

ARCHAEOLOGICAL INVESTIGATIONS AT PUEBLO SIN CASAS (FB6273), A MULTICOMPONENT SITE IN THE HUECO BOLSON, FORT BLISS, TEXAS

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I also would like to thank the following students for their efforts: Ronna Jane Bradley, Louis Foix, Tim Graves, Joseph Guinn, Mario Hernandez, Valerie John, Carter Lewis, Lee Scarbrough, Mark Simon, and Vincent Skinner. Ken West served as a teaching assistant for the field school. I hope they learned much from their experience. Certainly this report would not be possible without their efforts in the summer heat of the desert. Finally, I thank the following individuals for various contributions and assistance: Thomas O'Laughlin, Dr. Arthur Harris, and Dr. Richard Smartt.

Michael S. Foster
July, 1989

EXECUTIVE SUMMARY

During the summer of 1979, site FB6273 (Pueblo Sin Casas) was tested by students enrolled in an archaeological field school at the Department of Sociology and Anthropology at The University of Texas at El Paso. Previous descriptions of the site suggested it contained the remains of an El Paso phase pueblo with substantial subsurface cultural deposits. Controlled surface collections were made, and the subsequent testing quickly demonstrated the site was a deflated surface scatter of artifacts and hearths. The excavations at FB6273 clearly demonstrate the difficulties involved in assessing archaeological remains solely with data recorded during field survey.

Cultural remains indicate the site is multicomponent, with components that may date from the early Archaic through the Formative sequence. Different components could not be spatially defined. It is thought that the site represents a series of short-term occupations that probably occurred during midsummer to early fall, when available water and food sources would have been at their peaks in the basin floor surrounding the site. The site probably was occupied briefly by mobile social and/or family units foraging in the surrounding area and using the site as a temporary "residence."

FOREWORD

This report describes the results of the first excavation project conducted on Fort Bliss as part of the installation's Cultural Resources Management Program. It was a summer field school sponsored by The University of Texas at El Paso and conducted by Dr. Michael Foster, the principal author of the report. The cultural resources staff at Fort Bliss helped examine several sites in the process of selecting this site for the field school, arranged for access to the site, and arranged for various kinds of equipment to support the project. In retrospect, the character of this site portended cultural resources management issues that have become of extreme concern in the years since the field school was conducted.

One issue is the danger inherent in attempts to evaluate the excavation potential (i.e., the "significance") of archaeological sites in the desert environment of Fort Bliss with only surface data upon which to base the evaluations. Several projects conducted in the region and on Fort Bliss in the late 1980s and 1990s have documented that: (1) a very low density of surface artifacts that might be considered insignificant at some locations often can be the tip of the iceberg for well-preserved, buried sites; (2) a very low density of surface artifacts may be all that exists at other locations; (3) a substantial density of surface artifacts like that at Pueblo Sin Casas may be all that remains (or perhaps all that ever existed) at some locations; (4) a substantial density of artifacts at other locations can be associated with well-preserved, buried sites. In general, the fact that this kind of variability exists probably is no surprise to those who read this report. The variability, however, poses significant management problems for the cultural resources program on Fort Bliss.

About 13,000 sites already are recorded on Fort Bliss, and the results of field work conducted in the early 1990s (reports are in preparation) indicate there probably are at least 100,000 sites on the installation. It clearly is impractical to expect that all, or even a significant proportion of these sites can be tested as part of a program designed to evaluate their excavational potential. The variability also makes it impractical to test a few sites and to extrapolate the results of those tests to other sites with the intent of using only surface archaeological data to partition the sites into significant and not significant groupings.

Testing carefully selected samples of sites and extrapolating the results to other sites perhaps can be effective if variables affecting the visibility and the integrity of sites are identified and controlled. Identification of some of these variables can result from intensive investigation, dating, interpretation, and mapping of geomorphological strata and surfaces. Information developed from this kind of study can be used to identify areas where (1) the surfaces have been geomorphologically stable for known time periods, (2) the surfaces have been subjected to various levels of localized or regional deflational and/or depositional processes and when those processes were active, and (3) surfaces of archaeological importance probably are shallowly or deeply buried. This information, combined with archaeological surface data, clearly can be useful for evaluating the probable excavational potential of individual sites and of larger areas with several sites.

A report by Dr. Curtis Monger of New Mexico State University in Las Cruces, New Mexico describes the results of the first project on Fort Bliss designed to provide information about geomorphological variability useful for investigation of several issues concerned with archaeological variability. The report, titled *Soil-Geomorphic and Paleoclimatic Characteristics of the Fort Bliss Maneuver Areas*, is being published as Report No. 10 in this series.

Another issue results from the original interpretation that Pueblo Sin Casas was a single component El Paso phase site. The site was selected on the assumption that students in the field school could get experience

identifying and exposing pueblo walls, floors, faunal and floral materials, and perhaps burials. The site was found to have none of these attributes. Further, the data from the site suggest it actually is a multicomponent site of considerable occupational complexity. This suggestion is prophetic, because subsequent chronometric dating of sites on Fort Bliss has demonstrated that most of the investigated sites are, in fact, multicomponent.

This subsequent work was intended to be concentrated on "small site" phenomena represented by single isolated hearth features with fire-cracked rock, burned caliche, and associated artifacts. It was assumed that such small sites would have less functional and occupational complexity and that they would represent more easily interpreted chronological and occupational packages than larger sites. Developing understandings of the smaller sites, we thought, would be relatively easy, and the understandings then could be used to partition larger sites into their different components and occupations.

This first concentrated work on small sites demonstrates there are few isolated small sites; so-called small sites usually are part of larger, localized groupings of small sites, and the localized groupings have a bewildering mixture of chronometric attributes and occupational debris. The localized groupings represent areas characterized by multiple, short-term occupations for which chronometric dates often will span 2000 years. Further, so-called diagnostic artifacts such as projectile points and ceramics frequently--too frequently for comfort--are very misleading indicators for the cultural period or phase represented by a site. For example, El Paso phase sherds can be found on sites with no chronometric date after the late Archaic or early Pithouse periods. Reports for some of this work is in preparation, and will be published in this series.

This documented occupational complexity probably can be attributed to the several hundreds of years during which land use and residential systems on Fort Bliss were principally those of hunters and gatherers who frequently reoccupied areas now identified as localized groupings. These results, however, make use of standard archaeological practices to identify the analytical contexts of the localized concentrations of small sites very difficult, if not usually simply wrong.

Theoretically, the occupational complexity and the misleading diagnostic artifacts on sites also probably is not a surprise to most readers of this report. It is, however, quite disturbing when the accuracy of the theoretical expectation is documented as a frequent, not an infrequent, finding.

It is probable that the same generic chronological and occupational variability will be found to characterize many of the "residential" sites of the late Pithouse and Pueblo periods on Fort Bliss. The variability did exist at Pueblo Sin Casas. Thomas O'Laughlin of El Paso's Wilderness Park Museum and Dr. Michael Whalen of the University of Tulsa have documented considerable chronological and occupational variability at a local pueblo site and at a pit house site on Fort Bliss. This variability was not suggested by the surface data that originally were collected off the sites.

Clearly, a significant management issue on Fort Bliss, given the large number of sites on the post, is how to observe, collect, and interpret archaeological surface data that will provide acceptably accurate indicators for the probable chronological and occupational history of sites. However, we do not yet know how to use surface data to identify the occupational history of concentrations of either small or large sites with a high degree of accuracy and cost effectiveness. Clearly, such identifications must be made for regulatory, analytical, and management purposes.

To facilitate the identifications, we are working with others to develop more accurate obsidian hydration dating and to evaluate the feasibility of thermoluminescence dating of the ubiquitous burned caliche. Cultural resources staff also are working to refine and establish better understanding and analytical control over variables that may be useful for relative chronological dating. The results of these studies will be useful for the needs of the Fort Bliss Cultural Resources Management Program and for other archaeologists working in the region.

GLEN DEGARMO, PH.D.
Cultural Resources Management Program
Fort Bliss, Texas

Chapter I

INTRODUCTION

During the summer of 1979, ten students from the University of Texas at El Paso spent five weeks in a field school testing an archaeological site located on the Fort Bliss Military Reservation in the Hueco Bolson of West Texas (see Figure I-1). The project was carried out under the Cultural Resources Management program of what was then the Environmental Office of the Directorate of Facilities Engineering at Fort Bliss. The office has been reorganized, and the same project now would be conducted under the auspices of the Cultural Resources Branch, Environmental Management Division of the Directorate of Environment.

Site FB6273 originally was recorded and designated as site 3:1432E, as a result of an archaeological survey of Fort Bliss Maneuver Area I (Whalen 1978:116). The following is Whalen's summary description of the site:

3:1432E El Paso phase. Low desert at 3985 ft. Not playa associated. Not drainage associated. Vegetation type 3 (mesquite, snakeweed, and yucca). Slope NW. Gradient 1-5 degrees. Site type: small village. Occupation area 2.16 hectares. Depth of deposit: >10 cm. Estimated number of hearths: 6-10. Maximum ceramic density: light. Ceramic types present: El Paso Polychrome. Ground stone present. Raw materials: obsidian, limestone, chert. No nonutilitarian objects. Eroded and deflated. Damage by army maneuvers: superficial. Research Potential 4. High excavation potential.

In addition to the information provided by this description and a visit to the site, FB6273 was selected for excavation because of two considerations: First, the site was thought to be an El Paso phase pueblo with architectural features that would make it easy to control data recovery by untrained students; second, military maneuvers had damaged the site, and its location made additional damage in the future quite probable.

Based upon the assumptions about the characteristics of the site, five research interests guided the data collection. These were:

- (1) Identification and analysis of spatial distributions of surface artifacts and features recorded by systematic surface collection.
- (2) Reconstruction of subsistence activities from available data.
- (3) Identification of intrasite activities and determination of site function.
- (4) Analysis of resource procurement and utilization.
- (5) Analysis of inter- and intraregional exchange.

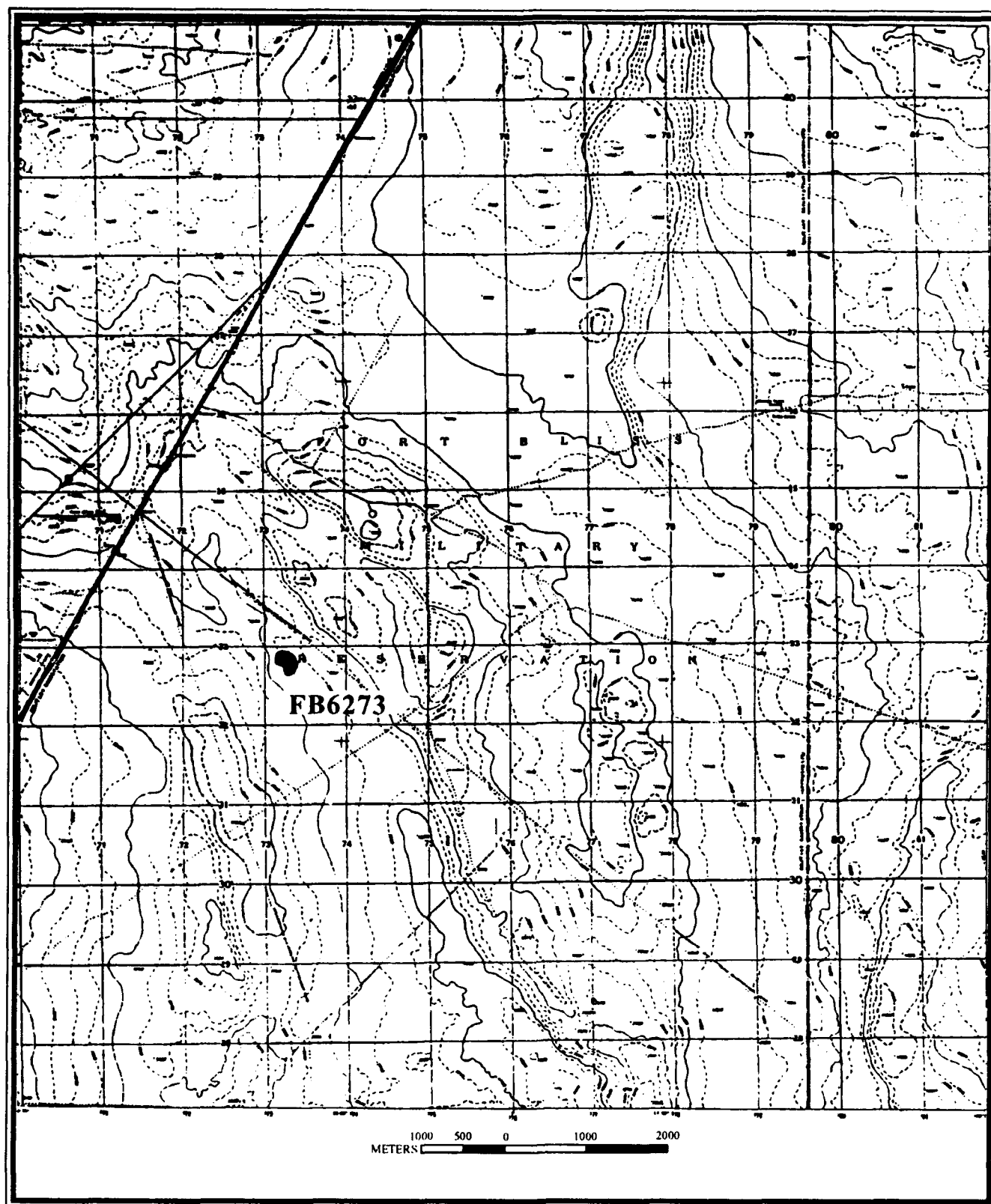


Figure I-1. FB6273 Location Map
(From Fort Bliss SE, Sheet 4747 IV SE, 1:25,000, Transverse Mercator Projection)

Data Recovery

The initial goal of the project was to determine the site boundaries. Crew members, spaced at 3- to 4-m intervals, intensively surveyed the site. The boundaries of the artifact concentration then were marked by pin flags. The site covers approximately 6,000 m², and cultural debris and features are exposed in deflated areas between dunes.

A total of 242 2- by 2-m units were excavated. The units were surface collected, and the collected materials were sorted by general type. The units then were excavated in 10-cm levels, and the materials from the levels also were sorted by type as they were excavated. Data from the first units suggested most cultural material was concentrated in the top 20 cm of sand and that a caliche substratum lay 20 to 40 cm below the surface. Excavation units were extended throughout the site with the same result.

A total of 17 test trenches were excavated (see figures I-2 and I-3) in an attempt to identify subsurface features and buried occupation surfaces. The trenches were 1-m wide, up to 1.75 m deep, and between 10 and 85 m long. Several were dug into and through the dunes scattered within the boundaries of the site. Several buried hearths were encountered but no subsurface structures and no occupation surfaces were discovered as a result of the trenching. Artifacts recovered from the trenches were collected in bulk.

The excavations revealed that Whalen's original assessment of the site greatly overestimated both its excavation potential and the amount of cultural remains present. Subsurface remains were limited. Even the dunes contained very little prehistoric material. Further, the dunes appear to be of recent origin. Foil from radar chaff and other historic material were found buried within the dunes and near their bases. The site was found to be extensively deflated with the cultural remains compressed into a single, unstratified layer.

The site was named "Pueblo Sin Casas" because of the lack of architectural features, which were expected but not found.

Cultural History

South-central New Mexico and West Texas have a long history of human occupation and utilization. Humans have been in the region for at least the last 11,000 to 12,000 years. During this time there have been a variety of cultural adaptations to local environments. Traditionally, the prehistoric occupation of the area has been divided into three periods: Paleo-Indian, Archaic, and Formative (see Figure I-4).

Paleo-Indian Period

The earliest occupants of the area are represented by the Clovis point, which dates to ca. 11,200 B.P. Clovis remains generally are rare in south-central New Mexico and western Texas. Published descriptions of Clovis materials within the region include Krone (1976); Harkey's (1981) account of a find near Hatch, New Mexico; and Weber and Agogino's (1968) report on a site near Mockingbird Gap, New Mexico. Additionally, several Clovis points are reported from northern Chihuahua, Mexico; one from the Timmy Site (Di Peso 1974) and another from the Samalauca Dunes south of Juarez, Chihuahua (Alan Phelps, personal communication).

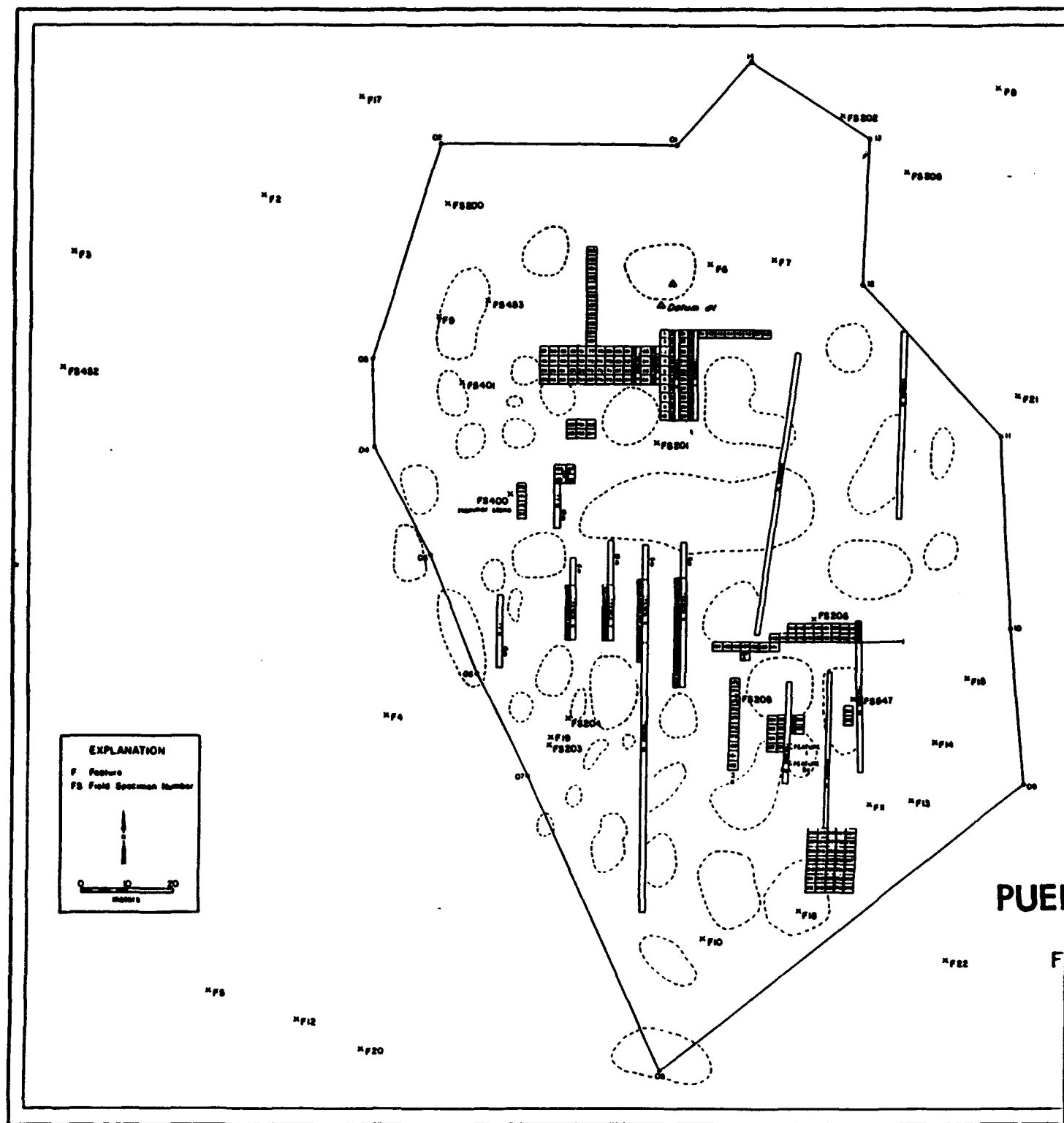
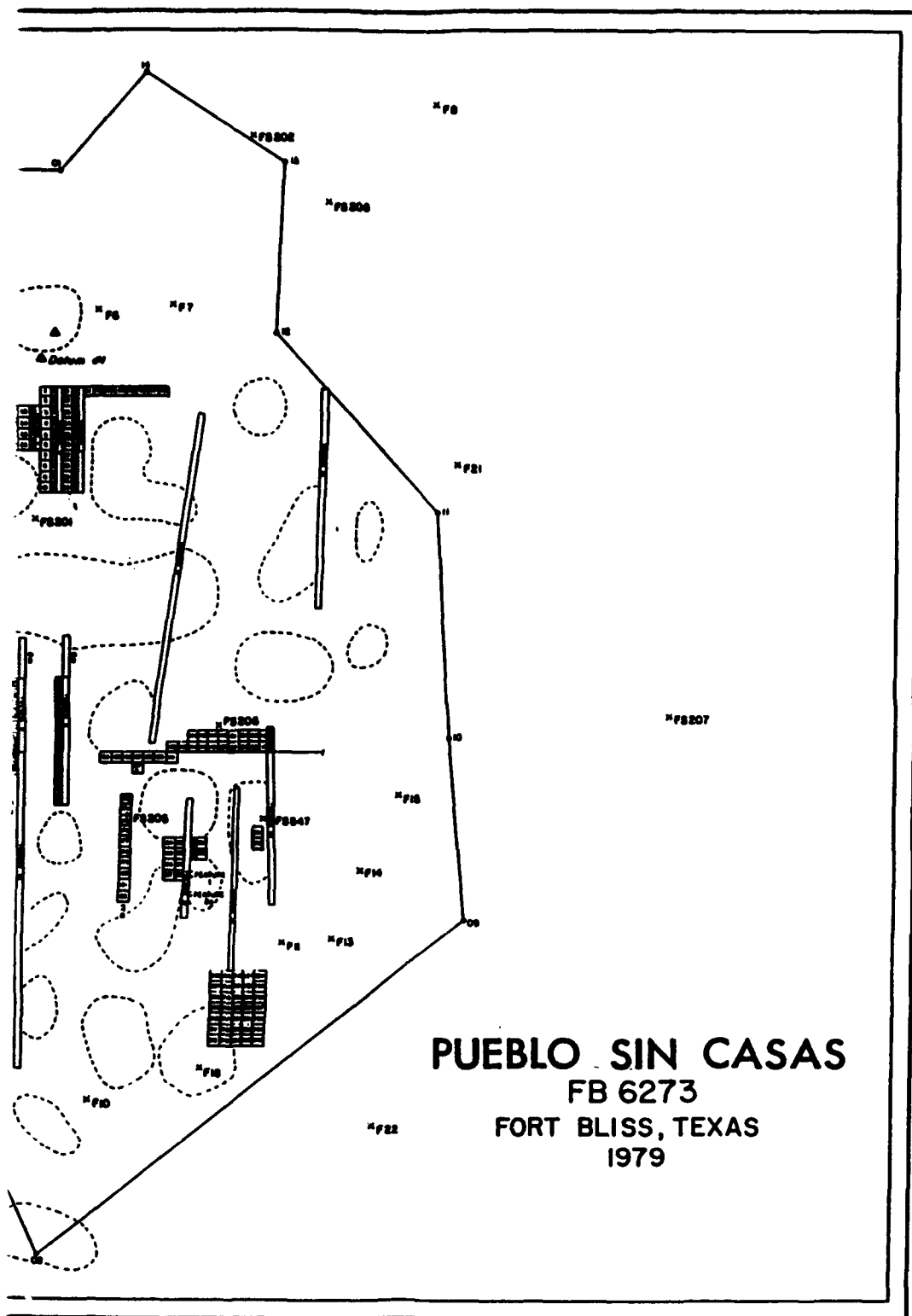


