required for an exhaustive analysis far exceeded that available, three samples were chosen for examination, with two from the fill below the burial and one from the material contained within the bundle. Objectives beyond the identification of as many specimens as possible were simply the recovery of items that could be securely associated with the cultural occupation, such as cultivated plant fragments and deliberately modified materials. Also submitted for analysis were four matting fragments and a length of cotton cloth, all of which were part of the burial.

Methods

The flotation samples were processed using the method developed by Bohrer and Adams (1977:37-40). The dried residues were then put through a series of four graduated geological sieves that sorted the material into the following five size classes: (1) >4.75 mm, (2) 4.75-2.0 mm, (3) 2.0-1.0 mm, (4) 1.0-0.495 mm, and (5) <0.495 mm. This procedure enhances the rapidity and reliability with which samples can be sorted. Sorting was done with a stereozoom binocular dissecting microscope with a maximum magnification capacity of 30x. Measurements were made by means of the microscope's ocular micrometer. Identifications were made through use of local and regional floras (McDougall and Haskell 1960; McDougall 1973) and the author's comparative collection. All specimens and samples will be accessioned into the holdings of the Western Archeological and Conservation Center where they will be available for study.
Results

Analysis revealed the presence of four domesticated plant taxa and 25 wild plant taxa. They are summarized in Table C.1. Additional specimens are present that could be identified beyond the familial or generic level but time constraints prevented an exhaustive treatment of the assemblage. Taxonomy for Table C.1 is based on the work of McDougall (1973).

Most of the flotation samples contained very little dirt, being mostly composed of shredded cotton fibers and plant parts. Sample volumes were 960 ML from around the body, and 1010 ML and 850 ML for the two samples from below the burial. The taxa and the number of parts of each found are presented by provenience in Table C.2. Results of the two samples from below the burial have been combined due to the homogeneous nature of the fill. In the case of the abundant yucca/agave seeds, totals are based on estimates made from volume measurements. One additional significant component of the flotation samples was insects, particularly dermestid larvae, ants and beetles. The results of their labors were readily apparent. Few of the plant parts were complete; the seeds in particular had in many instances been opened enough so that the contents could be extracted. The collaborative efforts of the resident rodents also helped ensure the deterioration and fragmentation of the seeds.

Based on the recorded magnitude of the rodent and insect disturbance of the burial area, it is impossible to interpret the plant assemblage with any degree of confidence. With the exception of the cultivated plants corn, beans, squash and cotton, whose presence is inextricably tied to that of humans, the remaining materials are of questionable origin. Unfortunate traits of the rodents such as eclectic collecting behavior and their appetite for the same wild plant products exploited by people make it impossible (in the absence of other lines of evidence such as parching, charring, or processing marks) to differentiate between the efforts of the two species. The difficulty is compounded here in that the burial area appears to be in trash fill; a sizeable number of the plant macrofossils are the kinds of items that could have been discarded after the desirable plant parts were utilized (that is, fibrous quids, the seeds of cotton, gourds, yucca, Rhus).

As a result, in the discussion that follows, the wild plants will be briefly dealt with in terms of the possible uses for some of the taxa based on the ethnographic record. This will be followed by sections on the four domesticated crop plants, quids, and each of the textiles.

Wild Plants

As Table C.2 shows, the flotation samples yielded a diverse array of plant materials. The only item found that was deliberately modified was a small knotted section of leaf fibers. The fibers had
Table C.1
MONTEZUMA CASTLE IDENTIFIED PLANT TAXA

