MUSEUM OF NEW MEXICO

OFFICE OF ARCHAEOLOGICAL STUDIES

THE BLINKING LIGHT SITE: A VALDEZ PHASE PIT STRUCTURE NEAR TAOS, NEW MEXICO

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ADMINISTRATIVE SUMMARY

Between October 16 and November 22, 1995, the Office of Archaeological Studies, Museum of New Mexico, excavated a portion of LA 53678 for the New Mexico State Highway and Transportation Department. A portion of the site was within the area proposed for realignment of the U.S. 64–NM 150–NM 522 intersection.

LA 53678 is a Valdez phase pit structure. Excavation of the pit structure yielded a large amount of discarded prehistoric artifacts and one extramural feature. A historic component was represented by two areas of discarded Anglo-American artifacts. Specialized artifact and sample analyses provided detailed information with which to interpret the artifacts in light of research questions proposed in the data recovery plan.

Submitted in fulfillment of Joint Powers Agreement D 05486 between the Office of Archaeological Studies, Museum of New Mexico, and the New Mexico State Highway and Transportation Department.

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INTRODUCTION

In January and February 1986, New Mexico State Highway and Transportation Department (NMSHTD) archaeologists identified LA 53678, near the intersection of US 64–NM 150–NM 522 in Taos County, New Mexico. LA 53678 is on state land acquired from private sources and administered by NMSHTD (Fig. 1 and Appendix 1). The NMSHTD proposed to realign the intersection, and part of LA 53678 fell within the proposed right of way. The site was recommended for data recovery.

The data recovery plan and subsequent archaeological data recovery efforts were proposed and performed by the Office of Archaeological Studies, Museum of New Mexico. The principal investigator was Timothy D. Maxwell. The project director was Peter Y. Bullock. Field assistants were Steven Lakatos, Raul Troxler, and Marcy Snow. The report was edited by Tom Ireland, graphics were drafted by Ann Noble, and photographs were printed by Nancy Warren.

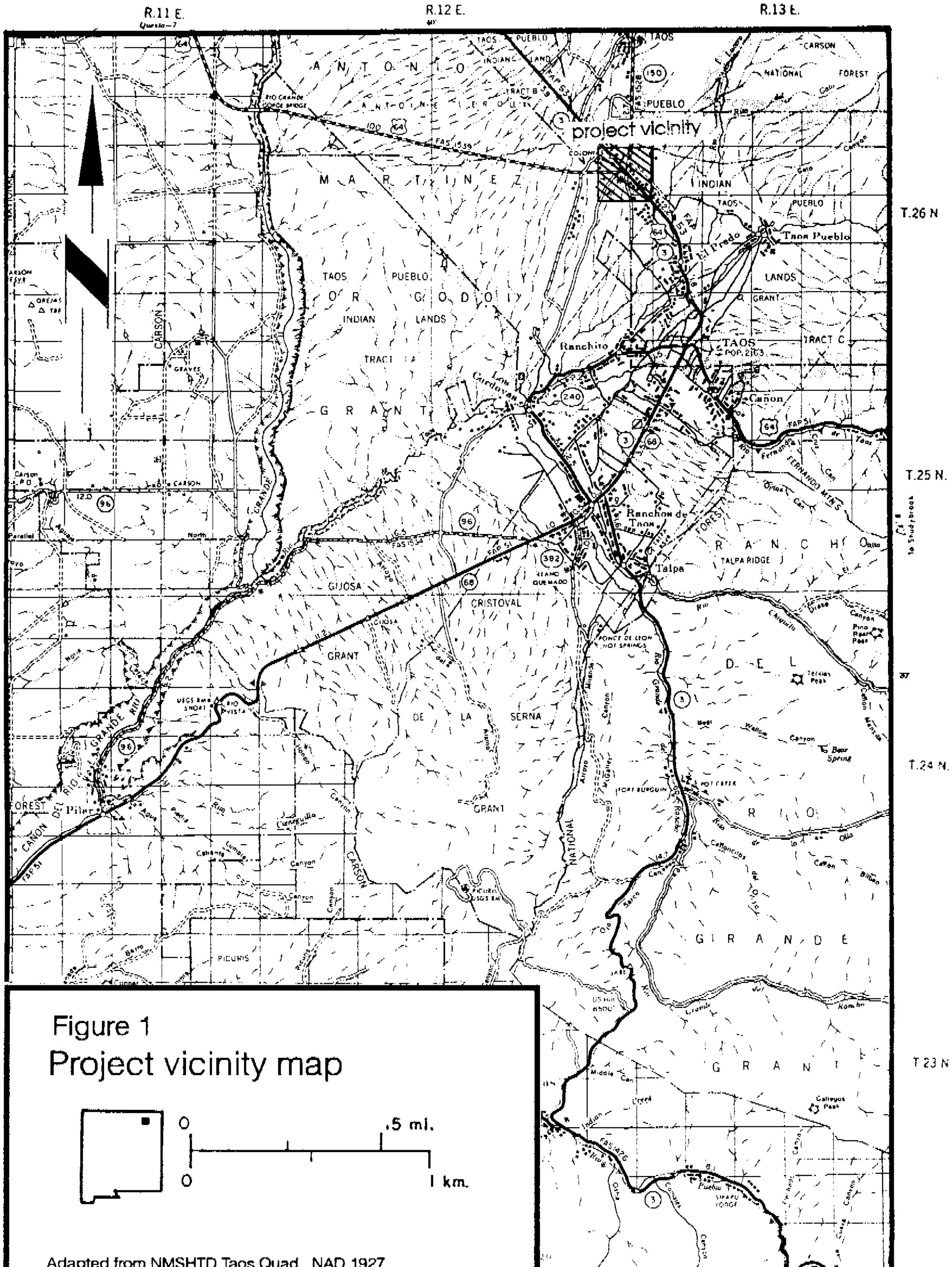

Figure 1
Project vicinity map

Adapted from NMSHTD Taos Quad, NAD 1927

ENVIRONMENT

The LA 53678 is in the Southern Rocky Mountain physiographic province (Fenneman 1931), Costilla Plains physiographic subdivision. Part of the Rio Grande Rift (Garrabrant 1993:3), the Costilla Plains are composed of alluvial fan and valley fill sloping westward from the Sangre de Cristo Mountains. Elevations on the Costilla Plains range from 1,767.84 to 2,438.4 m (5,800 to 8,000 ft).

LA 53678 is at an elevation of 2,185.41 m (7,170 ft). The site is on a southeast-facing slope on the south side of the small ridge that serves as the divide between the valleys of the Rio Seco and the Rio Lucero.

Geology

The Rio Grande Rift was formed when the Sangre de Cristo Mountains were uplifted during the Late Cenozoic period. This rift is an asymmetrical graben, bordered on the east by a north-south banded fault line that forms the western edge of the Sangre de Cristo Mountains. Volcanism in the area occurred during the Pliocene period within the Taos Plateau volcanic field, Sevilleta formation (Bauer et al. 1991; Kelley 1990).

The Costilla Plains were formed by alluvial rift, basin sediment deposits from deglaciation and glacial outwash from the mountains to the east. These form a series of large alluvial fans along the front of the Sangre de Cristo Mountains. The upper levels of this alluvial deposition form the Lama formation, dating to the Pliocene and Pleistocene periods. These alluvial deposits are separated by well-developed soils, indicating deposition spaced between periods of stability. This suggests that deposition episodes in the area correlate with periods of deglaciation (Hacker and Carlton 1982; Garrabrant 1993:7-8; Menges 1990:114-115; Pazzaglia and Wells 1990:429). An exception to this is the lack of aggregation in the Rio Hondo Valley during this period of deglaciation, caused by lengthy high-stream flow velocity in the Rio Hondo. Little change in terrain has occurred on the Costilla Plains since the end of the Pleistocene (Pazzaglia and Wells 1990).

A number of perennial streams originate in the Sangre de Cristo Mountains and flow across the Costilla Plains to the Rio Grande. Seeps and springs occur along the Rio Grande escarpment. Ground water in the Costilla Plains is plentiful, present in alluvial deposits of Quaternary and Tertiary age, at depths beginning at less than one foot below the surface (Garrabrant 1993:1).

Prehistoric water availability, in the form of perennial streams and ground water, was similar to today's. A higher water table existed in the area prior to recent extensive well drilling (Garrabrant 1993). This suggests that surface water in the form of seeps and springs was more plentiful than it is now. Even with water diverted for irrigation, many portions of the local floodplains are too waterlogged for crops (Baxter 1990).

Soils in the vicinity of LA 53678 are fine-textured loamy Haplargids-Camborthods, thin loam surface soil over moderately deep loamy clay to clay loam subsoils. Currently used primarily for grazing and raising forage crops, these soils are fertile when irrigated (Marker et al. 1974:85-86).

Climate

The local climate is characterized as semiarid, usually dry and sunny with mild summers and cold winters (Garrabrant 1993:5; Tuan et al. 1973: Fig. 78). Precipitation ranges from 25.4 to 35.6 cm (10 to 14 in) per year on the Costilla Plains. Snow provides only 13 to 18 percent of the precipitation in this area of the Taos Valley. The wettest months are July and August. The winter months are the driest at lower altitudes. In the Sangre de Cristo Mountains, annual precipitation ranges from 48.3 to 70.6 cm (19.0 to 27.8 in), and snow provides a third of the total (Gabin and Lesperance 1977:390-391; Garrabrant 1993:5; Tuan et al. 1973).

Prehistorically, there was an increase in precipitation in the A.D. 1000s across large areas of the Southwest. This was caused by a northward shift in the jet stream, allowing warm, moisture-bearing air masses to move north in a trend that peaked by A.D. 1100. This was reversed between A.D. 1100 and 1200 as the jet stream moved south, allowing the return of northern cool dry air (Knight 1982:51; Pazzaglia and Wells 1990:429).

Yearly temperatures for the project area range from 39.4 to 47.1 F. The difference between day and night temperatures averages 30 degrees (Gabin and Lesperance 1977: 390-391; Garrabrant 1993:5-6). The first frost generally occurs in the third week in September, and the last frost generally occurred in the third week of May (Tuan et al. 1973:86). The number of frost-free days averages 120; however, the length of the growing season averages 160-180 days (Smith 1920:272-273).

Flora and Fauna

Local vegetation in the area of LA 53678 is primarily big sage, with areas of mixed grasses also present. Scattered juniper stumps indicate that the site area previously was scattered juniper parkland. Open areas of grassland were once present in the vicinity of the site.

The sagebrush-grassland community supports elk, mule deer, bobcat, and coyote. Cottontail rabbit, jackrabbit, prairie dog, and assorted species of small mammals, including a variety of rodents and birds, are also common in the area.

CULTURE HISTORY

This discussion is limited to the periods represented by components at LA 53678: the Early Puebloan and Late Historic (1912-1946) periods. The reader is referred to Baxter (1990), Cordell (1979), Stuart and Gauthier (1981), Lamar (1970), Weber (1992, 1996), and Young and Lawrence (1988) for a more detailed synthesis of Taos area prehistory and history.

Puebloan

The cultural chronology used in the Taos area was first developed by Wendorf (1954). Although it has been altered a number of times since its inception (Wendorf and Reed 1955; Wetherington 1968), it is still useful to describe the general prehistory of the area. This chronology is based on a sequence of pit structures to large aggregated pueblos, and the individual phases are characterized by architectural and ceramic traits. A reevaluation of sequence dates based on nonceramic dating techniques by Crown (1990) suggests that the clusters of traits used to define each phase do not appear synchronously at the phase boundaries.

The Valdez Phase

The Valdez phase is the earliest Puebloan phase in the Taos region characterized by ceramics and architecture. Corresponding to the late Developmental phase in the Rio Grande chronology (Woosley 1986), this phase is commonly dated to A.D. 1000-1200 (Crown 1990), based on the presence of Taos Black-on-white pottery.

Valdez phase sites are primarily composed of deep pit structures, sometimes found in association with surface jacal structures, work areas, and storage pits. These sites are generally small. The pit structures are isolated or in groups of up to four (Green 1976). There has been some attempt to group these sites into larger communities based on structural styles (Boyer 1994). Recent test excavations have revealed small pueblos dating to the Valdez phase (Boyer and Bullock 1996), suggesting a greater degree of site variability within the phase than is usually considered. Associated ceramic types for this phase include mineral-painted Taos Black-on-white and Taos Gray, a plain, incised, or neckbanded gray ware or brown ware.

Pot Creek Phase

The Pot Creek phase, commonly dated to A. D. 1200-1250, is defined by the presence of carbon-painted Santa Fe Black-on-white. The Pot Creek phase sites have been traditionally characterized by population aggregation into small pueblos of 4-16 rooms that surround or abut a courtyard that may contain a kiva.

The use of pit structures as kivas may have begun during this phase, although they continue to be used as habitations (Boyer 1995). The end of the Pot Creek phase is marked by abandonment of small pueblos and population movement into a few larger pueblos. Larger aggregations occur at Pot Creek Pueblo (Wetherington 1968), along the Talpa Ridge, and in South Llano (Woosley 1986). Associated ceramics include organic-painted Santa Fe Black-on-white and a corrugated variety of Taos Gray (Crown 1990).

Talpa Phase

The Talpa phase, generally dated to A.D. 1250-1350, is characterized by a later style of organic black-on-white pottery, Talpa Black-on-white, a possible local variety of Santa Fe Black-on-white (Crown 1990).

The population aggregation that characterized the Pot Creek phase continued during the Talpa phase with the concentration of the population into several large pueblos, including Pot Creek Pueblo and Picuris (Crown 1990; Woosley 1986). The end of the Talpa phase is marked by the abandonment of Pot Creek Pueblo in A.D. 1350 (Wetherington 1968).

A final unnamed phase occurs in the Taos area. This phase serves as the connecting period between the Talpa phase and the historic Pueblo occupation of Taos Pueblo. The site of Cornfield Taos, ancestral to Taos Pueblo, is assigned to this phase (Boyer 1995). It has been dated by Ellis and Brody (1964) to A.D. 1375-1500. Sites in the area are attributed to this phase based on the presence of polychrome and glazed ceramics.

Historic Period

While the history of Taos is well known (see Baxter 1990; Lamar 1970; and Webber 1992), settlement in some of the other communities of the Taos Valley is not as well documented.

The community of El Prado is approximately 4 miles northwest of Taos. Dependent on the Rio Lucero for irrigation water, El Prado is served by two main irrigation ditches built in 1854 and 1865 (Baxter 1990:63).

The area, originally known as Los Estiercoles (the Dung Piles), was first settled as early as 1776 (Jenkins 1966; Lamar 1970). However, most early settlement occurred after 1800. Large tracts of land in the area were purchased, and later sold, several times by the Pueblo of Taos. The land was sold for the last time in 1847 to a group of investors that included the local Catholic priest, Padre Antonio José Martínez. These repeated land transactions and title transfers effectively limited settlement in the area (Baxter 1990).

Despite some settlement, the area remained primarily grazing and agricultural fields until a Presbyterian mission was established in the early 1880s (Szasz 1988; WPA Community Overview 1936). One incentive for establishing the mission in the Los Estiercoles area was the offer of free land from a son of the then defrocked priest, Padre Martínez (Blake n.d.; Szasz 1988). The community changed its name to El Prado (the meadow) in 1890 (Pearce 1965:53).

By the early 1900s, El Prado had become an established farming community. The Gusdorf Ranch and Trading Post served as the main economic focus of the community by 1936 (WPA Community Overview 1936). El Prado grew slowly until the 1960s, when the growing popularity of the Taos Valley brought increased settlement. The area is now a satellite community of Taos.

DATA RECOVERY RESEARCH ORIENTATION AND GOALS

This section deals with the orientation and goals of the research that guided the data recovery effort. It is primarily derived from the recovery plan for LA 53678 developed by Boyer (1995:23-42). In accordance with Boyer's data recovery plan, a different goal was pursued for each of the two components at the site.

Prehistoric Component

The data from other excavated sites dating to the Valdez phase (A.D. 1050-1225) indicate patterns between pit structure shape and site location within Taos Valley. Rectangular pit structures are limited to the northern portion of the Taos area. These types of structures are present in the Arroyo Hondo and Arroyo Seco Valleys and adjacent areas. Round pit structures are present south of Taos in the area of Pot Creek and Rio Grande del Rancho (Boyer 1995).

Boyer felt that this distribution represented two distinct populations within the Taos Valley during the Valdez phase, serving as evidence of what he saw as a "frontier" style of settlement. Each of these communities was believed to have more internal cohesiveness than would be expected from scattered unrelated households. Boyer (1995:30) concluded, "Therefore they appear to fit the description of "dispersed settlement" on the Anasazi frontier."

Other aspects of Taos Valley settlement during the Valdez phase were considered by Boyer (1995) to provide additional support for a "frontier" model. These included the relatively "sudden" appearance of Anasazi communities in the area, the spatial and temporal impermanence of settlement, settlement patterns believed to represent a colonization gradient, the perceived loss of sociocultural complexity, and continued but changing contact with the populations of the perceived Middle Rio Grande Valley core area.

Boyer's data recovery effort at LA 53678, which he believed is a nonstructural habitation site, primarily focused on identification issues:. These have been identified as refinement of the area chronology, a determination of site activities and their relationship to site function, and an assessment of how LA 53678 fits into the subsistence and settlement patterns suggested for the Taos Valley (Boyer 1995). The goals and expectations of the data recovery effort were as follows:

1. Changes in settlement patterns, community organization, and other aspects of cultural development within the Valdez phase are dependent on an ability to date individual sites from the phase. Establishing a date for LA 53678 should aid in refining the suggested dates for the Valdez phase and enable the placing of the site within the Valdez phase continuum.

Archaeomagnetic samples were collected from the central hearth of the pit structure at LA 53678. These may enable the precise dating of the pit structure. Carbon-14 dating from charcoal collected from the surface of the pit structures floor will also aid in establishing the dates of site use.

The ceramic assemblage from LA 53678 will be analyzed to produce data that will identify local pottery. This may be accomplished through the study of tempers present and through petrographic analysis. Local and intrusive pottery may also be identified on the basis of paste, surface finish, and design elements. The frequencies of intrusive ceramic types through time should provide information about the regional social and economic organization. The proportion of ceramic types within site assemblages changes through time. The ceramic assemblage from LA 53678, when compared with assemblages from other Valdez phase sites, will enable the establishment of relative site dates between sites within the Valdez phase. Cultural change within the Valdez phase may be documented in this way.

2. Site function can be postulated based on the range of activities that were pursued at that locale. On-site activities at LA 53678 can be understood through a determination of the location and function of site and pit structure features, and their relationship to site structure. Feature function can be determined through the description of the feature and the analysis of the associated artifacts and other material.

Excavation of cultural features and deposits may yield faunal and macrobotanical remains. These remains will be analyzed for anatomical portion, age, condition, and frequency to determine dietary information.

Pollen from cultivated plants will enable us to infer farming. Large amounts of pollen are likely to indicate intensive farming and consumption. Pollen analysis also reveals information about the general prehistoric environment, including the suitability of agricultural conditions. The types of grinding implements present may also correspond to the sorts of gathered or cultivated plants.

Nonlocal lithic materials may provide information about the social and economic organization. The presence of lithic materials that have specific source areas may confirm or supplement the data obtained from the petrographic study of the pottery.

3. Differences in Valdez phase sites, particularly pit structures, may reflect discrete populations. However, this may also be an indication of cultural change through time.

Changes in subsistence and settlement patterns within the Taos Valley during the Valdez phase should be apparent through a comparison of known sites and their distribution through time and space. A combination of ceramically derived relative site dates and more precise archaeomagnetic dates will allow the seriation of Valdez phase sites by age. This should make apparent any developmental patterns within the phase.

Historic Component

The historic component at LA 53678 is limited to two historic artifact concentrations. Although one artifact concentration was considered by Boyer (1995) to be domestic refuse, he theorized that the second concentration represented a historic sheepherder's camp.

By comparing historic artifact assemblages with suspected different origins, Boyer (1995) felt that the unique characteristics of historic artifact scatters could be better defined. Thus, a temporary sheepherder's camp should contain an assemblage varying from items commonly found in domestic refuse.

The research design for the historic component at LA 53678 focused on identification issues and the collection of baseline data. Emphasis was directed toward chronological control, the identification of on-site activities, and the distribution of site types within the general area. The goals and expectations of the data recovery effort were as follows:

1. Differences in historic site types should be reflected in differences within the artifact assemblages. However, different artifact assemblages may reflect differences in time of deposition rather than different activities or types of sites. Successfully dating the two historical assemblages should ensure that differences caused by time are not mistaken for differences in activities represented.

Historic Euroamerican artifacts can be accurately dated through dates of manufacture. Establishing dates of site occupation, in the case of the suspected sheepherder's camp, and of consumption and disposal, in the case of the domestic trash dump, can be based on Euroamerican artifact dates. Ethnographic history may also aid in establishing site occupation and use dates.

2. Based on Maxwell's (1981) research on the La Jara sheep camp, questions of site occupation and reuse, seasonality of site occupation, and site function and maintenance may be answered through the determination of on-site actives. Differences in types of sheep camps could be understood through the role of the activities represented.

Locating site features and defining their functions is essential to understand site structure. Features can be addressed by revealing their physical descriptions and through the analysis of the associated artifacts and other material. The presence of certain kinds of artifacts can also suggest the presence of features that may not be immediately apparent.

3. Grazing strategies should be represented by specifically defined land-use patterns. These can be defined through site type distribution and placement in the landscape. Environmental contexts, ecological and technological adaptations, economic conditions, and the social position of sheepherding within the local society may be addressed through the integration of site-distribution and on-site activity data.

METHODS

LA 53678 is north of Taos on a very gentle southeast-facing slope that forms part of the ridge between the Arroyo Seco floodplain to the west and the Rio Lucero drainage to the east. The site covers a large area (148 by 103 m); however, most of this area is an extremely thin artifact surface scatter. The main site area is a prehistoric pit structure with an associated concentrated surface ceramic and lithic artifact scatter (Fig. 2). This portion of the site measures 18 by 15 m, an area of 270 sq m. Surface artifacts within the artifact concentration totaled 130, a density of 0.48 artifacts per square meter. All of the artifact concentration is within the proposed right-of-way.

A historic component, comprised of two distinct historic artifact surface scatters, is also present at LA 53678 (Fig. 2). Each of these artifact scatters is a localized concentration that represents a single distinct dumping episode.

Stratigraphy

Excavation defined three natural strata. These were assigned consecutive numbers that were used in the excavation notes and site and feature drawings. No intact cultural strata were found outside of the pit structure.

Stratum 1 is a grayish tan fine silty loam, alluvial in origin. This stratum is present at LA 53678 as a topsoil layer. It contains prehistoric artifacts and flecks of charcoal. The depth of Stratum 1 ranges from 10 to 18 cm.

Stratum 2 is a dense dark brown fine textured clay. This culturally sterile stratum is directly beneath Stratum 1. It ranges in thickness from 18 to 30 cm.

Stratum 3 is a dense red clay. This material is directly below Stratum 2. It is fine textured and contains caliche deposits, gravel lensing, and occasional cobbles. Stratum 3 is culturally sterile.