Figure I-2. Site Map of Pueblo Sin Casas

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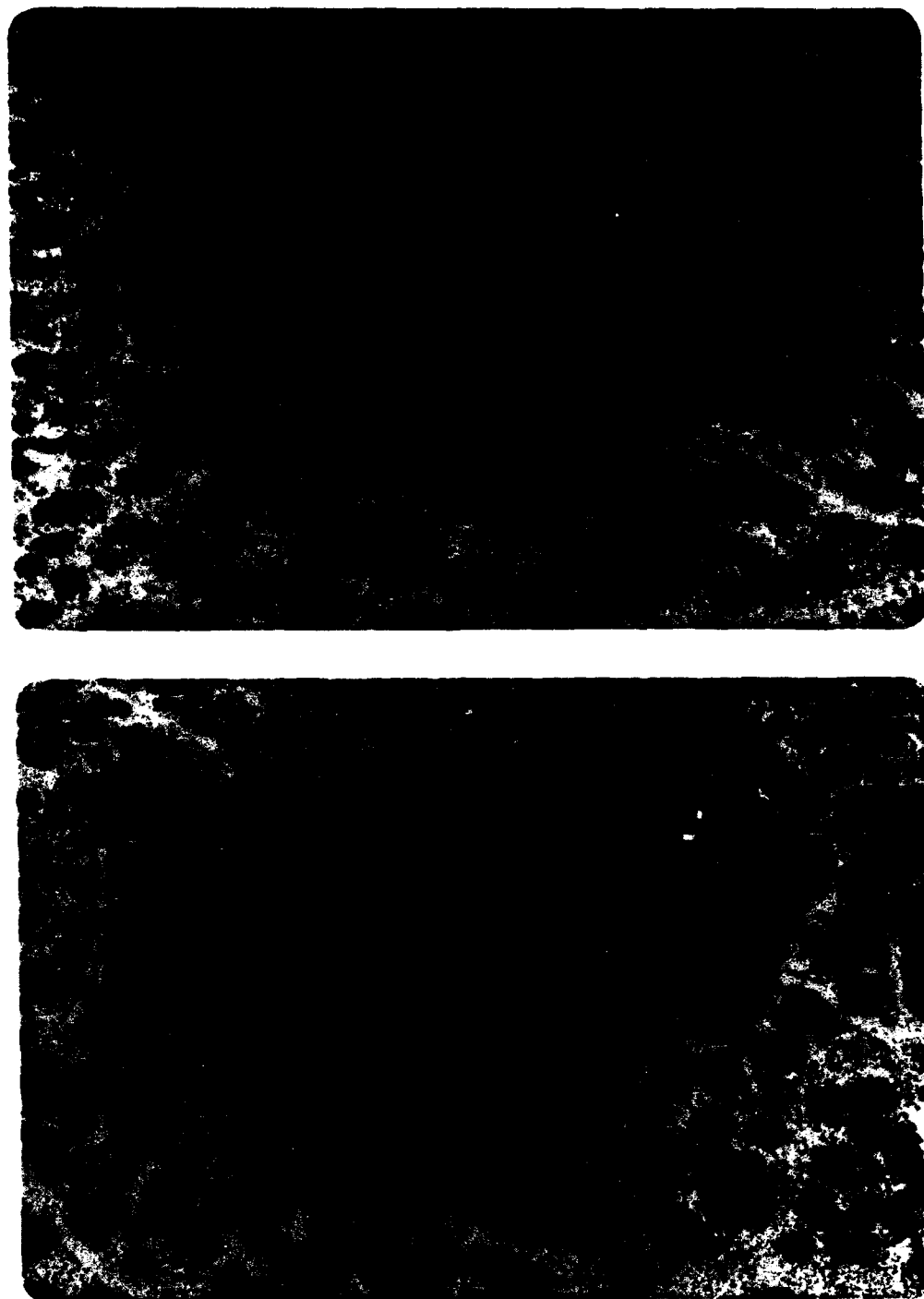


Figure I-3. Aerial View of FB-6273
Looking Northwest (top) and West (bottom)

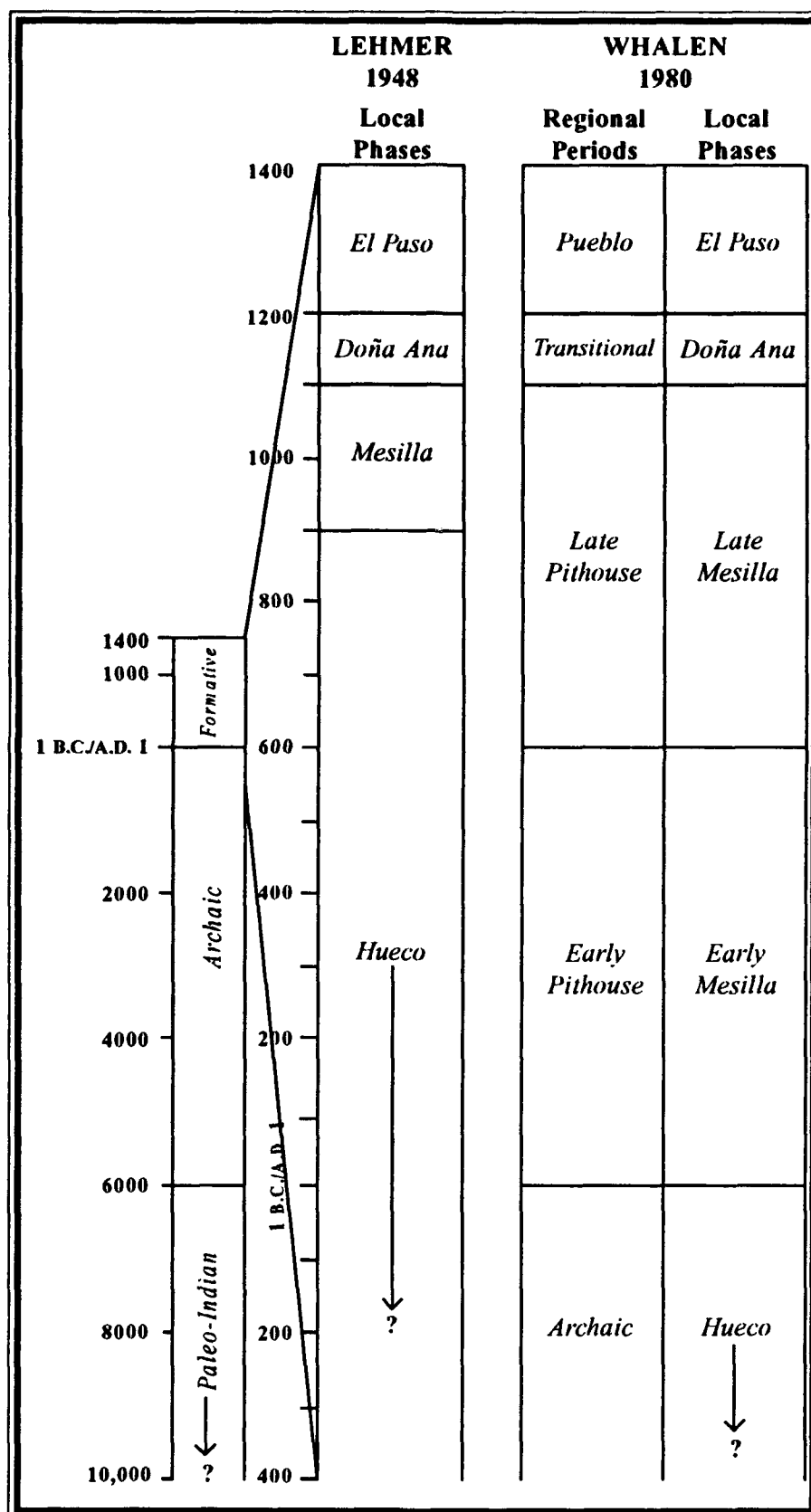


Figure I-4. Chronologies for the El Paso Area

Little is known of the cultural system used by the Clovis people in this area. Data from the adjacent Plains and Southwest suggest they were hunters of Pleistocene megafauna (mammoth) and lived in small, mobile bands.

The Tularosa Basin and Hueco Bolson have produced a great number of fluted projectile points associated with the subsequent Folsom culture, which is dated to between 11,000 and 10,000 B.P. Folsom points may represent a more specialized hunting adaptation than do the earlier Clovis points. Folsom points in the greater Southwest often are found in association with Late Pleistocene and Early Holocene forms of bison. Folsom populations are thought to have been organized into bands of highly mobile hunters similar to those of the earlier Clovis populations.

Folsom remains found in the Jornada Mogollon region generally are associated with small camps that probably were occupied for short periods of time (Brook 1968; Carmichael 1986; Davis 1975; Quimby and Brook 1967). Excavations at FB1613, located several kilometers northwest of the current study area, produced many Folsom projectile point fragments, probably from this sort of camp site. The site is multicomponent, and the Folsom remains come from fairly discrete loci within the site, which appears to have multiple Folsom occupations.

The late Paleo-Indian period is represented by a variety of lithic traditions collectively called the Plano culture. Plano materials generally date from 10,500 to about 5000 B.P. The Plano assemblage includes a series of projectile points, many of which are stylistically similar to the Folsom. Other Plano points have fine collateral flaking and are among the most technologically well made points in the New World. Types of projectile points within the Plano culture include Plainview, Agate Basin, Angostura, and Cody. These traditions are associated with the Late Pleistocene and Early Holocene. Plano people probably lived in small, mobile bands, as did their predecessors.

Projectile points of the Plano culture are found in the Jornada Mogollon region and on Fort Bliss. Small camps are the typical Plano site type in the area, although sites with Plano points are rare.

Carmichael (1986:205-212) summarized the small amount of data that exist on the Paleo-Indian occupation of the study region. There is little archaeological evidence of the Clovis populations, but the subsequent Folsom and Plano occupations are somewhat better represented. In general, the occupation seems to have been a limited one. Whether this reflects a lack of concentrated investigation of this period or a low intensity of occupation is unclear.

Within the general study area, Folsom sites tend to be located slightly closer to playas than do Plano sites. Plano sites, however, occur more commonly on overlooks than do Folsom sites (67 percent vs. 43 percent). In both cases, most of the sites recorded by Carmichael (1986:209) have tool and artifact inventories that indicate the sites were camps and not kill or butchering areas. Two possible kill sites, however, may have been identified in the study area.

Carmichael also reports the presence of ground stone on several possible Paleo-Indian sites. This finding has not been investigated further. It does, however, raise the interesting possibility that Paleo-Indians were not as dependent upon hunting as is generally assumed.

In sum, little is known of the early human occupants of south-central New Mexico and western Texas. More intense investigation of this period would be useful.

Archaic Period

During the Middle Holocene (8000 to 4000 B.P.), current climatic regimes were established within the region. Drying trends produced arid desert and desert grassland environments. Human adaptations to this climatic change included new subsistence strategies that developed into what is now known as the Archaic (8000 to 2000 B.P.).

Archaic people became extraordinarily efficient at intensively and extensively exploiting their local environment. During this period, there was an increased dependence upon collected plant foods and seed gathering. The extinction of Pleistocene megafauna led to the hunting of smaller game. Animals such as bison, deer, mountain sheep, and rabbit became primary sources of animal protein. Archaic people probably moved frequently in response to the seasonal availability of resources.

An important event in the late Archaic is the introduction of cultigens into the area. Although they had little immediate impact upon Archaic ways of life, cultigens would become increasingly important during subsequent adaptations.

The exploitation of diverse resources during the Archaic resulted in a variety of site types in a variety of environmental settings. Base camps, thought to have been seasonally occupied, are found in caves in the mountains bordering the basins and along the Rio Grande (Cosgrove 1947; Human Systems Research 1972; O'Laughlin 1977). A series of Archaic open sites also has been recorded in the study region (Carmichael 1986; O'Laughlin 1980; Whalen 1980, 1986). On the western side of the Franklin Mountains, O'Laughlin (1980) identified several small pithouses, or "huts," which date to the late Archaic, 2000 B.C. Archaic campsites have been identified in the Hueco Bolson using chronometric data from charcoal preserved in hearths (Whalen 1980, 1986). Commonly, Archaic sites and components are identified by the presence of Archaic projectile points.

Despite the multitude of ceramic sites recorded within the study region, little is known about the Archaic in south-central New Mexico and West Texas. Most archaeologists working in the area tend to assume that many aceramic sites represent the Archaic period, but there is little chronometric data to support this assumption. It is believed that a significant Archaic occupation of the area existed, but archaeological data documenting Archaic settlement patterns and ways of life still are quite limited.

Formative Period

The beginning of the Formative period is defined by the appearance of ceramic technology. The Formative is thought to be characterized by an increasing dependence upon agriculture and the development of settled village life. In the Jornada Mogollon culture area, the Formative period is divided into the Mesilla, Doña Ana, and El Paso phases (Lehmer 1948).

Mesilla Phase (A.D. 200-1100)

The Mesilla phase represents the Pithouse period in the research area. Whalen (1980) divided this period into early and late Pithouse periods and extended the date for the beginning of the Mesilla phase back to A.D. 200.

Early Pithouse Period (A.D. 1-600)

The early Pithouse period is yet to be well defined. Residential structures of this period typically are small, shallow depressions like those found in the late Archaic. They represent the expenditure of very little excavational labor. These features have come to be called "huts" by many local archaeologists to distinguish them from semisubterranean houses excavated into the ground and having prepared walls and floors. These features frequently are found isolated from one another. There has been little excavation of early Pithouse sites, however, and future excavation may document localized groups of these residential "huts."

The diagnostic ceramic ware of this period is El Paso Brown. Whalen (1980) has suggested ceramics were present as early as A.D. 200, but the relationship between the relevant radiocarbon date and the associated ceramic material is somewhat ambiguous. Therefore, this date for the appearance of ceramic technology in the area should be viewed as tentative.

Archaeological surveys of the Hueco Bolson and southern Tularosa Basin have produced the best data for the early Pithouse period. Many small sites have been recorded throughout the basin floor (Carmichael 1986; Whalen 1977, 1978, 1981, 1986). Some larger sites appear to be associated with playas. It is thought that the margins of the playas probably had greater quantities of usable resources, thus attracting more intensive utilization and occupation of these locations.

The early Pithouse period seems to represent a continuation of major features of the late Archaic cultural system. The principal differences in the current data for the two periods are the introduction of ceramics and a suspected, gradually increased dependence upon farming in the early Pithouse period.

O'Laughlin, et al., (1988) have identified the principal problem in studying the early Pithouse period as the difficulty of identifying early Pithouse sites and components. They note that the primary means by which such sites are identified is the presence of undecorated brown ware and the absence of painted ceramics. They point out that brown ware was manufactured throughout the Formative period, and the presence of undecorated brown ware alone does not prove that a site is an early Pithouse period site. Several attempts have been made to develop an index with which to measure chronological changes in El Paso Brown Ware rim forms (Carmichael 1986; Whalen 1980; West 1982). These, however, have had mixed success and acceptance. Thus, identifying sites as early or late Pithouse based either upon the rim form of the undecorated ceramics or simply the presence of undecorated brown ware is not yet well justified.

Late Pithouse Period (A.D. 600-1100)

The late Pithouse period is better documented than the early Pithouse period. In addition to El Paso Brown, intrusive decorated wares begin to appear on late Pithouse sites. In particular, Mimbres Black-on-white is found on these sites, and it is thought to occur in the area beginning around A.D. 750 (Anyon 1985). The local brown ware rims are thought to be more direct and thickened than those of the early Pithouse period. The changed rim form and the presence of Mimbres Black-on-white are the most frequently used indicators for late Pithouse period occupations.

Studies in the Hueco Bolson and Tularosa Basin (Carmichael 1986; Skelton et al. 1981; Whalen 1977, 1978, 1980) suggest that there was a substantial increase in the number of sites as the early Pithouse

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period gave way to the late Pithouse period. Additionally, several different kinds of sites have been defined for the late Pithouse period (Hard 1982; O'Laughlin 1979; Way 1977; Whalen 1977, 1978). These include campsites, agave processing sites, hunting camps, and small and large villages. These different kinds of sites may be a function of a more scheduled exploitation of seasonally available resources than was characteristic of the early Pithouse period. Many small sites are located in the central regions of the basins. These are thought to represent wild plant food procurement sites. The agave-processing sites principally are found at the margins of the basin where leaf succulents such as agave are more common. Hunting camps are found in the mountain areas. In general, the subsistence strategy of the late Pithouse period probably was very similar to that of the preceding period. It appears, however, that farming became increasingly important and that there was an increase in the level of sedentarism. Late Pithouse period populations, however, apparently remained primarily a hunting and gathering adaptation.

During the late Pithouse period there was also an increase in interregional interaction, evidenced in intrusive (i.e., nonlocal) ceramics and other materials, the origins of which are outside of the area. Mimbres Black-on-white, San Francisco Red, and marine shell (primarily *Olivella*, sp.) document the interaction. That interaction, however, still was quite limited in scope.

In summary, cultural change during the Pithouse period seems to have been rather slow. General developments include: (1) population increase, (2) larger and more sedentary communities, (3) increased dependence on farming, and (4) increased interregional interaction. The Mesilla phase adaptation in south-central New Mexico and West Texas seems to have been a stable and lengthy one.

Doña Ana Phase (A.D. 1100-1200)

The Doña Ana phase represents the pithouse to pueblo transition in the Jornada Mogollon culture area. Whalen recently has referred to this phase as the Transitional period. This phase is the most problematic and poorly understood in the southern Jornada Mogollon sequence.