<table>
<thead>
<tr>
<th>Family</th>
<th>Species</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cupressaceae</td>
<td>Juniperus monosperma (Engelm.) Sarg.</td>
<td>One-seed juniper</td>
</tr>
<tr>
<td>Gramineae</td>
<td>cf. Phragmites communis Trin.</td>
<td>Common reed-grass</td>
</tr>
<tr>
<td></td>
<td>Hordeum sp.</td>
<td>Wild barley</td>
</tr>
<tr>
<td></td>
<td>Stipa neomexicana (Thurb.) Scribn.</td>
<td>New Mexican feathergrass</td>
</tr>
<tr>
<td></td>
<td>Zea mays L.</td>
<td>Maize, corn</td>
</tr>
<tr>
<td>Liliaceae</td>
<td>Yucca sp.</td>
<td>Yucca</td>
</tr>
<tr>
<td>Amaryllidaceae</td>
<td>Agave cf. Parryi Engelm.</td>
<td>Century plant, agave</td>
</tr>
<tr>
<td>Cucurbitaceae</td>
<td>Cucurbita sp.</td>
<td>Pumpkin or squash</td>
</tr>
<tr>
<td></td>
<td>Cucurbita cf. foetidissima H.B.K.</td>
<td>Buffalo gourd</td>
</tr>
<tr>
<td>Leguminosae</td>
<td>Prosopis juliflora (Schwartz) DC.</td>
<td>Mesquite</td>
</tr>
<tr>
<td></td>
<td>Phaseolus vulgaris L.</td>
<td>Common bean</td>
</tr>
<tr>
<td>Malvaceae</td>
<td>Gossypium hirsutum var. punctatum (Schumacher) J. B. Hutch.</td>
<td>Native cotton</td>
</tr>
<tr>
<td>Anacardiaceae</td>
<td>Rhus trilobata Nutt.</td>
<td>Squawbush, skunkbush</td>
</tr>
<tr>
<td>Vitaceae</td>
<td>Vitis arizonica Engelm.</td>
<td>Canyon grape</td>
</tr>
<tr>
<td>Capparidaceae</td>
<td>Cleome cf. Jonesii (MacBr.) Tidestrom.</td>
<td>Bee-plant</td>
</tr>
<tr>
<td>Cactaceae</td>
<td>Platyopuntia sp.</td>
<td>Prickly-pear</td>
</tr>
<tr>
<td>Nyctaginaceae</td>
<td>Boerhaavia sp.</td>
<td>Spiderling</td>
</tr>
<tr>
<td>Polygonaceae</td>
<td>cf. Polygonum sp.</td>
<td>Knotweed</td>
</tr>
<tr>
<td>Solanaceae</td>
<td>Nicotiana sp.</td>
<td>Tobacco</td>
</tr>
<tr>
<td>Compositae</td>
<td>Ambrosia psilostachya DC.</td>
<td>Western ragweed</td>
</tr>
<tr>
<td>Umbelliferae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boraginaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amaranthaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chenopodiaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild Plant Taxa</td>
<td>Below Burial</td>
<td>Around Burial</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Maize cobs and fragments</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Maize cupules</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Squash seeds</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Bean-Phaseolus</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Gossypium</em> seeds</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Gramineae-panicoid caryopses</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>cf. <em>Phragmites</em> culms</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><em>Hordeum</em> spikes and spikelets</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>cf. <em>Stipa</em> caryopses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gramineae-unknown caryopses</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td><em>Yucca/Agave</em> seeds</td>
<td>600</td>
<td>1,202</td>
</tr>
<tr>
<td>Agave leaf fragment</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>cf. <em>Yucca/Agave</em> fibers and leaf fragments</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Cheno-Am seeds</td>
<td>192</td>
<td>195</td>
</tr>
<tr>
<td>Platyopuntia seeds</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Platyopuntia pads</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Prosopis</em> endocarps</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td><em>Prosopis</em> seeds</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Legume pod fragment</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Malvaceae carpels</td>
<td>18</td>
<td>13</td>
</tr>
</tbody>
</table>
Table C.2 (continued)

<table>
<thead>
<tr>
<th>Plant Group</th>
<th>Below Burial</th>
<th>Around Burial</th>
<th>No Provenience</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malvaceae seeds</td>
<td>6</td>
<td>6</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Nicotiana seeds</td>
<td>1</td>
<td>3</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Cucurbita seeds</td>
<td>650</td>
<td>127</td>
<td></td>
<td>777</td>
</tr>
<tr>
<td>Rhus seeds</td>
<td>12</td>
<td>19</td>
<td></td>
<td>31</td>
</tr>
<tr>
<td>Vitis seeds</td>
<td>1</td>
<td>5</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Umbelliferae mericarps</td>
<td>3</td>
<td>4</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Cleome seeds</td>
<td>6</td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Composite achene</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Ambrosia achene</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Boerhaavia fruits</td>
<td>5</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>cf. Portulaca seeds</td>
<td>14</td>
<td>14</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>cf. Polygonum seeds</td>
<td>2</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>cf. Linum seeds</td>
<td>2</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>cf. Boraginaceae nutlets</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Juniperus seeds</td>
<td>7</td>
<td>4</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Juniperus branchlets</td>
<td>32</td>
<td>10</td>
<td></td>
<td>42</td>
</tr>
<tr>
<td>Epidermis</td>
<td>2</td>
<td>1</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Quids</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Charcoal</td>
<td></td>
<td>4</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Unknowns</td>
<td>6</td>
<td>14</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,655</strong></td>
<td><strong>1,688</strong></td>
<td><strong>2</strong></td>
<td><strong>3,345</strong></td>
</tr>
</tbody>
</table>