Prehistoric Component

The first goal of the excavation was to collect surface artifacts within the right-of-way. This was accomplished by setting up a 1 by 1 m grid system across the right-of-way. A site datum was established at 100N/100E, with an arbitrary elevation of 1.00 m. Grid numbers were assigned to the southwest corner of each unit. Each grid unit was examined for artifacts, which were bagged by grid. A total of 1,000 sq m was inspected, and surface artifacts were collected.

Following the surface collection, the 1 by 1 m units excavated during testing were reopened. Adobe walls were exposed in two of the test units (97N/108E and 100N/109E). The site stratigraphy was also revealed once these earlier test units were reopened. Once Stratum 1 (noncultural site overburden) was identified, it was surface stripped from 18 additional grids to expose the rest of the walls and define the extent of the pit structure. This overburden averaged 10 cm in depth, and away from the pit structure, it was directly over culturally sterile clay (Stratum 2). Stratum 1 was removed as a single layer.

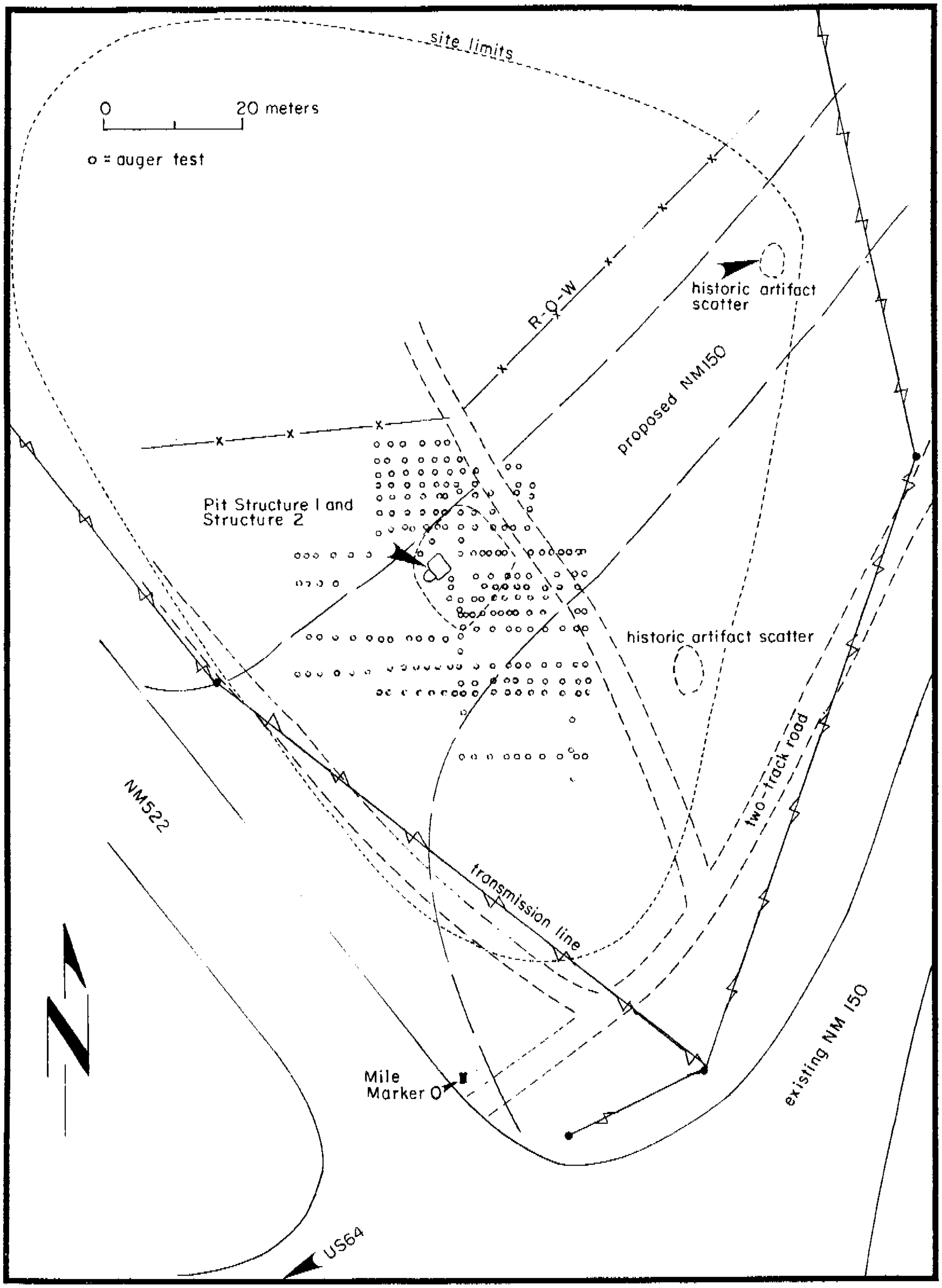

Figure 2. LA 53678 site map.

Once the pit structure was defined, Stratum 1 was also removed from 44 surrounding 1 by 1 m units to locate possible extramural features. Because of high artifact densities, Stratum 1 was then removed from an additional 21 grid units southeast of the pit structure (Fig. 3). No cultural layer or features were present outside of the pit structure.

Auger tests were then dug across the site in the area of the surface artifact concentration in either 1 m or 2 m intervals along the grid lines. These 205 auger tests were dug until culturally sterile soil was reached. No cultural material or deposits were found in any of the auger tests.

All of the dirt excavated at LA 53678 was sifted through 1/4-inch screen mesh. Artifacts were collected in paper bags that were labeled with vertical and horizontal provenience information.

One prehistoric structure, Pit Structure 1, was exposed by the removal of Stratum 1. Once the horizontal extent of the pit structure was defined, it was dealt with as a single structural unit. A trench (Segment 1) 1 m wide, extending the length of the pit structure, was hand excavated inside the structure's south wall. This trench was excavated in 10 cm levels to identify the pit structure's interior stratigraphy. A profile was drawn of the pit structure fill, and the rest of the fill was removed by natural strata. All of the fill was screened, and the artifacts bagged by provenience.

Three floors were identified within Pit Structure 1, based on the stratigraphic profile exposed within the Segment 1 trench. As each floor was uncovered, the floor surface and any features or artifacts present on the floor were mapped. Any features present on the floor were excavated.

All interior features within the pit structure were excavated in a similar manner. Once the horizontal extent of the feature was defined, it was excavated in halves. The first half was used to identify natural or cultural stratum. The second half of each feature was excavated by natural strata. If stratified deposits were absent, the feature was excavated in 10 cm levels. Samples were taken from contexts that appeared likely to yield the most data on feature function and age. Each feature was drawn and profiled, photographed, and described on field journal forms.

Similar excavation procedures were applied in the excavation of the single extramural feature at LA 53678 (Structure 2). Structure 2, a storage cist, was first bisected. A portion 1 m wide and extending the length of the storage cist (2.03 m) was hand excavated in arbitrary 10 cm levels to culturally sterile soil. The exposed profile was drawn, and the rest of the feature fill was removed in natural strata. The stratigraphy and the feature were profiled, photographed, and described on field journal forms.

Feature and site fill were described on field journal forms and grid forms. The forms included excavated depth in centimeters below site datum, information about soil color and texture, and artifact types and density. Soil colors were described using Munsell color notation.

After excavation was completed, the site was mapped with a transit and stadia rod, including the limit of the excavation, location of auger tests, and cultural features. After mapping, the excavation was backfilled.

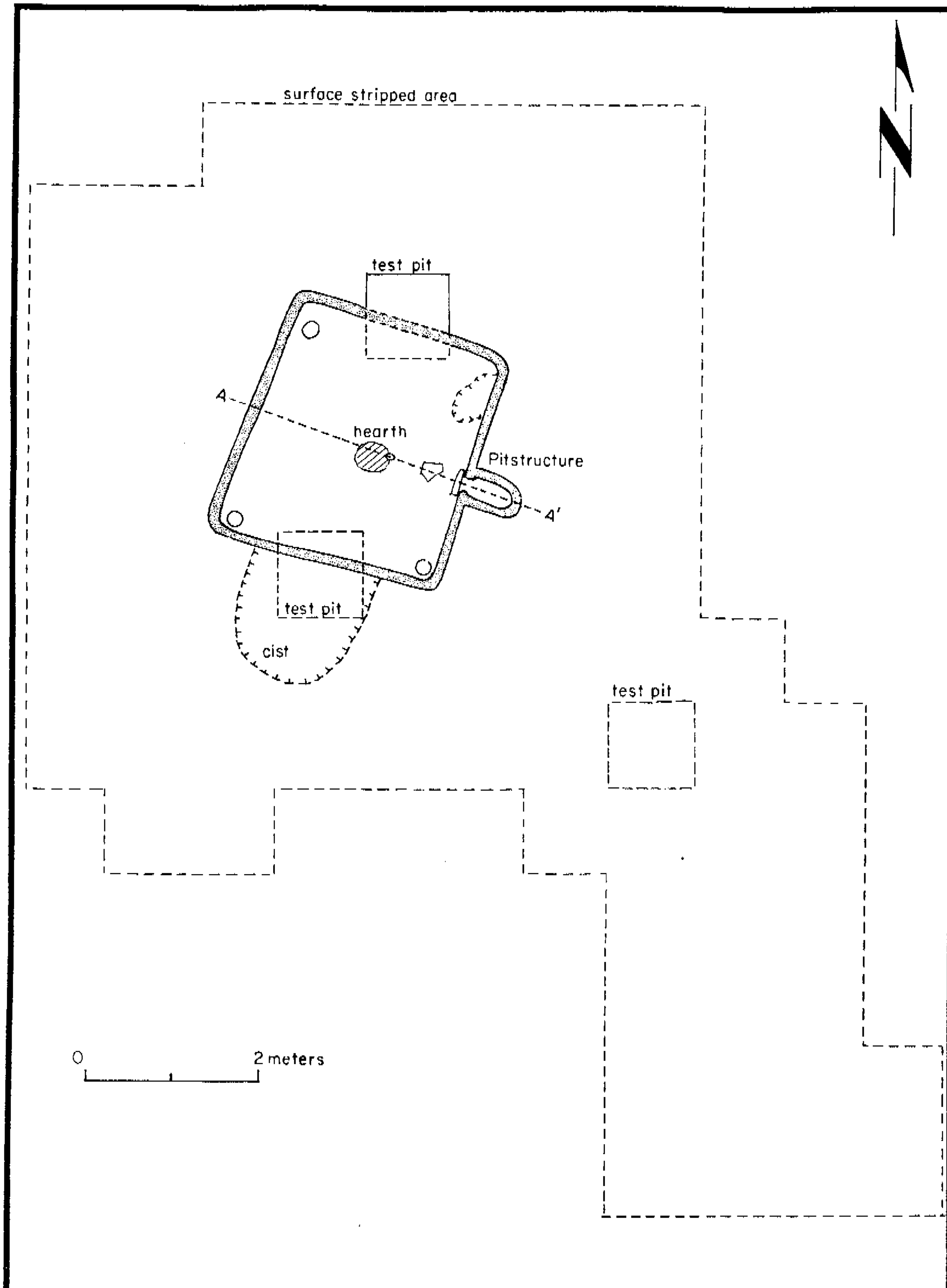

Figure 3. Excavated area of LA 53678.

Historic Component

Each historic artifact concentration was mapped and photographed in place. Once each of the two historic surface artifact concentrations was mapped and photographed, the artifacts were collected under the 1 by 1 m grid system and assigned provenience numbers based on dumping episode. Following the collection of the historic artifacts, interviews were conducted with a number of long-time local residents of the area.

All artifacts, unprocessed samples, and field notes, drawings, and maps are stored at the New Mexico Archaeological Research Collection and the New Mexico Cultural Resource Information System (NMCRIS) in Santa Fe.

RESULTS

Pit Structure 1

Pit Structure 1 is an adobe-walled rectangular pit structure in an area of a previously recorded ceramic and lithic artifact scatter. It measures 3.10 by 2.90 m, an area of 8.99 sq m. No other surface indications of the pit structure were present. Two test units (97N/108E, 100N/109E) excavated during the testing phase of the project cut through the adobe walls of Pit Structure 1. These test units were relocated and uncovered. Working out from these earlier test units, 17 sq m were excavated to a depth of 10 cm, exposing the tops of the pit structure's adobe walls.

Once the pit structure was defined, a trench 2.66 m long and 1 m wide was dug across the pit structure inside the south wall. This trench (Segment 1) was dug in five arbitrary 10 cm levels to culturally sterile soil. The resulting profile of the pit structure's contents was drawn, revealing three superimposed floors. The remaining fill was removed by stratigraphic layers, each stratum as a single unit. Pit Structure 1 is ceramically dated to the Valdez phase (A.D. 1050-1225). The last of the three floors (Floor 1) yielded an archaeomagnetic date of A.D. 935-1055.

Stratigraphy

The fill of Pit Structure 1 is a combination of eolian deposits and adobe wall and roof fall. Six layers of material are present in Pit Structure 1. These are described in descending order from the modern ground surface to Floor 3 (Fig. 4).

Stratum 1 is an eolian deposit composed of a fine grayish tan silty loan. Small flecks of charcoal and some ash are present within Stratum 1. This material is present across the site, forming the modern ground surface. Within Pit Structure 1, this stratum has an average thickness of 10 cm.

Stratum 2 is an alluvial deposit of brown silty sandy loam, directly below Stratum 1. Charcoal, ash, artifacts, and isolated pieces of gravel are present within this layer. Stratum 2 varies in thickness from 8 to 20 cm.

Stratum 3 is composed of adobe wall and roof fall. This material is present in an uneven layer directly below Stratum 2. Some mixing between Strata 2 and 3 is evident. Stratum 3 varies in thickness across the pit structure from 8 to 35 cm and is thickest in the south portion. Very few artifacts are present within Stratum 3.

Stratum 4 is a reddish brown fine silty sandy loam. Eolian in origin, this material is directly below Stratum 3. Stratum 4 is 3 cm thick and directly above the Floor 1 surface. Stratum 4 has a few artifacts and some charcoal.

Stratum 5 is a reddish brown sandy silt between Floors 1 and 2. Eolian in origin, Layer 5 is 5 cm thick and contains flecks of charcoal and some artifacts.

Stratum 6 is a brown silty loam between Floors 2 and 3. This layer has an average depth of 3 cm. It contains some flecks of charcoal and artifacts.

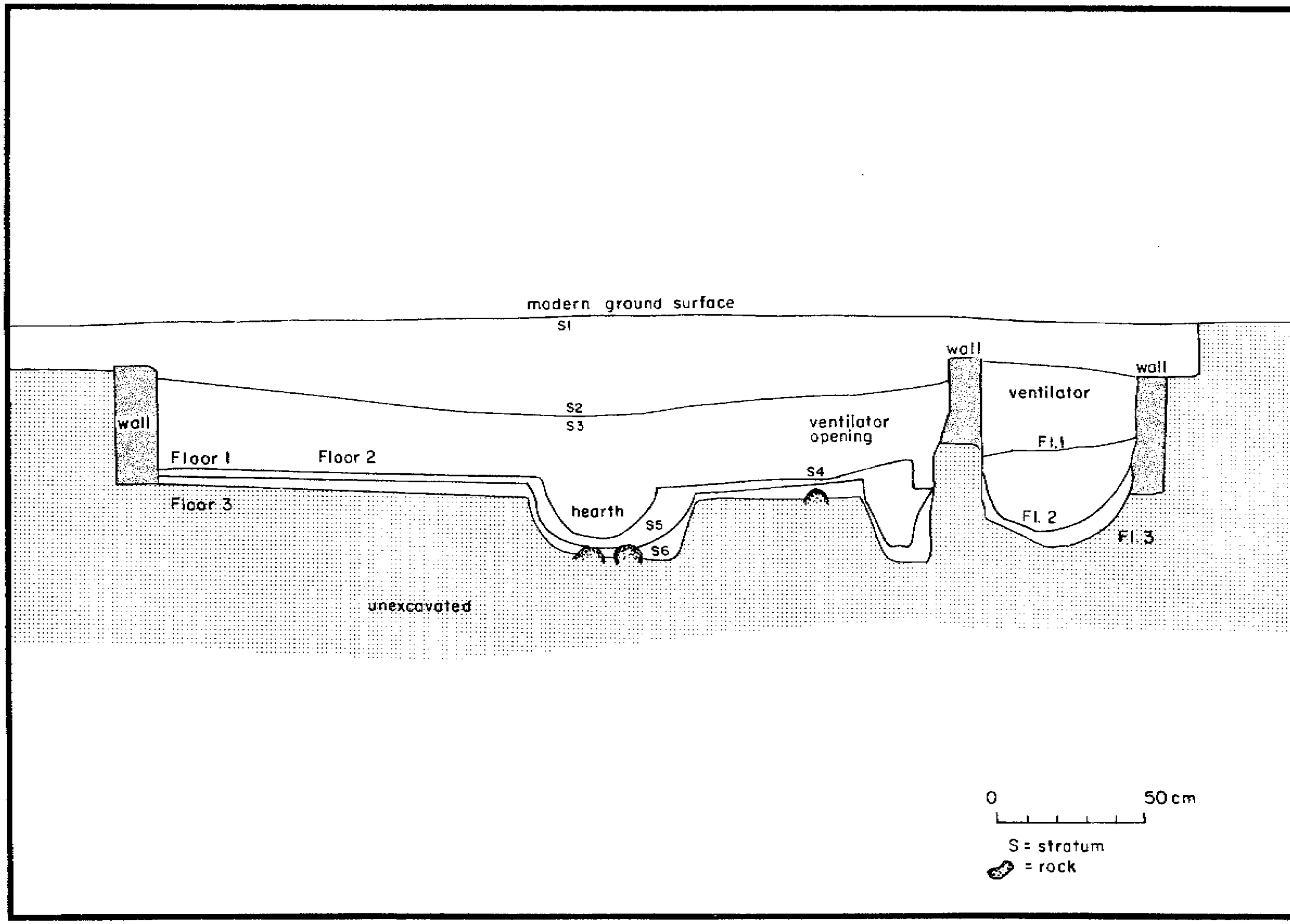

Figure 4. Pit Structure 1, cross section.

Architecture

Pit Structure 1 is rectangular with straight walls. It measures 3.10 m north-south by 2.90 m east-west. The depth of the pit structure from modern ground surface to Floor 1 ranges from 41 to 56 cm. Pit Structure 1 was constructed by excavation of a hole into culturally sterile clay and earlier cultural fill. This hole, forming the basic shape of Pit Structure 1, was then lined with adobe walls.

The pit structure has vertical adobe walls and a flat floor. The floor slopes down toward the southeast. There is no bench or pilasters. Interior features include the features comprising a heating/ventilator system: hearth, deflector, and ventilator. A number of postholes are also present. Structural orientation through the ventilator opening and centers of both the hearth and deflector is 103 degrees east of magnetic north. An earlier large storage cist (Structure 2) was cut by the south wall and floor of Pit Structure 1. Three floors were present in the pit structure, all of them very lightly stained. Very few floor artifacts were present on any of the floors within the pit structure. Repeated short-term use of Pit Structure 1 is suggested by the remodeling and low level of floor staining (generally perceived to be caused by use).

Walls

The walls of Pit Structure 1 are constructed of puddled adobe (Table 1). The walls are thicker in the corners than on the sides. There is no coursing visible in the adobe. This suggests that the remaining portions of all four walls were constructed as a single unit, in a single construction episode. All four of the corners are bonded.

The walls are constructed directly at the bottom and against the walls of the hole excavated for the pit structure. The north, east, and west walls are constructed directly on red culturally sterile clay. The south wall of Pit Structure 1 is partially constructed on both this red clay and on earlier cultural fill. This fill is within a an earlier subterranean storage cist.

A large amount of adobe wall fall was present within the pit structure as part of the pit structure's fill, suggesting that the pit structure walls were originally considerably higher than at present. No plaster is present on the remaining walls of Pit Structure 1. However, pieces of smudged wall plaster are present within the pit structure fill, indicating that the adobe walls were originally plastered.

Floors

Three floors are present within Pit Structure 1. Features are present in association with each of the three floors, including elements of the heater/ventilator system, and postholes connected with elements of the roof support system.

Floor 1

Floor 1 (Fig. 5) is a well-prepared, slightly charcoal-stained, prepared clay floor that abuts all four pit structure walls. The floor is flat but not level, sloping down toward the southeast corner of the pit structure. The depth of Floor 1 is 43 cm below site datum (BSD), except in the southeast corner, where it is 48 cm BSD. (The modern ground surface is at 0 BSD.) Floor features include a hearth, deflector slot, and a ventilator. Also present are a pit and three postholes (Table 2). None

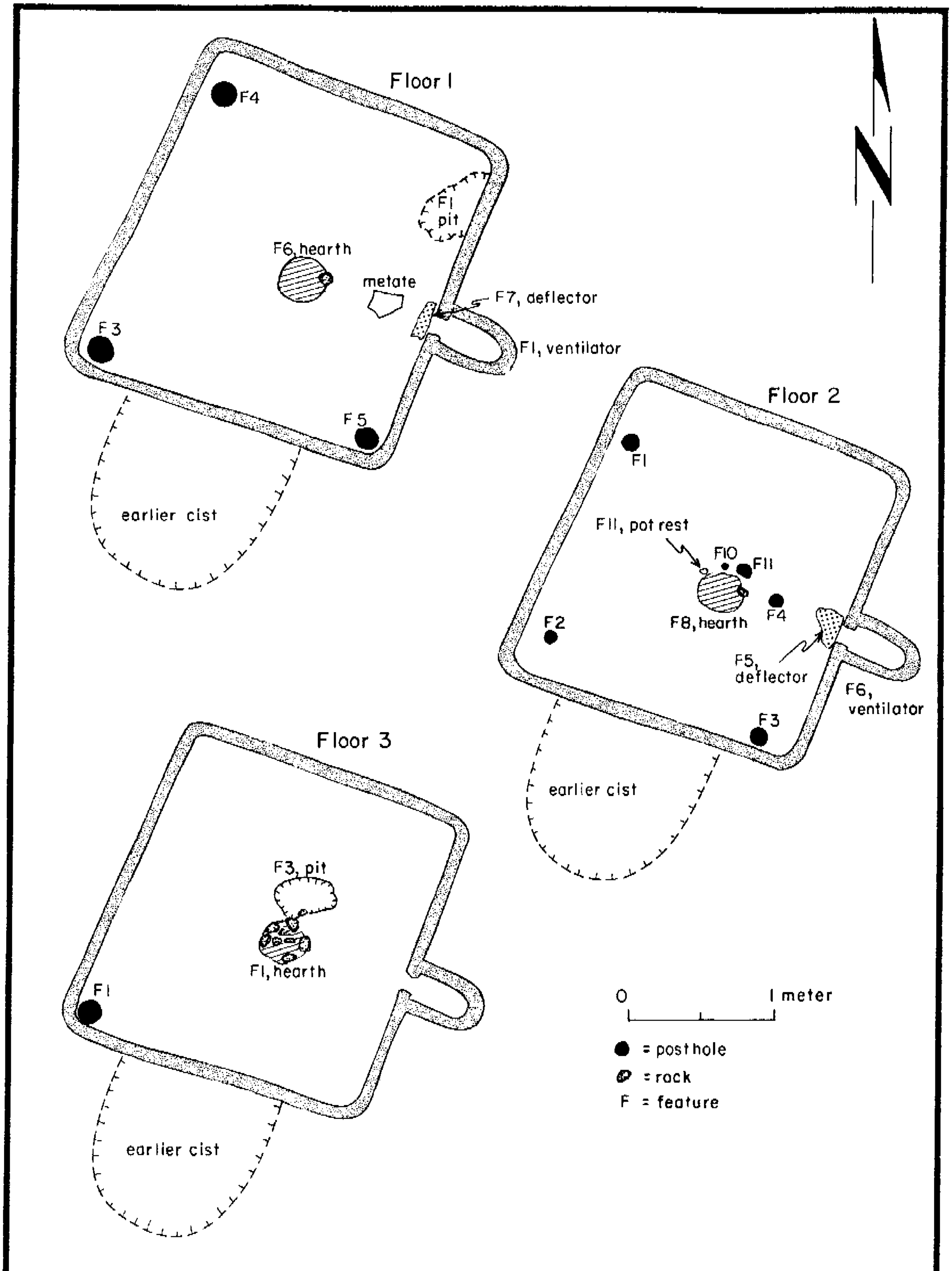

Figure 5. Pit Structure 1, Floors 1-3.

of these features were sealed. Floor artifacts are limited to two pieces of ground stone, the broken end of a two-handed mano, and a corner fragment of a trough metate.