The first locally manufactured painted ceramics appeared in this phase, including El Paso Bichrome and El Paso Polychrome. El Paso Brown continued to be manufactured, but it began to be made with thicker rims during this phase. Intrusive ceramics include Mimbres Black-on-white, Chupadero Black-on-white, and possibly Playas Red from northern Chihuahua. Whalen (1981b) did not identify Playas Red as occurring on Doña Ana phase sites; however, Carmichael (1986) suggested that it may be present in substantial quantities.

Pithouses apparently continued to be the predominant residential structure during the Doña Ana phase. Surface structures began to appear at this time; however, they initially may have been utilized for storage or other nonresidential purposes. The sizes of sites seem to have increased as well (Carmichael 1985; Whalen 1977, 1978, 1980).

There appears to have been an increased dependence on farming during the phase. Several varieties of corn and beans, along with bottle gourds, have been identified at the Meyer Pithouse Village (Scarborough n.d.). Sites frequently are located along the alluvial fans extending into the bolsons and basins. Site locations, the increase in site size, and the increasing reliance upon cultigens all indicate greater sedentarism during the Doña Ana phase than during previous periods. These factors also seem to have contributed to the

social reorganization of Doña Ana phase communities in that supra-family cooperation apparently became important during this time (O'Laughlin et al. 1988; Whalen 1977, 1978).

Research in the Hueco Bolson (Whalen 1977, 1978) and in the Tularosa Basin (Carmichael 1986) has resulted in differing views of the Doña Ana phase. Whalen presented a more traditional, linear view of the area's prehistory (pithouse, pithouse-to-pueblo, pueblo development). He suggests the Doña Ana phase is transitional between the earlier pithouse and the later pueblo periods in virtually all aspects.

Carmichael (1986) criticized this view on the basis of extensive survey data from the Tularosa Basin. He suggested that Doña Ana phase populations may have been more dependent upon farming than El Paso phase populations. He further suggested Doña Ana groups had an intensive land-use strategy and a more complex form of social organization than populations of the later El Paso phase. Carmichael also proposes that El Paso phase populations may have reverted to a more extensive land-use strategy than Doña Ana phase populations and that they may have been more like late Pithouse period populations than those of the Doña Ana phase. His suggestions, however, have not been tested.

O'Laughlin (1980; O'Laughlin et al. 1986) suggested that shifts in rainfall patterns may have resulted in two relatively distinct occupational/settlement patterns and that Carmichael's use of survey data to explain the whole of Doña Ana phase development may be premature. Additionally, Carmichael's interpretation is based upon the putative presence of middens during the Doña Ana phase and their absence during the El Paso phase. He generally has ignored the possibility that many Doña Ana phase sites may, in fact, be multiple-component late Pithouse period and El Paso phase sites. The ceramic assemblage on such sites would be much like that on Doña Ana phase sites. And it could be that such multiple component sites have middens that are representative of the El Paso phase. Clearly, the Doña Ana phase is problematic and poorly understood.

El Paso Phase (A.D. 1200-1400)

The Pueblo period in the southern Jornada Mogollon area is called the El Paso phase (Lehmer 1948). Although the El Paso phase is the most intensively investigated in the area, current understanding of the pueblo cultural system is still limited. Most of the data about the El Paso phase come from excavated rooms. As O'Laughlin et al. (1988:16) stated, there is little understanding of "the spatial organization of activities or patterning of artifact assemblages outside the rooms themselves."

The El Paso phase artifact assemblage is dominated by the late variety of El Paso Polychrome that often occurs in the form of large, thin walled ollas with recurvate rims. Intrusive wares from the Casas Grandes area, Arizona (Salado and White Mountain red wares), and central New Mexico are common. Marine shell and copper items also are present. Chipped stone assemblages suggest the use of bows and arrows, and ground stone assemblages suggest a heavy reliance upon farming for subsistence. Wild plants and hunted animals continue to account for substantial portions of the diet (Foster and Bradley 1984; O'Laughlin 1977b; Whalen 1977, 1978).

El Paso phase architecture is dominated by adobe surface structures with some pueblos having more than 100 rooms. Small pueblos with eight to ten rooms are more common. Evidence is limited for the presence of anything other than single-story structures. Some El Paso phase pit structures also have been recorded.

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Pueblo phase sites are found both along the Rio Grande and in the interior of the desert basins. Most large pueblo sites are located along rivers, near alluvial slopes to utilize rainfall runoff, and close to playas. An interesting water-control feature recorded at one El Paso phase site is a reservoir located so as to collect and store runoff from rainwater at the Hot Wells site (Scarborough 1988). This feature apparently was lined with caliche plaster, and it may have held as much as 180 cubic m of water.

El Paso phase society seems to have become more complex as well. There is an elaboration of material culture, increased interregional interaction, and increased ceremonialism evidenced in the abundant and complex rock art in the area. Undoubtedly, greater population concentrations and higher densities led to the internal reorganization of local populations as well.

Another important factor that probably contributed significantly to the development of the El Paso phase was the expansion of Casas Grandes as a regional economic and political power. The timing of the increased complexity in the El Paso phase occurred during the Medio period at Casas Grandes, which has now been dated to begin ca. A.D. 1200 (Ravesloot, Dean and Foster 1986).

Whalen (1981b) concludes that Pueblo period sites are numerous in the Hueco Bolson and that this was the time of most intensive occupation. He also presents evidence that Pueblo period sites are larger than previous sites. Carmichael (1986) noted that there was an apparent decline in the occupation of the Tularosa Basin during the El Paso phase. Again, this decline may have been related to changes in rainfall patterns, which are thought to have shifted southward during El Paso phase times (O'Laughlin 1980).

The Pueblo period in the southern Jornada area ends ca. A.D. 1400. The large pueblo sites in the basins are abandoned. Some, however, probably continued to be occupied along the rivers. It has been argued that local populations reverted to a mobile hunting and gathering way of life (Upham 1984). The end of the pueblo period is generally associated with the onset of extended droughts throughout the Southwest. Others (e.g., Ravesloot 1986) have suggested the collapse of the Casas Grandes system also may have contributed to the decline of the El Paso phase. At the time of the arrival of the Spanish, the area was occupied by several historic native groups (Freeman 1981).

Environment

Pueblo Sin Casas is located at an elevation of 1,198 m in what Whalen (1978:5) defined as the Low Desert Zone of the western Hueco Bolson. The bolson, a large intermontane basin, lies between the Franklin Mountains to the west and the Hueco Mountains to the east (see Figure 1-5). The Bolson is part of the Mexican Highland Basin and Range Province, characterized by a series of north-to-south-trending mountain ranges and basins. The site is in an extensive dune field that characterizes most of the Low Desert Zone.

Geology

The geology of the area has been summarized by Piggot (1978). The bolson is a graben complex resulting from crustal tension of the Rio Grande rift during the Tertiary (Chapin and Seager 1975). It since has filled with lacustrine and alluvial sediments of the Tertiary and Quaternary. During the Kansan period,

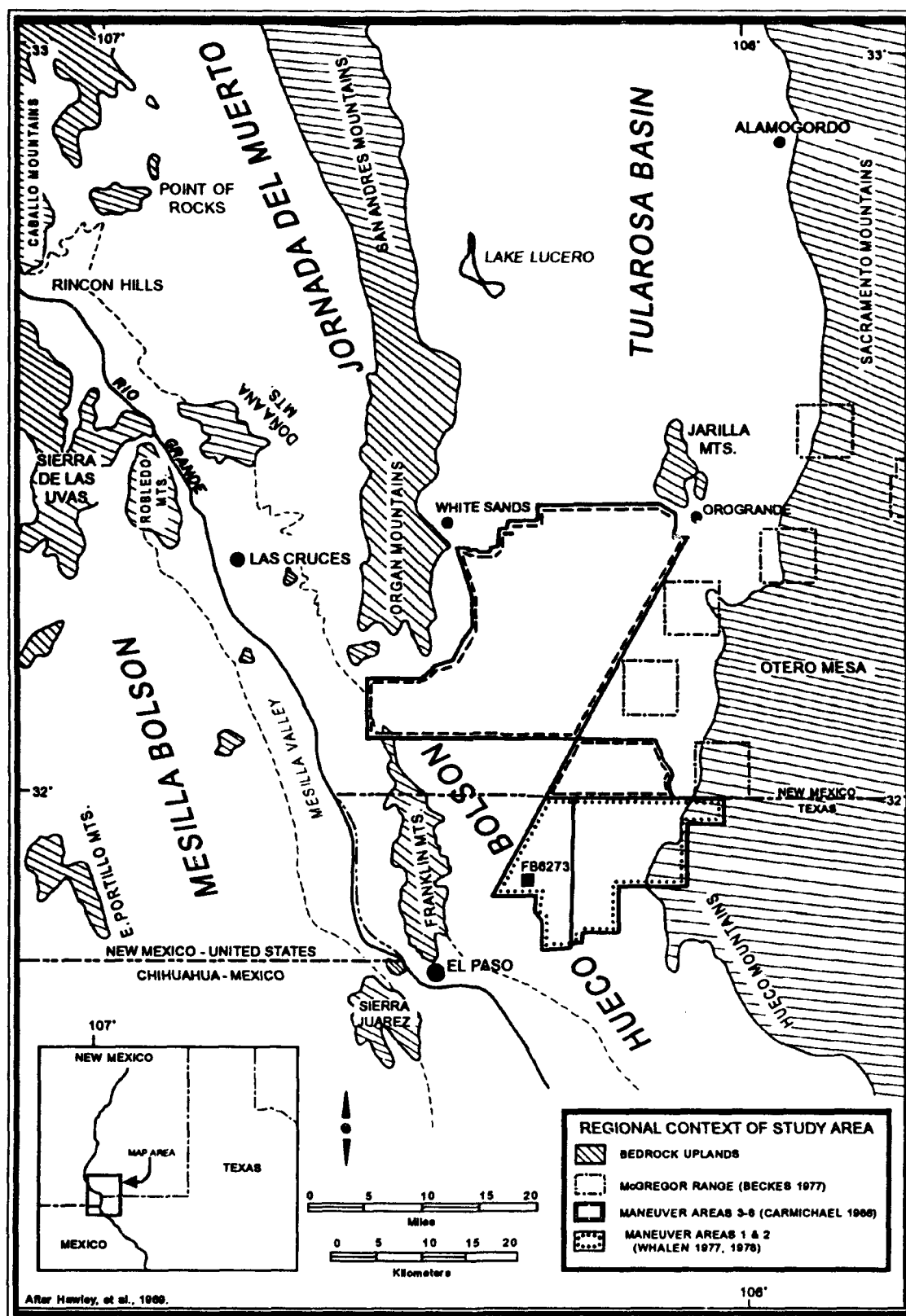


Figure I-5. Study Area in a Regional Context

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lacustrine deposition ceased when an outlet draining the basin was cut by geological forces. The Fort Hancock Formation, containing the sediments left behind, is composed of horizontal strata of fine sand, siltstone, and bentonitic clay (Strain 1969). The sediments measure as much as 2,744 m deep under Fort Bliss (Lovejoy 1980:9).

The Camp Rice Formation, composed of gravel, sand, silt, volcanic ash and caliche (Pigott 1979:209-210; Strain 1969), overlies the Fort Hancock Formation. The Camp Rice Formation appears to be shallow in the western part of the bolson.

The surface of the bolson is covered by soils produced during the last major Quaternary Pluvial (Pigott 1978:210). These soils have been divided into five groups (see Pigott 1978:210-215, for a detailed description): aquic calciorthids, aquic paleargids, torripsamments, calciorthids and paleargids. The aquic calciorthids and aquic paleargids are associated with ephemeral lakes, or playas, in the region. The playas have no drainage outlets and retain water for varying periods of time after heavy rains. The aquic paleargids contain impermeable montmorillonite clays that can remain saturated for extended periods of time.

Pueblo Sin Casas is partially covered by coppice dunes. The dunes are formed from torripsamment soils and usually are stabilized by mesquite. Coppice dunes are typical of the Low Desert Zone. The dunes are believed to date to the late nineteenth and early twentieth century (O'Laughlin and Crawford 1977). A caliche (calcium carbonate) horizon typically underlies the dune fields of the Low Desert Zone.

Water

The Hueco Bolson drains internally. Except for the Rio Grande, located approximately 22 km south of FB6273, surface water is not available permanently anywhere in the basin. During the dry season, October through June, very little water is available in the lower basins. In the rainy season, playas fill and temporarily retain water and moisture. During exceptionally wet years some playas may hold moisture throughout most of the year. Farming could have been practiced around these playas. Another major source of water for agricultural activities appears to have been rainfall runoff, particularly along the edges of the mountains surrounding the basin.

Climate

The modern environment of the study area is semiarid mesothermal. Most of the precipitation occurs in monsoon-like thunderstorms during July, August, and September. Summer rainfall causes rapid runoff while winter precipitation is slow and penetrating (O'Laughlin 1980:12).

Relative humidity is low, days are warm, and nights are cool. Daytime and nighttime temperatures may vary as much as 15° C. Maximum June temperatures average 35.2° Centigrade and January temperatures 13.5° C. Average annual frost free days number 248 for the Hueco Bolson area (O'Laughlin 1980:12).

Variations in rainfall and temperature combine to produce both a marked winter/summer seasonality and a long growing season. The productivity of plants and animals varies greatly as a result of the spatial and temporal

variation in temperature and rainfall (O'Laughlin 1980:12). The region's topography and geological substrata also affect vegetational patterns within the study area.

Paleoenvironment

In recent years a number of investigators have studied paleoenvironmental conditions in the south-central New Mexico and West Texas area (VanDevender 1977; VanDevender, Betancourt and HSR, n.d.; VanDevender and Everitt 1977; VanDevender, Freeman, and Worthington 1978; VanDevender and Riskind 1979; VanDevender and Spaulding 1979; VanDevender, Spaulding and Phillips 1979). Their findings indicate that during the Late Wisconsin, the study area contained dense mesic forests. White pine, piñon, and fir were present at the lower elevations of the Hueco, Sacramento, and Guadalupe Mountains as late as 11,500 B.C. (VanDevender, Betancourt and HSR n.d.; VanDevender and Riskind 1979; VanDevender, Spaulding, and Phillips 1979). A winter precipitation pattern may have dominated; winters probably were mild and summers cool. Large Pleistocene fauna were present, but they became extinct by the Early Holocene. Mesic forests were greatly reduced during postglacial times.

The Early Holocene also may have been dominated by a winter precipitation pattern. This was a transitional period, however, during which extensive grasslands were established (Harris 1977; VanDevender and Spaulding 1979). Evidence exists for the presence of juniper woodlands at elevations as low as 1,465 m at Bishop Cap (VanDevender and Everitt 1977). The transitional character of the Early Holocene is thought to be confirmed by the many plant specimens represented in fossil pack rat middens but not in modern plant assemblages in the area (VanDevender and Spaulding 1979:709). Furthermore, it appears that a great deal of diversity was characteristic of the plant communities of the region during the period (Carmichael 1986; VanDevender and Everitt 1977).

During the Middle Holocene, 8000 and 4000 B.P., the present climatic regimes were established. There was a reduction in winter precipitation and an increase in, and perhaps an intensification of, summer rainfall. In the study area, these changes resulted in the formation of desert grasslands and the appearance of desert plant species such as creosote, acacia, mesquite, agave, sotol, and ocotillo (VanDevender, Betancourt, and HSR n.d.; VanDevender and Riskind 1977). Between 5000 and 4000 B.P., aridity in the area appears to have increased with the loss of well-developed soils. This may have contributed to the development of the desert shrub-grassland vegetation typical of the Late Holocene in the area (VanDevender and Spaulding 1979:709; VanDevender and Worthington 1977). Subsequent changes during the Late Holocene are relatively minor and localized, although some probably had more widespread consequences (i.e. the drought of A.D. 1276-1299 [Carmichael 1986:44]). In general, the Late Holocene is a time of limited fluctuations in local climatic and vegetational patterns.

Chapter II

CHIPPED STONE ARTIFACTS

Lorna Lee Scarbrough
and Michael S. Foster

The most abundant artifactual materials recovered from the excavations at Pueblo Sin Casas were chipped stone debitage, flakes, and retouched tools. A total of 3,017 pieces of lithic material were analyzed.

Analysis of the debitage and flake material concentrated upon identification of reduction sequences and the activities carried out at the site. The spatial distribution of these materials was examined to reconstruct activity areas at the site. The retouched implements (projectile points, scrapers, choppers) were analyzed for a series of functional, formal, and temporal attributes that also could be used to identify the activities carried out at the site and temporal placement of the implements.

Lithic Materials

To standardize and facilitate analysis of the lithic material, the stone artifacts were sorted into groups based on material type (chert, quartzite, rhyolite, etc.), color, and texture (fine, medium, etc.) (see Table II-1). The typology and material codes employed are based on those established previously by Human Systems Research (Wimberly and Eidenbach 1980).

The most common material type present in the chipped stone assemblage is quartzite (49 percent), followed by chert (19 percent), rhyolite (13 percent), obsidian (4 percent), and basalt (2 percent). The remaining 13 percent of the material is made up of a variety of other materials (see Figure II-1).

Chert represents only 19 percent of the assemblage of material types, but it was used to make 68 percent of the formal tools recovered from the site. Clearly, prehistoric residents of the site were highly selective in their choice of material used for retouched implements. Obsidian and quartzite are the next most common lithic materials. Rhyolite and many of the miscellaneous material types are not represented in the assemblage of retouched tools.

Obsidian in the region occurs only as small, waterworn pebbles in the gravels of the ancestral Rio Grande that once flowed through the area. The current channel of the Rio Grande is more than 20 km to the south of Pueblo Sin Casas. No obsidian outcrops are known in the El Paso area. Several varieties of obsidian, probably representing several different upstream sources, are found in the gravels. Gravels from the east side of Fillmore Pass, the Black Hills on the southwest side of the Organs, and near McCombs Avenue in El Paso, Texas, are known to contain concentrations of obsidian pebbles (Carmichael 1986:167).

Another material type of particular note is chert from the Rancheria formation, the so-called Rancheria chert. Fifty-six pieces were noted in the chipped stone assemblage. Rancheria chert is fairly common and comes in nodular and tabular forms with a cortex of porous, fine-grained limestone. In fact, the chert itself often is porous. Colors range from brown to gray, and it generally is of good quality (Carmichael 1986:167).