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been partially cleaned, but still had sizeable pieces of yellow epidermis, the structure of which suggests the fibers are Yucca sp. The fibers are untwisted, and appear to represent two pieces joined by a square knot. The width of the knot is 6 mm, while the width of the strings or fiber clusters is 2 mm.

Montezuma Castle is situated in a rich floristic setting. In addition to the many riparian plants to be found along Beaver Creek just below the site, residents had access to elements of the desertscrub and grasslands in the surrounding vicinity. Components of all of these communities are present in the plant assemblage. Although it is true that, for various reasons, people do not always exploit all of the potentially useful plants within their domain, it is useful to examine the ethnographic record in order to assess the nature and extent of the utilization of the recovered taxa by other cultural groups as a means of gaining insight into the potential of the plant assemblage. Table C.3 has been constructed based on very limited data, but it still shows that many of these plants were widely used, and suggests ways in which they could have been employed to add variety and nutritional enrichment to the inhabitants' diet. Archeobotanical remains from other Sinagua sites in the area also suggest that many wild plant species were utilized. Excavations at Richards Caves near McGuireville and at other sites within the monument have yielded yucca seeds, acorns, walnuts, mesquite beans, acacia beans, wild gourds, a jimson weed fruit fragment, and many more unnamed species (Pierson 1956:94; Cutler and Kaplan 1956:98).

One final observation on the wild plants is the near absence of evidence of food preparation in the form of parching, scorching, or carbonization. Fill below the burial (FN 5) yielded a burned Chenopodiaceae seed, a Boraginaceae nutlet, three grass spikelet fragments and a grass culm internode fragment. One of the spikelets appears to be Hordeum, or barley, a taxon that appears in the sample taken from around the burial (FN 12) as well. A single barley spikelet with a scorched apex was also found. The other remains, all of which are carbonized, include three grass culm fragments, an Amaranthaceae seed, five possible cactus spines, a tree spine fragment reminiscent of mesquite spines, and three unknowns that are fragments of seeds. Whether these items represent deliberate efforts at preparing them for food or are the products of campfires of postoccupational visitors cannot be determined. The tiny seeds of the Chenopodiaceae and Amaranthaceae are invariably parched prior to being ground into meal or flour. Their size would easily enable some to escape into the cooking fire where complete carbonization could occur. Cactus pads are generally exposed to fire to singe off the spines before they are cooked. It seems likely that the spines would fall into the fire where they also would be completely carbonized. Grass "seeds," or caryopses, are also usually parched to help remove unwanted chaff and to improve the flavor and storage potential of the grains. Although many species of grasses have been known to be utilized by historic southwestern Indian groups (Doebly 1984), the prehistoric evidence for such use has begun to emerge only recently with the advent of sophisticated retrieval techniques like flotation. Discoveries of little barley (Hordeum pusillum) in Hohokam sites in Phoenix indicate the strong possibility that the plant was undergoing incipient domestication. Although H. pusillum is not
Table C.3

KNOWN ETHNOGRAPHIC USES FOR WILD PLANT TAXA RECOVERED FROM MONTEZUMA CASTLE

(Sources: Castetter and Underhill 1935; Castetter 1935; Whiting 1966; Elmore 1944; Bean and Saubel 1972)