Ventilator (Feature 1). A rectangular opening in the middle of the east wall serves as the opening of the ventilator tunnel. The outside portion of the ventilator is positioned extremely close to the pit structure. The total length of the ventilator from the opening to the back wall is 60 cm. The ventilator opening is built directly into the pit structure wall, 5 cm above the level of Floor 1. The lower portion of the wall forms a lip in the ventilator opening. The top of the ventilator opening is missing, having possibly collapsed with upper portions of the walls. The narrowness of the space between the pit structure and the ventilator indicates that the ventilator tunnel is only slightly longer than the thickness of the pit structure's east wall. The interior walls of the ventilator are lined with a 5 cm thick wall of adobe for their entire length. The ventilator interior also has an adobe lining on the bottom.

The feature fill is a single stratum of brown silty loam, eolian in origin. Two large cobbles, neither of them structural, are also present within the ventilator fill. No artifacts were recovered from Feature 1.

Pit (Feature 2). Feature 2 is a large shallow pit in the northeast portion of Floor 1. This pit is directly against the east pit structure wall and just to the south of the north wall. It has a flat base and straight sides, except on the south side, where the wall slopes inward. Feature 2 may have served as a posthole for the northeast corner of the pit structure.

The feature fill is a fine reddish brown silty loam containing some melted adobe. A number of small rocks within the feature fill may have served as shims for a post. No artifacts were recovered from this pit.

Postholes (Features 3, 4, and 5). Postholes are in three of the four corners of the pit structure, in each case, not far from the junctures of the walls. The postholes vary in both size and depth. No trace of wood or post impressions was found, suggesting that the posts were removed prior to abandonment. This is supported by the similar fill within the postholes, a brown sandy silt. No artifacts were recovered from any of the postholes. The posts contained in these postholes would have served as the structural supports for the pit structure roof.

Hearth (Feature 6). Feature 6 is a prepared hearth within the pit structure, slightly east of center. This simple hearth is circular and has a concave base. This feature is lined with adobe. The hearth is completely encircled with a 6 cm wide adobe collar. On the east side of the hearth, one large cobble protrudes through this adobe collar. The interior of this feature is heavily oxidized. One layer of fill was within the hearth. Feature fill is a sandy clay containing burnt adobe, charcoal, and a small number of artifacts (both ceramics and lithic artifacts).

Deflector (Feature 7). A slot for a slab deflector is on Floor 1, directly in front of the ventilator opening. This deflector slot is rectangular. It has straight walls and a relatively flat base. A single stratum of fill is present within this feature, a fine brown sandy silt containing bits of adobe. Traces of adobe in the fill suggest that the slab was firmly secured in the floor. The stone slab that formed the deflector was not recovered, indicating that it was removed prior to abandonment of the pit structure.

Floor 2

Floor 2 (Fig. 5) is a prepared clay floor with a slightly stained surface. This surface abuts all four pit structure walls. It is flat but not level, sloping down in the southeast corner. Floor depth is 45 cm below the site datum (BSD), except in the southeast corner, where it is 56 cm BSD. Floor 2 is separated from Floor 1 by a thin stratum (Stratum 5) of brown sandy silt. This stratum measures 2 cm thick, except in the southeast corner, where it is 8 cm thick.

Features on Floor 2 include a hearth, deflector, ventilator, a pot rest, and a number of postholes (Table 3). All of the features are sealed by the later floor remodeling. No artifacts were recovered from the surface of Floor 2.

Postholes (Features 1, 2, and 3). Postholes are present in three of the four corners of the pit structure, each near one of the corners. These postholes are in the general area of three postholes associated with Floor 1. The postholes vary in both size and depth. No traces of wood or post impressions were found, suggesting that the posts had been removed prior to remodeling. This is supported by the similarity of the feature fill within the three postholes. All three of the postholes contain a single stratum of fill. In all three cases, this is a yellowish brown sandy silt. The broken half of a two-handed mano was found at the bottom of Feature 2. It was placed flat in the bottom of the posthole, serving as a base for the post. No artifacts were collected from Features 1 and 3. The posts contained in these postholes would have structurally supported the pit structure roof.

Posthole (Feature 4). Feature 4 is a single posthole midway between the hearth and the deflector. A single stratum of fill is present within the posthole, a fine yellow-brown sandy silt. No artifacts were recovered from this feature.

Deflector (Feature 5). A rectangular hole for a deflector is directly in front of the ventilator opening. The east wall of this feature is straight and is the pit structure's east wall. The north and south walls are also straight, while the west wall of the deflector hole slopes inward to a flat base. One stratum of fill is present within Feature 5. This is a light brown silty loam containing bits of charcoal and adobe. No artifacts were collected from this feature. A deflector slab was presumably positioned in this hole, similar to the deflector slot on Floor 1. The deflector was removed prior to remodeling, and the hole was filled in before Floor 1 was constructed.

Ventilator (Feature 6). The ventilator associated with Floor 2 has the same opening into the pit structure that was recorded for Floor 1 and is similar in most respects. Although the ventilator has the same adobe walls, the base of the tunnel is distinctly different. Once past the pit structure wall, the base of the tunnel drops 5 cm for the first half of its length and 21 cm for the second half. A wall across the base of the tunnel composed of a single course of masonry separates these two portions of the tunnel floor. The masonry of this wall is a single course of puddled adobe, containing small rocks.

A single stratum of fill is present within the ventilator. This material is a fine light brown silty clay containing flecks of charcoal, bits of adobe, and some pieces of caliche and gravel. Rodent burrows have affected the ventilator. No artifacts were present within this feature.

Posthole (Feature 7). A small posthole is present on Floor 2 in the northwest corner of the pit structure. The posthole is directly against the west wall at the junction between the wall and the Floor 2 surface. Feature fill is limited to a single stratum of material. This is a reddish brown sandy silt. There is a pronounced slant to the posthole, suggesting that the post that occupied it would have projected away from the wall into the interior of the pit structure. This posthole has a smaller diameter than the postholes representing structural supports.

Hearth (Feature 8). The Floor 2 hearth is circular with a concave interior. This feature is masonry lined, and the lining is composed of cobbles and adobe. An adobe collar circles the lip of the hearth. The interior of the hearth is oxidized, and a thin stratum of ash separates this lining from the later remodeling. Two cobbles project from the adobe collar of the hearth and may represent some form of pot rest. No artifacts were recovered from this feature.

Pot Rest (Feature 9). Feature 9 is a shallow oval depression on the surface of Floor 2. It is 5 cm northeast of the hearth. A single stratum of feature fill is present within this feature. This material is a light gray ash. Feature 9 may have served as a pot rest associated with the hearth (Feature 8). No artifacts were recovered from this feature.

Post Holes (Features 10, 11). Two shallow postholes are in the adobe collar of the hearth (Feature 8), both of which represent small-diameter posts. One posthole is 3 cm from the edge of the hearth, the other is 6 cm from the edge. The two postholes are 12 cm apart. A single stratum of feature fill is present within either of the two postholes. This is a grayish brown ashy silt. No artifacts were present within either posthole. The position of these shallow postholes adjacent to the hearth suggests that they are associated with hearth use. However, there is nothing to suggest how they may have been used. It has been suggested that these postholes represent a ladder rest, the marks left by the base of a ladder.

Floor 3

Floor 3 (Fig. 5) is the original floor of Pit Structure 1. This is an unprepared, lightly smudged surface directly on culturally sterile reddish clay. A portion of Floor 3 is on top of cultural fill associated with an earlier subterranean storage cist. The surface of Floor 3 extends beneath the adobe walls of the pit structure. However, the smudged surface ends at the edge of the walls. This indicates that although all of the pit structure was excavated at the same time, the walls were built before the pit structure was occupied.

Floor 3 is flat, but not level, sloping down toward the southeast corner of the pit structure. Floor 3 is 52 cm below site datum (BSD), except in the southwest corner, which is 58 cm BSD. A single stratum of fine reddish brown sandy silt (Stratum 6) separates Floors 2 and 3. This stratum is 7 cm thick except in the southwest corner of the pit structure, where it is 2 cm thick.

Four features are present on Floor 3 (Table 4), including a hearth, posthole, pit, and ventilator. The pit was the only feature sealed. No artifacts were found on the surface of Floor 3. Additional features such as a deflector slot and additional postholes may have existed on Floor 3. These may have been removed by later features associated with the other floors (see Floor 3, Feature 2). No artifacts were found on the surface of Floor 3.

Hearth (Feature 1). Feature 1, a central hearth, is just east of the center of Floor 3. The hearth is circular with a concave base. This feature is dug directly into culturally sterile red clay and partially cuts through an earlier cultural deposit. The walls and base of the hearth are cobble lined, although there is no indication of adobe use prior to the later remodeling. The interior of the hearth is oxidized, indicating use. A thin layer of light gray ash separated the hearth surface from later remodeling. No artifacts were recovered from the hearth.

Posthole (Feature 2). A single posthole is in the southwest corner of the pit structure and represents a structural support for the pit structure. Only a remnant crescent of the posthole is present, the rest having been removed by a posthole associated with Floor 1. This suggests that postholes in the other corners of the pit structure existed on Floor 3 but were removed by later remodeling. A single stratum of material is present as feature fill in this posthole. The fill is a dark brown silty soil containing flecks of charcoal. No trace of wood or post impression is present within the feature. No artifacts were found in this posthole.

Pit (Feature 3). A pit is directly north of the hearth. This feature is roughly circular with a flat base. The pit is sealed with a layer of grayish brown clay 2 cm thick. Smudging on the surface of the clay seal suggests that the pit was sealed before or during the time Floor 3 was in use. A single stratum of feature fill is present within the pit, a brown silty clay containing flecks of charcoal, several small cobbles, and bits of caliche. There is nothing present to indicate pit use. No artifacts were recovered from Feature 3.

Ventilator (Feature 4). The ventilator associated with Floor 3 has the same wall opening used with the two later floors and is similar in most respects. The ventilator has the same adobe walls present during later use, but the base of the tunnel is distinctly different. The ventilator tunnel is 21 cm lower for its entire length than the ventilator opening in the east pit structure wall. A single stratum of feature fill is present within the ventilator tunnel, a brown silty clay containing flecks of charcoal and bits of caliche. No artifacts were found within this feature.

Artifact Distribution

Artifact distribution reveals little about the activities that may have taken place in association with Pit Structure 1. Artifact frequency is low. This suggest that the pit structure saw little use prior to abandonment, even taking into consideration the two remodeling episodes.

Artifacts were recovered from several features, but again, the numbers are low. A single artifact was recovered from any of the floor surfaces, a corner portion of a trough metate from Floor 1. The presence of a metate on Floor 1 suggests that food processing took place during at least the later period of pit structure occupation. No ceramic or chipped stone artifacts, fauna, or flora remains were recovered from any of the three floors in Pit Structure 1.

Construction Sequence and Interpretation

Initially, a rectangular hole was excavated for the pit structure, partially cutting through the fill of the earlier subterranean storage cist. The hole was dug with straight sides and a flat but not level base. Adobe walls were constructed within the sides of the pit structure's hole. Once the pit structure was roofed and interior features were constructed, the base of the original hole became the first floor (Floor 3) of the pit structure. Postholes in Floor 3 supported the pit structure's roof. A pit was dug into this floor surface and was then filled in and sealed. A hole for a hearth was then dug. Prior to being used it was lined with cobbles. A short ventilator lined with adobe walls was also constructed.

The light degree of staining suggests that the pit structure was occupied for a relatively short period of time before it was remodeled. The roof of the pit structure was rebuilt, and the support posts were pulled out of their holes. A layer of sandy silt covered the earlier floor surface, filling the floor features. This indicates that the structure stood empty for a short period prior to remodeling. A prepared clay floor was put down over the layer of silt. The roof, including a roof entrance, was put back on the pit structure. The original hearth was remodeled with a coat of adobe and the addition of an adobe collar. A pot rest was made adjacent to the hearth. The ventilator tunnel was remodeled by being partially filled with clay. The deflector was restructured and the deflector slot enlarged to accommodate a larger slab.

The pit structure was again occupied for a relatively short period of time, based on the light degree of smudged staining on the floor surface. It again stood empty for a short period of time and was then remodeled. The roof of Pit Structure 1 was again rebuilt, and the structural posts were pulled from their holes and reset. A layer of silt covered the surface of Floor 2 and filled the features. This material could have been naturally deposited in the empty structure or purposely used to cover the Floor 2 surface. A prepared clay floor (Floor 1) was put down across the pit structure's interior. The hearth was remodeled with the addition of a new adobe lining and collar. The deflector was remodeled, and the deflector slot was reduced in size to fit the new thinner slab. The ventilator was remodeled, the tunnel was made level with the opening, and the bottom was lined with adobe.

After a third relatively short occupation (indicated by the light degree of staining on the Floor 1 surface), Pit Structure 1 was abandoned. The roof was removed, and the support posts were pulled from their holes. The pit structure sat open, allowing an eolian deposit to collect. The adobe walls collapsed, partially filling the pit structure. Through time, alluvial deposition filled the rest of the structure. Additional eolian deposition covered any remaining traces of Pit Structure 1.

This repeated short-term use of the pit structure could indicate seasonal use. Each of the shallow deposits between the floors could have been collected easily in a single season or year. Of course, this material could have been purposely spread throughout the pit structure prior to the construction of a new floor surface. Obviously, the later inhabitants were familiar enough with the pit structure and its features to have been its original inhabitants.

Structure 2 (Subterranean Storage Cist)

Structure 2 is a large bell-shaped storage cist measuring 2.1 by 2 m (area=4.2 m) and 1.49 m deep. It is adjacent to and partially beneath Pit Structure 1. This structure was first visible as an area of slumping soil adjacent to Pit Structure 1, after the surface soil was removed to a depth of 10 cm.

Structure 2 is constructed as a subterranean storage cist. Dug into culturally sterile clay, the cist is lined and roofed with adobe. The lower walls bell out on the east, south, and west sides of the cist. Entrance was through a tunnel on the north side of the structure. The upper fill of the storage cist is cut by the later construction of Pit Structure 1.

Once the area of the structure was defined, it was bisected by a trench measuring 2 by 2.03 m, hand excavated inside the length of the structure's south edge. This trench (Segment 1) was dug in 14 arbitrary 10 cm levels to culturally sterile soil. The resulting profile of the feature fill was then drawn. This profile revealed two layers of material within Structure 2. The remaining fill was removed by natural layers. This storage cist is ceramically dated to the Valdez phase.

Stratigraphy

The fill in Structure 2 is a combination of roof fall and eolian deposits. Three layers of material are present with the structure. These are described in descending order from the modern ground surface.

Layer 1 is a layer of fine sandy silt, eolian in origin. A layer of this material, averaging 10 cm, forms the present day topsoil of the general area. This deposit is deep in the area of the storage cist, filling the depression caused by the collapsed roof. The deepest portion of Layer 1 is 112 cm thick. Flecks of charcoal and pieces of adobe are present in this layer. Artifacts from Layer 1 included a small fragment of a mano.

Layer 2 is composed of adobe roof fall. This material is directly below Layer 1. It is present as an uneven layer of fine tan sandy silty clay. Layer 2 varies in thickness from 5 to 20 cm. No artifacts were present within this layer.

Layer 3 is a fine brown sandy silt. This material is eolian in origin and directly beneath the layer of roof fall (Layer 2). Layer 3 varies in thickness from 17 to 39 cm and is directly on the storage cist floor. Artifacts and small pieces of charcoal were present in Layer 3.

Architecture

Structure 2 is a walk-in subterranean storage cist (Fig. 6). Excavated into culturally sterile clay, it has an oval form, a domed roof, and concave walls. Entrance is through a tunnel at the north end of the feature. Extensive rodent burrowing has taken place in this feature.

The east, south, and west walls bell out 40 to 48 cm from the floor of the feature. This belling of the walls is limited to the south two-thirds of the feature and is most pronounced on its south side, where it measures 48 cm. Although most of the north third of the storage cist was removed by Pit Structure 1, the remaining lower portions of the walls in this area are vertically straight. This suggests that these walls, unlike the others, were straight for most of their height.

The walls of the storage cist are composed of two parts, each of which reflects a different form of construction (Fig. 6). The lower walls of the pit structure are formed by the edge of the excavated hole and are comprised of natural culturally sterile clay. This has been covered with a single coat of plaster to a height of 50 cm. At this height, the edges of the original hole are stepped back between 12 and 20 cm. Adobe walls extended upward from this step. These walls vary in thickness from 12 to 20 cm.

The adobe walls are plastered. There is no evidence of smudging on any of the remaining plaster within this feature, indicating that it is not a habitation structure. It was probably used for the storage of cultivated or gathered vegetal foodstuff. Since the north portion of the storage cist was removed by Pit Structure 1, the configuration of the upper walls in that area is not known.

The upper portions of the remaining adobe walls curved inward, forming a domed roof. There are no postholes in the feature to indicate any other form of roofing. The height and angles of the remaining walls suggest the height of the roof was slightly lower than the modern ground surface. The finished roof was probably covered with dirt.

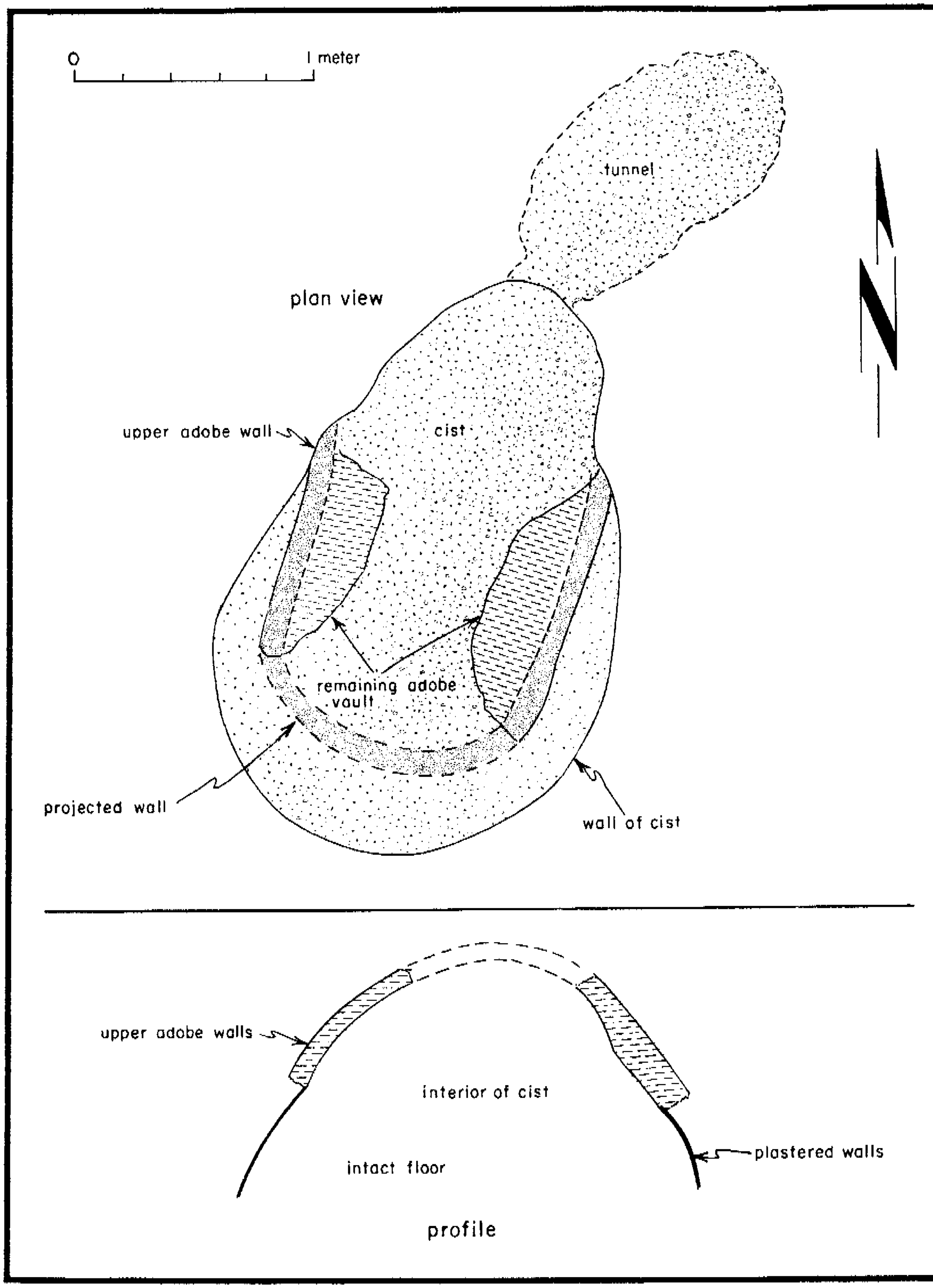

Figure 6. Structure 2, plan and cross section.

The floor of the storage cist is unprepared packed clay. The floor is relatively flat but has an uneven surface. The depth of the storage cist floor is 1.40 BSD. There are no wall or floor features within this storage cist.

Entrance to the feature was through a tunnel on its north side. The entrance tunnel is 140 cm long and 80 cm wide. The tunnel has an unprepared packed clay floor that slopes downward toward the storage cist. The surface of this tunnel floor is slightly smudged with ash. The floor of the tunnel is 71 cm BSD at the north end and 93 cm BSD at the south end. A 47 cm difference in floor depths exists between the tunnel and the storage cist at the point they intersect. A single layer of feature fill is present within the tunnel. This is a brown sandy silt containing a small number of artifacts, similar to Layer 3 in the main portion of the storage cist. It is not known if the tunnel was roofed, since the upper portion of the tunnel was removed by the later construction of Pit Structure 1.

Construction Sequence and Interpretation

Structure 2 (the storage cist) was constructed as an oval hole dug into culturally sterile clay. The lower walls were covered with a layer of plaster. The upper walls of the hole were cut back and then lined with puddled adobe walls. The adobe walls curved inward to also form the roof of the cist. The roof then may have been covered with dirt. A tunnel was dug to provide an entrance into the north side of the cist. The cist was used for a period of time, probably for storing gathered wild or cultivated vegetal foodstuffs.