Table II-1. Raw Material Type Codes by Lithic Artifact Categories

CODE	DESCRIPTION	TOTAL NUMBER	TOOLS	CORES	REDUCTION FLAKES	THINNING FLAKES	EDGERETOUCH FLAKES	FLAKE FRAGMENTS	UTILIZED ANGULAR DEBRIS	UNUTILIZED ANGULAR DEBRIS
CHERT										
2	white	2					1			
3	white w/black inclusions	2		1						1
4	white w/yellow inclusions	13			1	3	4			5
5	opaque white	10			2	4	1			3
6	gray	104	2	2	11	19	9	3		58
7	black	102	6	1	10	20	15		1	49
8	light gray w/gray to brown inclusions	38			6	13	1		1	17
9a	tan to brown w/white to dark brown inclusions	62	3		4	17	8	3		27
9b	dark brown	14			1	6	1			6
9c	dark red chert (some w/red and/or blue inclusions)	7			1		2			4
9e	pink w/yellow and/or blue inclusions	6				2	1			3
9g	yellow/brown w/red inclusions	7	1		2	2				2
9h	pink/brown w/red inclusions	26	1		1	8	5			11
9i	beige/brown w/transparent quartz inclusions	9			2	3	1			3
9j	tan/brown banded	54	1	1	5	16	6		1	24
9k	rose/tan	40			1	15	3			21
9m	light blue w/transparent quartz inclusions	1								1
9n	green	4	1		2					1
9o	cream/white w/red inclusions	6			2	2				2

Table II-1, continued

CODE	DESCRIPTION	TOTAL NUMBER	TOOLS	CORES	REDUCTION FLAKES	THINNING FLAKES	EDGE RETOUCH FLAKES	FLAKE FRAGMENTS	UTILIZED ANGULAR DEBRIS	UNUTILIZED ANGULAR DEBRIS
	AGATE	24			3	6	2	1		12
CHALCEDONY										
10	dark gray transparent	3				1				2
11	white transparent w/black inclusions	1								
12	gray/white transparent w/red inclusions	7			2	3				2
14	white transparent	1								1
15	beige w/red inclusions	7						2		5
16	dark brown transparent	2				2				
18	white/brown w/pink and/or blue inclusions	2			1		1			
19	dark gray to black transparent	1			1					
JASPER										
50	red	6			1	1				4
51	yellow w/red and/or black inclusions	7		1						6
QUARTZITE										
20	yellow/tan/brown	352	2		37	39	7			267
21	yellow w/black inclusions	25			1	2				22
22	rose/yellow/tan	222	1	1	4	5	1			210
23	white	45			4					41
24	rose/vermillion	125			3	2				120
25	gray	624		2	42	51	10	3		516
26	rusty rose	86			5	4	1			76
27	pink	6								6

Table II-1, continued

CODE	DESCRIPTION	TOTAL NUMBER	TOOLS	CORES	REDUCTION FLAKES	THINNING FLAKES	EDGE RETOUCH FLAKES	FLAKE FRAGMENTS	UTILIZED ANGULAR DEBRIS	UNUTILIZED ANGULAR DEBRIS
QUARTZITE, continued										
28	red	6								6
BASALT										
30	gray/black	35		1	3	4		3		22
31	gray/green	4								4
33	cream w/brown/red inclusions	9	1							8
34	white/gray w/vermillion inclusions: coarse grained	3								3
36	mustard yellow vitreous	1								1
37	yellow w/transparent quartz inclusions: coarse grained	2								2
91	green	7				1				6
OBSIDIAN										
40	black opaque	113	3	17	29	26	18	1		19
RHYOLITE										
110	gray to pink w/inclusions	408		4	43	30	7	5		319
MISCELLANEOUS MATERIALS										
60	silicified wood: gray banded w/yellow/brown/red/gray	4								4
70	fossiliferous	2		1						1
100	quartz: white	14				1		1		12
120	limestone	20								20
130	metallic	9								9
140	slate	2								2
160	gneiss: pink	2								2

Table II-1, continued

CODE	DESCRIPTION	TOTAL NUMBER	TOOLS	CORES	REDUCTION FLAKES	THINNING FLAKES	EDGE RETOUCH FLAKES	FLAKE FRAGMENTS	UTILIZED ANGULAR DEBRIS	UNUTILIZED ANGULAR DEBRIS
MISCELLANEOUS MATERIALS, continued										
	agrilatious sandstone	115		1						114
	sandston	40								40
	red clay	6								6
	conglomerate	99								99
	unknown	68								68
	TOTALS	3,022	22	33	226	308	107	24	3	2,297

It appears that all lithic material types represented at the site are available locally. Most of the cherts occur in pebble form, like obsidian, from the Rio Grande gravels, although chert nodules are found in limestone strata on the mountain ranges surrounding the basin. Rhyolite is available in the mountains and alluvial fans of the Franklin and Organ Mountains. The local rhyolites are generally dark red, pinkish, purple, or black in color.

Technological Attributes

Several technological attributes (see Table II-2) were examined to assess the technological ability of those who produced the chipped stone implements and debris recovered from the site. These attributes also helped interpret the ways in which the lithic materials at the site were procured, reduced, and utilized.

Decortification

The cortex of a piece of stone is the outer, weathered layer or surface that covers the stone. The cortex usually is not suitable for flaking because of its weathered condition, its state of decomposition, and its battered and flawed state. The cortex usually is removed and discarded during the preparation of a core for further reduction. The presence or absence of cortex on the dorsal surface, the nonbulbar surface, of a flake is used to assess the reduction stage during which the flake was removed from the core material. Flakes with 50 to 100 percent of the dorsal surface covered with cortex are classified as primary decortification flakes and are associated with the initial stages of lithic reduction. Flakes with less than 50 percent of the dorsal surface covered with cortex are classified as secondary flakes. Flakes totally lacking cortex on their dorsal surfaces are classified as interior flakes. Secondary flakes generally are associated with the intermediate stages of core reduction. Interior flakes are associated with the latter stages of core and flake core reduction (Bradley 1975).

The majority (73 percent) of the flakes recovered from Pueblo Sin Casas are interior flakes. Secondary flakes constitute 17.7 percent of the flake material and primary flakes make up 8.9 percent.

The material recovered from FB6273 indicates the later stages of lithic reduction occurred more often at the site than did the initial stages (see Table II-2). This conclusion is further supported by the finding that 64 percent of the flakes are thinning or edge retouch flakes. This suggests lithic materials (cores, preforms, and tools) were transported to the site in a reduced state. Some maintenance activities, such as resharpening, probably were performed at the site.

Table II-2. Flake Attributes

ATTRIBUTE	NUMBER	PERCENTAGE
Decortification		
Primary	59	8.9
Secondary	117	17.7
Interior	486	73.4
Complete Flake	389	58.8
Incomplete Flake	273	41.2
Bulb Absent	104	
Bulb Diffuse	441	79
Bulb Distinct	117	21
Lip Present	468	
Platform Prepared	109	
Utilized	133	20.1
Unutilized	529	79.9

Bulb of Force

The bulb of force is located at the proximal (platform) end on the ventral surface of the flake. It has been argued that the size and distinctiveness of the bulb may be indicative of the type of force, percussion or pressure, used to remove a flake from the parent material (Crabtree 1967:60, 1972:48; Muto 1971:110-111). A distinct, well-defined, prominent bulb is associated with hard hammer percussion, whereas a diffuse, somewhat amorphous bulb is more typical of soft hammer percussion or pressure flaking.

Of those whole or fragmentary flakes with bulbs, 79 percent were classified as having diffuse bulbs while 21 percent were defined as being distinct. If bulb size and distinctiveness is an indicator of hammer type

or flaking method, then this finding suggests that the vast majority of flakes were produced by soft hammer percussion or pressure flaking. In further support of this hypothesis, the number of flakes with diffuse bulbs and the number of interior flakes correspond closely. Four hundred and forty-one flakes with diffuse bulbs were found at the site as were 486 interior flakes. Soft hammer percussion and pressure flaking are commonly used in the latter stages of lithic reduction and maintenance because they provide more control over how material is removed from a blank, preform, or tool edge.

However, using the size and distinctiveness of the bulb as an indicator of the hardness of the indenter is problematic. Although they noted some association of bulb size with indenter hardness, Del Bene and Shelley (1979:251-252) suggest other factors, such as the rapidity and the degree of applied force, also seem to influence the size and shape of the bulb. Thus, the form of the bulb may be an ambiguous indicator of hammer or indenter hardness.

Lip

A lip occurs along the platform edge on the ventral surface of a flake and is identified as a slight projection of stone from the platform itself. Crabtree suggested that lips are associated with soft hammer percussion (Crabtree 1972:74). Lips occurs on 468 specimens from the site. Although the association between lips and soft hammer percussion and pressure flaking is tenuous, it may be a further indication that soft hammer and pressure techniques were commonly used during the final stages of reduction at the site.

Platform Preparation

Platform preparation was observed on 109 of the flakes or flake fragments analyzed. Platform preparation occurred exclusively in the form of dorsal overhang removal. During the reduction of lithic material, a slight projection sometimes develops along the dorsal edge of the platform. Knappers usually will remove this projection or overhang in order to strengthen the platform. If force is applied to the overhang during the attempt to remove a flake, the overhang can break away and result in the indenter slipping and force being misapplied or in the failure to remove the flake. The dorsal overhang is removed either by grinding or flaking, procedures that sometimes are confused with crushing.

Hinge Fracture

The term "hinge fracture" is used to refer to the way a flake terminates at the distal end where its ventral and dorsal surfaces join and terminate. If a flake is properly removed, it will terminate in a feather termination. In other words, the ventral surface will taper to the dorsal surface evenly, forming a sharp edge along the distal perimeter of the flake. A hinge fracture, on the other hand, results from the misapplication of force. A rounded distal edge is formed when the ventral surface curves into the dorsal surface. Of those flakes or fragments having distal flake ends, 140 exhibited hinge fractures. Hinge fractures are surprisingly common among the flakes at the site, occurring on approximately 20 percent of all flakes. These fractures indicate the knappers had problems in material reduction.

Morphological Types

The chipped stone assemblage, after being sorted by material type, was sorted by the presence or absence of flake attributes (i.e., bulb of force, platform) and retouching. Three broad categories were derived: angular debris (shatter), flakes, and tools.

Angular Debris

Angular debris is a by-product of the reduction of lithic material. However, it lacks the attributes of flakes, such as bulbs of force, flake scars, or undulations (ripple marks). Angular debris results from uncontrolled breakage of lithic material caused by excessive application of force, misapplication of force, or imperfections in the material being reduced. Some 2,297 pieces of angular debris, representing 76 percent of the total chipped stone assemblage, were examined. This number is likely inflated, probably substantially, by the presence of naturally broken materials that could not be differentiated from those pieces that were the result of lithic reduction. All but four of the items put into the "miscellaneous" category were classified as angular debris.

Quartzite is the most common material type among angular debris (55 percent, N=1,264). Other materials represented include rhyolite (14 percent, N=319), cherts (12 percent, N=272), basalt (2 percent, N=46), and obsidian (1 percent, N=19). The remaining 16 percent (N=377) of the angular debris is made up of a variety of materials. Items classified as shatter were not studied in depth and will not be considered further.

Cores

Thirty-three cores were recovered from the excavations. Fifty-two percent (N=17) are obsidian. The obsidian cores are generally small, and appear to have been reduced with a bipolar technique (Crabtree 1975:42). Accordingly, obsidian tools tend to be small. Cores also were made of chert (N=6), rhyolite (N=4), quartzite (N=3), basalt (N=1), and unidentified material (N=2).

All the cores from the site are fairly small. They range in size from 1.35 x 1.35 x 0.65 cm (obsidian) to 4.25 x 6.25 x 9.25 cm (quartzite). Multidirectional flake removal is common on most of the materials other than obsidian. Unidirectional flake removal is more common on obsidian and appears to be the result of bipolar reduction.

Some of the cores also exhibit secondary use as scrapers (see Figure II-1,a), choppers, and hammerstones. Several of these uses are discussed below.

Flakes

Six hundred and sixty-five flakes and flake fragments were recovered from the excavations at Pueblo Sin Casas. Material types represented in the flake material include cherts (41 percent, N=270), quartzites (34 percent, N=221), rhyolite (13 percent, N=85), obsidian (11 percent, N=74), and basalt (1 percent, N=13), (see Table II-3). Two flakes are of a white quartz material.

Table II-3. Flake Dimensions by Material Type

MATERIAL TYPE	FLAKE TYPE	NUMBER	DIMENSION	MEAN	STANDARD DEVIATION	VARIANCE
Chert/Chalcedony/ Jasper/Agate	Reduction	55	Length	2.04	0.89	0.79
			Width	2.03	0.68	0.46
			Thickness	0.65	0.31	0.09
	Thinning	143	Length	1.46	0.51	0.26
			Width	1.37	0.43	0.18
			Thickness	0.3	0.11	0.01
	Edge Retouch	63	Length	0.89	0.22	0.05
			Width	0.9	0.26	0.07
			Thickness	0.18	0.11	0.01
Quartzite	Reduction	96	Length	2.77	1.38	1.9
			Width	2.67	1.26	1.59
			Thickness	0.79	0.47	0.22
	Thinning	103	Length	1.55	0.66	0.44
			Width	1.55	0.63	0.39
			Thickness	0.38	0.15	0.02
	Edge Retouch	19	Length	0.81	0.23	0.05
			Width	0.91	0.34	0.12
			Thickness	0.16	0.03	0.001
Basalt	Reduction	3	Length	2.37	0.68	0.46
			Width	2.54	0.92	0.85
			Thickness	0.65	0.04	0.002
	Thinning	5	Length	1.26	0.39	0.15
			Width	1.51	0.89	0.79
			Thickness	0.38	0.15	0.02
	Edge Retouch	0				

Table II-3, continued

MATERIAL TYPE	FLAKE TYPE	NUMBER	DIMENSION	MEAN	STANDARD DEVIATION	VARIANCE
Obsidian	Reduction	29	Length	1.46	0.44	0.17
			Width	1.53	0.39	0.15
			Thickness	0.42	0.15	0.02
	Thinning	26	Length	1.4	0.48	0.23
			Width	1.3	0.47	0.22
			Thickness	0.26	0.13	0.02
	Edge Retouch	18	Length	0.9	0.17	0.03
			Width	0.85	0.13	0.02
			Thickness	0.18	0.07	0.005
Rhyolite	Reduction	43	Length	2.57	1.12	1.25
			Width	2.41	0.98	0.96
			Thickness	0.85	0.41	0.19
	Thinning	30	Length	1.45	0.44	0.19
			Width	1.42	0.46	0.21
			Thickness	0.32	0.1	0.01
	Edge Retouch	7	Length	0.92	0.21	0.04
			Width	0.87	0.4	0.16
			Thickness	0.19	0.1	.01

Note: Measurements in centimeters.

Flakes were sorted further based on morphology, platform type [core vs. biface (cf. Mange and Pokotylo 1981)], presence or absence of cortex, and size. Other attributes monitored included the distinctiveness of the bulb of force; the presence or absence of a lip on the proximal, ventral edge of the platform; the form of termination on the distal end of the flake; and the presence or absence of evidence of utilization (see Table II-2).

Table II-3 shows 34 percent (N=226) of the 665 flakes were classified as reduction flakes. These flakes result from core reduction or the reduction of flakes into blanks (Bradley 1975). Cortex may or may not be present on the dorsal surfaces, and the angle formed at the interior edge of the platform is obtuse (near 90 degrees). These flakes are associated with initial stages of the reduction of lithic materials.

Forty-six percent (N=308) of the flakes are classified as thinning flakes (see Table II-3). Thinning flakes are produced by the shaping of blanks, preforms, or tools by facial reduction. They generally represent both intermediate and latter stages of lithic reduction. Typically, cortex is rarely present on the dorsal surface and when present accounts for only a small percentage of the surface.

Edge retouch flakes comprise the final category of flakes analyzed. Sixteen percent (N=107) of the assemblage is represented by this category (see Table II-3). Edge retouch flakes are associated with the final thinning, shaping, and sharpening of a working edge. These flakes also would have been produced during maintenance activities, such as resharpening.

Edge retouch flakes represent a small percentage of the total flake population. This partially may be because the materials excavated were screened with a 1/8-inch screen; therefore, small retouch flakes would not have been recovered. However, the low frequency of edge retouch flakes suggests the activities that produces these flakes rarely occurred at the site.



Figure II-1. Unifaces and Bifaces
(a=FS:510, b=FS:200, c=FS:280.1,
d=FS:518.3, e=FS:206, f=FS:175.13, g=FS:175.12)

Tools

Unifaces and Bifaces

FS:175.12 (Figure II-1, g)

Provenience: 128 L1 (0-40 cm)

This is a small obsidian flake (Material Type 40) that has been partially facially retouched. Some cortex is present on the platform, and the distal end is terminated in a hinge fracture. It appears that several unsuccessful attempts were made to thin the flake. One edge has been completely retouched. Part of another edge also has been retouched, and the two edges come together to form a sharp point. The shaped edge exhibits rounding and microflake removal on both faces, suggesting it was used to cut or saw material such as green wood or bone.

FS:175.13 (Figure II-1, f)

Provenience: 128 L1 (0-40 cm)

This is a small biface made from a gray chert with large inclusions of light gray (Material Type 6). One edge has been broken off. One face exhibits multidirectional flake removal; many of the flakes terminate in step fractures. The long edge is sharp and exhibits slight rounding, indicating it was used to cut green wood or bone.

FS:200 (Figure II-1, b)

Provenience: see map

This specimen is a small black chert uniface (Material Type 7) made from a flake. A point has been shaped on the distal end of the flake. Unimarginal microflake removal is present on the dorsal edges of the pointed tip. Some flake removal also is present on the opposite edge faces, and the edge of the tip itself is rounded and dull. It appears the specimen was used as a drill in a twisting, back-and-forth motion rather than in a unidirectional rotation.

FS:206 (Figure II-1, e)

Provenience: see map

This is a small biface, triangular both in cross section and in overall form, made from black chert (Material Type 7). Bifacial flaking is complete and workmanship is mediocre. A series of hinge fractures is present, indicating there were some problems in reducing and shaping the specimen. No evidence of utilization was noted.

FS:252.3

Provenience: 141NE

This small biface fragment may be part of a projectile point. It is made from a fine-grained, tan chert (Material Type 9a).

FS:280.1 (Figure II-1, c)

Provenience: 16 L1 (0-10 cm)

This is a small uniface made from a tan-brown-yellow chert (Material Type 9g). The uniface has a chunky appearance and may be a small, unifacially retouched core remnant. It is roughly ovoid in form. One edge has been retouched, forming an acute working edge. This edge exhibits microflake removal and some rounding, and it may have been used as a scraper on green wood or bone.

FS:356

Provenience: 171 L5 (32 cm)

This is a small biface made from a brown, banded chert (Material Type 9j). It exhibits some evidence of use, primarily in the form of microflake removal. Microflake scars terminate in step fractures, suggesting the implement was used as a scraper.

FS:518.3 (Figure II-1, d)

Provenience: 209NE

This specimen is a black chert biface (Material Type 9a). One edge is slightly serrated. Evidence of use is limited, but microflake removal along one edge suggests that it may have been used as a scraper.

FS:541.6

Provenience: 120 L1 (0-10 cm)

This is a possible biface or core fragment made from a dark tan-brown chert (Material Type 9a). One face retains a small portion of cortex. The fragment appears to have been broken during reduction. One edge exhibits some microflake removal; however, this removal does not appear to be the result of use.

Choppers

FS:220.1 (Figure II-2, b)

Provenience: North extension of TT8, north of Grid 128

This tool is a chopper/hand ax made from a yellow-to-tan quartzite (Material Type 22). The tool is ovoid in form and biconvex in cross section. Bifacial retouch is nearly complete, but several small areas of cortex are present on both surfaces. The edges of the specimen are fairly sharp; one is somewhat rounded. There is no evidence the edges were battered; other evidence of use is minimal.



Figure II-2. Choppers
(a, left=FS:388.1; b, right=FS:220.1)

FS:388.1 (Figure II-2, a)

Provenience: 116NE

Length: 9.4 cm; Width: 8.81 cm; Thickness: 3.4 cm

This artifact is made from a rose-gray quartzite. It exhibits unimarginal retouch on one side and unifacial retouch on the other. One end exhibits some rounding, blunting, and microflake removal. Alteration from use is slight.

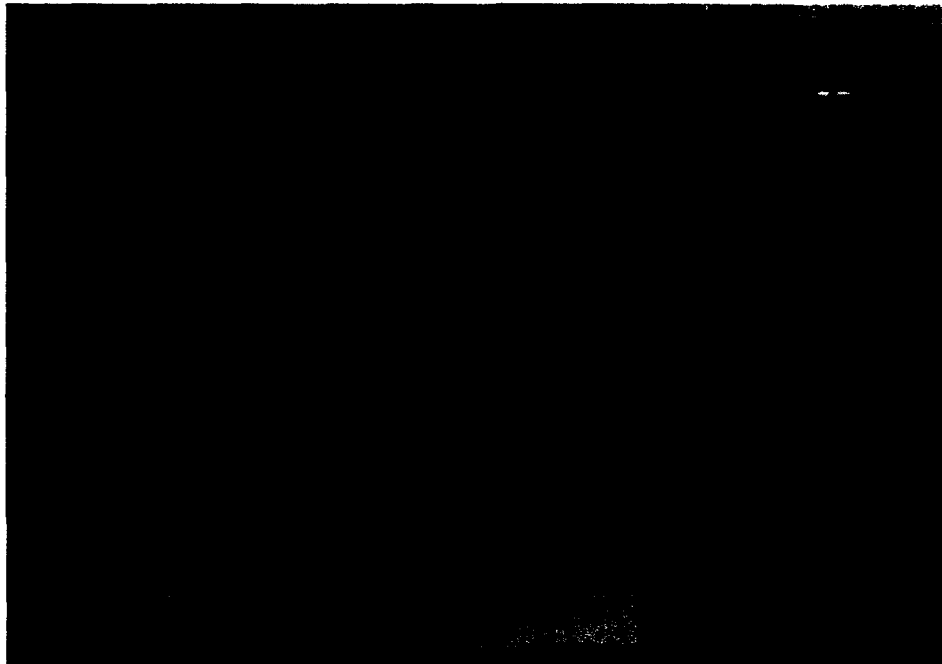


Figure II-3. Choppers
(a, left=FS:548; b, right=FS:453)

FS:453 (Figure II-3, b)

Provenience: see map

Length: 6.2 cm; Width: 5.2 cm; Thickness: 3.6 cm

This implement is made from a tabular piece of Rancheria chert. One edge and end exhibit flake removal in opposite directions. The tool originally may have been a core. However, the projecting edge and adjacent edge areas have been battered and rounded. The implement appears to have been used as a chopper on durable material.