<table>
<thead>
<tr>
<th>TAXON</th>
<th>PARTS USED</th>
<th>USE</th>
<th>CULTURAL GROUPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhus</td>
<td>Fruits</td>
<td>Beverage</td>
<td>Mescalero Apache, Navajo, Hopi</td>
</tr>
<tr>
<td>Yucca</td>
<td>Leaves, Fruits</td>
<td>Fibers, Food</td>
<td>Mescalero Apache, Papago, Hopi, Cahuilla, Navajo, Zuñi</td>
</tr>
<tr>
<td>Agave</td>
<td>Leaves, Fruits</td>
<td>Fibers, Food, Drink</td>
<td>Papago, Apache, Navajo, Hopi</td>
</tr>
<tr>
<td>Chenopods</td>
<td>Leaves, Seeds</td>
<td>Food</td>
<td>Cahuilla, Papago, Navajo, Zuñi, Hopi</td>
</tr>
<tr>
<td>Amaranths</td>
<td>Leaves, Seeds</td>
<td>Food</td>
<td>Apache, Papago, Hopi, Navajo, Cochiti, Acoma, Laguna</td>
</tr>
<tr>
<td>Nicotiana</td>
<td>Leaves</td>
<td>Smoking, Medicine</td>
<td>Papago, Navajo, Cahuilla, Hopi</td>
</tr>
<tr>
<td>Grasses</td>
<td>Caryopses</td>
<td>Food</td>
<td>Cahuilla, Hopi, Navajo</td>
</tr>
<tr>
<td>Platyopuntia</td>
<td>Pads, Fruits</td>
<td>Food</td>
<td>Papago, Hopi, Cahuilla</td>
</tr>
<tr>
<td>Wild Cucurbita</td>
<td>Seeds</td>
<td>Food</td>
<td>Cahuilla</td>
</tr>
<tr>
<td>Vitis</td>
<td>Fruits</td>
<td>Food</td>
<td>Isleta, Acoma, Laguna, Jemez, Cahuilla, Navajo</td>
</tr>
<tr>
<td>Prosopis</td>
<td>Pods, Seeds</td>
<td>Food</td>
<td>Pima, Papago, Cahuilla</td>
</tr>
<tr>
<td>Juniperus</td>
<td>Berries</td>
<td>Food, Seasoning</td>
<td>Laguna, Jemez, Navajo, Zuñi, Cochiti, Acoma, Hopi</td>
</tr>
<tr>
<td>Cleome</td>
<td>Plant</td>
<td>Food, Pigment</td>
<td>Tewa, Hopi, Zuñi</td>
</tr>
</tbody>
</table>
recorded as occurring at Montezuma Castle (McDougall and Haskell 1960), four other species are. It may be that the local residents were also experimenting with native barley as a food plant.

Maize

Apart from two loose cupule fragments, all of the maize remains were found in the form of cobs, cob fragments or vertical cupule rows from dissociated cobs. Data for the eight specimens are presented in Table C.4.

It is difficult to interpret the significance of the maize remains. The whole or nearly complete cobs are very small. They may be tiller ears or they may be the results of a period of climatic stress that produced stunted, impoverished crops. Such negative conditions can tend to reduce the row number on a cob as well as its overall size. The small sample size from what is evidently a trash context also makes it impossible to discern and evaluate trends or patterns. However, the broad cupule widths of specimens 5 and 7 suggest the presence of the Pueblo race of maize discussed by Cutler (1960:278). The large size and broad, flat cupules are typical features of this large-cobbed race that is thought to have entered the Southwest around A.D. 1000 from Mexico.