The cist was abandoned and stood empty for a period of time, partially filling with eolian deposition. The roof then collapsed. The resulting depression was filled by additional eolian deposition. Some time later a hole was dug for the construction of Pit Structure 1, cutting through the filled earlier storage cist.

Similar subterranean storage cists with domed roofs are known from northwest New Mexico. A subterranean storage cist with a domed roof is known from LA 37598 in the La Plata Valley (Bullock n.d.). However, the La Plata example was entered from an adjacent subterranean masonry room, rather than through a tunnel. Several other similar storage cists in the same area have been recorded in Shumway Arroyo (Powers et al. 1980).

Historic Component

The site grid was extended to encompass both historic features, and elevations in the area of the historic features were tied into the main site datum through the use of Subdatum B to maintain vertical control. After the artifact concentrations that comprised the features were mapped and photographed, the surface artifacts were collected in 1 by 1 m grids. Provenience numbers were assigned based on dumping episode.

Feature 1 (Historic Artifact Concentration)

Feature 1 forms part of the historic component at LA 53678. This feature is 38 m southeast of Pit Structure 1. It is a dense historic artifact concentration that measures 6 by 6 m. A total of 417 artifacts were collected from the surface of Feature 1.

Artifacts were limited to the upper 2 cm of soil. No soil discoloration or textural changes were present, apart from the earlier dumped pile of gravel.

Once the surface artifacts were collected from Feature 1, it was apparent that the site represented a single dumping episode and that no associated cultural features or deposits were present. The stacked nature of the artifacts indicates that this material represents a dump site. The artifact concentration is surficial and localized, representing a single dumping episode. Part of the deposit is above an earlier deposited pile of gravel.

Feature 2 (Historic Artifact Concentration)

Feature 2 is a historic artifact concentration measuring 3 by 3 m. This feature is 61 m northeast of Pit Structure 1. Artifacts collected from the surface of Feature 2 totaled 77.

Once the surface artifacts were collected, it was apparent that this artifact concentration represented a single dumping episode. All the artifacts were on the modern ground surface. A majority of the deposit is localized, and the artifacts are stacked, a pattern typical of dumped material.

No evidence of cultural features or deposits is present in the area of Feature 2. No areas of soil discoloration or artifacts not associated with the dumping episode are present.

Interpretation

The historical component of LA 53678 is composed of two features. Each feature is a historic artifact concentration, representing a distinct dumping episode.

Boyer (1995) believed Feature 1 is domestic trash, based on the diversity and types of artifacts present. He also felt that the historic artifact concentration designated as Feature 2 represented a sheepherder's camp.

The similarity of the two features, based on appearance, the nature of deposition, and artifacts, suggests that they are the product of a similar activity, the dumping of domestic trash. The historic artifacts primarily date to the early to late twentieth century, which suggests they were dumped during the same time period. This was confirmed through interviews with long-term residents of the area.

SITE DATING

The dating of LA 53678 was based on archaeomagnetic analysis. Other dating methods have not proved successful. Wood fragments at the site were not large enough for reliable tree-ring dating. It has also been possible to determine a relative date for the site within the Valdez phase based on the ceramic assemblage.

Archaeomagnetic dating is based on the presence of iron in the soil. Released by heat, these particles line up on magnetic north and remained fixed once they cool down. By measuring the angle present and comparing it to the route of the wandering north pole, a precise date can be obtained for any area of burned earth (such as a hearth). Archaeomagnetic samples were collected from the burned lining of the hearth associated with Floor 1 in Pit Structure 1 (the last period of pit structure use). A date of A.D. 935-1055 was obtained from this sample. This dates the pit structure to the early portion of the Valdez phase, a conclusion supported by the ceramic assemblage.

Three samples of burnt ponderosa pine recovered from the Floor 1 surface of Pit Structure 1 were subjected to radiocarbon dating by Beta Analytic Inc. The resulting radiocarbon dates were then cross-checked with the relative dates of the ceramics at the site. Based on the known relative dates of the ceramics at LA 53678, no viable dates were obtained for LA 53678. One sample was dated approximately 900 years too late (100 ± 30 B.P.), suggesting it was an intrusive piece of charcoal, possibly brought in by rodents. The other two samples dated roughly 900 years too early (2030 ± 40 B.P. and 1960 ± 40 B.P.), suggesting they are the result of reused or scavenged old wood.

Relative dates for the pit structure were obtained by comparing the LA 53678 ceramic assemblage to those from other Valdez phase sites. This allows gross age differences to be determined within the Valdez phase. The results indicate that in northern Taos Valley, Valdez phase sites with rectangular pit structures and more than 94 percent gray ware ceramics are older than Valdez phase sites in the south portion of the Taos Valley, which have round pit structures and larger amounts of white ware ceramics. This is confirmed by the early archaeomagnetic date obtained from LA 53678.

CERAMIC ANALYSIS

C. Dean Wilson and Steven A. Lakatos

This chapter presents data resulting from the analysis of 1868 sherds recovered during excavations of LA 53678. To allow the results to be compared to those of earlier studies, analysis approaches and categories followed other recent OAS studies in the Taos Valley (Levine 1994; Wilson 1995). The analysis system provides ceramic data useful in detailed characterizations of the associated ceramic assemblages. These data are presented in a manner conducive to determining the time of occupation of this site and examining various issues. These issues include patterns of local ceramic production, potential sources of immigrant populations, examinations of patterns of interaction and exchange of vessels between separated Anasazi groups, and the identification of functions and activities associated with various vessel forms.

In order to examine these issues, it is necessary to record a variety of data classes, including associated provenience, descriptive attributes, typological categories, counts, and weights. A range of descriptive attributes and typological categories provides the basis for examining various issues and trends.

Descriptive Attributes

Descriptive attributes recorded for all sherds include temper type, paste profile, interior pigment, exterior pigment, interior slip, exterior slip, vessel form, modification, and rim radius. In addition, refired paste color was recorded during analysis of selected sherd subsamples. Attribute categories employed during the present study include the following:

Temper

Temper categories were identified during microscopic analysis of freshly broken sherd surfaces. *Temper* refers to either aplastic particles intentionally added to the clay or natural inclusions in the clay that would have served the same purpose as added temper. Temper categories were recognized based on combinations of color, shape, size, fracture, and sheen of fragments. It is often not possible to differentiate rock types based on microscopic identifications, so the categories represent visually similar groups rather than specific rock or mineral classes. Even in the absence of precise rock or mineral types, these categories may indicate the use of distinct sources associated with a particular area.

The great majority of sherds from LA 53678 contain one of two temper classes. The first consists of translucent quartz grains of varying sizes. These grains are large, angular to subangular, and white, gray, or pink. These grains have a crystalline appearance, and some grains contained dark mineral or mica fragments. Petrographic analysis conducted during the Pot Creek project indicates the use of local crushed granitic schists (Hill 1994), which are classified here as Taos granite.

The other common temper class consists of fine particles apparently representing natural clay inclusions (Hill 1994). These particles consist of small lustrous clear to white angular fragments and black fragments. In addition, dull white fragments are common and are probably tuff or pumice fragments. This combination of fragments probably represents natural volcanic and sand inclusions present in local clay sources used in the production white wares. This combination of fragments was used to recognize a *Taos self-tempered* category. Similar temper with numerous black particles were coded as *Taos self- tempered with black inclusions*. Refiring of sherds usually resulted in the disappearance of these distinct dark particles, and their presence may reflect firing differences rather than a source distinct from that of Taos self-tempered. A variation of the self-tempered class includes *fine sand*, which as defined here includes the presence of numerous small sand grains along with very small particles similar to those in the self-tempered group.

Sand refers to rounded or subrounded, well-sorted sand grains. These grains are white light gray to transparent and may be frosted. This category was distinguished from the *sandstone* category by the presence of large even-sized quartz grains and the absence of matrix.

Paste Profile

Sherd cross section color reflects combinations of clay sources used and firing conditions to which a vessel was exposed. Vessels fired in reduction atmospheres tend to be dark gray to black. Those fired in a low oxidizing or neutral atmospheres are usually gray or white. Oxidized sherd cross sections are reddish or buff, depending on clay iron content. Paste profile was recorded because of previously noted differences in the range of paste color of pottery produced in different areas. These differences reflect combinations of clay resources and technologies employed in different locations. Paste profiles reflect color combinations in terms of darkness and redness. Paste color categories recorded include *black to dark gray throughout*, *light gray to white paste throughout*, *white to gray with dark core*, *light brown*, and *oxidized colors*.

Pigment Type

Pigment categories are based on the presence, type, and color of painted pigments. Pigment was recorded for each surface. Surfaces without painted decorations were recorded as *none*. Pigment distinctions involve the separation of organic (or carbon) and mineral pigments based on visual characteristics (Shepard 1956).

Matte mineral refers to the use of ground minerals such as iron oxides as pigments. These were applied as powdered compounds, usually along with an organic binder. The pigment is a physical layer and rests on the vessel surface. Pigments are often thick enough to exhibit visible relief. Mineral pigments usually cover and obscure surface polish and irregularities. Exposure to various firing atmospheres effects the color of mineral pigments. Mineral pigment categories identified during the present study include *mineral black*, *mineral brown*, and *mineral red.*

Organic paint or *carbon paint* refers to the presence of vegetal pigment only. Organic paint is soaked into rather than deposited on the vessel surface. Thus, streaks and polish are often visible through the paint. The painted surface is generally lustrous, depending on the degree of surface polishing. Organic pigments are gray, black, bluish, and occasionally orange. The edges of the painted designs are often fuzzy, and there is often a slight ghosting beyond the painted area. Sherds exhibiting the faded remnants of organic pigment were classified as *organic diffuse*.

Slip and Polish

Slip refers to the intentional application of a distinct of clay, pigment, mineral, or organic layers over a vessel surface. Such applications are used to achieve black, white, or red surface colors, not obtainable using paste clays or methods normally employed. Information concerning the presence of surface polishing was also recorded in these categories. *Polishing* implies intentional smoothing with a polishing stone to produce a compact and lustrous surface. The presence of a polished or slipped surface is often used to distinguish unpainted white ware sherds from gray wares. Unslipped surfaces were assigned to *unpolished* or *polished unslipped.*

For Anasazi types, slips are usually commonly polished, although some examples with slipped and unpolished surfaces were noted. White wares often have a slip applied in a distinct low-iron white clay. Sherd surfaces with this clays were assigned to *white clay wash* or *white clay slip*, depending on slip thickness. Surfaces reflecting the use of a distinct high iron red clay slip were classified as *red clay slip*.

Vessel Form

Vessel form categories were assigned to all sherds based on observed shape and surface manipulation. The resolution of vessel form characterizations possible is usually dependent on sherd size and portion of vessel represented. The consistent placement of all sherds into similarly defined vessel form categories provides information concerning vessel form and use. These categories, however, comprise form class definitions of varying degrees of resolution. Rim sherds are normally assigned to more specific categories than body sherds.

Indeterminate refers to vessels whose form cannot be determined. *Bowl rim* refers to rims with a inward curvature, indicating they were derived from bowls. *Bowl body* refers to body sherds that have polished or painted interior surfaces.

Most of the sherds examined were from unpolished body sherds for which it was impossible to determine the precise vessel form. While all unpolished gray body sherds were assigned to a *jar body* category, very few could have been derived from bowls. Polished white ware body sherds with painted or polished exterior surfaces were also assigned to this category.

Jar neck includes sherds with curvatures indicating they came from jar necks. Most sherds assigned to this category are from cooking/storage jars. It is sometimes possible to differentiate jar forms based on the diameter and rim shape. *Cooking/storage jar rim* refers to forms with relatively wide rim diameters. Associated vessel forms could have been utilized for cooking or storage activities. Sherds placed into this category were distinguished from other jar forms by a wide rim diameter, relative to vessel size.

Miniature jars refer to extremely small jar-shaped items. Such items were too small to have served in storage and cooking activities and were probably used as toys or in ritual contexts. A very unusual form recovered from this site is a *perforated coil* not attached to a vessel.

Other forms were distinguished on the basis of attached or unattached handles, based on coil shape and presence of attachment. On Anasazi vessels, handles are common on pitchers and ollas. Categories for which sherds belonging to handles were placed include *jar body with strap or coil handle*, *jar body with lug handle*, *dipper handle*, *jar body with handle*, *cooking storage jar rim with lug handle*, and *unattached lug handle*.

Modified Sherds

Modified sherds refers to evidence of modification, repair, or wear, including abrasion, drilling, chipping, and spalling. Modification categories incorporate information concerning item shape and size as well as process of modification. Most of the sherds examined did not exhibit postfiring modifications and were coded as *none*. Data concerning modified sherds, however, provide information about the actual use and repair of sherds and vessels. *Punched hole* refers to a hole punched in a vessel prior to firing.

Typological Categories

All sherds examined were assigned to typological categories. Sherds are assigned to a type based on traits with spatial, functional, and temporal significance. The system employed involved first the recognition of the associated ceramic tradition, then ware, and finally type. Ceramics were initially placed into broad tradition assignments indicative of postulated area of origin or "cultural" association. The great majority of the sherds exhibited local temper and pastes and were assigned to types of a local Taos Valley tradition. Next, sherds were divided into broad ware groups based on technological attributes and surface manipulation. Finally, they were assigned to ceramic types or groupings based on temporally sensitive painted decorations or textured treatments.

Most sherds from LA 53678 displayed characteristics identical to those previously assigned to Taos Black-on-white and various varieties of Taos Gray (Levine 1994; Peckham and Reed 1963; Wetherington 1968). Types of other traditions were assigned to the few sherds with paste and temper characteristics indicating they originated in other regions. Because different materials and methods were used in the production of gray ware versus white ware vessels, different strategies and criteria were used to classify sherds belonging to different ware groups. Thus, discussions regarding the assignment of sherds into various traditions and types are presented separately for each ware group.

Gray Utility Ware Types

Gray ware types are almost always unpainted and unpolished on both surfaces. Temper often protrudes through the surface. The great majority of all gray ware types are derived from cooking or storage jar forms. Exterior surfaces are often dark gray or black, reflecting sooting during cooking.

Gray ware sherds were assigned to a particular tradition or series based on paste or temper characteristics. All of the gray ware sherds from LA 53678 were tempered with material very similar to that noted in sherds from other Valdez phase sites (Fig. 7) (Hill 1994; Levine 1994). Pastes were consistently dark and fire to a red color in oxidizing atmospheres. This indicates that Taos Valley potters consistently fired gray vessels in reduction atmospheres. Gray ware pastes were often vitrified, reflecting the low vitrification temperature of high iron clay in a reduction atmosphere. Temper consisted of variable sized white to pink crystalline angular fragments, indicating a granitic schist. While similar tempers occur in the gray wares from contemporaneous sites in the Tewa Basin to the south, those from Developmental phase sites in the Taos Valley do not contain the mica common in Tewa Basin utility wares (McNutt 1969).

The great majority of the sherds from LA 53678 were assigned to local Taos Gray ware types.

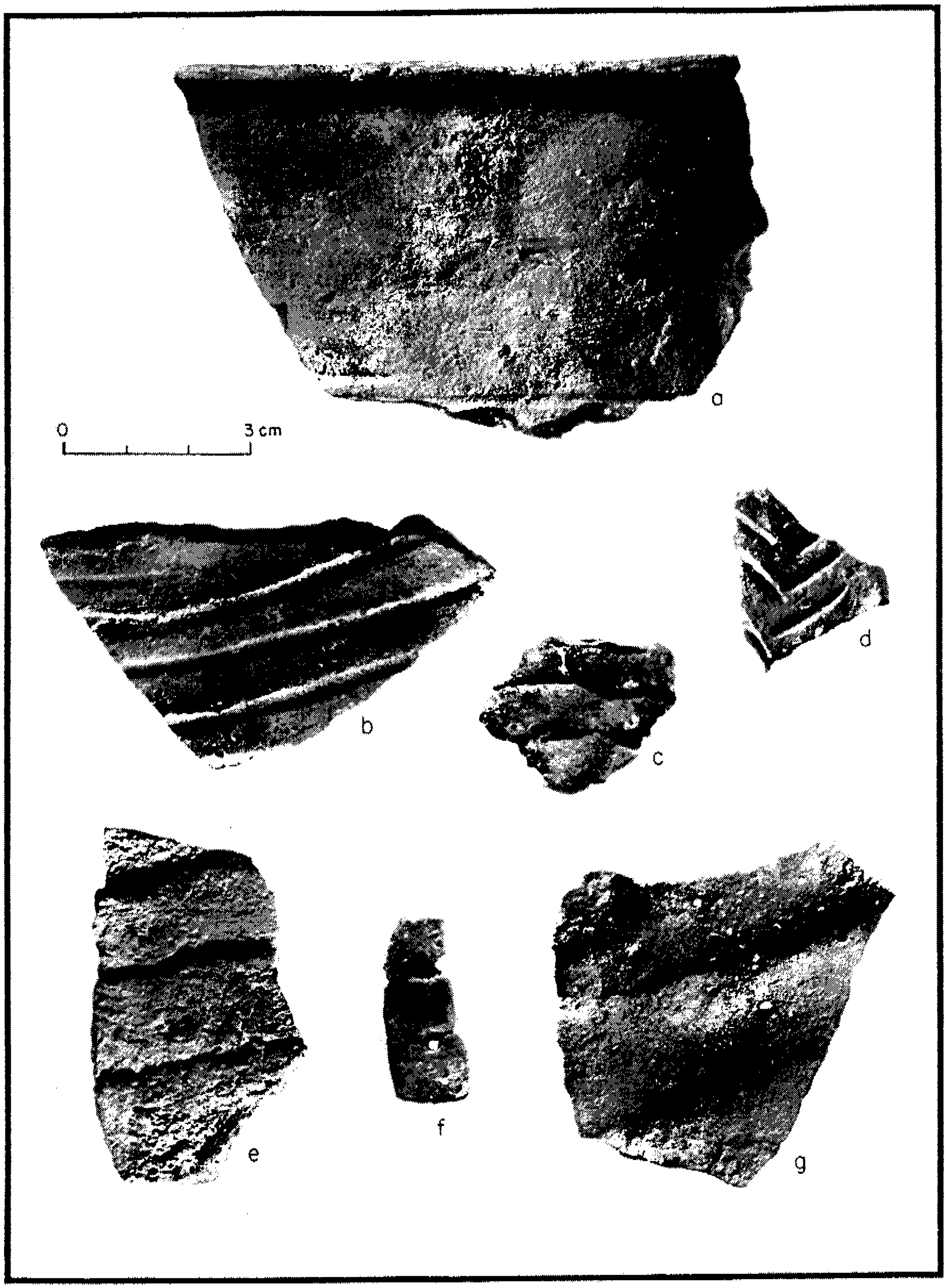

Figure 7. Taos Gary utility ware types.

Gray ware sherds with a local granitic temper utilized in the Taos Valley area were assigned to different Taos gray ware types based on surface texture (Levine 1994; Peckham and Reed 1963; Wetherington 1968). Most previous studies divided Taos Valley gray wares into one of four type categories based on surface textures. These categories include Taos Plain, Taos Incised, Taos Corrugated, and Taos Punctated. Examinations of Valdez phase gray wares indicate that more detailed divisions of types based on surface texture are sometimes useful (Wilson 1995). While these finely defined categories are useful for some purposes, they can also be easily lumped together into the more basic groups utilized in other studies of Valdez phase gray wares.

The majority of gray ware sherds had smoothed unpolished surfaces identical to pottery previously classified as Taos Plain Gray (Levine 1994: Peckham and Reed 1963). Smoothed plain gray sherds could have derived from any portion of completely smoothed Taos Plain Gray vessels, or from the lower portion of vessels with incised, neckbanded, or corrugated necks. Therefore, different type categories were assigned to smoothed gray ware rim and body sherds. Smoothed rim sherds, which most likely derived from completely smoothed (Taos Gray Plain) vessels, were classified as *plain rim*. Smoothed body sherds that could have originated from plain vessels or smoothed portions of neckbanded, incised, or corrugated vessels were classified as *plain body*.

Gray wares were placed into other types based on the presence of potentially sensitive surface textures. Plain and incised gray wares dominate Taos Valley assemblages at a time when most gray wares from other Anasazi regions were corrugated. *Plain incised gray* refers to plain sherds with incised exterior decorations. Sherds that would be assigned to Taos Incised Gray were placed into several different categories based on the type of incised treatments. *Parallel incised gray* includes a series of parallel horizontal incised lines along the neck and shoulder. This decoration is similar in appearance to neckbanded gray wares and may simply represent an additional modification of this type. Another incised style occurring in Taos Valley pottery consists of a herringbone pattern consisting of parallel horizontal rows of chevrons. Occasionally both linear and herringbone elements occur in the same vessel. Squiggle and zigzag lines are sometimes present. *Punctate gray* refers to the present of decorations made by pressing a blunt object into the wet clay. *Punctate incised* refers to sherds with this combinations of surface textures.

During the present study, sherds exhibiting unobliterated coils that would have been previously classified as Taos Corrugated were assigned to a series of neckbanded or corrugated type categories based on the type of coil treatment. The recording of various forms of coiled treatments allow comparisons with developments in other Anasazi regions as well as the examination of chronological trends in coil textures. *Clapboarded neck* refers to an effect created by overlapping coils or fillets. Sherds belonging to this category are similar to plain corrugated sherds, although sherds of this category are usually narrower and limited to neck sherds.

Corrugated gray wares have thin, sometimes indented, overlapping coils. These coils usually cover the entire exterior surface of a vessel, although corrugated treatments are sometimes limited to the upper part of a vessel. Corrugated types were distinguished by attributes relating to the pronouncement and type of coiled treatment. *Indented corrugated* includes sherds with narrow coils with regular indentations and moderate to high contrast between coils. Indented corrugated sherds are the dominant corrugated type in Developmental and early Coalition phase sites. *Smeared indented corrugated* refers to sherds with indented corrugations that were subsequently smeared. This results in the partial obliteration of the indentations and junctures between coils. Sherds from some areas of the Rio Grande with these treatments have been previously classified as Tesuque Smeared Corrugated (Mera 1935). In the Rio Grande region, *smeared indented* represents the later form of corrugation and dominates late Coalition and early Classic phase sites. *Smeared plain corrugated* is assigned to pottery with coiled treatments and relief similar to that of *smeared indented corrugated* but without regularly spaced indentations.

White Ware Types

The great majority of white ware sherds from LA 53678 are similar to ceramics previously classified as Taos Black-on-white (Fig. 8) (Levine 1994; Mera 1935; Peckham and Reed 1963; Wetherington 1968). All of these painted sherds display pan-Anasazi decorative styles of the Late Pueblo II period and Early Pueblo III periods. Almost all of the decorations are executed in similar mineral pigment. While similar painted styles were used in most Anasazi regions, spatially distinct temper and paste combinations provide for the identification of white wares belonging to various regional traditions.