FS:548 (Figure II-3, a)

Provenience: 121 (trench extension)

This specimen is made from rhyolite. It also may be a utilized core. It appears to be a crudely shaped biface with multidirectional flake removal. One edge exhibits some rounding and microflake removal, suggesting it was used as a chopper. Damage is not extensive.

Hammerstones

FS:211.1 (Figure II-4, a)

Provenience: 103SE L2 (19-39cm)

Length: 6.64 cm; Width: 6.15 cm; Thickness: 4.34 cm

This specimen is made from a dark gray quartzite. It is a hammerstone/core that also may have been used as a chopper. Cortex is present on about 40 percent of the surface. One edge exhibits moderate battering, indicating the artifact was used as a hammerstone. One face is flat, forming a natural platform. Flakes have been removed from one adjacent face of this platform. One edge, formed from initial flake removal, was used as a secondary platform from which flakes were removed perpendicular to the initial flaked surface. This produced a rather sharp edge that appears to be well suited for chopping activities. However, no evidence of alteration from use is apparent on the edge.

FS:301.20



Figure II-4. Hammerstones
(a, left=FS:211.1; b, right=FS:400.1)

Provenience: 139A NE

Length: 5.89 cm; Width: 4.19 cm; Thickness: 3.69 cm

This specimen is made from a medium- to coarse-grained quartzite. Some cortex is present on the surface and there is evidence of multidirectional flake removal. One edge shows some evidence of having been battered. It appears to be a core used as a hammerstone.

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FS:400.1 (Figure II-4, b)

Provenience: see map

Length: 9.54 cm; Width: 8.5 cm; Thickness: 6.14 cm; Weight: 749 g

This hammerstone is made from a dark gray quartzite cobble. All edges exhibit evidence of battering and one edge is severely damaged.

Projectile Points

Eleven complete and fragmentary projectile points were recovered from Pueblo Sin Casas. They range in temporal association from the middle Archaic into the Formative period. Several are nondiagnostic, temporally and culturally. Metric data on the points are provided in Table II-4.

Table II-4. Projectile Point Dimensions

FS:	185	201	202	203	204	205	288.1	402	452	455
Length	2.56	—	—	—	3.80	2.56	—	—	—	2.84
Blade Width	1.34	1.56	1.88	1.36	1.84	1.31	1.98	1.87	—	1.13
Shoulder Width	—	—	—	—	—	—	—	—	—	1.55
Thickness	0.45	0.43	0.49	0.72	0.50	0.56	0.56	0.33	0.61	0.49
Blade Length	1.82	—	—	—	2.57	1.83	—	—	—	2.00
Stem Width	0.61	0.67	—	—	1.03	0.92	1.21	—	1.30	1.13
Base Width	0.75	0.69	—	—	1.21	0.80	1.66	—	1.16	1.20

FS:185 (Figure II-5, c)

Provenience: 126 L1 (0-20)

This specimen is a small stemmed point made from obsidian (Material Type 40). The point is dull, the blade edges are slightly convex and slightly serrated, and the shoulders are abrupt. The stem is asymmetrical and slightly expanding. The base is slightly rounded. The transverse cross section is biconvex and the longitudinal cross section is plano convex. One face is fully retouched and the other retains a portion of the ventral surface of the flake from which the point was made. Workmanship is fair.

Type: Scallorn-like.

Temporal Position: Late Formative (A.D. 1200-1400)

FS:201 (Figure II-5, d)

Provenience: see map

This specimen is a fragment of a small projectile point made from black chert (Material Type 7). The upper quarter of the blade is missing. The blade edges appear to be straight to slightly convex, the shoulders are round, the stem is more or less straight, and the base is straight (irregularly). The specimen is incomplete and nondescript and therefore nondiagnostic. Its large size, however, suggests it was made during the Late Formative period.

Type: Undetermined

Temporal Position: Unknown

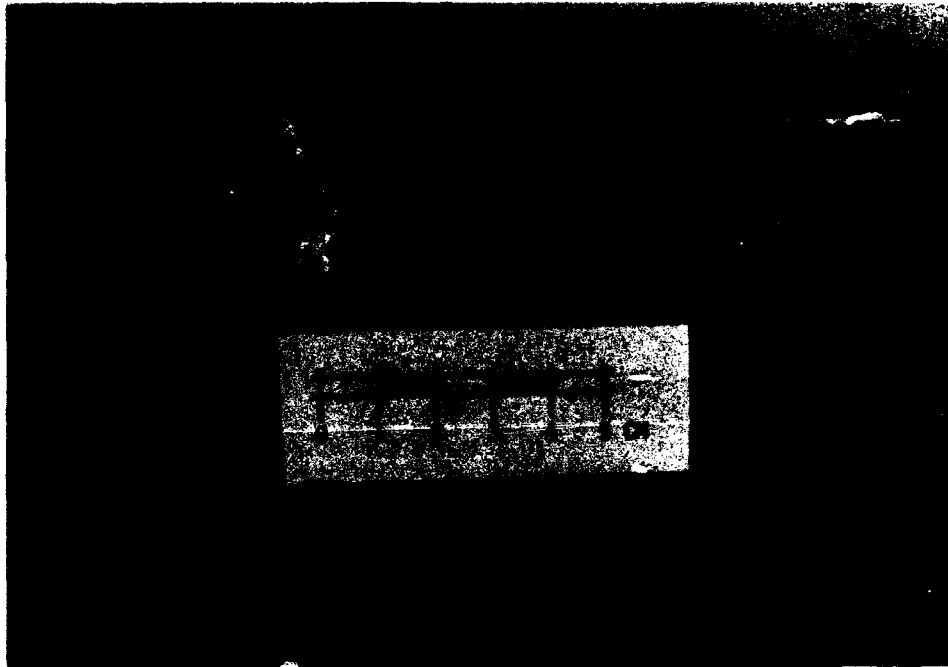


Figure II-5. Projectile Points
(a=FS:455; b=FS:203; c=FS:185; d=FS:205; e=FS:201)

FS:202 (Figure II-6, c)

Provenience: see map

This is a midsection of a probable projectile point made from gray chert (Material Type 6). The blade edges are straight to slightly convex and are highly serrated. A small portion of the stem is present on one side and it appears to be ground. The specimen is biconvex in cross section.

Type: Amargosa (?)

Temporal Position: Early Archaic

FS:203 (Figure II-5, b)

Provenience: see map

This specimen is an elongated projectile point made from obsidian (Material Type 40). The basal section is missing. The point is sharp, but the very tip is missing; one blade edge is straight and the other is convex,



Figure II-6. Projectile Points
(a=FS:402.20; b=FS:204; c=FS:452; d=FS:288.1; e=FS:202)

giving the specimen a curved appearance; the edges are serrated; and facial flaking is complete. The specimen may have broken during manufacture, and the broken end retouched. The point is biconvex in cross section.

Type: Undetermined

Temporal Position: Late Archaic to early Formative (?)

FS:204 (Figure II-6, b)

Provenience: see map

This projectile point is made from a pink-brown chert (Material Type 9h). The point is sharp; one edge is slightly convex and the other is straight, the shoulders are rounded, the stem is slightly expanding, and the base is round. The specimen is biconvex in cross section.

Type: San Pedro

Temporal Position: Late Archaic

FS:205 (see Figure II-5, e)

Provenience: see map

This is a small projectile point with a rather amorphous shape made from a black chert (Material Type 7). The point is dull. Both edges are convex, one nearly forming a crescent shape from the base to the tip. The shoulders are sloping, almost nonexistent; the stem is gradually contracting; and the base is round. Facial flaking is complete on one side and nearly so on the other. The point retains a portion of the original flake scar on what was the ventral surface of the flake from which it was made.

Type: Augustin-like

Temporal Position: Middle Archaic

FS:262

Provenience: 150NW

This is a fragmentary specimen made from black chert (Material Type 7). It is well flaked and thinned. It appears to be a section of a projectile point stem or a basal portion of a small, triangular point type which is commonly found in El Paso phase contexts. However, the specimen is so fragmentary it cannot be conclusively assigned to any cultural period.

Type: Undetermined

Temporal Position: Unknown

FS:288.1 (Figure II-6, d)

Provenience: 136 L2 (10-20)

The tip is missing from this mottled gray chert projectile point. The remaining blade edges appear straight, the shoulders are abrupt, the stem is slightly expanding, and the base is slightly curved. It is biconvex and the workmanship is good. On one face, what appears to be an impact fracture is present, suggesting the tip of the point may have been broken as a result of the point striking an object.

Type: San Pedro

Temporal Position: Late Archaic

FS:402.20 (Figure II-6, a)

Provenience: 180 L1 (0-10 cm)

This point consists of the lower blade and a portion of the stem. It is made from a brown chert (Material Type 9a). The remaining blade edges are straight with very slight serrations. The shoulders, mere bumps, are present; the stem is expanding; and the base is concave. It is biconvex in cross section and the workmanship is good. The stem and the base appear to be ground.

Type: Chiricahua (?)

Temporal Position: Early to middle Archaic

FS:452 (Figure II-6, e)

Provenience: see map

This point consists of a shoulder and stem. It is made from a light tan, fine grained quartzite (Material Type 20). The remaining shoulder is abrupt, the stem is slightly contracting, and the base is slightly concave. The edges of the base have been ground. The fragmentary nature of the specimen makes type identification problematic.

Type: Bajada (?)

Temporal Position: Early Archaic

FS:455 (Figure II-5, a)

Provenience: unknown (from within site)

This point is small, made from a tan to brown chert (Material Type 9a). The tip is dull, one side is

irregularly concave and the other side is irregularly convex. The two shoulders, one of which is partially broken, project horizontally from the sides of the specimen. The stem is slightly expanding; the base, which is slightly beveled, is straight. Facial flaking is complete on one surface and nearly so on the other. Workmanship is mediocre and overall form is asymmetrical.

Type: Undetermined

Temporal Affinity: Unknown

Summary

The chipped stone assemblage from Pueblo Sin Casas is typical of multicomponent sites found in the Hueco Bolson and Tularosa Basin of western Texas and south-central New Mexico. Coarse-grained materials such as quartzites, rhyolites, and basalt dominate the debitage. Fine-grained materials like cherts and obsidian represent about a quarter of the lithic debris at the site. However, cherts make up about 68 percent of the formal tools. The materials themselves appear to be of local origin. The most distinctive material is Rancheria chert. The different kinds of obsidians probably are from gravels left by the ancestral Rio Grande, where they occur in pebble form. It is likely that some of the finer grained materials were brought to the basin floor area from the adjacent foothills and mountains, where they outcrop. Chert pebbles are common in the Rio Grande gravels. They also commonly occur in the limestone strata of the surrounding mountains from which they erode into the alluvial washes and fans.

All stages of lithic reduction are represented at the site. Flakes with some degree of cortex present on their dorsal surfaces represent approximately 27 percent of the flake material. Flakes associated with thinning, shaping, and sharpening dominate the assemblage. Therefore, we suggest many of the finer grained materials, such as the cherts, were reduced before they were brought to the site, where they were reduced further. It also is likely some of the lithic debris is associated with maintenance activities.

The spatial distributions of different types of flakes (reduction, thinning, edge retouch) were plotted in an effort to identify areas where specific stages of reduction occurred. Although quantities of flakes per grid unit varied, no significant patterns in the spatial distribution of flake types were identified. The highest concentration of flakes occurred in the southern half of the site.

Several attributes of flakes were monitored in an attempt to identify the reduction technology (i.e., hard hammer vs. soft hammer) employed at the site and the level of technological skill represented. If, as discussed earlier, the size of the bulb of force, its distinctiveness (distinct vs. diffuse), and the presence of a lip are diagnostic of a particular hammer type and type of force applied (percussion vs. pressure), then it should be possible to make some conclusions regarding the reduction methods employed. Where bulbs of force are present, 79 percent were diffuse. Additionally, lips were present on 468 of the platforms represented. Based on these attributes, it appears the majority of flakes were produced by either soft hammer percussion or pressure flaking. Because most flakes apparently are associated with the latter stages of reduction, the use of soft hammer percussion or pressure flaking is not unexpected. As stated previously, soft hammers and pressure flaking are commonly used in the late stages of reduction because of the control they afford the knapper. However, the association of the above-mentioned attributes with a particular hammer type or flake removal technique remains tentative.

Two other technological attributes recorded are platform preparation and hinge fractures. Preparation of the platform is accomplished either by removing the dorsal overhang or by abrading the platform. The

removal of the dorsal overhang, through grinding or chipping, strengthens the platform, preventing its collapse during the application of force. This is the only type of platform preparation noted in the assemblage.

Hinge fractures occurred on approximately 21 percent of the flakes. These are caused by a force inadequate for well-controlled removal of a flake. This could result from a miscalculation by the knapper or from a lack of knowledge about a particular material type.

A number of flakes exhibited use-wear. Both cutting and scraping activities are represented in the flake material. Additionally, several facially and marginally retouched implements exhibit evidence of alteration from use. Most appear to have been used in cutting activities. One possible drill or perforator was recovered as well.

Several hammerstones, cores, and scrapers make up part of the chipped stone assemblage. Some of the cores exhibit evidence of battering damage, which indicates their secondary (or primary) use as hammerstones.

Eleven complete or fragmentary projectile points were recovered from the site. These range in date from the early Archaic to the late Formative. Several of the parts are nondiagnostic. All are types common to West Texas and southern New Mexico.

In summary, the lithic assemblage at Pueblo Sin Casas is characterized by the following:

1. Residents depended upon locally available lithic materials.
2. The flake assemblage represents all stages of lithic reduction, but the assemblage represents relatively little primary reduction.
3. Soft hammer percussion and pressure flaking predominates.
4. A variety of facially and marginally retouched implements are present.
5. A combination of both an expedient and a curated lithic technology was utilized.
6. Projectile points represent the early Archaic to late Formative periods.
7. Coarser grained materials were used for larger flakes and for implements thought to have been used for heavy-duty tasks, such as chopping.
8. Finer grained materials were used for formal tools and for curated implements, such as projectile points and retouched tools.

Unfortunately, neither temporal components nor specific activity areas could be isolated. The horizontal and vertical spatial integrity of the lithic assemblage at Pueblo Sin Casas has been degraded by natural deflation and by military activity. Historically, archaeological sites in the maneuver areas on Fort Bliss have been collected extensively. The extent of collector activity on this site is completely unknown.

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Chapter III

CERAMICS, GROUND STONE, AND MISCELLANEOUS ARTIFACTS

Introduction

This chapter summarizes the data on ceramics, ground stone (manos, metates, pestles), and several miscellaneous artifacts recovered from Pueblo Sin Casas. Few artifacts other than chipped stone debris were recovered from the site. No whole ceramic vessels were recovered, and the ground stone, principally manos and metates, generally was fragmentary. However, several worked sherds and a large pestle/hoe were recovered.

Ceramics

Six hundred and thirty-two ceramic sherds were recovered from the excavations (see Table III-1). Undifferentiated brown ware was the most common ceramic material found at the site. Other ceramics include El Paso Brown, El Paso Polychrome, a black-on-brown (probably weathered El Paso Polychrome and not El Paso Bichrome), Villa Ahumada Polychrome, and Gila Polychrome. Additionally, an unidentified polychrome sherd and several plain ware sherds probably of Chihuahuan origin were recovered. Descriptions and references for the named types recently have been revised and summarized by Carmichael (1983) and by Runyan and Hedrick (1987).

Table III-1. Ceramic Type Counts for Pueblo Sin Casas

TYPE	NUMBER	PERCENTAGE
Undifferentiated Brown Wares	328	51.9
El Paso Brown	7	1
Black-on-brown	252	39.9
El Paso Polychrome	36	5.7
Ramos Polychrome	1	less than .1
Villa Ahumada Polychrome	2	less than .1
Gila Polychrome	1	less than .1
Unidentified	5*	1
TOTAL	632	100

*Brown ware sherds thought to be of Chihuahuan origin.

Brown Wares

Undifferentiated Brown Wares: With the exception of rim sherds, brown ware sherds are classified as undifferentiated brown ware (UB) and not as El Paso Brown or Jornada Brown because of the difficulty of partitioning body sherds into El Paso Brown, El Paso Bichrome, El Paso Polychrome, and Jornada Brown. The UB sherds are divided into six groups based on the condition of the surface of the sherd, the presence or absence of gray staining or sooting, and the size and amount of the temper. These divisions generally follow O'Laughlin's (1979, 1980), and they are used to organize the data from Pueblo Sin Casas in a manner similar to those used for other sites (see Table III-2). At other sites, investigators have identified temporal and spatial differences between different types of undifferentiated brown wares. It is hoped that the divisions in UB described below are used by other investigators to identify temporal and spatial distinctions at FB6273 at some later date.

Table III-2. Undifferentiated Brown Wares by Group

GROUP	NUMBER	PERCENTAGE
1	219	66.6
2	10	3.1
3	20	6.2
4	69	21
5	9	2.8
6	1	0.3
TOTAL	329	100

Group 1: The exterior surface is scraped and smoothed, but not polished or slipped. A matte finish is typical. Temper is exposed on the surface but does not protrude. The temper is sand, ranging in size from medium-fine to fine. It is generally well mixed, and the amount ranges from moderate to moderate-light.

Group 2: The exterior surfaces of this group are well smoothed, slipped, and sometimes slightly polished. No temper is exposed on the surface. Temper is similar to Group 1, ranging from medium-fine to fine in size and moderate to moderate-light in amount.

Group 3: Group 3 is a variant of Group 1, differing only in that the exterior surface is stained or sooted gray.

Group 4: Sherds in this group are more weathered. The exterior surfaces are eroded and the temper protrudes, making the surface rough to the touch. Additionally, the temper size ranges from medium to large and is moderately abundant.

Group 5: Group 5 is also a variant of Group 1, differing only in that the temper size ranges from medium to large.

Group 6: Group 6 is a variant of Group 4. The only difference between these two groups is that Group 6 sherds are stained or sooted gray.

As discussed earlier, investigators have divided collections of UB into subcategories to discern temporal or spatial patterns in the ceramic assemblage (Lynn, Baskin, and Hudson 1975; O'Laughlin 1977, 1979, 1980). These studies focus primarily on the temper of the sherds being considered.

At the Sandy Bone site, a late Mesilla phase site on the Rio Grande, O'Laughlin (1977) found that medium- to coarse-tempered brown ware accounts for 88 percent, fine-tempered brown ware 6 percent, and brown ware tempered with biotite 6 percent of the brown ware at the site. At the Transmountain Campus site, the respective percentages were 94 percent, 3 percent, and 3 percent. The Transmountain data are similar to those reported by Lynn, Baskin, and Hudson (1975) from the southern Hueco Bolson.

Based on temper type, the six groups of UB from Pueblo Sin Casas can be combined into two general groups. The first group (Group A) includes groups 1, 2, and 3; the second group (Group B) consists of groups 4, 5, and 6. Thus, Group A, medium-fine- to fine-tempered brown ware, accounts for 76 percent of the UBs, and Group B, the medium- to large-tempered brown ware, is represented by 24 percent of the material. Based on published descriptions, especially Runyan and Hedrick (1987), El Paso Polychrome is usually medium- to coarse-tempered, and El Paso Brown tends to be a fine-tempered ware. Therefore, we suggest most of the UBs at FB6273 probably are El Paso Brown and the remaining UBs are El Paso Polychrome. This trend generally is supported by the rim sherds recovered from the site. The El Paso Brown rims tend to be fine tempered while the El Paso Polychrome rims tend to be more coarsely tempered. Clearly, there is much variability in temper size within the El Paso Brown Ware series; therefore, these chronological interpretations are tentative at best.

El Paso Brown: Seven El Paso Brown rim sherds were recovered. Three of the rims appear to be the early pinched forms of El Paso Brown as defined by Whalen (1981:219) and the remaining four appear to be late pinched and flattened forms.

One of the pinched rim sherds contained a high percentage of very coarse-grained temper. It is the most coarsely tempered sherd specimen from the entire Pueblo Sin Casas ceramic assemblage.

Decorated Wares

El Paso Bichrome and El Paso Polychrome: Two hundred and fifty-two black-on-brown sherds were recovered. It is not clear if these are El Paso Bichrome or El Paso Polychrome. We suspect they are El Paso Polychrome fragments lacking evidence of red paint. Two explanations for this lack of paint are possible: First, the fragment simply may be from a portion of the sherd that originally lacked red paint; second, the red color of the paint may have eroded from the sherd. The designation of these sherds as probable El Paso Polychrome is supported by the recovery of many El Paso Polychrome rims.