Table C.4

MAIZE ASSOCIATED WITH CHILD'S BURIAL AT MONTEZUMA CASTLE

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>LENGTH (mm)</th>
<th>WIDTH/DIAMETER (mm)</th>
<th>ROW NUMBER</th>
<th>AVERAGE CUPULE HEIGHT (mm)</th>
<th>AVERAGE CUPULE WIDTH (mm)</th>
<th>NUMBER CUPULES MEASURED</th>
</tr>
</thead>
<tbody>
<tr>
<td>FN 5 Cupule Row</td>
<td>34.0</td>
<td>1.2</td>
<td></td>
<td>2.00</td>
<td>9.00</td>
<td>2</td>
</tr>
<tr>
<td>FN 12 Cupule Row</td>
<td>15.0</td>
<td>1.4</td>
<td></td>
<td>1.25</td>
<td>7.50</td>
<td>2</td>
</tr>
<tr>
<td>FN 12 Cob Midsection</td>
<td>18.0</td>
<td>1.5</td>
<td>8</td>
<td>2.50</td>
<td>6.00</td>
<td>1</td>
</tr>
<tr>
<td>FN 10 Tip Section</td>
<td>55.0</td>
<td>15.0</td>
<td>8</td>
<td>1.35</td>
<td>6.35</td>
<td>2</td>
</tr>
<tr>
<td>FN 10 Almost Complete</td>
<td>62.0</td>
<td>16.0</td>
<td>8</td>
<td>1.61</td>
<td>5.59</td>
<td>8</td>
</tr>
<tr>
<td>FN 10 Complete</td>
<td>48.0</td>
<td>15.0</td>
<td>10</td>
<td>2.17</td>
<td>4.30</td>
<td>3</td>
</tr>
<tr>
<td>FN 17 Midsection</td>
<td>50.0</td>
<td>30.0</td>
<td>14</td>
<td>1.73</td>
<td>8.80</td>
<td>4</td>
</tr>
<tr>
<td>FN 29 Tip Section</td>
<td>54.0</td>
<td>18.0</td>
<td>8</td>
<td>1.75</td>
<td>6.40</td>
<td>2</td>
</tr>
</tbody>
</table>
It is still being grown today by traditional Pueblo Indian farmers. In the complete absence of kernels, it is impossible to know the nature of the corn raised by local farmers (flint, flour, pop, and so forth). That corn was undoubtedly the economy's mainstay is evidenced by the discovery of corn cobs, husks and stems from storage caves in Castle A (Jackson and Van Valkenburgh 1954:29). However, present data can do little more than reiterate the presence of maize at the site.

Squash

Four small fragments of cultivated cucurbit seeds were found. They consist of rim fragments that represent less than one-fourth of the seed. The thickened, pronounced rim and projected large size of the seeds indicate that they are domesticated species. The fragmentary nature of the specimens precludes a more specific identification. Previously recovered evidence in the form of rinds, peduncles, and seeds confirms that the site residents grew all three species of squash or pumpkin known to have been cultivated prior to European contact (Jackson and Van Valkenburgh 1954:29; Cutler and Kaplan 1956:98-100).

Beans

A single common bean was found in the fill surrounding the body. Beans are an unusual occurrences in archeobotanical assemblages, for they lack indurated protective seed coats or shells that discourage predation or that can persist in a fragmentary state. This specimen is even more remarkable in that it is completely hollow, with most of the testa or seed coat intact. The insect entered at the edge of the hilum, or attachment scar, but left the diagnostic features minimally damaged.

The dark, red-brown bean measures 1.1 cm in length, 0.7 cm in width and 0.48 cm in thickness. The anterior end is truncated while the posterior end is round. The hilum length is 2.2 mm. The large hilum and divided caruncle indicate that the specimen is a common bean, Phaseolus vulgaris (Kaplan 1956:206-207). The hilum ring is elevated and the color of the ring and the immediate area is dark, appearing black. The seed coat appears to be dull or have a low gloss.

Beans have been recovered from Montezuma Castle in the past. Jackson and Van Valkenburgh (1954:29) mention “four kinds of seeds or beans” that were obtained during Boundey's excavations. These may be the beans from Montezuma Castle that Kaplan (1956:247; Cutler and Kaplan 1956:98-100) examined. He identified two types of common beans (C20 and C11), three types of tepary beans (T1, T6, T8) and a lima bean (L1). It is possible that the specimen from the burial may be Kaplan's C20 type, but it is bit larger than the dimensions Kaplan presented. It is also impossible to know how the bean's current color compares with its fresh color. Beans are known to change color dramatically with age, often
going from a light to a dark color (Kaplan 1956:202). It would be interesting to compare this specimen with the others recovered previously.

Cotton

Twenty cotton seeds and seed fragments were recovered from the samples. The dark brown teardrop-shaped seeds all retained the distinctive tuft of hairs that surrounds the hilum. With few exceptions, the seeds have been damaged by insects, who have destroyed the round distal ends and consumed the cotyledons and endosperm. The seeds can be assigned to Gossypium hirsutum var. punctatum (Schumacher) J. B. Hutch., which is the sole variety of cotton known to have been cultivated in the prehistoric southwest.