One problem commonly encountered during the analysis of Rio Grande white wares concerns distinguishing Taos Black-on-white from Kwahe'e Black-on-white, which is from areas to the south (Lentz 1991; Levine 1994; Mera 1935; Peckham and Reed 1963). These types are stylistically similar and were originally differentiated based on slip, temper, or stylistic characteristics. Criteria and definitions previously used to distinguish these types, however, is often ambiguous and contradictory (Lentz 1991; Levine 1994). In the original descriptions of these types, Mera (1935) noted a number of stylistic similarities. He, however, described the slip as being thicker in Taos Black-white than the thin wash of Kwahe'e Black-on-white. Mera (1935) noted that Kwahe'e Black-on-white was tempered with crushed potsherd and a sandy substance. More recent examinations indicate that Kwahe'e Black-on-white and Taos Black-on-white were manufactured with a self-tempered clay containing various combinations of tuff, ash, and sand fragments (Lentz 1991; Hill 1994). Other studies also noted stylistic similarities between these two types and continued to emphasize differences in slip and temper (Peckham and Reed 1963; Proctor-Weiss 1983; Wetherington 1965; Green 1976; Wolfman et al. 1965), although later descriptions of both of these types vary from those presented by Mera (1935).

Lentz (1991) attempted to resolve contradictions in the definitions of Taos Black-on-white and Kwahe'e Black-on-white by examining the same sherd collections used by Mera to define these types. These examinations indicate variability and overlap in sherds assigned to both types. Lentz (1991) noted that the criteria previously used to differentiate these types were unreliable. Thus, he felt that the distinction between these two types was not warranted. Levine (1994) assigned mineral painted sherds for which further distinctions could not be made based on the presence or absence of exterior slip into a single category described as "Taos Black-on-white or Kwahe'e Black-on-white."

Data from recent studies indicate that Taos Black-on-white should be regarded as a variety of Kwahe'e Black-on-white. The Taos variety is distinguished from Kwahe'e Black-on-white only by slight differences in the pastes utilized in the two different areas. These differences, while slight, appear to provide the basis for the distinction of Kwahe'e Black-on-white from Taos Black-on-white varieties. The great majority of white ware sherds from LA 53678 displayed paste and temper characteristics indicative of Taos Black-on-white. Temper consists of small fragments that represent natural inclusions in the local clay. Pastes tend to be fine and light gray to gray.

Types belonging to other white ware regional traditions were identified by other paste and temper combinations. The presence of light clay pastes and sand or sherd temper may provide for

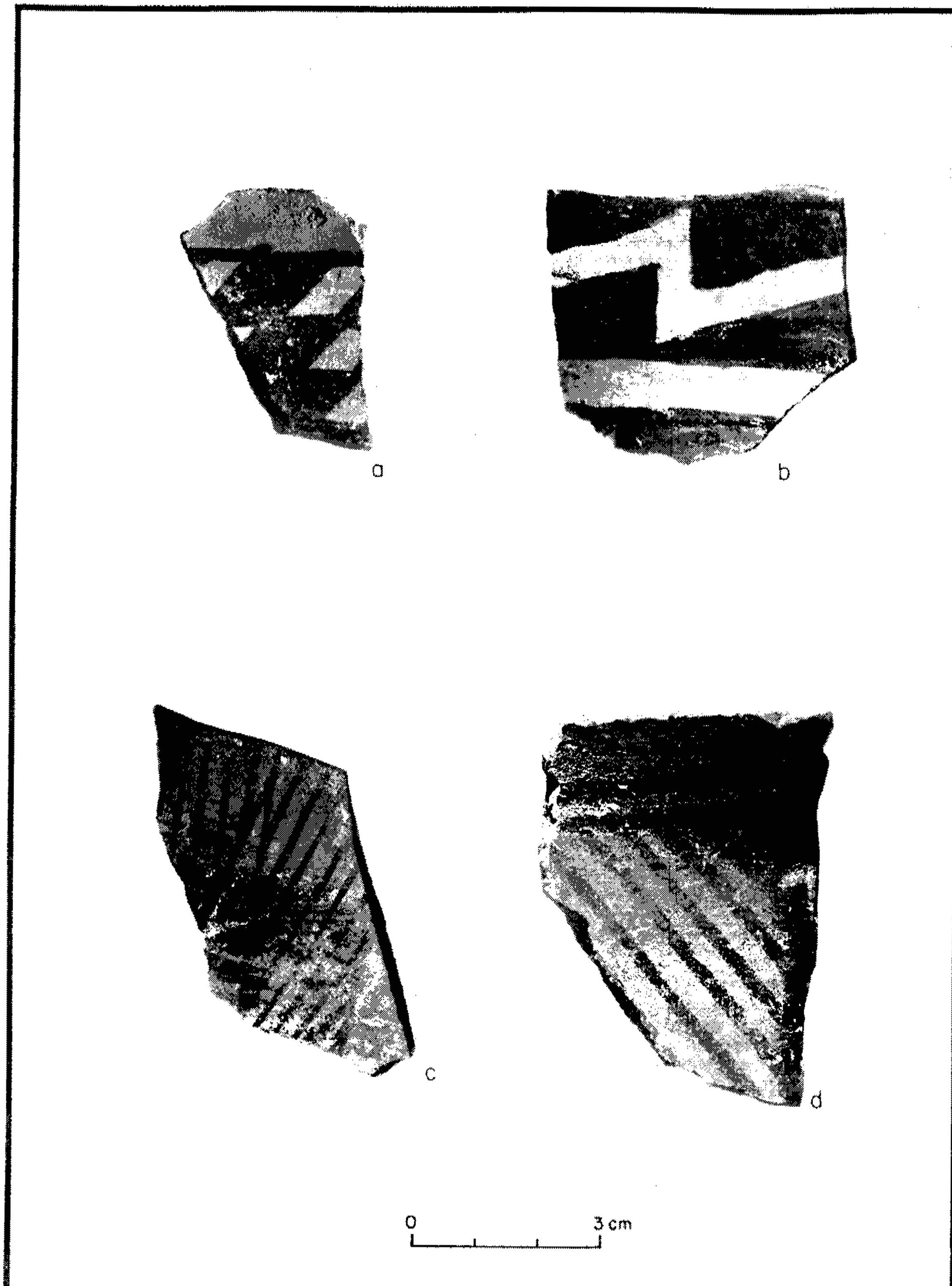

Figure 8. Taos Black-on-White.

the recognition of pottery originating in areas of the Little Colorado Plateau such as the Cibola region. The very low frequency of sherds belonging to other regional types includes sherds with solid designs, classified as Escavada Black-on-white, from the Cibola region.

While earlier studies assigned all the mineral painted white wares to Taos Black-on-white, in this study local white ware sherds were further divided into several stylistic groups. Grouping recognized as styles of Taos Black-on-white from LA 53678 include the following.

Unpainted white ware sherds, recognized by the presence of surface polish and paint, were placed into a *unpainted white ware* category. While it is sometimes possible to distinguish unpainted white wares produced during different periods based on thickness, color, and texture, such distinctions are fairly difficult and inconsistent. No attempt was made to further group or distinguish unpainted white ware sherds. Early mineral painted types were assigned to type categories based on temporally sensitive design styles. Painted sherds without distinct styles were assigned to a *mineral paint (undifferentiated)* category. Other mineral painted sherds were assigned to type categories based on ranges of design styles.

Pueblo II indeterminate mineral refers to the presence of indistinct Pueblo II design styles. *Pueblo II solid designs* refers to solid design styles commonly found on Taos Black-on white and other Pueblo II types. Such designs are usually boldly executed and often consist of a single motif. Solid motifs commonly occurring on late Pueblo white ware vessels include dots, opposing triangles, radiating triangles, step triangles, checkered triangles, checkered squares, and scrolls. *Pueblo II hatchured designs* refers to the presence of straight hatched elements commonly occurring in Taos Black-on-white and other Pueblo Anasazi II types. Hatched designs represent one of the dominant Pueblo II styles in most Anasazi regions. Cibola tradition ceramics with hatched designs are classified as Gallup Black-on-white or Chaco Black-on-white, depending on the thickness of framing lines. Hatched designs are also common in sherds previously classified as Kwahe'e Black-on-white and Mancos Black-on-white. Sherds with line decorations were divided into two types based on line thickness. *Pueblo II thin lines* refer to the presence of parallel line decorations less than 2 mm thick. Those with thicker lines were classified as *Pueblo II thick lines*. These line designs are often organized into rectilinear patterns.

A single sherd recovered from the surface represents a historic Tewa type. This sherd was polished on both surfaces and had a red slip. Surfaces were heavily polished. Small mica flecks were visible on the surface. Temper consists of a fine ash temper common in Tewa types. This sherd was classified as *Tewa Red Slipped.* Tewa pottery is common in historical Hispanic and Tiwa Pueblo sites in the Taos Valley and reflects trade with historic Tewa-speaking Pueblos to the south. This sherd was probably from a vessel produced between A.D. 1700 and the present. It may have derived from the same dumping episode that accounts for the other historical material at LA 53578.

Examination of Ceramic Trends

Ceramic type and attribute distributions address a wide range of issues relating to the time and nature of the occupation of LA 53578. With the exception of the single Historic Tewa sherd, all the sherds from this site appear to be associated with a Valdez occupation. Given the prehistoric settlement history and marginal location of the Taos Valley, recent investigations of this area by OAS have employed a frontier approach to examine various issues (Boyer 1994). The Valdez phase dates from A.D. 1050 to 1200 and is the earliest occupation of the Taos Valley by ceramic-producing Anasazi groups (Crown 1990). This initial Anasazi settlement is substantially later than the earliest occupations at many other areas and regions. Ceramic data providing information about the timing and sequence of occupation, associated settlement patterns, the nature of the local technology, degree of interaction with and influences with groups in different areas, and activities and associated with ceramic vessels all may contribute to the examination and evaluation of various models of the Valdez phase occupation.

Ceramic Dating of LA 53678

Distributions of ceramic types in various contexts at LA 53678 are illustrated at Table 5. These distributions are similar to those noted at other Valdez phase sites in the Taos Valley. This site is dominated by Taos gray wares, which represent 95.7 percent of all sherds. The remaining 4.3 percent sherds are all probably derived from Taos Black-on-white.

Table 6 compares distributions of ware groups at LA 53678 and recorded at other Valdez phase sites in the Taos Valley. These distributions are most similar to those noted at sites in Arroyo Hondo. They are slightly lower than those noted at Blueberry Hill Project sites and much lower than at sites in the Pot Creek area. These areal discrepancies in ware frequencies could reflect several factors, including a slight difference in the dating of sites at different localities, patterns of area production of white wares, or the influences of different strategies of artifact recovery and classification during different projects.

The majority (83.8 percent) of the gray ware sherds from LA 53678 had plain untextured exterior surfaces (Table 7). Most of the other gray ware sherds had incised decorations (13.2 percent of all gray wares). Other gray ware surface textures include corrugated (2.2 percent), clapboarded (.3 percent), and other (.5 percent). Similar distributions of gray ware surface textures were noted at other Valdez phase sites in the Taos Valley (Table 8). The total frequency of incised surface textures is in the relatively low range for this surface texture. For each locality with Valdez phase sites, considerable variability in the range frequency of incised gray ware decorations was noted. At each locality, the total frequency of incised sherds ranges from just under 10 percent to over 25 percent of the total gray wares. There is little relationship between frequency of incised or plain gray ware sherds and ware frequencies. While the total frequency of corrugated and neckbanded gray ware sherds is extremely low (almost always under 5 percent) at all Valdez phase sites, those with higher frequencies of corrugated and neckbanded types tend to have lower frequencies of white wares. For example, at sites in which the combined total of corrugated and neckbanded sherds was over 2.5 percent of the gray wares, the total frequency of white wares was usually lower. Given that Valdez phase groups may have migrated from areas to the south where a higher frequency of gray wares were corrugated or neckbanded, it is possible that Valdez phase sites with lower frequencies of white wares and higher frequencies of corrugated and neckbanded sherds are earlier. It is also possible that increased frequencies of corrugated pottery could be later, foreshadowing the presence of high frequencies of utility wares at assemblages dating to the Pot Creek phase. Further investigations are needed to determine the meaning of these trends.

Almost all the white ware sherds from LA 53678 display pastes, surface characteristics, and design styles indicating they were from Taos Black-on-white vessels. White ware type categories represented include white unpainted (42.3 percent of all white wares), mineral paint (19.2 percent), Taos solid design (6.4 percent), Taos thin parallel lines (11.5 percent), Taos thick parallel lines (3.5 percent), Taos hatchure design (7.7 percent), and diffuse organic paint (9.0 percent). These stylistic groupings were not recorded for white wares from most Valdez phase sites except those investigated during the Blueberry Hill project (Boyer in prep.), preventing broad comparisons of design styles from different areas. However, data from Blueberry Hill indicates distributions similar to those at LA 53678. Distributions noted for gray and white ware types are very similar to sherds illustrated in Valdez phase sites in the Taos Valley.

Interaction and Exchange

The movement of populations into the Taos Valley appears to have been part of a long sequence of expansion in the northeast Anasazi region. This expansion ultimately included areas of the San Juan Basin, Northern San Juan, Jemez Mountains, Northern Rio Grande drainage, and the mountain slopes and plains to the east. Comparisons of ceramics at LA 53678 with those from other sites in the Taos Valley and elsewhere in the northern Anasazi region provide clues to patterns of interaction, exchange, and expansion.

The best candidate for the source of the Taos Valley immigrant populations and subsequent influences are areas along the Rio Grande to the south, such as the Tewa Basin, north of Santa Fe. Descriptions of Developmental phase components in the Tewa Basin indicate dispersed populations and ceramics fairly similar to those associated with contemporaneous Valdez occupations in the Taos Valley (McNutt 1969; Cordell 1979; Mera 1935). Areas of the Tewa Basin appear to have been the scene of earlier episodes of migration and colonization by groups from the Colorado Plateau during the Red Mesa phase in A.D. 900-1050 (McNutt 1969). Population appears to have increased and expanded substantially during the subsequent Kwahe'e phase (A.D. 1050 to 1200).

Characteristics of white wares reflect strong Anasazi influences. During the Pueblo II period, many painted styles were widely spread throughout the Anasazi country (Lang 1982; Toll et al. 1992). Surface manipulations and styles noted in Taos Black-on-white from LA 53678 and other Valdez phase sites attest to strong influences and interaction with other Anasazi groups to the south and southeast. Because of these stylistic similarities, intrusive white ware vessels in Taos Valley sites are distinguished solely by the presence of distinct temper and paste resources. In contrast, there are more differences in Developmental phase gray ware assemblages from the Tewa Basin and surrounding areas.

Another potential source of influence and populations of Valdez phase occupations are Plains Woodland groups along the mountain slopes and plains to the east and northeast (Wood and Bair 1980; Gunnerson 1987). For example, groups associated with the Upper Purgatoire Complex on the slopes east of Taos produced gray ware similar to Taos Gray (Ellwood 1995; Wood and Bair 1980). Similarities in utility wares produced among the plains woodlands and those produced in the Taos Valley and Gallina region of the Southwest may also indicate potential Plains influence on these cultures. While pottery definitely indicates some type of influence between separated areas, there is some disagreement concerning the direction of this influence. Unfortunately, the absence of dating information concerning early plains pottery from these areas makes the direction of influence difficult or impossible to determine.

Gray ware distributions could reflect influences from the Plains, but such interpretations present several quandaries. Some characteristics of gray wares from Valdez phase sites are similar to those noted at contemporaneous sites in other Anasazi regions (particularly the Tewa Basin), and others are quite different. A major difference is the dominance of plain and incised pottery at a time when most Anasazi gray wares were corrugated. Incised decoration are common on some Plains vessels, while corrugations are generally absent. Other characteristics common to Plains and Taos Valley gray ware forms, but absent in other Anasazi regions, include elongated utility wares with pointed or conical bottoms. Another potential influence could be represented by the use of a high reduction atmosphere as indicated by the very dark pastes associated with Taos utility wares.

Thus, one explanation for the distinct characteristics of Valdez phase gray wares is that the initial occupation of the Taos Valley represents a distinct culture area, strongly influenced by Plains groups and relative isolation from other Anasazi groups. If this is the case, these influences had a greater influence on utility ware than white ware manufacture. Interestingly, this trend is opposite that noted in many other areas of the Southwest, where intrusions or influences from other areas are usually thought to be reflected by changes in decorated wares (Martin and Plog 1973). This contrasts with many areas where gray ware technologies and style seem to be more conservative and extremely similar over very wide areas.

Other explanations for the distinct characteristic of Taos Gray wares have focused on influences of immigrant groups imposed by clay resources and a frontier economy (Wilson 1995). Of particular significance are factors influencing the manufacture, decoration, and breaking of gray utility wares. A series of gradual influences on the gray ware technology is partially supported by ceramic developments at earlier sites in the Upper San Juan, Gallina, and Tewa Basin areas that foreshadow the developments in Taos Valley utility wares (Lang 1982; Wilson 1995). For example, the frequency of plain and incised gray wares from sites in the Taos Valley is much lower than those noted in Kwahe'e phase sites in the Tewa Basin. They are, however, significantly greater than those in areas of the Colorado Plateau. This seems to indicate a series of gradual changes in utility wares as groups moved out from core areas of the Colorado Plateau and into areas of the northern Rio Grande. In addition, some of the forms noted in Taos gray wares have precedence at sites in northeastern Anasazi regions as early as the Rosa phase of the Upper San Juan. Data concerning similarities in the economy of these groups may provide clues concerning the causes of these similarities. More information concerning detailed vessel oriented analysis, resource characterizations, and vessel replications is needed than presently available to determine the causes of these gray ware distributions. Explanations of the gray ware distributions at LA 53678 are discussed in more detail later in this chapter.

Thus, traits and distributions of white wares and gray wares may reflect a variety of types and directions of influences. Interaction between groups may be indicated by the presence of nonlocal vessels and stylistic similarities in pottery produced in separated areas. Temper and paste similarities in Valdez phase sherds from different sites indicate the use of similar temper and clay resources throughout the Taos Valley (Levine 1994; Wilson 1995). These similarities also reflect the lack of pottery exchange and relative isolation of immigrant groups soon after migrating to Taos Valley.

Temper and paste characteristics of sherds from LA 53678 indicate that the great majority of pottery recovered could have derived from locally produced vessels (Table 9). Paste and temper traits in ceramics belonging to the two major ware groups, however, are often very distinctive. The great majority of the gray ware sherds had granitic temper and high iron pastes. Similar pastes and tempers were noted in sherds recovered from other sites in various areas of the Taos Valley (Hill 1994). All of the gray ware sherds from LA 53578 contained similar granitic temper. Refiring of selected sherds indicate that the use of distinct red firing clays.

Temper and paste distributions of white wares indicate more variability in materials used in the production of white ware vessels. Distinct temper groups recognized include a local self-tempered group, Taos granite, sand, and sandstone. A strong relationship between paste color and temper reflects several potential sources of production for white ware vessels from this site.

The majority (55.1 percent) of the white ware sherds contained material fragments indicating the probable use of self-tempered clays (Hill 1994). This includes material initially assigned to several groups, including Taos self-tempered, self tempered with black inclusions, and fine sand. Refiring of some of these sherds indicates that these three categories actually represent variation within similar sources. The use of clay deposits with volcanic and sand inclusions is indicated. These self-tempered white wares usually have light gray to gray pastes and fire to light red to yellow-red in oxidizing atmospheres. Sherds with this temper are often dense and more vitrified than other white wares. The temper and paste is similar to that noted in Kwahe'e Black-on-white from the Tewa Basin, although white wares originating in these two districts are sometimes distinguished by characteristics of temper fragments and darker pastes. No white ware sherds clearly representing Kwahe'e Black-on-white were identified at LA 53678.

Another local temper present in these white wares was coded as Taos granite. This category consists of particles very similar to those noted in the local gray ware temper except they are usually smaller. In contrast to gray wares, this temper is rare (10.3 percent) in white wares. White wares with this temper are usually gray and refire to yellow-red.

The remaining white ware sherds were tempered with sand (26.9 percent) and sandstone temper (11.5 percent). These two tempers were often differentiated only by the presence of a distinct matrix after refiring. White wares, tempered with sand and sandstone, tended to refire to buff or pink. Sand and sandstone temper pottery was often porous with blocky texture. These associations indicate that sand or sandstone tempered sherds were produced in other areas than white ware pottery with other tempers. Some of these sherds may be from vessels produced in other regions, including those in the Colorado Plateau, where these pastes and tempers were common.

Thus, ceramic data indicate very different types of influences on the production, exchange, and decoration of pottery belonging to different wares. All the gray wares examined contained similar tempers and paste and could have originated from the same source. In addition, the ranges of decorations in gray wares were often distinct from those in contemporaneous assemblages from other Anasazi regions. This could reflect isolation from other Anasazi areas to the south and southwest as well as influences with Plains group to the east. Another possibility is the influence of clay resources and economic factors on the shape and texture of utility ware vessels.

In contrast, a much greater variation in temper and clay sources are represented by the white wares. This indicates more specialized production and greater amount of exchange for white ware vessels. A possible influence on white ware production may be the rarity of clay sources suitable for the production of white wares in the Taos Valley. Evidence of a greater exchange of white wares is consistent with evidence of strong stylistic similarities with those from other areas, and indicates some exchange and interaction with other Anasazi regions.

Functional Trends

Trends relating to vessel use or function were also examined. Attributes relating to vessel shape, size, material resources, surface manipulation, firing technology, and wear patterns reflect intended or actual uses of ceramic vessel in various activities (Blinman 1988; Braun 1983; Ericson et al. 1972; Schiffer and Skibbo 1987). Ceramic ware and vessel categories reflect many aspects of vessel function. Distributions of ware and vessel forms are presented in Table 10 and provide information concerning activities for which ceramic vessels were used.

Differences in vessel form distributions in the Taos Valley may ultimately reflect selective pressures relating to mobility on the decorations, construction, and forms of ceramic vessels. Ceramic trait distributions may reflect "historical" processes concerning the transmission of information on how to make and decorate vessels through time and across space, as well as processes or pressures resulting from the selection of some ceramic traits and rejection of others (Neff 1993). The latter step involves the examination of causes for the persistence of or changes in ceramic traits observed in terms of resulting advantages or failures and forms the basis for "evolutionary" or selectionist models for ceramic change (Neff 1993).

One strategy that may be used to examine selective influences on pottery is a comparison of ceramic traits and trends noted in adjacent areas. This approach may be particularly useful in the Taos Valley, where archaeologists have long struggled to explain similarities in the painted decorations to other Anasazi areas, and differences in the frequency and decoration of gray wares in Taos Valley pottery assemblages and those found in surrounding areas. As previously indicated, the model often employed explains geographic differences in terms of distinct cultural boundaries or isolation of the Taos Valley. Alternative interpretations may result from the examination of factors ultimately influencing the production and manufacture of pottery in various localities, including potential influences of available material resources on pottery production, population, and environmental pressures on ceramic technology and changes in the cooking technology resulting from increased agricultural intensification.

Characteristics of pottery vessels ultimately reflect their production for use as ceramic containers, reflecting facilities that function to even out spatial and temporal heterogeneity in subsistence resources (Mills 1989). Preceramic groups dealt with resource heterogeneity through mobility. Pottery, however, provides technological alternatives to full-scale mobility (Mills 1989). One model for understanding potential changes in ceramic production and manufacture involves the distinction of maintainable and reliable systems (Bleed 1985; Mills 1989). Maintainable systems sacrifice durability for other factors, such as modularity and portability, while reliable systems are designed for increased durability. The expected characteristics of maintainable systems include ease of manufacture and repair, little time for manufacture and use, lack of backup systems, and portability. Containers are utilized for a limited number of tasks, are simple, and involve easily transferred construction and firing techniques. Containers resulting from reliable production systems tend to be abundant and sturdy. They involve more specialized forms and resist failure during a specific task. They may require more specialized manufacturing and firing techniques, which may be relatively time consuming. Mills notes widespread trends concerning the shift from reliable to maintainable production systems in the Anasazi region from the Basketmaker III to Pueblo II periods.