Thirty-six El Paso Polychrome sherds were recovered; twenty-four are rim sherds. Twenty-three of the twenty-four rim sherds appear to be late El Paso Polychrome rims (Whalen 1981:225). They have thickened, rounded, recurvate profiles. Several exhibit slight rim edge flattening. One rim sherd has a well-flattened rim edge and may be an early El Paso Polychrome rim form.

Most of these sherds are badly weathered, and little decoration remains. Most, however, have black paint on the exterior surfaces just below the rim, on the rim, and on the interior surface of the rim. One seems to lack a painted rim edge but has bands of black paint on both the interior and exterior surfaces just below the rim edge. Another appears to have been painted only on portions of the rim edge, forming what may have been a "dashed line." Again, both the interior and exterior surfaces below the rim are painted.

Intrusive Wares

Intrusive or nonlocal ceramic wares are limited in number. Five of the nonlocal sherds are undifferentiated brown or plain wares and, based on the paste used in their manufacture, it is likely that they are of a Chihuahuan origin. Two sherds of Villa Ahumada polychrome fit together. One sherd from a Gila polychrome bowl also was recovered.

A single sherd of Ramos Polychrome was recovered from Test Trench 10, along the west edge of the midden area. This specimen appears to be a neck portion from a globular jar. The neck is about 4 cm high and only slightly recurvate at its mildly thickened lip. Decoration is limited to the sherd's exterior; a band of small rectangles in columns of four, outlined in black paint on a light buff or cream slip, also is present. This band extends to about 2 cm below the rim. Alternate top and bottom rectangles are painted reddish brown. Below the rectangles is an unpainted band with a black line defining its lower edge. A series of small tick marks extends upward from this bottom line. Below this line is a band of reddish brown paint.

The paste and temper are very fine and well mixed. The core is a light gray and is nearly as wide as the 0.4-cm-thick vessel wall. It is well fired and very hard.

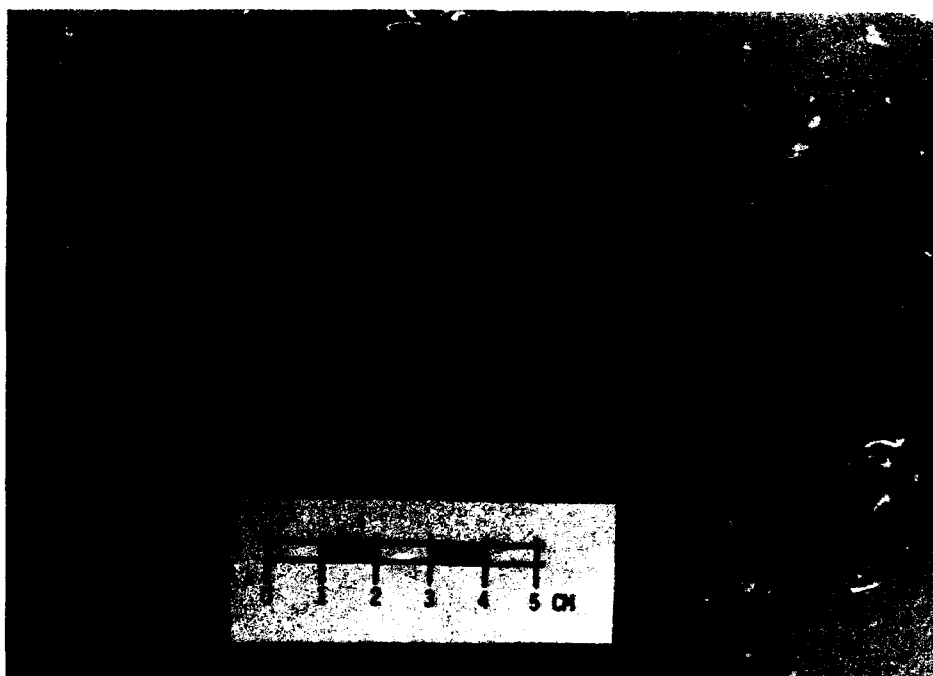


Figure III-1. Worked Sherd (left) and Possible Eccentric Stone (right)

Worked Sherds

The bottom edge of the Ramos Polychrome sherd, where the neck would have attached to the body of the vessel, appears to have been ground into a finished edge. It is possible that this neck was broken from its vessel, the edge ground to even it out, and then used as a ring base to hold other vessels.

Four other worked sherds were recovered. One specimen (Figure III-1, a) is a nearly circular sherd; its edges were broken to form a round disk. The edges do not appear to have been ground either deliberately or through use. The sherd's maximum diameter is 6.07 cm. The three remaining specimens are fragmentary and all have ground edges. One appears to be from a circular object, and the other two are rectangular in form. All four are made from undifferentiated brown ware.

The function of these specimens is unclear. They may be blanks from which scoops, lids, ladles, or spindle whorls might have been made.

Ground Stone

Ground stone artifacts include examples of complete and fragmentary manos, metates, and pestles. One hundred and twenty-two pieces of fragmentary ground stone were recovered from the excavations. These were pieces of stone that exhibited some degree of grinding wear but were not complete enough to be definitively classified as fragmentary manos or metates. These unidentifiable fragments principally were made from quartzites, although basalt, tuff, and granite also are represented. It is likely that most fragmentary specimens are from manos.

A total of 23 manos, one complete and 22 fragmentary, were recovered. All appear to be of one-handed size with moderate to heavy wear. They vary in cross section from triangular to plano-convex. Material types also are dominated by quartzite, but include sandstone, rhyolite, vesicular basalt, andesite, and tuff.

Twenty-three metate fragments were recovered. One is nearly complete and another is roughly half complete. Quartzite is the principal type of manufacturing material found. Also present are tuff, rhyolite, and a granitic material. All but one appear to be from slab metates; this one may be a fragment from a basin metate. One specimen of note exhibits well-defined grinding surfaces on opposite faces (see description in next section).

One complete pestle, which may have been used as a hoe, was collected. Two possible pestle fragments also were recovered.

The following artifact descriptions are for the more complete specimens. These accounts provide detailed descriptive and metric data suitable for comparative analysis.

Dimensional Data

Manos and Mano Fragments

FS:83: (Figure III-2, b)

Provenience: Surface 110SW

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This specimen is made from a coarse-grained, tan-pink quartzite. It has been shaped. It is plano-convex in cross section. The longitudinal cross section is subrectangular. The plano face is rough and the convex smooth. The remaining end is smooth; the edges are weathered rough. It may have been heat damaged.

Length: 7.7 cm; Width: 8.0 cm; Thickness: 5.0 cm

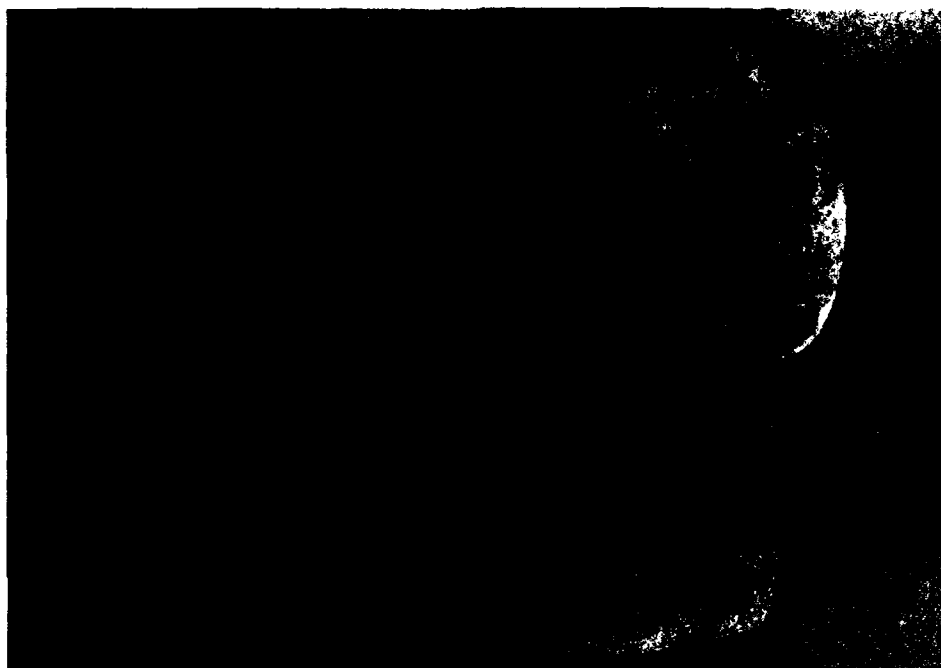


Figure III-2. Manos
(a=FS:383.1; b=FS:83; c=FS:999; d=FS:504.1)

FS:129:

Provenience: Surface 124NE

Fragment made from vesicular basalt. It is rectangular in cross section, is well shaped, and both faces are well smoothed.

FS:383.1: (Figure III-2, a)

Provenience: Surface 170

This fragment appears to be a fragment of a one-handed mano. It is made from a dark gray andesite. One face and one edge are well flattened and smoothed.

FS:386.5: (Figure III-4, a and b)

Provenience: 169NW (Hearth 4)

Midsection made from a quartzite. It is plano-convex in cross section. The plano face has a slight concavity along one edge, which appears to be the result of use. Both faces exhibit some utilization. One end is flat but not completely smooth and may have been shaped by pecking and grinding. This specimen may be a mano-metate.



Figure III-3. Manos
(left, a=FS:560.2; right, b=FS:450.1)

S:445.4:

Provenience: Surface 230NE

Fragmentary end with one face worked. Made from a dark brown rhyolite. Some shaping may have resulted from flaking.

FS:450.1: (Figure III-3, b)

Provenience: Feature 6

The specimen appears to be made from a welded tuff. It is burned and purple-tan-brown in color. It has been shaped, and all edges but one are smoothed. It is rectangular in overall form and cross section. Use appears to have been light; one face is convex and slightly smoothed and the other is slightly concave and slightly smoothed.

Length: 15.3 cm; Width: 9.9 cm; Thickness: 5.1 cm;

Weight: 1114 grams

FS:488.3:

Provenience: 203SE

Fragment made from a tan quartzite cobble. The surface is badly weathered and only portions of two worked faces remain. It is triangular in cross section.

FS:504.1: (Figure III-2, d)

Provenience: Feature 7

Almost complete; made from a cobble of fine-grained sandstone. It is plano-convex to convex-

convex in cross section. The most convex surface is smoothed and the ends may be slightly smoothed. It is unshaped.

Length: 8.5 cm; Width: 9.8 cm; Thickness: 4.5 cm

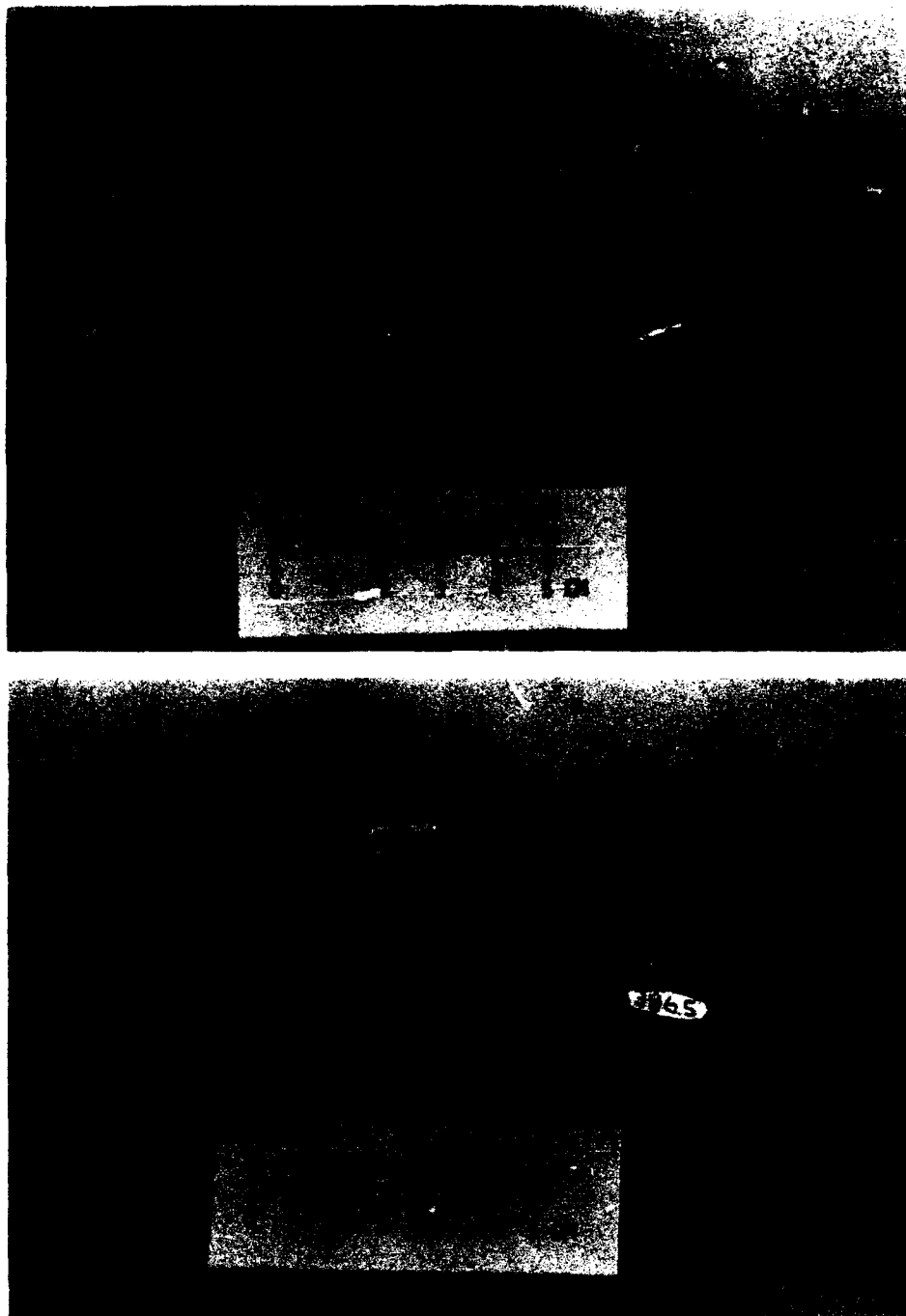


Figure III-4. Possible Mano/Metate
(top=FS386.5 convex surface; bottom=FS:386.5, side view showing concave surface)

FS:418.1:

Provenience: TT11 (32 cm below surface)

Fragment made from a brown, medium-grained sandstone. It is trapezoidal in cross section. All four faces exhibit some pecking and smoothing.

FS:560.2: (Figure III-3, a)

Provenience: 242, Level 3 (20-30 cm)

Fragment made of quartzite; it has been burned. It is approximately one-half complete and is triangular in cross section. Only one face has been used.

Length: 10.1 cm; Width: 11.4 cm; Thickness: 5.9 cm;

Weight: 843 grams

FS:999: (Figure III-2, c)

Provenience: unknown

This specimen is made from a tan-brown, fine-grained sandstone. Approximately two-thirds complete. It is triangular in cross section. Two worked faces are present, and a third may be present along the tapered face.

Length: 5.65 cm; Width: 9.8 cm; Max. Thickness: 4.85 cm;

Min. Thickness: 2 cm

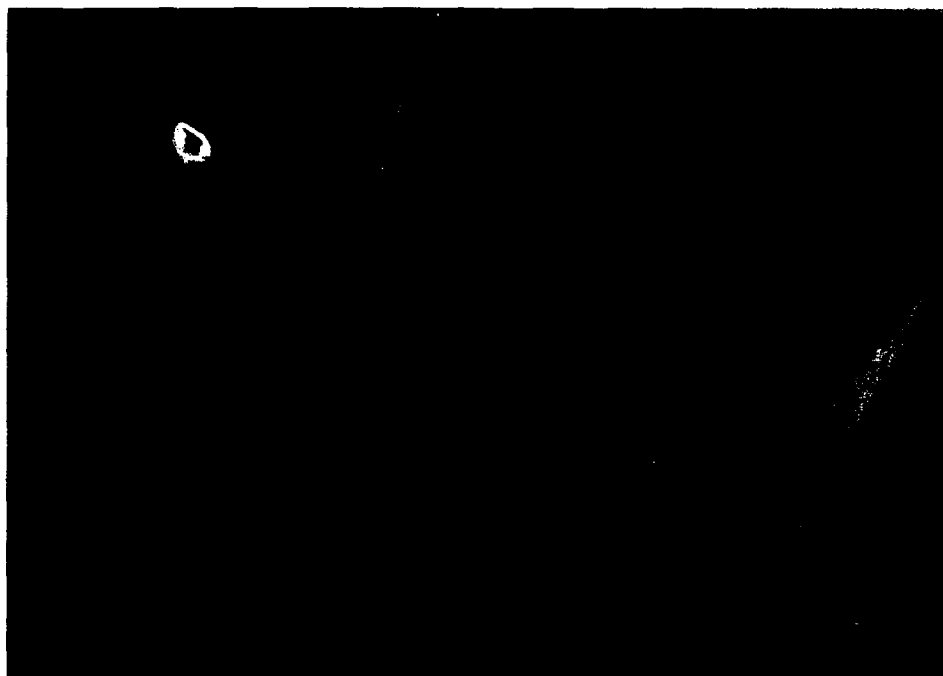


Figure III-5. Slab Metate

Metates and Metate Fragments

FS:37:

Provenience: Surface 46NW

This fragmentary specimen is made from a banded tan quartzite. One surface shows wear from use.

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FS:102:

Provenience: 123NE

This specimen is made from a gray quartzite. It is rectangular in overall form, and the shape does not appear to have been modified. All faces and edges are smooth and a light concavity is present on one face.

FS:207.1: (Figure III-5)

Provenience:

This is a slab type metate made from quartzite. One surface shows evidence of light use. The trough area, which is about 10 cm wide and 22 cm long, is smooth and slightly concave. A small portion of the slab from which the specimen was made is missing. However, the adjacent edge is rounded and smoothed, suggesting the breakage occurred prior to its use as a metate. The edges themselves appear to have been partially shaped by flaking and then by pecking.

Length: 32.0 cm; Width: 20.8 cm; Thickness: 6 cm

FS:208.1:

Provenience:

Fragment of a basin metate. It was made from an andesite. A portion of the surface is pecked.

FS:347:

Provenience: 161SE

Fragment of a metate trough. It is made from a tan quartzite.

FS:349.1:

Provenience: 161NE

Portion of a trough metate made from a gray rhyolite(?). Both faces are smoothed, and one face is slightly concave.

FS:351:

Provenience: Surface 23SW

Small fragment made from a rose-brown-tan, medium- to fine-grained quartzite.

FS:366.2:

Provenience: 165SE

Fragment of a trough, or possibly a slab metate, made from a light tan quartzite. Both faces are well smoothed; one is concave and the other is flat.

FS:401: (Figure III-6, a and b)

Provenience:

Nearly complete slab metate made from quartzite. The troughs are rather narrow (9 cm wide) and well smoothed. It is double faced with one face heavily patinated. Use appears moderate to heavy.

Length: 24 cm; Width: 14.3 cm; Max. Thickness: 4.3 cm;
Thickness at trough bottoms: 1.6 cm



Figure III-6. Double-sided Slab Metate

FS:427:

Provenience: 215SE

Fragment of a probable slab-type metate made from a gray welded tuff material with dark inclusions. Only one surface has been utilized.

FS:428.1:

Provenience: Surface 215SW

Fragment made from a rectangular slab of banded purple-rust-tan quartzite. The edges are rounded and may have been shaped by pecking. One face is naturally uneven, and the other is smoothed and slightly convex. The convex face may have been used as a grinding surface.

Length: 7.2 cm; Width: 6.67 cm; Thickness: 2.1 cm

FS:506.1: (Figure III-7)

Provenience: Surface Feature 18

Fragment of a slab metate made from a gray quartzite. The surface has been pecked.