The presence of cotton seeds in the plant assemblage strongly suggests that cotton was locally grown by Montezuma Castle residents undoubtedly to meet domestic demands. Those few textiles that have been recovered from the site (Kent 1954) reveal that highly skilled artisans used the cotton fibers to produce outstanding loom-woven cloth in a diverse array of colors, patterns and weaves. In addition to the fibers, cotton yields another valuable product in the form of the seeds, which contain large quantities of oils, a rare food commodity for maize-based agriculturalists. Both the Hopi and the Pima eagerly consumed any leftover seeds after the supply for the next year's crop had been set aside (Beaglehole 1937:43; Castetter and Bell 1942:198). It is possible that the Sinagua also exploited the seeds for food. The seeds may represent a food offering left with the child or may simply be the discarded by-products of ginning that were gathered by the mice.

Quids

Twelve quids were recovered from the vicinity of the burial. Quids are the expectorated by-product of the mastication of fibrous plant parts. Suggested uses for such fibrous masses include the production of clean fibers for cordage, the chewing of sweet plant parts for pleasure and nutrition, and the manufacture of utility pads suitable for scouring, plugs and diapers (Reed 1978:5).

The quids are variably shaped masses that range in size from 1.7 cm by 1.2 cm by 0.8 cm to 5.6 cm by 4.5 cm by 1.8 cm. Although some are spherical, most are flattened. All but two appear to be composed of twisted, angularly folded fibers; the others show no parallel orientation of fibers, creating a tangled rat's nest effect. Microscopic examination of the fibers reveals that with one exception, the quids are made of two distinct fiber types that are occasionally combined in some specimens. The first is found in four specimens and is represented by a pale yellow epidermis with a finely alveolate surface sculpture. Two specimens belong to the second type, which is a reddish-brown epidermis that has a striated appearance due to the linear
arrangement of the longer than wide epidermal cells. Stomates are also much more abundant on the dark epidermis than on the yellow one. Two specimens appear to be composed of a mixture of both. Although a positive match was not found for the dark epidermis, it is suggested here that the yellow epidermis is a Yucca species and that the other may be Agave. All of the quids contained abundant, readily visible calcium oxalate crystals, which can be found in great quantity in the leaves of the two genera. A. parryi, Y. elata and Y. baccata are known to occur in the monument boundaries (McDougall and Haskell 1960:28-29).

The atypical quid recovered represents an intermediate step in quid production, for a portion of the unchewed plant material remains. This small remnant reveals an unusual structure in cross section that is composed of very closely spaced lenticular bundles that do not exhibit the typical arrangement of vascular bundles and fibers seen in Yucca and Agave (Bell and King 1944:153). The specimen may come from a portion of the plant that possesses atypical structure or it may come from a different species altogether. Several other species have been used as quids (Reed 1978:2); time did not permit the examination of these other possibilities.

The functions of the quids from Montezuma Castle are difficult to assess. Most have only modest amounts of adherent parenchyma and epidermis left. However, the small sizes of the specimens suggest that the extracted fibers would be short and therefore presumably less suitable for cordage. Three are embossed with the molar prints of the chewer; they suggest that the material was kept between the teeth and sucked until the flavor was gone. None of the specimens shows signs of wear from use as a pad or wipe. If the identities of the fibers can be confirmed as Yucca and Agave, it may be that the quids represent portions of pit-roasted plants of both species that were chewed for the strong, molasses-like flavor that develops after prolonged cooking. Pit-baked agave, or mescal, has been considered a sweet treat and delicacy by many contemporary southwestern Indian groups. The task of chewing the leaves to liberate the fibers would also be rendered much more enjoyable by this means, although it would seem an impractical method to employ when large quantities of fibers were needed. Among the Zuni, however, yucca leaves were formerly chewed to obtain fibers in quantity. By the turn of the century, limited amounts were still produced by this method for ceremonial cordage (Stevenson 1915:78).

Additional information on quids and their research potential may be found in the papers by Zauderer (1975) and Reed (1978).