As noted, the great majority (95.7 percent) of the sherds from LA 53678 are from gray ware vessels. Gray wares were differentiated from white wares by the absence of painted or polished surfaces, but they also exhibit distinct pastes. Most gray wares had dark to black or dark brown paste profiles. This reflects the firing of vessels with high-iron pastes in a reduction atmosphere that appeared to differ from that employed in the firing of white wares. The firing of high-iron clays in reducing atmospheres appears to have resulted in frequent vitrification of the paste. This may have made these relatively porous vessels produced from local clays less likely to leak and better suited for cooking and boiling food. Another distinct characteristic of gray ware paste was the presence of large, intentionally added crushed granite temper. The addition of these relatively large crushed rock fragments would have weakened these vessel but made them more resistant to breakage from thermal shock resulting from continual exposure to heat shock during cooking. Thus, the distinct characteristics of gray ware pastes as compared to white wares may reflect different technological needs of these wares, particularly in their use as cooking vessels.

The dominance of gray wares as large cooking or storage vessels is certainly indicated by gray ware sherd forms (Table 10). The great majority of gray ware sherds from LA 53678 and other Valdez phase sites appear to have derived from wide-mouth jars. At LA 53678, 85.8 percent of all gray wares represent jar body sherds, 7 percent are jar neck sherds, and 5.7 percent are rim sherds from wide-mouth cooking/storage jars. Other forms include miniature jar body (.4 percent), jar body with strap handle (.2 percent), jar body with lug handle (.4 percent), coil handle (.3 percent), cooking storage jar rim with lug handle (.1 percent), and lug handle (.1 percent). These trends indicate that the great majority of sherds from this site derived from cooking or storage jars. Rim radius measurements were recorded for 36 sherds. These measurements indicate that all these sherds derived from jars with a rim radius of 10 cm or greater. These indicate that almost all the gray sherds examined were derived from relatively large wide-mouth jars, which would have been a suitable size for the boiling and serving of food for the meal of a household. They could have also served in the storage of relatively high quantities of perishables. The dominance of this form indicates an emphasis on activities such as cooking, transport, or storage, which would have resulted in the breakage of gray ware jars.

White ware pastes tend to be light gray to gray, and temper appears to have been limited to small naturally occurring fragments in the clay. Differences in white ware as compared to gray ware pastes may reflect both the selection of different clay resources as well as different firing techniques. The small inclusions found in the clay would have produced vessels strong enough to endure routine use in serving and food preparation, but were not suitable to continual exposure to thermal shock. In addition, a neutral or low oxidizing firing appears to have been employed. This would have involved firing vessels in a more controlled atmosphere and probably a higher temperature for vessels to be sufficiently strong and durable. The controlled neutral or low oxidizing atmosphere was required to produce the distinct black designs on a white surface characteristic of this ware.

Low frequencies (4.2 percent) of white wares were recovered from LA 53678. These are dominated by bowl sherds, which represent 82 percent of all white wares. Other white ware forms include indeterminate (14.1 percent) and jar body (3.8 percent) forms. All rim sherds large enough for rim radius measurements were derived from relatively large bowls (11 cm or greater in radius). The fact that all white ware bowls and jars are from large forms further indicates a relatively standardized ceramic container took kit. The low frequency of white ware sherds may reflect the rarity of activities involving the breakage of bowls. It could also indicate the absence of rarity of production of white wares at this sites. Previously presented information concerning variability in white ware paste could also support this premise.

Because a greater number of sherds usually derive from large jars versus bowls, frequencies of sherds belonging to different wares don't necessary reflect the frequencies of vessels (see Table 8). Such a comparison is possible, however, through a comparison of total summation of rim arch between white ware bowls and gray ware jars. A total rim arch of 360 degrees represents the expected contribution of a complete vessel. A similar score, however, could just as easily come from several incomplete vessels. Although not a good measurement of total vessels, a comparison of scores provides a relatively accurate ratio of sherds originating from these two forms. A comparison of these scores indicates that sherds originating from gray ware jars outnumber those from white ware bowls about 6 to 1. This certainly indicates a much higher breakage rate of gray ware jars than of white ware bowls, although lower than that indicated by sherd ratios alone.

Similar high frequencies of gray war jars and low frequencies of white ware bowls occur at other Valdez phase sites in the Taos Valley (Levine 1994; Wilson 1995) and contemporaneous Kwahe'e sites in the Tewa Basin. These distributions, however, contrast dramatically with contemporaneous assemblages in other Anasazi regions to the east. The differences are particularly notable at contemporaneous sites in the Cibola and San Juan regions, where a third to half of the sherds from Late Pueblo II or Early Pueblo III components dating to the late eleventh and twelfth century occupations are white wares (Wilson 1988; Wilson and Blinman 1995; Toll and McKenna 1987). These differences may reflect greater mobility in the northern Rio Grande, resulting in the shift back toward a maintainable vessel production system. This would explain the increase and shift in decorations of gray wares in the Taos Valley. A maintainable system associated with increased mobility may have required higher amounts of utility ware jars for transport and temporary storage. The utilization of jars in such activities may partially explain the dominance of plain decorations in Valdez phase utility wares, compared to other Anasazi occupations. The combination of a ceramic container tool kit consisting almost solely of large jars and lower frequencies of large bowls appears to be unique to Developmental phase occupations of the Rio Grande. This combination of pottery may represent the culmination of a technology suitable to the rapid dispersal of agricultural groups over a wide area. Still, differences in earlier Basketmaker III maintainable technologies may possibly reflect the shift to a maintainable technology out of a reliable technology. This is indicated by the presence of both painted design styles and some other traits associated with Pueblo II technologies in regions of the Little Colorado Plateau.

The majority of gray wares from contemporaneous occupations in other regions of the Anasazi are dominated by utility wares with corrugated exteriors. The lack of corrugations or other exterior coiled treatments at Valdez phase sites may indicate that they were used more in storage than in cooking. Surfaces with smoothed surfaces may be more suited for storage than cooking. Experimental studies indicate that the presence of unobliterated coils on the exterior reduces the overall strength and durability of the vessel, since coils create fractures, increasing the survival of the vessel during cooking cycles (Schiffer et al. 1994). Utility ware vessels with obliterated surfaces may have been better suited for activities associated with a more varied subsistence base involving a greater amount of mobility and the importance of storage and less emphasis on cooking and boiling. Still other attributes discussed suggest the use of this pottery in cooking. Thus, activities involving the storage, movement, and cooking of gray ware vessels may be reflected in the archaeological record. It is interesting to note that regardless of the temporal or cultural association, plain gray wares appear to consistently dominate components associated with small dispersed patterns rather than large nucleated villages, more commonly associated with corrugated ware and higher frequencies of decorated wares. Examples of occupations in which ceramic assemblages are overwhelmingly dominated by plain utility wares are Early Anasazi occupations (Basketmaker III and Pueblo I) from all regions, later Pueblo II and Pueblo III components along the northeastern Anasazi periphery (such as the Gallina and Taos regions), and Fremont, Mogollon, and Navajo components. Most of the occupations dominated by plain utility wares are characterized by scattered hamlets, reflecting relatively small, scattered, and mobile populations. Thus, utility ware and forms and manipulations at Valdez phase sites could partially reflect the influence of a mobile subsistence base. Low frequencies of decorated white ware ceramics associated with most of these assemblages may also reflect constraints in time spent on decoration that were imposed by mobility.

While most of the differences between Taos assemblages and those contemporaneous assemblages may be explained by the shift back to a reliable production technology resulting from mobility, this does not explain the presence of the unique incised gray wares. While vessels with plain surfaces would have been more suitable with increased mobility, the additional presence of incised decoration served no additional purpose. It is possible that this difference could reflect the intentional attempts of potters who had already began to produce distinct utility ware pottery to further differentiate their pottery, and it could partially reflect developing social boundaries.

PETROGRAPHIC ANALYSIS OF CERAMICS

David V. Hill

Five sherds from LA 53678 were submitted for petrographic analysis. Two of the sherds represent samples of Taos Black-on-white. The other three were from utility wares. The results of this analysis will be compared to a previous study of ceramic pastes conducted in the Rio Grande del Rancho, east of Taos.

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

Analysis was conducted by first going through the ceramic collection and generating a brief description of each of the sherds. A second phase created of classification groups based on the similarity of the paste and temper between sherds. Additional comments about the composition of individual sherds were made at this time.

208-6 Taos Incised

The paste of this sherd is a golden brown color. The paste contains abundant silt-sized to fine rounded quartz and kaolinized feldspar grains. Also present in the paste are fine flakes of brown biotite or opaque black inclusions--biotite that has altered to hematite and clay minerals. The silt-sized mineral grains are natural inclusions in the ceramic paste.

Very coarse igneous rock fragments make up approximately 15 percent of the paste. These rock fragments appear to be an added tempering agent. The rock fragments were derived from a granitic or metamorphic source, possibly as sands, owing to the variable nature of the rock types observed in the sample. The most common material is derived from inequigranular quartzite. Some biotite is associated with these quartzite. Also present are granites. The feldspars in the granitic fragments are usually altered to sassurite and clay minerals. Two fragments of a hornblende-rich amphibolite were also present, as were a few fragments of quartz mica schist.

122-5 Taos Incised

The paste of this sherd is brown birefringent and contains abundant silt-sized to fine quartz and altered feldspar grains and flakes of brown biotite.

The paste was tempered using crushed quartz mica schist. The temper particles range in size from coarse to very coarse or larger. The temper particles constitute approximately 15 percent of the paste.

504-1 Taos Gray

The paste of this sherd is brown and birefringent, similar to Sample 122-5. Very coarse sized fragments of quartz mica schist were also used as the tempering agent in this sample. The tempering agent constituted about 15 percent of the paste.

107-11 Taos Black-on-white

The paste of this sherd is an light gray color and opaque. Silt-sized to medium-sized isolated quartz grains and occasional micaceous schist fragments are present and make up approximately 30 percent or more of the paste. These isolated mineral grains and rock fragments represent natural inclusions in the ceramic clay. The most common mineral observed is quartz. Quartz occurs as isolated mineral grains and as small aggregate masses. Most of these quartz grains display undulose extinction indicative of a metamorphic source. Some feldspars are also present; however, they are altered to clay minerals and sassurite masking identifying features. A few fragments of quartz mica schist are present. The biotite associated with the schist fragments is either brown or black and altered to clay minerals and hematite. Sparse black inclusions in the paste may also represent fragments of altered biotite.

122-13 Taos Black-on-white

The paste of this sherd is a light gray color and opaque similar to that of Sample 107-11. Also like Sample 107-11, it was not tempered, but contains about 30 percent silt-sized to medium isolated mineral grains and fragments of quartz mica schist. The biotite in the rock fragments is usually altered to clay minerals and hematite. Like Sample 107-11, the inclusions observed in this sherd represent natural inclusions in the ceramic clay.

Discussion

Samples 107-11 and 122-13 are decorated white wares. Both appear to have been derived from the same source. The two sherds have similar paste colors and inclusions. The inclusions are dominated by quartz, and both contain fragments of altered quartz mica schist.

Two of the utility ware sherds were also produced with clay and tempering materials from the same source. Both sherds had brown birefringent pastes and were tempered with quartz mica schist. Quartz mica schists are available in the Taos Range and as cobbles in streams that drain the range.

The third utility ware sherd, Sample 208-6, was from a different source. The paste of this sherd was similar in color and birefringence to the other two utility wares examined. However, sands derived from diverse metamorphic sources served as temper for this sherd, indicating a different origin for this specimen. All of the types of intrusive or plutonic rock observed in Sample 208-6 are also available in the Taos Range, which that would have served as a source of the sediments used as temper in the parent vessel.

The pastes of the white wares from LA 53678 differed little from the decorated sherds examined from Rio Grande del Rancho (Hill 1994). None of the decorated sherds examined during either project contained an added tempering agent. However, sherds from both areas had gray pastes that contained abundant fine quartz, feldspar, and altered fragments of mica schist. The present samples lack the rounded siltstone fragments observed in most of the Rio Grande del Rancho white ware sherds. The lack of siltstone in the current samples suggests that a different source of clay was used for producing the decorated ceramics from LA 53678 from the clay sources used for the Rio Grande del Rancho ceramics.

The utility wares examined from LA 53678 were similar to the few utility wares examined from the Rio Grande del Rancho sites. All of those sherds were tempered using crushed quartz biotite schist in brown birefringent pastes. Quartz mica schist is found throughout the Taos Range and could have served as the source of the temper in the Rio Grande del Rancho and LA 53678 utility ware sherds. The similarity of the pastes of the utility ware sherds from the Rio Grande del Rancho and those from LA 53678 reflect the use of similar clay and temper resources.

LITHIC ARTIFACT ANALYSIS

Peter Y. Bullock

Lithic artifact analysis was accomplished with two basic goals: to provide a descriptive summary of the lithic artifacts from the site, and to provide information that could be used to address the general research problems outlined in the data recovery plan for LA 53678. Anasazi sites tend to have fewer lithic artifacts for their size than earlier prehistoric sites. However, the lithic artifact assemblage from LA 53678 is small (N=84), even for an Anasazi site.

The descriptive artifact analysis attempted to identify patterns in prehistoric artifact production and use. It also provided a basis for comparison with the lithic artifact assemblages from Pot Creek. Comparison of the different assemblages might allow the identification of patterns attributable to different activities, based on the different proportions of formal tools, utilized flakes, ground stone, and exotic materials. Interpretation is based on the assumption that Anasazi lithic assemblages reflect the need for flakes that can be utilized without further modification as expedient tools and the need for material that can be further modified into formal specialized tools. It has been argued that expedient tools, flakes utilized with little or no modification, are the result of material abundance on residential sites (Post 1993).

The existence of formal tools such as projectile points, drills, etc. within an assemblage implies design directed toward specific tasks or activities. Early stages of formal tool manufacture and expedient flake production produce flakes that are indistinguishable from each other. The waste flakes produced in the later stages of formal tool production, however, are distinctive biface flakes.

Distinctive resharpening, or rejuvenation, flakes are a common by-product of tool maintenance and reuse. Their presence indicates that these activities occurred at the site.

The presence of nonlocal, or exotic, materials can be used to postulate spheres of social and economic interaction. Conversely, an absence of nonlocal lithic material may reflect the isolation of a population or community.

The research design developed for LA 53678 (Boyer 1995) focused on the identification of site activities as a way of inferring site function. While this small lithic assemblage can be expected to yield only limited information, it can at least indicate a range of activities that may have taken place at LA 53678. Different activities can be inferred through the presence of different artifact types and their frequencies. Since LA 53678 contains a residential structure, a wider range of actives can be expected than at a hunting camp or short-term procurement area.

Methods

The guidelines and format of *Standardized Lithic Artifact Analysis: Attributes and Variable Code Lists* (OAS 1994a) were followed in the analysis of lithic artifacts from LA 53678. Definitions used in lithic analysis are also included in this volume. The following attributes were recorded:

Material Type

Codes for material types are for general material groups unless the material is unquestionably from a recognized source. For example, although a wide range of chert occurs on these sites, all were classified as "chert." If a specimen was of a specifically named chert (such as Washington Pass chert), it was coded by the specific name.

Morphology (Artifact Type)

This is the characterization of artifacts by form.

Portion

Portion is the part of the artifact present. Flakes and tools can be whole or fragmentary. Angular debris and cores are whole by definition.

Dorsal Cortex

Cortex is estimated to the nearest 10 percent increment. For flakes, this is the cortex on the dorsal surface. Cortex on the platform was not included. For other morphological types, the percentage of cortex on all surfaces is estimated and added together.

Flake Platform

Flake platform is recorded for whole and proximal flakes. Some lateral flakes also have their platforms recorded, if the platform is still present. The morphology of the impact area prior to flake removal or extreme modifications of the impact area caused by the actual flake removal is coded.

Size

Artifact size is recorded in millimeters.

Edge Number

Artifacts can have one or more utilized edges. Each utilized edge on an artifact is given an edge number. Consecutive numbers are used for artifacts with more than one utilized edge. Each edge was analyzed separately for function and wear patterns.

Function

Function describes and characterizes artifact form.

Wear Patterns

Artifact modification caused by human use is coded as wear.

Results

There are 84 lithic artifacts in the LA 53678 assemblage.

Material Selection

Lithic artifacts collected at LA 53678 were comprised of six materials: basalt, chert, metamorphic sandstone, obsidian, siltstone, and quartzite (Table 11). Basalt is the most common material, making up 50 percent of the total assemblage. Chert is the second most common at 29.7 percent. Quartzite comprises 10 percent of the total. Metamorphic sandstone (4.7 percent), siltstone (1.2 percent), and obsidian (2.5 percent) are also present in small qualities.

All but one of the materials in the lithic assemblage at LA 53678 is available locally in the Taos area (Moore 1994). Obsidian is the only nonlocal material at this site, comprising 2.5 percent. This obsidian resembles Jemez obsidian. Both Jemez and Polvadera obsidian are known for the Taos Valley (Moore 1994). However, an additional prehistoric obsidian source has been recorded near San Antonio in south-central Colorado (Shackley 1995). It is not known if this material is similar in appearance to Jemez obsidian.

Material use serves as an indication of human decision-making processes with regard to the suitability of materials (Young and Bonnichsen 1985:128). The presence within a site area of tested material or substantial numbers of core flakes exhibiting dorsal cortex can thus be presumed to illustrate the manner in which this material suitability is determined. The LA 53678 assemblage lacks both tested material and large numbers of core flakes exhibiting dorsal cortex (Table 12). Of the lithic artifact total, 73.8 percent lacks any dorsal cortex. This suggests that the suitability of this lithic material, except basalt, was determined at an unknown location before its use at LA 53678.

Artifact Morphology

Biface thinning flakes make up the largest category of artifacts at LA 53678, making up 53.6 percent of the total assemblage (see Table 11). The second largest category is comprised of core flakes, 34.5 percent. All of the additional morphological categories are limited to one or two occurrences.

The high percentage of biface thinning flakes is indicative of on-site tool production. The range of materials represented by biface thinning flakes shows this is not the result of a single toolmaking episode.

Core flakes can represent core reduction or the manufacturing of flakes for use as expedient tools. Core flakes are present in all material types occurring at LA 53678. This range of occurrence suggests that the creation of core flakes for use as expedient tools was taking place. This form of convenient, disposable lithic technology is characteristic of Anasazi sites (Neusius 1988). Only among basalt artifacts in this assemblage is there the range of cortex occurrence that might indicate core reduction.

Flake Portion

Numbers of distal and proximal flake portions within an assemblage can be an indication of core reduction or tramping by livestock. An extremely high percentage of distal fragments suggests breakage took place during core reduction. Numbers of distal and proximal fragments that are roughly equal are believed to represent breakage caused by livestock (Moore 1994), as are high percentages of proximal fragments.

The LA 53678 flake assemblage (Table 13) contains roughly equal percentages of distal and proximal portions among core flakes, suggesting trampling by livestock. This conclusion is supported by the high percentage of proximal portions present among biface thinning flakes.

Flake Platform Type

Flake platforms are the remnants of the core or tool from which the flake was struck. Platform types provide information on the level of core reduction technology pursued at a particular site. Cortical platforms are those that contain cortex material, thus representing early-stage reduction. Single-facet platforms can occur at any stage of reduction. Multiple-facet platforms represent late-stage core or biface reduction (Moore 1994).

Platform types are shown in Table 14. Multiple-facet platforms are by far the largest category present at 40.6 percent. Flakes where the platform was absent comprised 25.8 percent of the total. Cortical platforms made up 22.8 percent. Artifacts with collapsed platforms comprised the remaining 10.8 percent. No single-facet platforms were present in the flake assemblage from LA 53678.

Tools

All but one lithic artifact recovered at LA 53678 showed evidence of utilization (Table 15). Included in this assemblage are two cores utilized as hammerstones, two projectile points, one biface, one uniface, one chopper, and five scrapers.

Utilized debitage makes up 81.9 percent of the total utilized assemblage. Every flake in the assemblage, both core flakes and biface thinning flakes, was utilized.

The small number of formal tools was dominated by scrapers. Five, made of three materials, are in the assemblage. One scraper was flaked as a uniface. Projectile points (2) are the next most frequent formal tool.

Two projectile points were recovered at LA 53678. These were assigned to temporal categories. One of the projectile points is a Puebloan side-notched. The second is a broken tip fragment that may also be Puebloan.

The presence of bifaces and their percentage within an assemblage has been used by Kelly (1988:721-723) to differentiate between types of sites. Biface production should take place at residential sites, indicated by the presence of large numbers of bifaces and biface thinning flakes. In contrast, logistical camps and resource procurement areas should have few biface thinning flakes, but large percentages of resharpening flakes and biface fragments.

The frequency of biface thinning flakes is high in this assemblage, as we would expect for a residential site. The large percentage of expedient flake tools and the small percentage of formal tools are also typical of an Anasazi site and suggests a range of activities representing a year-round habitation (Akins and Bullock 1992).

Gross interpretations can be made of possible activities represented by utilized artifacts. Bidirectional wear is traditionally considered an indication of cutting and slicing, while unidirectional wear is thought to indicate scraping. Experiments conducted by Brose (1975), Vaughan (1985), and James L. Moore (pers. comm., February 1992) show that wear patterns are unreliable indicators of use. However, it should be possible to determine, however roughly, the types of activities pursued at this site (Christenson 1987:77).

Projectile points exhibiting wear indicate that hunting took place at LA 53678. The presence of the chopper, biface, and the scrapers suggests that animal butchering and leather processing also was carried out at this site. The presence of hammerstones may be related to the striking of flakes to use as expedient tools, although they could have also been used to sharpen (pit) the surfaces of ground stone tools. Many of the expedient flake tools utilized in this assemblage could have also functioned in a manner similar to that of the formal tools. They may, however, represent different, unknown actives, such as the processing of vegetal foodstuffs. These expedient tools could be the result of unplanned actions, the repairing of clothing or equipment.

Material Texture

While material selection may depend on local availability as well as the intended project, studies have shown different material textural preferences among Anasazi and Archaic groups (Elyea and Eschman 1985:246).

As Table 15 indicates, projectile points and bifaces are made of finer-textured material than most of the other artifacts. Utilized debitage occurs in the widest variety of materials. The largest range of tools occurs among basalt artifacts. Artifacts with multiple utilizations are limited to items of basalt.

This suggests that formal tools are made of material that will enhance their specialized functions. An ability to have a sharp edge is valued in materials such as obsidian and chert for projectile pints and bifaces. Materials such as basalt, quartzite, and chert are utilized where durability is valued, as in scrapers and choppers. A greater variety of materials is acceptable as utilized debitage, where the main value of the artifacts may be availability and convenience.

Discussion

Analysis of the lithic artifacts from LA 53678 shows that an expedient core-flake reduction technology was utilized by the pithouse inhabitants. Tool manufacturing was also carried out, as evidenced by the large number of biface thinning flakes in an assortment of materials. Tool production focused on formal specialized tools. Little initial core reduction took place at LA 53678, except with basalt. The biface flakes were utilized, as were the generated core flakes.