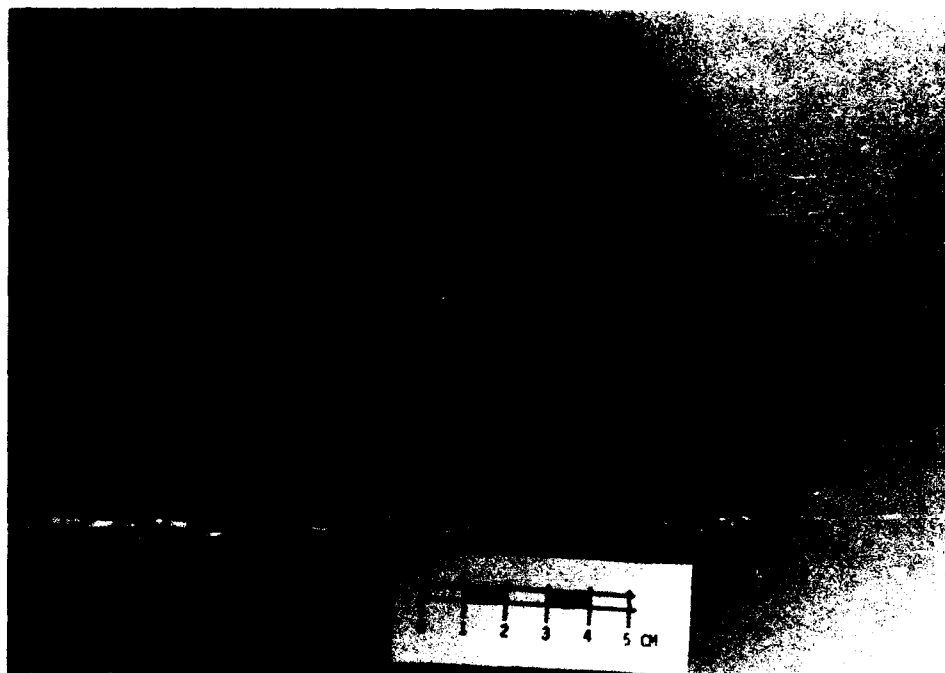


Figure III-7. Metate Fragment Showing Pecked Surface

Pestles

FS:547: (Figure III-8, a and b)

Provenience:

This specimen is made from sandstone and is rectangular in cross section. One end is tapered, forming a triangularly shaped point. Striations extend 4.5 to 6 cm from the end up the long axis. It appears that this end may have been used as a hoe or a digging tool. Use is not extensive, although the tip and adjacent

edges are well smoothed from use.

The opposite end is somewhat square. The adjacent edges were rounded by pecking for about two-thirds the length of the implement, which makes the tool easier to hold.

Length: 32.7 cm; Width: 6.28 cm; Thickness: 6.62 cm; Weight: 2,351 grams.

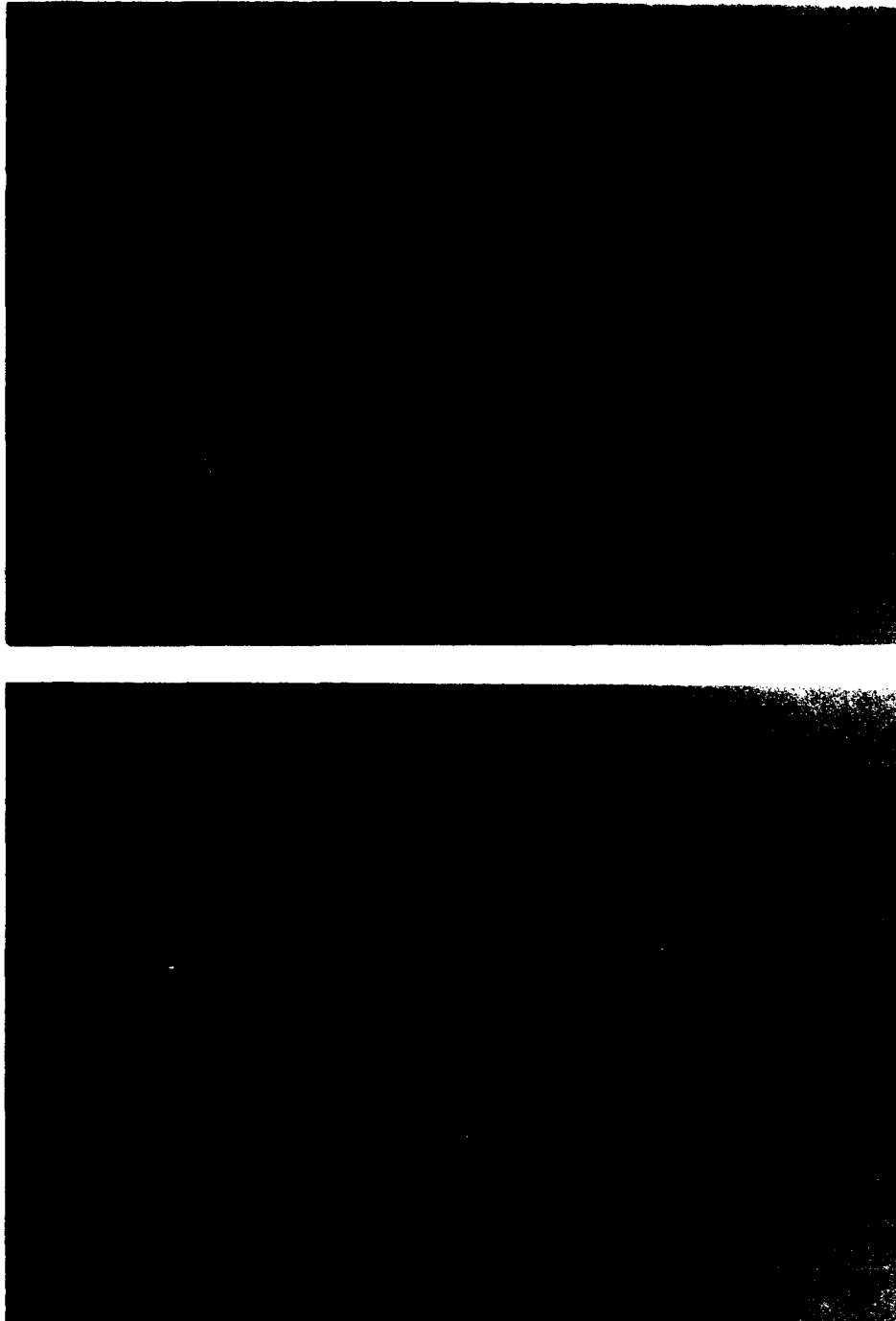


Figure III-8. Pestle
(top-top view; bottom-side view)

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Eccentric Stones (Fetishes?)

Two small, waterworn pebbles were recovered from the site. One (FS:108.1) is oblong and the other (FS:149.1) is amorphously shaped (FS:149.1) (Figure III-1, b). It is not clear whether these stones occurred naturally at the site or were brought to the site by humans. No other such stones were noted or recovered. It is possible that the stones may have been used as fetishes. Naturally shaped, unmodified stones are commonly used as fetishes by many ethnographically known groups, and they sometimes occur in archaeological contexts suggesting special uses (Di Peso 1974; Foster and Bradley 1984; Pennington 1969; Stevenson 1904).

FS:108.1:

Provenience: 20NE

Length: 4.6 cm; Width: 1.5 cm; Thickness: .7 cm

FS:149.1: (see Figure III-1, b)

Provenience: 112NE

Length: 5.8 cm; Width: 3.6 cm; Thickness: 1.2 cm

Summary

The ceramic assemblage from Pueblo Sin Casas is somewhat limited and is dominated by undifferentiated brown ware. El Paso Brown rims are represented in small quantity (seven sherds). El Paso Polychrome is represented in moderate quantity (36 sherds). A number of black-on-brown sherds were recorded. It is not clear whether these sherds represent weathered El Paso Polychrome sherds or El Paso Bichrome. O'Laughlin (personal communication) points out that the red paint used on El Paso Polychrome often is fugitive and weathers easily, making the identification of El Paso Polychrome difficult. Given the number of El Paso Polychrome rims in the assemblage, it is suspected that the black-on-brown sherds are El Paso Polychrome.

Intrusive wares are represented by single sherds of Ramos and Gila Polychrome and two sherds of Villa Ahumada Polychrome. These sherds indicate a late Formative component is present at the site.

Several worked sherd disk fragments and one complete specimen also were recovered. Their function is unknown. They may have been used as spindle whorl blanks, scoops, or gaming pieces.

The ground stone assemblage is dominated by one-handed manos and slab metates. A large pestle also was recovered. All of these tools typically are used for wild seed and and/or plant processing. Many of the specimens exhibit considerable wear from use. It is likely they were left or cached at the site to be used by subsequent occupants.

It is thought that the site was used as a short-term camp for food collecting and processing. Given the deflated and disturbed character of the site, it has not been possible to identify spatially distinct components, and we only can speculate about the nature of the occupations. It is not clear if any of the components represent residential occupations. Most occupations may have been groups engaged in a foraging land-use pattern.

Chapter IV

FEATURES

Thirty-one features were recorded at Pueblo Sin Casas. These include seven fire-cracked rock (FCR) features, twenty-three circular basin-shaped hearths or amorphous stains containing carbon-stained soil, and what appears to be a large sheet midden area on the western edge of the site. None of the features has been chronometrically dated. None of the FCR features provided charcoal suitable for dating. Soil samples were taken from the basin-shaped hearth areas with carbon-stained soil, but they have not been submitted for dating. The cultural and temporal context of many of the basin features is suspect; therefore, submission of the samples would be fiscally unwarranted.

Small Fire-cracked Rock Features

The FCR features typically are scattered and badly deflated. Between 19 and 41 distinct pieces of rock, primarily either quartzite or rhyolite, were present in each feature. The features range from 90 to 185 cm in diameter (see figures IV-1 and IV-2). They are slightly basin shaped in cross section, and several extend to a maximum depth of 10 to 15 cm below the present ground surface.

Such features are ubiquitous in western Texas and have been investigated by several archaeologists (e.g., Carmichael 1985; Fields and Girard 1983; Foster and Kelley 1987; Hard 1983; O'Laughlin 1979, 1980; Whalen 1978, 1980). The FCR features recorded at Pueblo Sin Casas are similar to those reported from the Keystone Dam area on the west edge of El Paso. There, on sites 29, 33 north, 33 south, and 34, FCR features ranged from 65 to 180 cm in diameter (O'Laughlin 1980:109). At sites 37 and 37 the area of small FCR features ranged from 0.5 m² (3 kg of rock) to 7.0 m² (40 kg of rock); some features contained up to 80 kg of rock (Carmichael 1985:Table 12, 95-97).

Hard (1983:Table 8) has summarized many small FCR feature data for the Hueco Bolson. Mean diameters range from 64 to 90 centimeters. The Castner Heights study showed an average of 28.5 pieces of rock per hearth and an average weight of 6.84 kg of rock per hearth (Hard 1983:Table 9).

The use of such small FCR features remains a subject of much debate. Several investigators (Hard 1983; Wetterstrom 1978; Whalen 1977, 1978, 1980) argue that such features were small campfires used for cooking and/or warming. Whalen (1977, 1980) further notes that small FCR features are present in several environmental zones in the Hueco Bolson and that their size, shape, and spatial distribution vary little through time. He suggests they had similar uses during several cultural periods.

O'Laughlin (1979, 1980:118-125) presents an alternative interpretation. He suggests many of these features are functions of the amount of their reutilization. Large FCR features generally are associated with leaf succulent roasting and processing. Therefore, O'Laughlin argues that some small FCR features probably also were used for preparation of leaf succulents. He notes that the limited distribution of small FCR features on the western side of the Franklin Mountains corresponds to that of leaf succulents.

Unfortunately, the FCR features investigated at FB6273 provide few data useful in resolving this debate. The small amount of rock in these features and their small size make it probable that they were

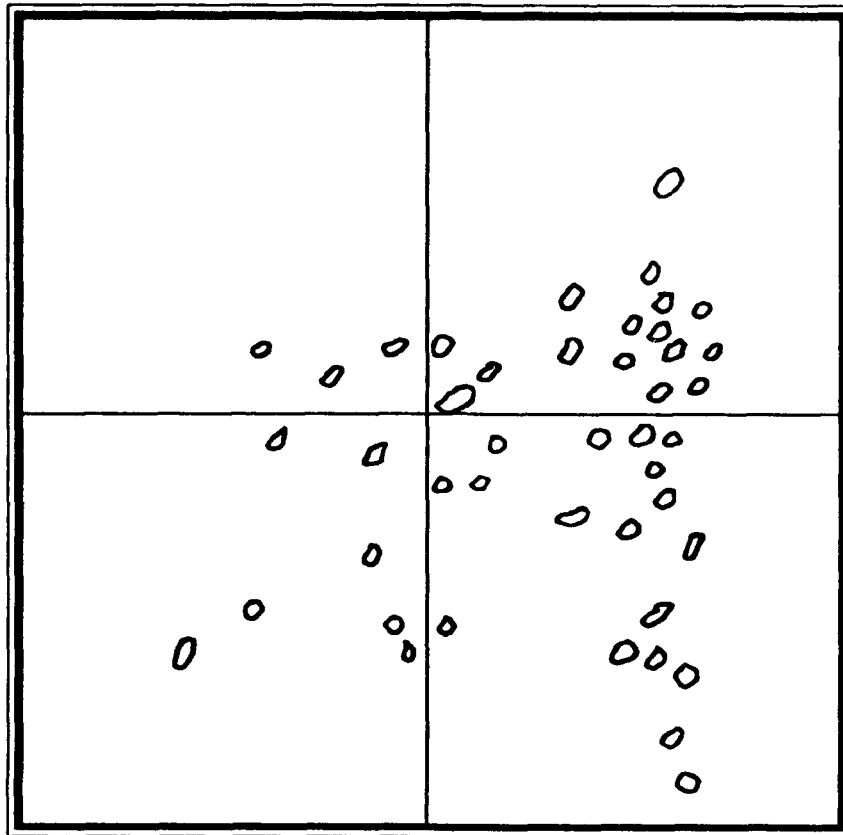


*Figure IV-1. Fire-cracked Rock Scatter
(grids 165, 166, 167, and 168)*

utilized only once. Additionally, no floral or faunal remains useful for discerning feature function were found in association with the FCR features. However, burned animal bone and what may be burned plant material was recovered from the site. These materials indicate some of the site's hearths were used in the processing of both plant and animal foods.

Basin Hearths/Stains

Twenty-three other features are believed to be the remains of hearths. These rockless features are carbon stains exposed at the surface or identified through excavation and trenching. They range from circular to rather amorphous in plan view. The stains are between 93 and 129 cm in diameter and are basin shaped in cross section, with a maximum depth of 50 cm.

Feature 22 in grids 137 and 137a is of particular interest. One circular stain is in Grid 137, another is in 137a. They form a figure "8" in plan view, and their close proximity suggests multiple occupations of the site.

The function of these hearths is unclear. They do not appear to be roasting pits associated with leaf succulent processing. It is more probable that they served as small cooking or warming hearths.

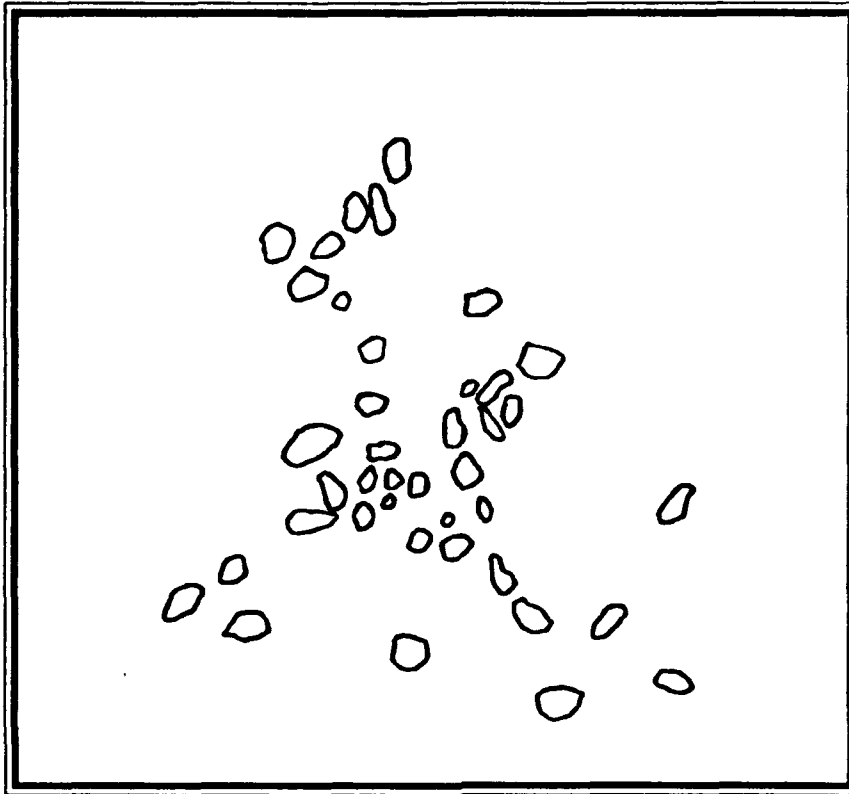


Figure IV-2. Fire-cracked Rock Scatter (Grid 169)

The cultural identity of these features also is unknown. They probably are prehistoric. However, the land surrounding the site has been utilized extensively as a military maneuver area, and some of the basin hearths may be rather recent. A military activity that would produce such features on an archaeological site, however, is unknown. As indicated earlier, none of the hearths have been dated by chronometric means.

Midden

One other feature, a possible sheet midden, was recorded in the southeast section of the site. It has a slight charcoal staining, is roughly ovoid in plan view, and has a maximum diameter of approximately 17 m. The eastern half was exposed at the modern ground surface, and the western half was buried under a dune. The maximum thickness of the western edge of the midden area is approximately 40 cm. Little cultural debris was recovered from this feature. Numerous flotation samples were processed, but they produced very little in the way of plant and bone remains.

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Chapter V

SUBSISTENCE

Ronna Jane Bradley
and Michael S. Foster

A limited number of macrofloral and faunal remains were recovered from FB6273. Faunal remains were collected when encountered during excavation, and flotation samples were taken from the hearths and from the presumed midden area. Macrofloral remains were recovered from some of these areas and from the general excavations, but they were preserved very poorly. The data that might be used to reconstruct subsistence activities are quite limited. The remains are so few and scattered that provenience data virtually are irrelevant.

Fauna

The bone recovered from the site is of uncertain cultural origin. For example, several elements of *Canis* sp. (dog) and *Lupus* sp. (jackrabbit) were recovered in units that lacked cultural material. Furthermore, several unburned bones of young *Equus* sp. (horse) were found on the site. It is not probable that these would have survived from prehistoric times.

Additionally, a quantity of small bone, most of which was highly fragmented, was recovered from the midden area. Approximately 240 unidentifiable fragments were examined by Dr. Arthur Harris of the Department of Biology at UTEP. Only about 15 of these were burned, and only a few were sufficiently complete for identification.

Reptilia

Several skeletal elements from the midden were identified as lizard and snake remains. Fifteen small lizard vertebrae were found, none of which were burned. One snake vertebrae also was identified. None were identifiable below the family level of classification.

Reptiles are plentiful in the region today and may have been economically important to the area's prehistoric inhabitants. A number of ethnographic studies document the use of lizard and snake for subsistence purposes (e.g., Pennington 1969:144). Such species are good sources of protein, vitamins, and minerals.

Rodentia

Two very small unidentified rodent phalanges were recovered from the midden. Rodents are one of the most common inhabitants of the desert lowlands today, and they were an excellent source of nutrition for prehistoric human groups. Ethnographically known populations such as the Pima commonly rely on rodents as a supplementary source of meat and protein (Russell 1980:81-82). The Tepehuan and Tarahumara also eat a variety of small rodents (Pennington 1963, 1969). Rodents usually are trapped in storage facilities or in agricultural fields and then skinned and roasted. Again, unfortunately, most of the bone from Pueblo Sin Casas is unburned and probably is of historical origin.

Leporidae

Only one species of rabbit, *Sylvilagus* sp. (cottontail), was identified in the midden material. Although *Lepus* sp. (jackrabbit) remains were found in some excavation units, they are not believed to be of prehistoric origin. Cottontail is the most commonly identified species in the faunal assemblage from Pueblo Sin Casas. Cottontail was represented by 20 fragments, including three metapodial fragments, four tooth fragments, one proximal radius fragment, one calcaneum, one anterior portion of a premaxillary, and ten phalanges.

The presence of cottontail and the lack of jackrabbit is curious. The cottontail primarily occupies undisturbed grasslands, creosote stands, or cactus deserts, and it prefers low-hanging vegetation and dense grasses for concealment and safety. It feeds on tender grasses and forbs and is more common in areas where lush vegetation is found. Today, the xeric area surrounding the site abounds with jackrabbit, and cottontail tend to frequent the low-lying drainages and playas where vegetation is densest. Although cottontail do occur alongside *Lepus* sp. in the Chihuahuan Desert, their presence at Pueblo Sin Casas could indicate a lush, more mesic type of vegetation pattern existed in the past. Cottontail remains also might be evidence that hunting was carried out near playas.