Matting

Excavation records and photographs (see Fig. 7.5) show that the child was put in a woven mat prior to being placed in the burial location. Four pieces of the mat were recovered (Figs. C.1 and C.2). All of them are incomplete, but probably came from a single, large mat that was cut into the desired shapes. The largest is a triangular piece that was put under the body (see Fig. C.1). It measures 63 cm long and
Figure C.1 Matting found beneath the body.

Figure C.2 The three pieces of matting covering the body.
55 cm wide. The edge toward which the child was facing bears the only finished edge present (see Fig. 7.4). The largest matting fragment is rectangular, measuring 76 cm by 43 cm. The two remaining pieces are much smaller. Both are teardrop-shaped, and measure 47 cm by 25 cm and 21 cm by 17 cm (see Fig. C.2).

Microscopic examination revealed that the mat is made of beargrass (Nolina sp.). The distinctive surface pattern of parallel longitudinal rows of interlocking papillae that cover the stomates are present as are marginal teeth on some elements. The leaves appear to have been split longitudinally into halves or thirds prior to being used. All of the pieces are woven in a uniform, well-made plain twill weave that employs an over-3 under-3 pattern. In the fragment bearing the finished edge, the elements were given one "S" twist and then were redirected diagonally back into the pattern (Fig. C.3). A similar edge finish is illustrated by Kent (1954:Pl. 48, Specimen 44) for another twilled mat fragment from Montezuma Castle. Two other specimens of twilled matting are known from the site (Kent 1954:69-71).

Figure C.3 Closeup of a section of matting illustrating twilled weave and finished edge.
Cotton Cloth

Prior to being placed in the twilled mat, the child was covered with a cotton cloth. Unfortunately, the nature and function of the cloth cannot be determined due to the extensive damage it has sustained over the centuries from insects and mice undoubtedly seeking warm linings for winter nests. Pieces, unraveled chunks and balls of yarn bits were found throughout the flotation samples collected and adhering to some of the macrobotanical specimens.

The portions that managed to escape destruction reveal that the cloth is in reality two separate cloths sewn together. The larger of the two pieces measures 40 cm long and 35 cm wide. It is woven into a fine, beautifully made plain weave, with 14 warp threads to the centimeter and 8 weft threads to the centimeter. Both warp and weft elements are single ply with a Z-twist. The threads are varying shades of brownish-gray in color. This cloth has what appears to be 2 added strings a few centimeters apart that have been inserted over and under groups of 5-10 threads. They are oriented parallel to the warps, and are 2-ply, Z-twist threads that have been S-spun. It is possible that they could have functioned as drawstrings, although they have been so badly damaged that it is impossible to tell. There is also a major mend on the side of the cloth opposite the strings. Running parallel to the weft, the two edges have been gathered together and rather erratically and unsystematically overcast stitched, creating a large, puckered area that is a minimum of 12 cm long. One of the selvage edges is also present, being the edge that is joined to the second fabric. It has been tightly twisted to make a thick rounded margin.

The second piece of cloth has been joined to the first with a minimal number of irregular stitches. It has no selvage edges. It has borne the brunt of the rodent depredations and now resembles an incomplete jigsaw puzzle. It measures 33 cm in length and 34 cm in width and is a dark brown color. The weave is also plain, but it is considerably more coarse than the other cloth, somewhat resembling gunny sacking. In the absence of selvages, it is difficult to determine warps and wefts. However, Kent (1954:9) suggests that the finer, smaller element of the two is the warp, and uses this criterion in her analysis. Accordingly, there are six warp threads to the centimeter and five weft threads to the centimeter. Orienting the specimen with this cloth at the bottom, the warps run vertically, being perpendicular to those of the first cloth. Both warp and weft threads are also single ply with a Z-twist.

Of the 31 specimens from Montezuma Castle examined by Kent (1954:9), 13 are plain weave with no variations. An additional nine variations of plain weave are also present, making two-thirds of the assemblage plain weave. About 85 percent of all prehistoric textiles are undecorated simple plain weave white cotton (Kent 1983:128). They are woven from single-ply Z-spun yarn by means of looms. The two specimens making up the burial cloth are typical examples of this most common and utilitarian textile.
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