Assemblages from excavated Anasazi sites reflect an expedient lithic technology, in which flakes were produced for use as short-term, disposable tools (Vierra 1987). Formal tools other than projectile points are rare (Larralde 1994; Vierra 1987). LA 53678 reflects this type of assemblage.

One difference between LA 53678 and other Anasazi sites may be the large percentage of biface flakes. Bifacial reduction is generally associated with Archaic and Basketmaker II sites (Lentz 1991; Moore 1994) and seems to have been replaced as part of the general cultural shift to a sedentary agricultural lifestyle (Abbott et al. 1996). Since LA 53678 is a Valdez phase site, it is considerably later than any Basketmaker II site.

This assemblage suggests that LA 53678 had a population with a long-established lithic tradition based on expedient core reduction and flake tool use. Bifacial reduction seems to have been maintained exclusively for the extensive production of formal specialized tools.

Nonlocal material is sparse at LA 53678 and limited to obsidian. The presence of this nonlocal material indicates at least a degree of long-distance procurement, suggesting that these sites functioned as part of a larger settlement system.

Comparison with Three Pot Creek Sites

The lithic artifact data from LA 53678 is compared with similar material from three Valdez phase pit structure sites (LA 2742, LA 3570, LA 70577) investigated during the Pot Creek project. This comparison focused on three attributes of the lithic assemblages: material type, the percentage of local verses nonlocal materials, and tool frequencies.

Lithic Material Types

The range of material utilized for lithic artifacts at LA 53678 is compared to the material utilized at three pit structure sites in the Pot Creek area in Table 16.

The range of material utilized for chipped stone artifacts at all three of the Pot Creek sites is considerably greater than that at LA 53678. Part of this difference seems to be the result of the assemblage size. The larger the assemblage, the greater the number of varieties present. This does not however account for the material percentage differences between sites.

The biggest difference in material use between LA 53678 and the Pot Creek sites is in the occurrence of basalt and chert. The largest material category at LA 53678 is basalt, followed by chert and then quartzite. Chert comprises the largest material category at all three of the Pot Creek sites, followed by chert and quartzite.

Local versus Nonlocal

The percentage of local versus nonlocal material differs considerably among the Pot Creek sites (LA 2742, LA 3570, and LA 70577) (Table 17).

Nonlocal material at LA 53678 is relatively scarce, comprising 2.42 percent of the total lithic artifact assemblage. Nonlocal material makes up varying percentages of the Pot Creek site assemblages, all of them considerably greater than the percentage of nonlocal material at LA 53678.

Although assemblage size may be a factor in the percentage of nonlocal versus local material percentages. The numbers from the Pot Creek sites show there is not a clear correlation. LA 3570 is the smallest of the Pot Creek assemblages, yet nonlocal materials make up 20.4 percent. This is far larger than at LA 2742, which contains over twice as many artifacts.

Tools

Tool percentages vary greatly when LA 53678 and the three Pot Creek assemblages are compared. There is some variation between LA 2742, LA 3570, and LA 70577, but these three sites resemble each other to a greater degree than they resemble LA 53678. Table 18 illustrates the differences in the four assemblages. The percentage of utilized debitage is extremely high for LA 53678 at 89.3 percent. Utilized debitage at the Pot Creek sites ranges from 0.5 percent (LA 3570) to 3.9 (LA 70577) to 5.1 percent (LA 2742).

The percentages of cores varies between the sites, but there is not a clear pattern. Cores make up 2.4 percent of the LA 53678 assemblage. The totals for LA 2742 and LA 3570 are, respectively, 3.5 percent and 3.7 percent. The percentage of cores in the LA 70577 assemblage is 1.4 percent.

Formal tool percentages are higher at LA 53678 than at any of the Pot Creek sites. Cobble tools and unifaces occur over twice as frequently in the LA 53678 assemblage than in any of the other assemblages. Bifaces are also present in higher numbers at LA 53678.

Comparison of the lithic artifact assemblage from LA 53678 and the three Pot Creek pit structure sites shows considerable variation between them. The range of materials represented, the percentage of local verse nonlocal materials within the assemblages, and the composition of the artifact assemblages, all show considerable differences. Since all four of the compared sites date to the Valdez phase, any one of these differences can be explained.

Some of these differences may be a by-product of assemblage size. Clearly, the larger the artifact assemblage, the larger the range of lithic materials present. Assemblage sizes do not account for differences in material percentages and show differences between LA 53678 and the other three sites that are not dependent on assemblage size.

Material availability may also be a consideration in differences of material use. Local versus nonlocal material percentages are dramatically different between LA 53678 and the Pot Creek sites. The larger range of materials from the Pot Creek sites could reflect a greater range of material availability in that portion of the Taos Valley, as well as greater contact with other areas.

The percentages of tool types within the LA 53678 assemblage is considerably different from that of the other assemblages. Although this may be a result of site location, reflecting differences in site function or activities pursued at the site level, the higher percentages of formal tools suggest that LA 53678 is an earlier site.

The three Pot Creek sites have been assigned dates based on a variety of dating techniques, each appropriate to the specific site. LA 2742 is dated from A.D. 1170 to A.D. 1245, based on archaeomagnetic dates. LA 3570 dates from A.D. 1079 to 1163, based on obsidian hydration dates. LA 70577 has been assigned a date from A.D. 1120 to A.D. 1170 based on archaeomagnetic, radiocarbon, and obsidian hydration dates (Boyer et al. 1994b). LA 53678 has an archaeomagnetic date of A.D. 935-1055. Differences in these four lithic artifact assemblages could reflect this earlier date for LA 53678.

GROUND STONE ARTIFACT ANALYSIS

Four ground stone artifacts were collected from LA 53678. Attributes chosen for analysis reflected the desire to achieve the greatest return of useful information within the available time. The analysis followed *Standardized Ground Stone Artifact Analysis: A Manual for the Office of Archaeological Studies* (OAS 1994b).

Three of the four pieces of ground stone artifacts are mano fragments. The fourth ground stone artifact is the corner of a trough metate. These artifacts were recovered from three proveniences.

Manos

Portions of three manos were collected from LA 53678. All are made of a fine-grained quartzite.

One mano was recovered during testing from the surface of Floor 1 in Pit Structure 1. This is the end fragment of a two-handed mano. Only one side has been used for grinding. The remaining end exhibits worn flake scars, proof that the rock was at least partially shaped prior to use. The utilized side has a grinding surface that extends up the remaining end, indicating that the mano was used with a trough metate (Schlanger 1991). The grinding surface also exhibits resharpening, pitting to the use surface in order to revive the artifacts grinding capability.

A single mano was recovered from the base of Feature 2, a posthole associated with Floor 2. This is an end fragment from a two-handed mano. The stone was at least partially shaped by flaking prior to its use for grinding. One side has been used for grinding. The grinding surface extends up the remaining end, indicating that the mano was used with a trough metate. The grinding surface has been roughened by being pitted with a hammerstone. This grinding side is heavily worn. After the mano was broken, this fragment was heavily oxidized in a fire. It was later used as a base support in a posthole associated with Floor 2.

A small edge fragment of a mano was recovered from Layer 1 of Extramural Area 2, Feature 1, the storage cist. Because this is an edge fragment from the middle of the mano, it is impossible to determine the type of mano represented. The mano was at least partially shaped by flaking prior to its utilization. This artifact's position in the upper fill of the collapsed storage cist suggests that it was out of its original context and was redeposited from the site surface.

Metate

A single metate was recovered from LA 53678. Found on the surface of Floor 1, it is the corner fragment of a trough metate. The stone of the metate was shaped by flaking prior to its use for grinding. The grinding surface exhibits pecking, evidence that the metate was resharpened to rejuvenate its grinding surface at least once during its use-life. It is possible that this metate and the mano, also recovered from the same Floor 1 surface provenience, were used together. The two ground stone artifacts do fit together, but joint use may be impossible to determine.

Discussion

Although small, the ground stone assemblage from LA 53678 provides important information on the degree of agriculture and the related activities pursued at the site. The presence of ground stone artifacts associated with Floors 1 and 2 indicates that the use of these artifacts, as well as the activities they represent, had taken place at the site over a period of time as an integrated aspect of Valdez phase culture.

Two-hand manos and trough metates are the major elements of a grinding technology oriented toward efficient domesticated maize processing (Bartlett 1933; Lancaster 1986). These artifacts are portable, but they are usually found in archaeological contexts that show they were primarily used inside of structures or in sheltered areas (Schlanger 1991). Trough metates are often found as built-in features, set adobe or masonry stands. They are also found sitting on the floors of structures or stored and leaning against the walls. The metate in Pit Structure 1 was found on the surface of Floor 2, upside down between the hearth and the deflector.

Two-hand manos and trough metates had to be resharpened frequently. Bartlett (1933) suggested this had to be done every five days when the tools were in constant use. This resharpening was done by pecking the grinding surface with a hammerstone or core to rejuvenate the grinding surface. This resharpening was responsible for most of the wear on these ground stone tools. Two-hand manos had to be resharpened more frequently, and they had to be replaced more frequently than trough metates (Wright 1990).

The two larger mano fragments and the metate fragment from LA 53678 are the result of transverse breaks. Common forms of breakage, transverse breaks occur when these types of artifacts are being resharpened and the worker fails to provide enough support for the artifact (Shelley 1983). When these artifacts are broken, they may be discarded immediately, stored for future use, or utilized in some other manner (Schlanger 1991).

None of the ground stone artifacts from LA 53678 show any indication of secondary wear, indicating that they were not used later for another purpose, such as the grinding of clays or paints, or for the shaping of beads. One mano fragment was reused in a posthole. The two ground stone artifacts found on the Floor 1 surface may have been stored or could have been discarded prior to abandonment.

Schlanger (1991) has found that there is a correlation between the locations of mano and metate fragments and length of site occupation. Broken mano and metate fragments only occur in fill and trash deposits when the site occupations or structures last longer than the use-life of these tools. The broken artifacts are first delegated to a floor surface. Through time these artifacts accumulate and are then "transformed" into trash and removed from the structure to designated trash locations (midden areas, fill, sheet trash, etc.).

In the case of LA 53678, the ground stone artifacts remained on the pit structure's floor surface and never made the transition to trash status. This suggests that the pit structure at LA 53678 was only occupied for a short period of time. A similar interpretation has been suggested based on the relatively shallow depth of postoccupational deposition on the pit structure's floor surfaces.

Trough metates and two-handed manos, designed for the efficient grinding of domesticated maize (Bartlett 1933; Wright 1990), appeared at Anasazi sites before A.D. 600. Their numbers increase dramatically at Anasazi sites after A.D. 850 with agricultural intensification (Phagan 1986; Shelley 1983). This developed dependence on maize was well established by the development of the Valdez phase in the Taos Valley. The presence of two-hand manos and trough metates at LA 53678 shows that this maize-based subsistence system was in place at this site during its occupation.

FAUNAL REMAINS

Nancy J. Akins

The small faunal assemblage (66 pieces of bone) from LA 53678 is remarkable for the number of taxa represented. Unfortunately, most are probably postoccupational additions to the site. At least five species of burrowing rodent are present, and few of the taxa are likely prehistoric economic species. The size and nature of the sample precludes any discussion of animal utilization by the site inhabitants.

Analytic Methods

A modified version of the OAS faunal recording format was used to record the fauna. Variables recorded include the FS number, lot number, number of pieces of bone with that identification, cases in which an identification was uncertain, the taxon, whether the element was part of an articulation, the body part represented, body part side, body part completeness, portion of the skeletal element represented, the age of the animal, criteria for aging, environmental alteration and degree, animal alteration and location, burning degree and location, rounding, processing type and location, and whether the element is a tool, ornament, or manufacturing debris. Several of the variables (articulations, burning, rounding, and manufacture) do not occur in this small sample and are not discussed.

Taxonomic identifications were made as specific as possible using the OAS comparative collection. Because this collection lacks some species and does not cover the variability found in many of those present, identification to the species level is often not possible. When an element (piece of bone) could not be identified to species or even family, a range of indeterminate categories was used to identify the size of the animal and determine whether it was mammal, bird, or unknown. Each bone was counted only once, even if it was broken into a number of pieces during excavation or laboratory processing.

Taxa

The taxa found, common name or indication of the size of the animal, number of elements, percent of elements, and minimum number of individuals (MNI) are given in Table 19 and broken down by major provenience in Table 20. The minimum MNI treats the entire site as a single sample, the maximum is additive, calculating an MNI for each of the three major proveniences and adding these together.

Unidentified Taxa

Relatively few bones could not be identified to at least the kind of animal (7 pieces, or 10.6 percent). One piece of a long bone shaft could have been a large bird or small mammal; two others were from small mammals. The medium mammal includes rib and long bone fragments from an immature animal. The medium to large mammal is indicated by a piece of a flat bone, and the large mammal a long bone splinter. More of the surface stripping provenience group is composed of unidentifiable elements (33.3 percent, compared to 7.7 percent from the pit structure and 6.9

percent from Extramural Area 2, Feature 1, a storage cist). All but one are very fragmentary (less than 25 percent of the body part) (Table 21), four are pitted from soil conditions, and two have rounded and dissolved edges, suggesting they are scatological (Table 22).

Squirrels

At least two species of squirrel are represented, one large variety and one small variety. The small golden mantled ground squirrel (*Spermophilus lateralis*) favors meadows in montane forests but also occupies piñon-juniper woodlands. Their burrows are found in a variety of places, including open unsheltered sites (Findley et al. 1975:128). The element is much of a mandible that does not exhibit environmental alteration. Both the completeness of the bone and the lack of erosion suggest this squirrel was a postoccupational addition to the site. The two small squirrel elements could represent this or some other species. One is a mandible from an immature squirrel, and the other is a partial humerus. Other species that currently inhabit the Taos area are the least chipmunk (*Eutamias minimus*) and the Colorado chipmunk (*Eutamias quadrivittatus*) (Findley et al. 1975:103-123).

Prairie dogs (*Cynomes gunnisoni*) inhabit grasslands in the northern part of the New Mexico ranging from low valleys to parks in montane forests. They live in loosely organized towns where as few as two or three animals can form a colony (Findley et al. 1975:133-134). With 21 elements, prairie dog is the most numerous of the taxa. Most were recovered from Extramural Area 2, Feature 1 (n=20), especially Level 7 (n=15). Almost half of the pieces recovered were from crania, with a scattering of limb parts and a rib. Fragmentation (Table 21) ranges from complete or nearly complete (42.9 percent) to very fragmentary (38.1 percent). A few are pitted and root etched (n=2 each), and two appear to have been crunched by carnivores (Table 22). Again, the fragmentation and relative lack of environmental alteration suggest most or all of these specimens are postoccupational additions to the site–burrowers, or bone left behind by carnivores.

Large-squirrel elements include a radius and ulna from an immature large squirrel and a rib from a mature animal. Other large squirrels inhabiting the Taos area include rock squirrels (*Spermophilus variegatus*) and red squirrels (*Tamiasciurus hudsonicus*) (Findley et al. 1975:126-140).

Pocket Gophers (Thomomys sp.)

Botta's pocket gopher (*Thomomys bottae*) and the northern pocket gopher (*Thomomys talpoides*) inhabit the Taos area. Botta's pocket gopher occupies almost every habitat where suitable soils exist, except higher elevations. Northern pocket gophers prefer higher montane forests but meet the range of Botta's pocket gopher in ponderosa forests (Findley et al. 1975:144-151). The specimens recovered from LA 53678 are slightly larger than the Botta's pocket gopher compared to material from other parts of the state. Because of the size difference and lack of northern pocket gopher comparative material, these specimens were left at the *Thomomys* level, but the habitat, once a piñon-juniper woodland and now covered with sagebrush, suggests the specimens are Botta's pocket gopher.

Pocket gophers are the second most numerous taxa in terms of counts and the most numerous in MNI. Found in all three major provenances (Table 20), they are most common in the pit structure and Extramural Area 2, Feature 1 (storage cist). Half of the pieces are complete or nearly so, and slightly less than half are very fragmentary (Table 21). Pitting is found in an appreciable number (28.6 percent), and one appears to be scatological (Table 22). Cranial parts (n=6) and innominates (n=4) are the most common body parts. The remainder are front limb bones. These are from pocket gophers ranging from immature to mature in age. Most, if not all, are probably postoccupational additions to the site.

Kangaroo Rats

Like the pocket gophers, the kangaroo rats from LA 53678 are slightly larger than comparative Ord's kangaroo rat (*Dipodomys ordii*) specimens. However, since this is the only kangaroo rat that currently inhabits the area (Findley et al. 1975:174-184), it is probably a large Ord's. All three pieces are from Structure 2 and include a mandible, an innominate, and a femur from a full-sized but less than mature individual. The bones are all complete or nearly complete (Table 22), and none are weathered, suggesting these are postoccupational burrowers.

Peromyscus sp.

Peromyscus maniculatus, the deer mouse; *Peromyscus truei*, the piñon mouse; and *Peromyscus difficilis*, the rock mouse, all inhabit the Taos area. Deer mice live in almost every habitat in New Mexico, while the piñon mouse, the most common mammal in open stands of piñon, is also found in areas of deciduous shrubs. The rock mouse lives in large accumulations of large rocks or boulders, often in piñon-juniper and oak woodlands (Findley et al. 1975:210-225).

The specimens from LA 53678, all from Structure 2, include a partial mandible and innominate, and a complete femur from at least one mature or near-mature mouse. None are eroded, suggesting these are relatively recent additions to the faunal record.

Small Rodent

The small rodent could represent the small rodents represented in the assemblage or other species from the area. The parts are a rib and femur shaft.

Cottontail Rabbit

Both *Sylvilagus nuttalli* (mountain cottontail) and *Sylvilagus auduboni* (Audubon's cottontail) inhabit the Taos area. These two species often occupy the same area (Findley et al. 1975:83-89), and both could be represented in this small collection. Elements include a partial tibia from an immature animal, and two other tibias and a femur from mature animals. Half of the elements are complete or nearly so (Table 21). All exhibit either pitting or root etching.

Cottontails were commonly used for food by prehistoric groups. Their propensity to invade fields and multiply rapidly often requires hunting or fencing to keep them in check (Bailey 1931:60). Hunting in and around agricultural fields would not only protect the growing plants but would also provide a low-cost food source. While cottontails were a likely resource for the inhabitants of LA 53678, none of the elements recovered show direct evidence of human use, and these could represent yet another postoccupational invader of the site area.

Jackrabbit

Three of the four jackrabbit species found in New Mexico occur in and around Taos. The snowshoe hare (*Lepus americanus*) inhabits spruce and fir forests around Taos; the white-tailed jack rabbit (*Lepus townsendii*) occupies sage plains from Taos northward; and the black-tailed jackrabbit (*Lepus californicus*) is found throughout the state below the ponderosa forest zone (Findley et al. 1975:91-93). The single bone from this site, a fragment of an ulna, could not be identified to the species level and could represent any one of these jackrabbits. The piece, from Pit Structure 1, is fragmentary and heavily pitted.

Small Carnivore

The small carnivore from this site is represented by a piece of a humerus shaft from an immature carnivore smaller than a coyote and larger than a skunk. Recovered during surface stripping, it may or may not be prehistoric. It is not pitted, but it is partially sun bleached from exposure.

Medium Artiodactyl

A rib shaft fragment from a medium or deer-sized artiodactyl is the only piece of bone from the site that might have been processed by humans. Unfortunately, the diagonal break on the shaft is ambiguous at best and could have been caused by a number of natural agents.

Mule Deer

Mule deer (*Odocoileus hemionus*) live in all habitats and elevations in New Mexico (Findley et al. 1975:328). The element from this site is a complete hoof core that is heavily pitted. Deer are frequently found in prehistoric faunal assemblages and were a common food source. However, since this element was recovered during surface stripping, it could be a postoccupational addition to the site.

Large Bird

One piece of bone is definitely from a large bird. The piece has cresting, suggestive of a tibiotarsus or femur, but it is too fragmentary to determine which part it is. While the bird represented is about the size of a turkey, comparison with a number of turkey tibiotarsi, femora, and other long bones indicate it is not turkey. It is a particularly well preserved piece with no weathering, but it has a round hole, probably a canine puncture, and all edges are rounded, suggesting it is scatological. Recovered during surface stripping, this too could be a postoccupational addition to the site.

Discussion

The faunal collection from LA 53678 provides a chronicle of post-occupational invasion of an archaeological site by burrowing rodents, rabbits, and carnivores. Many of the rodents represented in this sample may have died in their burrows with only the larger bones retrieved by quarter inch screens. Others may have been digested and left as scat by carnivores and possibly raptors.

Rodents and cottontails are mainly found in the two structures where potential burrowers comprise 85 percent of the Pit Structure 1 assemblage and at least 93 percent of the Extramural Area 2, Feature 1 sample, compared to only 22 percent of that recovered during surface stripping.

More bone from the surface is highly fragmented (66.7 percent), and that from the structures tends to be fairly complete (Table 21).

Bones with carnivore punctures or crunching occur in all three provenances (see Table 4). Scat, bone rounded by digestive processes, is all from surface stripping; although evidence for digestion may be obscured by environmental alteration in the more deeply buried elements. Pitting, generally caused by acidic soils, and root etching are most frequent in Pit Structure 1 (Table 22).

None of the potential prehistoric economic species have unambiguous evidence of antiquity. No burned bone was found, and the only possible processing is a diagonal break on a medium artiodactyl rib shaft fragment. Diagonal breaks can result from carnivore feeding and other nonhuman processes, and ribs commonly break in this manner. Even the rabbit bones tend to be complete or nearly so, and only a small number of generally larger body parts are found. Poor preservation, disposal practices, and brevity of occupation seem to have resulted in the absence of subsistence remains at LA 53678.

POLLEN ANALYSIS

Richard G. Holloway

A single pollen sample form LA 53678 was submitted to the Castetter Laboratory for Ethnobotanical Studies (CLES) at the University of New Mexico (UNM). This sample, a pollen wash of a trough metate fragment, was recovered from Room 1.

Chemical extraction of pollen samples was conducted using a procedure designed for semiarid southwestern sediments. The method, detailed below, specifically avoids use of such reagents as nitric acid, bleach, and potassium hydroxide, which have been demonstrated experimentally to be destructive to pollen grains (Holloway 1981).

From this pollen sample, the entire sample submitted was used for extraction. The area of the metate washed measured 6 (15.24 cm) by 8 inches (20.32 cm), which equaled 309.67 cm^2. Prior to chemical extraction, three tablets of concentrated *Lycopodium* spores (batch #124961, Department of Quaternary Geology, Lund, Sweden; 12,542 marker grains per tablet) were added to each subsample. The addition of marker grains permits calculation of pollen concentration values and provides an indicator for accidental destruction of pollen during the laboratory procedure.

The samples were treated with 35 percent hydrochloric acid (HCl) overnight to remove carbonates and release the *Lycopodium* spores from their matrix. After neutralizing the acid with distilled water, the samples were allowed to settle for at least three hours before the supernatant liquid was removed. Additional distilled water was added to the supernatant, and the mixture was swirled and then allowed to settle for five seconds. The suspended fine fraction was decanted through 250μ mesh screen into a second beaker. This procedure, repeated at least three times, removed lighter materials, including pollen grains, from the heavier fractions. The fine material was concentrated by centrifugation at 2,000 revolutions per minute (RPM).