All the faunal species discussed here are typical of those found today in the region, and all would have provided substantial economic support to the prehistoric inhabitants of the site and the area as a whole. Recent excavations of both Mesilla and El Paso phase sites have demonstrated extensive utilization of both jackrabbit and cottontail (Bradley 1983:87; Foster et al. 1981; Robert J. Hard: personal communication).

Flora

Some macrofloral remains, primarily seeds, also were recovered from the site. These were examined by Dr. Richard Smartt of UTEP. The remains are examples of the kinds of flora available in the area today and are thought to be of modern origin. However, they also are thought to represent the types of plants common in the area prehistorically and, therefore, are suggestive of the plant resources that could have been exploited prehistorically. The following comments summarize the plant remains recovered from FB6273 and their economic potential for human populations.

Prosopis glandulosa

Several honey mesquite seeds were recovered from a subsurface context on the site. Mesquite grows in a variety of habitats, and is one of the most common and widespread desert trees. It is most common in mesic areas such as washes, but it also is plentiful in the basin where it is the principal stabilizing plant of the abundant coppice dunes. Several ethnographically known groups rely on the mesquite as a major subsistence staple (Castetter and Bell 1942; Russell 1980:66), utilizing the dried seed pods that become available in late summer as well as other portions of the plant. Its economic value to aborigines cannot be overly stressed. It served not only as a valuable subsistence staple and as a source of fuel for fires, but also was an important aid in the production of tools and clothing.

However, mesquite productivity in the Chihuahuan desert tends to be less seasonally reliable than in nearby areas such as the Sonoran Desert. Ethnographic data on Arizona Indian groups documents their reliance on the mesquite harvest and notes that a stable volume of produce could be obtained from the

plants (Castetter and Bell 1942). In the Chihuahuan Desert, however, environment and climate combine with properties of the mesquite plant to often make the plant's productivity unpredictable and mesquite an unreliable resource (Basehart 1974).

Astragalus

Several seeds of the genus *Astragalus* were recovered from a subsurface context in the midden. Species of this large genus are found in a variety of habitats, ranging from hot and dry environments to cooler high-mountain areas (Dodge 1976:168). Some of the varieties, such as locoweed, are quite toxic, while others are used as food by ethnographic groups (Weiner 1980:168).

Amaranth

Amaranth seeds were recovered from the midden. Amaranth includes a variety of species used as food sources by aboriginal groups. Amaranth is a weedy plant common throughout the region. It is particularly prevalent in disturbed soils, often growing in cultivated areas alongside domesticates (Pennington 1963). The leaves and stems produced in early spring are valuable food items (quelites), and the seeds harvested in late summer provide an excellent, storable food that can be ground into meal.

Chenopodium

A single chenopodium seed was recovered from Feature 1, a hearth. These annuals also produce greens that may be picked and eaten in early summer. Seeds ripen and are harvested later in the summer. Chenopodium, like Amaranth, grows in disturbed soils as a wild weedy plant and is found in cultivated fields.

Other Plant Remains

Several other plant species were recovered. These include: *Dimorphocarpa wislizenii* (spectacle pod), *Atriplex canescens* (four-wing salt bush), *Lepidium* sp. (pepper grass), *Xanthocephalum sarothrae* (broom snakeweed), *Mentzelia* sp. (desert lily), and several unidentified compositae.

D. wislizenii is a weedy plant that grows well in disturbed areas in sandy soil or along streams. Its presence often is evidence of human disturbance. This plant was found in most of the samples and in all levels of the midden.

Atriplex includes a wide variety of species found in the region. Salt bush leaves and seeds are highly nutritious and can be ground into meal or used as seasoning herbs. The Navajo use the leaves and twigs to make dye (Elmore 1944). Ashes from the plant are used by the Hopi and Tewa to color piki bread (Dennis 1939). It is a woody plant, perhaps useful as fuel, as building material, or making tools.

Lepidium is a member of the mustard family. It is an edible plant, and the leaves often are used as a garnish or in salads. Pepper grass seeds are eaten by the Papago (Castetter and Underhill 1935).

Mentzelia is a weedy plant that grows both in sandy loam and caliche soils. It is a perennial that may reach heights of 1 m. Some members of the genus are utilized as foodstuffs and as tobacco (Elmore 1944; Underhill 1954).

Xanthocephalum sarothrae is very common in the area today. It is a woody perennial that occurs in caliche or in sandy soils. There is no ethnographic record of its use as a foodstuff.

Discussion

Almost all of the plant remains found at Pueblo Sin Casas still grow in the area today. If few changes have occurred in the local environment in the past several thousand years, then these plants probably had economic importance for prehistoric populations. This brief discussion of the usefulness of many of these species demonstrates the diversity of economic plants in the Chihuahuan Desert, and perhaps may help explain why the site was successively reoccupied over a long period.

The limited quantity of environmental and subsistence data recovered from the excavations at Pueblo Sin Casas does not lend itself to an illustrative reconstruction of the subsistence activities represented at the site. Additionally, at Pueblo Sin Casas the long history of reoccupations by different cultural groups adversely affects our ability to reliably assess the site's role within the overall subsistence patterns of the cultural systems associated with the site's various components.

Archaeological investigations in the Hueco Bolson and Tularosa Basin have produced information suggestive of a variety of different kinds of sites (Carmichael 1986; Whalen 1977, 1978). Also, several cultural ecological models of settlement and subsistence have been constructed for the Mesilla (Hard 1983a) and El Paso (Mauldin 1986) phases. In the context of these models, Pueblo Sin Casas is believed to be a temporarily, frequently reoccupied site at which a limited set of activities was conducted. The small amount of cultural debris and midden deposits at the site further supports the proposition that the site was occupied for logistic rather than residential purposes. At sites like Pueblo Sin Casas, prehistoric groups gathered, processed, and in some cases, cultivated plants, and coordinated hunting expeditions. Sites like Pueblo Sin Casas are not uncommon in the region (Hard 1983b; O'Laughlin et al. 1988), and they are thought to have played a major role in the subsistence systems of both mobile and sedentary groups (Hard 1983a; Mauldin 1986).

The location of the site near a playa suggests it probably was occupied during mid-to-late summer when water likely would be present. Wild plant and animal species are more prevalent in wet areas, possibly making the playa a productive site for hunting and gathering. Possible cultivation of domesticates around the playas has been suggested (Whalen 1977); the site may well have functioned as a field station. In addition, several researchers have suggested that mesquite clumps were important in the subsistence activities of the groups that occupied the region (Carmichael 1982). If clumps of mesquite stood near Pueblo Sin Casas, the site also may have served in the procurement of this resource.

Artifactual data provide few clues about the subsistence activities practiced at Pueblo Sin Casas. Ceramics characteristic of the Mesilla and El Paso phases and perhaps the Doña Ana phase were present, suggesting a long but intermittent use of the site. In other regions of the Southwest, sherd scatters often are associated with agricultural field stations and wild-plant gathering locales (Lindauer 1984). Their presence at limited-activity sites such as Pueblo Sin Casas is not surprising. However, sherd scatters themselves yield little substantive insight into subsistence activities.

The variety of projectile point styles at the site also is indicative of the site having been occupied from the Archaic to the late Formative. The presence of large projectile points suggests hunting activities were conducted outside the site. Large game, such as deer or pronghorn antelope, may have been hunted. Rabbits also may have been prey, although ethnographic data indicate rabbits more often were captured with sharpened sticks, snares, or clubs . . . not projectiles tipped with stone points.

In addition to the projectile points, the chipped and ground stone artifacts, manos, metates, and pestles indicate plant procurement and processing were conducted at the site. It has been suggested (Nelson 1981) and demonstrated (Foix and Bradley 1985; Foster et al. 1982) that durable, coarse-grained lithic materials that produce a wear-resistant working edge may be suitable for plant procurement and processing activities.

The several FCR features suggest some type of plant processing was carried out at the site. Of the four hearths identified at the site, at least one could be defined as a roasting pit on the basis of the depth of the FCR deposits. Roasting pits often were used for processing desert succulents such as agave and yucca. It is unclear whether the more shallow depth of the other hearth features was a result of their original morphology in relation to their use, or to severe deflation.

In conclusion, subsistence activities at Pueblo Sin Casas are demonstrated in the variety of data that indicate the site was occupied for short periods to procure and process wild plants and to hunt wild animals. Because water was not available on a permanent basis, the site probably was occupied during the late summer when the nearby playa was filled and when plants and animals were at their peak productivity and availability.

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Chapter VI

DISCUSSION

The 1979 test excavations at Pueblo Sin Casas (FB6273) provided additional information about what is an archaeologically little-known area. Similarly, subsequent studies in the Hueco Bolson and Tularosa Basin (Carmichael 1986; Hard 1983; Lukowski and Mauldin, in press ; Mauldin 1986; O'Laughlin 1979; O'Laughlin et al. 1988; Whalen 1977, 1978, 1981) have provided a better framework with which to assess the archaeological and cultural significance of FB6273.

This study is also of interest for its implications regarding the evaluation and interpretation of archaeological sites based on surface data. The results of test excavations at FB6273 are significantly different from Whalen's (1978:116) expectations about the site developed from survey data. This observation is not a criticism of Whalen's efforts. It is, however, another confirmation of one of the fundamental problems in archaeological research generally and in cultural resources management in particular.

Chronology

No chronometric determinations were made for Pueblo Sin Casas. Thus, projectile point and ceramic cross dating have been employed in an effort to identify possible temporally different occupations of the site. Projectile point styles, ceramic types, and ceramic rim forms all suggest multiple occupation and use of the site did occur. The projectile points potentially are problematic. It is possible that some, or even all, may have been collected in other locations, brought to the site, abandoned, and/or reused by subsequent occupants. Some styles of projectile points, therefore, may have had life spans that extended substantially beyond the dates with which the points currently are associated. Thus, their uncritical use as temporally diagnostic artifacts with which to identify chronologically different occupations is inappropriate. This general problem cannot be solved with the limited data from Pueblo Sin Casas.

Nevertheless, the projectile points tentatively suggest the following periods of utilization: early to middle Archaic (6000 to 2000 B.C.), late Archaic/early Formative (2000 B.C. to A.D. 600), and late Formative (El Paso phase, A.D. 1200 to 1400) (Hard 1984, Whalen 1980b).

Unlike the projectile points, the ceramic material at the site probably is in its primary context. Ceramics may represent all phases of the Formative period in the El Paso area. These include the Pithouse period (Mesilla phase, A.D. 250 to 1100), the Transitional period (Doña Ana phase, A.D. 1100 to 1200), and the Pueblo period (El Paso phase, A.D. 1200 to 1400). It might be possible to subdivide the Pithouse and Pueblo periods further based on rim sherd form; however, the lack of rim sherds from the site makes such a subdivision tentative at best.

The general characteristics of the features and the artifacts at the site suggest several short-term occupations took place there. The projectile point and ceramic data suggest these occupations occurred beginning as early as 6000 B.C. and ending by A.D. 1400.

Site Context and Function

Artifactual evidence suggests FB6273 was used periodically from the early Archaic through the end of the Formative period. The evidence includes the variety of temporally diagnostic projectile points and different elements of the El Paso Brown Ware ceramics. It assumes, perhaps incorrectly, that all of these artifacts are in their primary archaeological context. Despite the problems involved in accepting the chronological implications of the early projectile points on the site, it is clear FB6273 is multicomponent.

The lack of architectural features, storage facilities, artifact accumulations, and midden accumulations is evidence of the temporary and transitory use of the site. The only possible exception to this characterization is what may be the remnant of a sheet midden on the southeast area of the site. This feature did not contain substantial quantities of cultural refuse, and its classification as a midden is tenuous. The lack of features and cultural debris in the site becomes more significant in the context of archaeologists' current models of the probable regional prehistoric land use and residential patterns.

A general model for the Archaic and early Formative occupation and use of the basin floor has been developed by Hard (1982). He proposes that the basin floors were used most intensively during the mid to late summer when basin resources (plants, animals, water) are at their peak availability. Hard contends that a foraging strategy probably was employed in which people moved from water source to water source, exploiting the adjacent food resources. Playas would have served as the water sources in the basins. He suggests camps were occupied for short periods, not more than a few days to a few weeks. This land-use system would have required little investment in housing and storage facilities.

Hard (1983) and Mauldin (1986) also have generated land-use models for the Formative period in the West Texas and southern New Mexico area. Both of these are better developed than is Hard's (1982) earlier model and both emphasize a high degree of residential mobility. They suggest that as proposed for the Archaic, the most intensive use of the basin floor during the Formative was during mid summer to early fall. Prehistoric populations are thought to have continued to take advantage of the late summer congruence in the availability of water and food resources in the basin.

Hard (1983) proposes that populations during the Mesilla phase left their winter villages in mid-summer to take harvest of the food and water resources seasonally available in the basin. Groups temporarily would camp near locations where water was available, in the playas, and they would move on as food resources near their camps were depleted. With the end of the rainy season and the diminishment of the basin resource base, these people once again would retreat to their winter villages in the foothills and alluvial fans of the surrounding mountains, where water and plant food would be more abundant. Thus, Hard expects most of the Mesilla phase sites within the basins to be summer foraging camps.

Mauldin's (1986) model of puebloan land use in southern New Mexico and western Texas borrows from and builds upon Hard's model. Mauldin suggests that by late spring and early summer puebloan populations probably would have depleted the farm and wild plant foods harvested and stored during the previous year. Local groups who stayed together in "primary" villages during the winter then would break up into smaller groups, probably into closely related kin groups, as a result of this seasonally reoccurring subsistence stress. These small kin groups probably would move into the basins to their summer residences to exploit the wild food resources generated by the onset of spring rains.

Summer residences may have been more seasonally "permanent," and they may have served as "secondary villages" or "farmsteads" at which farm crops were planted, tended, and harvested during the

summer and early fall. These secondary villages probably would have been located adjacent to the more reliable playas to take advantage of the richer soil and higher levels of soil moisture at these locations. Mauldin suspects foraging camps, much like those used in the late Archaic and early Formative, probably also were established. Groups occupying these camps probably would return either to their primary or secondary village periodically as the summer season progressed into fall.

The secondary villages and foraging camps would have been used until the end of the rainy season when the playas in the basins would begin to dry out. The scattered kin groups then would return to their primary villages in the foothills or along the Rio Grande. They would bring with them the crops harvested at the secondary villages and the temporarily excess wild foods gathered at the foraging camps. They also probably would assist in the harvesting of farm crops planted by some members of the population left behind at the primary village in the spring. The focus of both Hard's (1983) and Mauldin's (1986) models is residential mobility and a continued high level of dependence upon hunting and gathering.

Nonresidential sites, like Pueblo Sin Casas, with few features and little cultural debris, probably were used by special-task groups in the exploitation of a specific resource or set of resources (Hard 1983:42). For example, mesquite is plentiful around Pueblo Sin Casas, and the site is within 1 km of several large playas. Therefore, wild food resources should have been concentrated near the site. It does not seem unreasonable to assume nonresidential occupations are represented at Pueblo Sin Casas. These occupations might represent activities like those expected at a summer foraging camp during the Archaic period or during the early Formative period. They also could be like those staged either from primary or secondary villages during the Pueblo period.

The characteristics of Pueblo Sin Casas suggest it probably was used for short periods of time. Wild plant and game food resources in its vicinity would have been collected and, probably, processed. The resources then probably were either consumed at the site or transported to a residential site, depending upon the cultural system represented at the time. The food resources exploited at Pueblo Sin Casas primarily would have been wild plants, such as grass seeds and mesquite beans (Carmichael 1981; Eidenbach and Wimberly 1980), and animals, such as rabbits, other rodents and reptiles, and possibly deer.

Although Pueblo Sin Casas probably represents a series of short-term foraging occupations, the possibility that residential components (base camps) also are present cannot be excluded. If such components can be identified, the occupation of Pueblo Sin Casas well may fit the models developed by Hard (1983) and Mauldin (1986). The kinds of residential hut structures that are beginning to be identified in the basin, however, are not present at the site. And there is no evidence of a more substantial structure, such as a pithouses or small, two- to three-room pueblos.

Pueblo Sin Casas, then, probably was occupied principally during the summer when food and water resources would have been at their maximum availability in the basin floor. Occupation of the site, which may have begun in the early Archaic and continued through the Formative, probably consisted of a series of short occupations for foraging activities around the site.

Artifact and Feature Distribution

One of the goals of this project was the identification of spatially discrete occupations and activity areas. Artifact types and features were plotted on the site map in an effort to identify clustering. All

categories of artifacts are more abundant in the southern half of the site, but no identifiable associations of features and artifacts interpretable as localized occupations could be identified.

Likewise, no areas were identified as the locales where specific stages of lithic reduction occurred. Cores were found in the same areas as primary flakes. In turn, primary flakes occurred where thinning and edge retouch flakes also were found. In other words, no areas of the site can be definitively identified as workshops where core reduction or final tool shaping or maintenance was performed. No association between chipped stone or lithic debris and any of the features was identified.

The same lack of association generally is true for the ground stone. However, two exceptions are noted. The remains of a fire-cracked rock feature were recorded in grids 165, 166, 167, and 168. Associated with the feature was a cluster of metate, mano, and ground stone fragments. It appears that grinding activities were concentrated around a hearth area. The lack of associated temporally diagnostic artifacts, however, prevents even a tentative assessment of the feature's age.

A similar situation exists at Feature 21 (see Figure 1-2). The feature is a charcoal-stained area with an associated concentration of several metate and mano fragments. Grinding activities also appear to have been concentrated at this location. This feature and artifact assemblage contain no temporally diagnostic artifacts.

Sherd material was well scattered across the site but occurred more frequently in the southern half. Projectile points were distributed fairly evenly across the site both spatially and temporally. It was hoped that Archaic or Formative points might cluster and help identify different temporal components.

In summary, it appears both temporal and functional components at FB6273 are well mixed. Because the site is deflated, components could not be stratigraphically isolated. Furthermore, if the various temporal components were laid down one on top of the other, separating them spatially would prove extremely difficult. Although additional analyses might result in the identification of other discrete activity areas, it is unlikely that they would help identify temporal components.

Management Considerations

The protection and preservation of the archaeological record on Fort Bliss is a monumental effort, and unfortunately an effort that often conflicts with the mission of Fort Bliss—the training of military personnel. Clearly, the identification and subsequent evaluation of the archaeological record become even more important, even beyond analytical concerns, when sites face the immediate risk of being destroyed.

Numerous examples exist concerning the reevaluation of sites after their initial recording. I am sure most archaeologists would rather not have to redo previous surveys and, at the same time, I am sure we all have overlooked significant data in previous investigations. Additionally, project directors are dependent upon the data recorded by their field crews. Even the best of crews, however, can vary recording procedures unless carefully monitored and controlled. Recording can vary from day to day and, as is well known, from crew to crew. This variability causes difficulties in comparative analysis across projects and, sometimes, across crews of the same project. These difficulties in comparative analysis make it imperative that a program such as the Fort Bliss Historic Preservation Plan insist all projects adhere to a well-developed, standardized,

and easily understood set of requirements for performing field survey and for recording data during field survey.

Excavations at FB6273 demonstrated that the site is different in many respects from the description provided by Whalen (1978:116). The site initially was reported to be a small El Paso phase village with high excavation potential. Excavation demonstrated this obviously was not correct. The recovered artifacts indicate the site may range in date from the early Archaic through the Formative period. Ceramic materials and lithic material types were much more variable than was reported at the onset.

There are several obvious reasons for the discrepancies between the initial description and this report. First, five weeks were spent on the site, not the few hours allotted during the first survey. Second, recovery of subsurface data during the second survey added greatly to an understanding of the variety of material present at the site, material that would not necessarily be represented on the surface. Finally, the region's dynamic geomorphology may have contributed to some of the disagreement between the initial site description and the data reported herein. Anyone who has worked in the Tularosa Basin or Hueco Bolson has observed how dramatically changes in surface visibility can occur in a relatively short period of time (Seaman et al. 1988:143). The development of, and changes in, sand dunes and the blowing sheet sands can expose and obscure artifacts and sites quickly.

Considering that most recent research in the Tularosa Basin and Hueco Bolson has been survey work, the findings at Pueblo Sin Casas have important implications for interpreting the archaeological record of the area. Many of the site topologies developed and occupational histories presented probably are incomplete or, worse, simply inaccurate. Unquestionably, it is important that researchers develop a better understanding of the region's climatic and geomorphic history. This, combined with improved and more intensive data-collection techniques (such as those now under development at Fort Bliss), will lead to a better understanding of the region's prehistory.

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