The fine fraction was treated overnight in cold 48 percent hydrofluoric acid (HF) overnight to remove silicates. After completely neutralizing the acid with distilled water, the samples were treated with a 1 percent solution of trisodium phosphate (Na_3PO_4) and repeatedly washed with distilled water and centrifuged (2,000 RPM) until the supernatant liquid was clear and neutral. This procedure removed fine charcoal and other associated organic matter and effectively deflocculated the sample.

Heavy density separation ensued, using zinc chloride ($ZnCl_2$) with a specific gravity of 1.99-2.00 to remove much of the remaining detritus from the pollen. The light fraction was diluted with distilled water (10:1) and concentrated by centrifugation. The samples were washed repeatedly in distilled water until neutral and were treated with glacial acetic acid to remove any remaining water.

Acetolysis solution (acetic anhydride: concentrated sulfuric acid in 8:1 ratio), following Erdtman (1960), was added to each sample. Centrifuge tubes containing the solution were heated in a boiling water bath for approximately eight minutes and then cooled for an additional eight minutes before centrifugation and removal of the acetolysis solution with glacial acetic acid followed by distilled water. Centrifugation at 2,000 rpm for 90 seconds dramatically reduced the size of the sample, yet from periodic examination of the residue, did not remove fossil palynomorphs.

The material was rinsed in methanol stained with safranin, rinsed twice with methanol, and transferred to 2-dram vials with tertiary butyl alcohol (TBA). The samples were mixed with a small quantity of silicone oil (1,000 cks) and allowed to stand overnight for evaporation of the TBA. The storage vials were capped and are permanently stored at CLES. A drop of the polliniferous residue was mounted on a microscope slide for examination under an 18 by 18 mm cover slip sealed with fingernail polish. The slide was examined using 200X or 100X magnification under an aus-Jena Laboval 4 compound microscope. Occasionally, pollen grains were examined using either 400X or 1,000X oil immersion to obtain a positive identification to either the family or genus level.

Abbreviated microscopy was performed on the sample, in which either 20 percent of the slide (approximately four transects at 200X magnification) or a minimum of 50 marker grains were counted. The uncounted portion of the slide was completely scanned at a magnification of 100X for larger grains of cultivated plants such as *Zea mays* and *Cucurbita,* two types of cactus (Platyopuntia and Cylindropuntia), and other large pollen types such as members of the Malvaceae or Nyctaginaceae families.

The pollen concentration values of those taxa identified during the low magnification scans were adjusted to reflect the true concentration values of these taxa. If, for example, a single *Cucurbita* grain was encountered during the scan of a slide, an estimate of its concentration was made based on the number of marker grains present on that slide. This was done by averaging the number of marker grains per transect counted during the actual count and multiplying by the number of transects examined. The resultant number was substituted into the formula for computing pollen concentration values for all taxa encountered during the scan, but these data are presented in a separate table. Lowered pollen concentration values for the target taxa are the outcome, but it is believed that a more accurate assessment of the true pollen concentration values are achieved. However, because of the effect of nonrandom distribution of pollen grains on the slide (Brookes and Thomas 1967), the result sometimes is an increase of pollen concentration values for these target taxa.

Total pollen concentration values were computed for all taxa. In addition, the percentage of indeterminate pollen was also computed. Statistically, pollen concentration values provide a more reliable estimate of species composition within the assemblage. Traditionally, results have been presented by relative frequencies (percentages), where the abundance of each taxon is expressed in relation to the total pollen sum (200+ grains) per sample. With this method, rare pollen types tend to constitute less than 1 percent of the total assemblage. Pollen concentration values, provide a more precise measurement of the abundance of even these rare types. The pollen data are reported here as pollen concentration values using the following formula:

$$\mathbf{PC} = \frac{\mathbf{K}*\sum_p}{\sum_L * \mathbf{S}}$$

Where: PC = Pollen concentration
K = *Lycopodium* spores added
$\sum_p$ = Fossil pollen counted
$\sum_L$ = *Lycopodium* spores counted
S = Sediment weight

The following example should clarify this approach. Taxon X may be represented by a total of 10 grains (1 percent) in a sample consisting of 1,000 grains, and by 100 grains (1 percent) in a second sample consisting of 10,000 grains. Taxon X is 1 percent of each sample, but the difference in actual occurrence of the taxon is obscured when pollen frequencies are used. The use of "pollen concentration values" are preferred because it accentuates the variability between samples in the occurrence of the taxon. The variability, therefore, is more readily interpretable when comparing cultural activity to noncultural distribution of the pollen rain.

The pollen concentration values for this pollen wash sample were calculated using a modification of the above formula. This modification involved the removal of the sediment weight (S) variable from the denominator in the equation because the area sampled was measured. The resulting concentration value is thus expressed as estimated grains per cm^2 of the surface area.

Variability in pollen concentration values can also be attributed to deterioration of the grains through natural processes. In his study of sediment samples collected from a rockshelter, Hall (1981) developed the "1,000 grains/g" rule to assess the degree of pollen destruction. This approach has been used by many palynologists working in other contexts as a guide to determining the degree of preservation of a pollen assemblage and, ultimately, to aid in the selection of samples to be examined in greater detail. According to Hall (1981), a pollen concentration value below 1,000 grains/gm indicates that forces of degradation may have severely altered the original assemblage. However, a pollen concentration value of fewer than 1,000 grains/g can indicate the restriction of the natural pollen rain. Samples from pit structures or floors within enclosed rooms, for example, often yield pollen concentration values below 1,000 grains/g.

Pollen degradation also modifies the pollen assemblage because pollen grains of different taxa degrade at variable rates (Holloway 1981, 1989). Some taxa are more resistant to deterioration than others and remain in assemblages after other types have deteriorated completely. Many commonly occurring taxa degrade beyond recognition in only a short time. For example, most (ca. 70 percent) angiosperm pollen has either tricolpate (three furrows) or tricolporate (three furrows each with pores) morphology. Because surfaces erode rather easily, once deteriorated, these grains tend to resemble each other and are not readily distinguishable. Other pollen types (e.g., cheno-am) are so distinctive that they remain identifiable even when almost completely degraded.

Pollen grains were identified to the lowest taxonomic level whenever possible. The majority of these identifications conformed to existing levels of taxonomy with a few exceptions. For example, cheno-am is an artificial, pollen morphological category that includes pollen of the family Chenopodiaceae (goosefoot) and the genus *Amaranthus* (pigweed), which are indistinguishable from each other (Martin 1963). All members are wind pollinated (anemophilous) and produce very large quantities of pollen. In many sediment samples from the American Southwest, this taxon often dominates the assemblage.

Pollen of the Asteraceae (sunflower) family was divided into four groups. The high spine and low spine groups were identified on the basis of spine length. High spine Asteraceae contains grains with spine length greater than or equal to 2.5μ, while the low spine group have spines less than 2.5μ long (Bryant 1969; Martin 1963). *Artemisia* pollen is identifiable to the genus level because of its unique morphology of a double tectum in the mesocopial (between furrows) region of the pollen grain. Pollen grains of the Liguliflorae are also distinguished by their fenestrate morphology. Grains of this type are restricted to the tribe Cichoreae, which includes such genera as *Taraxacum* (dandelion) and *Lactuca* (lettuce).

Pollen of the Poaceae (grass) family are generally indistinguishable below the family level, with the single exception of *Zea mays*, identifiable by its large size (ca 80ų), relatively large pore annulus, and the internal morphology of the exine. All members of the family contain a single pore, are spherical, and have simple wall architecture. Identification of noncorn pollen is dependent on the presence of the single pore. Only complete or fragmented grains containing this pore were tabulated as members of the Poaceae.

Clumps of four or more pollen grains (anther fragments) were tabulated as single grains to avoid skewing the counts. Clumps of pollen grains (anther fragments) from archaeological contexts are interpreted as evidence for the presence of flowers at the sampling locale (Bohrer 1981). This enables the analyst to infer possible human behavior.

Finally, pollen grains in the final stages of disintegration but retaining identifiable features, such as furrows, pores, complex wall architecture, or a combination of these attributes, were assigned to the indeterminate category. The potential exists to miss counting pollen grains without identifiable characteristics. For example, a grain that is so severely deteriorated that no distinguishing features exist closely resembles many spores. Pollen grains and spores are similar both in size and are composed of the same material (Sporopollenin). So that spores are not counted as deteriorated pollen, only those grains containing identifiable pollen characteristics are assigned to the indeterminate category. Thus, the indeterminate category contains a minimum estimate of degradation for any assemblage. If the percentage of indeterminate pollen is between 10 and 20 percent, relatively poor preservation of the assemblage is indicated, whereas indeterminate pollen in excess of 20 percent indicates severe deterioration to the assemblage.

The pollen assemblage recovered from this metate contained a total pollen concentration value of 121.5 grains/cm^2 of the surface area (Table 23). This was based on a pollen sum of 111 grains and contained 3.6 percent indeterminate pollen. *Pinus* was low (25.18 grains/cm^2), and the assemblage was dominated by cheno-am pollen (78.81 grains/cm^2). Poaceae, Fabaceae, *Ulmus,* and low spine Asteraceae pollen were all quite low (1.09 grains/cm^2 each). A single grain of *Zea mays* pollen (0.46 grains/cm^2) was observed in the low magnification scan of the slide.

Ulmus is not thought to be native to New Mexico, although it presently grows in the area. Thus, the presence of this taxon is likely the result of modern contamination via long distance transport. The extremely good condition of the grain supports this interpretation.

The single grain of Fabaceae pollen was likewise in pristine condition. Given the condition of this grain, it is possible that this also represents modern contamination. The grain likely represents one of the locally available genera and therefore not the cultivated varieties.

Cheno-am pollen dominated the assemblage (65 percent). This taxon is ubiquitous within southwestern archaeological deposits and is possibly representative of the background pollen rain. Alternatively, as Bohrer (1981) has observed, when cheno-am is present in large relative frequencies within an assemblage, this often reflects cultural behavior. Since the sample was taken from a metate, it is possible that one of the functions of this metate was in the preparation of cheno-am material.

A single grain of *Zea mays* was also present on the slide. Given the type of artifact, this probably indicates that some processing of corn was occurring. Thus the metate appears to have been used potentially for the preparation of corn and cheno-am material.

The results of this pollen analysis reveal the possibility of processing both wild and cultivated plant materials. That corn pollen was present from this site is not surprising, given the dated age of the site.

BOTANICAL ANALYSIS

Pamela J. McBride and Mollie S. Toll

Botanical analyses at LA 53678 provide a view of foods, fuelwood, and tobacco used at this Valdez phase pit structure. Site architecture and depositional clues point to short, intermittent occupations. Two flotation samples from sealed postholes in Floor 2 document an earlier occupation. A single flotation sample from the rodent-disturbed Floor 1 hearth reveals traits of later activity at the site. Charcoal from the flotation samples, as well as larger pieces of charcoal collected for carbon-14 dating, provides data on fuelwood choices geared to specific site proveniences.

The three soil samples collected during excavation were processed at the Office of Archaeological Studies, Museum of New Mexico, by the simplified "bucket" version of flotation (Bohrer and Adams 1977). Soil samples were first measured by volume to compare seed densities between proveniences. One liter was collected from the upper floor hearth, with 500 and 800 ml, respectively, available from the postholes. Each sample was immersed in a bucket of water, and a 30-40 second interval allowed for settling out of heavy particles. The solution was then poured through a fine screen (about 0.35 mm mesh) lined with a square of "chiffon" fabric, catching organic materials floating or in suspension. The fabric was lifted out and laid flat on coarse mesh screen trays until the recovered material dried. Each sample was sorted using a series of nested geological screens (4.0, 2.0, 1.0, 0.5 mm mesh) and then reviewed under a binocular microscope at 7-45X. Actual numbers of plant parts encountered are recorded in Table 24, as well as adjusted seeds per liter of soil.

From each flotation sample, a sample of 20 pieces of charcoal was identified (10 from the 4mm screen, and 10 from the 2 mm screen). Each piece was snapped to exposed a fresh transverse section and identified at 45x. Charcoal specimens examined prior to submission for radiocarbon dating were examined in the same fashion, but selection was adapted to securing a minimal sufficient sample (the object was 5 g) with the fewest pieces, rather than aiming to examine both large and small pieces. Low-power, incident-light identification of wood specimens does not often allow species- or even genus-level precision but can provide reliable information useful in distinguishing broad patterns of utilization of a major resource class.

Flotation remains related to cultural behavior included low-density carbonized corn cob fragments and saltbush fruits in all three samples, and tobacco seeds in one of the sealed postholes (Table 24). Likely contaminants (unburned seeds of local annuals) are present in greater diversity in the rodent-disturbed upper hearth.

Although juniper stumps in the site area suggest juniper was once part of the site environs (now sagebrush flats), no juniper was positively identified in wood charcoal remains (Tables 25 and 26). However, small fragments of indeterminate conifer and pine were identified in both flotation and C-14 samples. Ponderosa pine was also recovered from C-14 samples. "Indeterminate conifer" is used when wood fragments are too small to identify to a more specific category, so the indeterminate conifer could represent juniper, pine, or another conifer. Indeterminate conifer and saltbush/greasewood were the dominate wood taxa recovered in C-14 and flotation samples, followed by sagebrush. The recovery of conifer wood does not necessarily mean that the prehistoric environment differed greatly from today. Pine and juniper could have been gathered in the foothills of the Sangre de Cristo Mountains, while ponderosa pine could have been harvested at higher elevations in the mountains.

Saltbush and greasewood charcoal have similar morphological characteristics, which preclude distinguishing the two species from each other. The fruits of *Atriplex canescens* or four-wing saltbush were recovered from all three flotation samples, indicating a high probability that the wood in the combined category is actually saltbush. Willow and box elder were also placed in a combined category because of morphological similarities. They are riparian species, which could have been collected along the nearby Rio Lucero, where willow still grows today.

Small amounts of corn cob residue recovered in flotation samples from LA 53678 indicate that the occupants were farmers. The tobacco seeds in Posthole 2 could represent cultural artifacts, although they are uncharred. Tobacco seeds are frequently recovered uncharred in good cultural contexts (Adams and Toll 1997). Postholes often serve to collect and concentrate botanical and other remains found on floor surfaces. Uncharred tobacco seeds were recovered from 13 sample locations at two Valdez phase pit structures in the Pot Creek area (Boyer et al. 1994b).

Sagebrush and saltbush wood charcoal were recovered in all three flotation samples. The results of flotation and C-14 wood analysis reveal that conifer, saltbush, and sagebrush were recovered from all three floors. The combined category willow family/maple family wood charcoal was recovered from Floors 1 and 2 only. Wood contents of Posthole 2 (Floor 2) were predominately but not exclusively *Pinus* sp., perhaps indicating a pine post. Eleven pieces of ponderosa pine were identified in C-14 samples from Floor 1, but the samples were not collected from a feature, so the wood charcoal could represent remnants of construction material or fuelwood residue. Some woods used at La 53678 could have been collected in the mountains or along the Rio Lucero, while other woods, like sagebrush and saltbush, were available on or near the site.

HISTORIC ARTIFACT ANALYSIS

Marcy Snow and Peter Y. Bullock

Historic artifacts from LA 53678 were dated by their documented spans of manufacture. Manufacture dates do not necessary reflect the artifact's period of use. Functional items are generally used continuously until their usefulness ends. Items may be curated within families as heirlooms or collected by individuals as antiques. The second-hand use of functional items also serves to prolong their lifespan beyond that indicated by their manufacturing or makers' marks.

A number of techniques for dating different categories of historic artifacts have been devised (Oakes 1983; South 1977b). These systems assume that artifacts are not used beyond their period of manufacture and thus tend to skew calculated dates toward the earlier end of the occupation period.

In the case of the LA 53678, it is possible to qualify the resulting date clusters through the information of local informants.

Functional categories are comprised of different types of items that have specific yet related functions (Boyer et al. 1994a). *Domestic* items are used in serving, preparing, and preserving food. *Food Products* items are tin or glass containers that held edible products. *Household* items are equipment found in a dwelling. *Hardware* items are connected with building or maintaining structures or machinery. *Personal* items are artifacts belonging to an individual for personal use. The item would be used only by the individual, rather than a group of people. *Indulgences* in this case relates to a leisure product, usually that one can consume. *Indeterminate* items are those that have identifiable types, but unidentifiable functions.

Feature 1 (Historic Artifact Concentration)

A total of 418 artifacts were collected from Feature 1. These artifacts were analyzed and divided into seven functional categories based on artifact types.

Domestic

Domestic artifacts total 44 items, or 10.5 percent of the total historic assemblage. The majority of these artifacts are glass and ceramic fragments. Glass artifacts consist of five pieces of milk glass of varying dates and four fragments of a pressed candy dish. The ceramics in this category include 32 pieces of white ware, one possible pearl ware handle, and one fragment of American-made porcelain decorated with gold paint.

Food Products

Recognizable food and beverage cans amount to 17 percent of the total assemblage. The majority of these were identified on the basis of visible labels or distinguishable shapes. The three largest categories of cans include 27 hole-in-top condensed milk cans, 9 hole-in-top evaporated milk cans, and 9 Ortega's chili cans. Other artifacts within this category include 11 sardine\anchovy cans, 1 oval fish can (possibly salmon), 7 potted meat cans, 3 lard buckets, 1 baking powder can, and 1 spice can.

Household

Household items total 10 artifacts, or 2.3 percent of the artifact assemblage. Twenty percent of the household assemblage are fragments of a broken kerosene lamp. Window glass forms the rest of the items in this category.

Hardware

Hardware items total 11 artifacts, or 2.63 percent of the artifacts assemblage from Feature 1. Seventy-three percent of this category is composed of bailing wire fragments. Also present is one machine-made nail, one piece of rolled tin tubing, and one metal clasp.

Personal

Personal items are restricted to a single, partially intact leather heel with metal nails (possibly from a mans shoe).

Indulgences

Indulgences include two items, a tobacco can and the base of a wine bottle.

Indeterminate

Indeterminate metal and glass make up the majority of artifacts collected from Feature 1. Metal items total 221, or 53 percent of the assemblage, while glass items total 61, or 14.6 percent. Most artifacts were noted as indeterminate because of a lack of labels, embossed lettering, or other distinguishing attributes.

It has been suggested that by noting the type of opening on a can, its original contents can be determined (Rock 1978). Since all of the openings were similar, the lack of labels or embossed lettering on the cans in this category made identification of the original contents impossible.

Summary

Artifacts in the domestic, household, food products, indulgences, personal, and hardware categories indicate that Feature 1 is a domestic household trash dump. Dates from Feature 1 range from 1790 to the present and cluster between 1930 and the present (Florence 1990; Gillio et al. 1980; Kovel and Kovel 1985; Spillman 1986; and Toulouse 1969). This suggest that the material comprising Feature 1 was deposited in the early 1930s.

The piled nature of the artifacts in this deposit indicates that they were dumped in their present location. Since the artifacts form a single integrated mound, their deposition was the result of a single dumping episode.

While we cannot determine the location of the household responsible for this trash deposit, interviews with local residents indicate that LA 53678 is within a traditional dumping area for the community of El Prado.

Feature 2 (Historic Artifact Concentration)

Feature 2 has a total of 77 artifacts. These artifacts were analyzed and divided into six functional categories.

Domestic

Domestic artifacts total 4, or 5.2 percent of the Feature 2 assemblage. Three of the artifacts are white ware sherds. One enamel bowl makes up the rest of this category.

Food Products

Food products total 11 cans, or 14.2 percent of the artifact total. The largest portion of this category is comprised of six rectangular sardine/anchovy cans. The second most frequent item is lard buckets (3). Other artifacts present include one oval fish can (possibly salmon) and a single hole-in-top condensed milk can.

Household

Household items are limited to two pieces of stove pipe (possibly from a wood stove) and a single gas can.

Indulgences

Artifacts in this category are limited to two tobacco cans.

Personal

One personal item was present at Feature 2, a still intact leather shoe heel.

Indeterminate

Indeterminate metal and glass make up the largest portion of Feature 2 artifacts. Metal items totaled 46, or 60 percent; glass 16, or 20.7 percent. Artifacts noted as indeterminate lacked labels, embossed lettering, or other identifiable attributes.

Summary

The artifacts from Feature 2 represent a range of functional artifacts: domestic, food products, indulgences, household, and personal. These indicate that the artifact assemblage reflects household domestic trash similar to that of Feature 1. Dates from Feature 2 range from 1830 to the present, but cluster from 1930 to the present (Gillio et al. 1980; Gates and Ormerod 1982; Kovel and Kovel 1985; Spillman 1986; Toulouse 1969).

The pattern of piled artifacts indicates this feature is comprised of dumped trash. The artifacts form a single mound, indicating a single dumping episode.

Interviews with local residents confirm that Feature 2 is within a traditional dumping area for the community of El Prado.

Discussion

A total of 495 artifacts came from the two features that comprise the historic component at LA 53678. Feature 1 contained 418 artifacts, while Feature 2 contained 77 artifacts.

Feature 1 was originally interpreted (Boyer 1995) as a domestic household trash dump dating to approximately 1930. Feature 2 was believed to be a sheepherder camp (Boyer 1995).

Archaeological excavations at other sites show that sheepherding camps should contain one or more of the following attributes: remnants of structures, or stones set in a circular pattern from the use of canvases, or traces of animal pens. Also present should be evidence of outside hearths, charcoal debris, fragments of bone, and discarded tools and types of hardware. Personal items should also be present in the camp depending on how long it was (Maxwell 1981; Schlanger and Goodman 1993).

Few sheepherding camps have been studied in northern New Mexico. However, excavations at La Jara (Maxwell 1981) uncovered eight shallow bone pits as well as surface concentrations of charcoal, sheep bone fragments, and 130 Euroamerican artifacts. However, no structures were found.

In comparison, (Schlanger and Goodman 1993) excavated a sheepherder camp near Ocate in Mora county. Excavations revealed four semicircular structures and a small amount of artifacts, which included barbed wire fragments, can fragments, and two wire nails. The structures in association with the artifact assemblage suggested that the structures were the remains of animal pens.

Based on the above descriptions and by comparing Feature 2 to Feature 1, which we know to be a domestic household trash dump, we should be able to determine if Feature 2 is a sheepherding camp. The two features are similar in the categories represented by their artifact assemblages.

Domestic

Percentages in the domestic category for both features range from 10.5 percent for Feature 1 to 5.2 percent for Feature 2. A larger variety of artifacts is present in Feature 1. In the ceramic category for both features, white wares are the largest portion of the assemblage. Feature 1 also contained a possible piece of pearl ware and one piece of porcelain.

Glass is present in the domestic category of Feature 1 in considerable variety. The assemblage includes pressed glass and two types of milk glass. Feature 2 has no glass in this category.

Food Products

Recognizable food and beverage cans from Feature 1 total 17 percent of the total assemblage, while those from Feature 2 total 14.2 percent. Artifact types within both features are similar. Both assemblages contain one oval fish can (possibly salmon), sardine/anchovy cans, condensed milk cans, evaporated milk cans, and lard buckets.

Household

Household items from Feature 1 make up 2.4 percent of the artifact total. Household items from Feature 2 total 3.9 percent.

Indulgences

Indulgences are similar in both features, although more variety is present in Feature 1. Indulgences in Feature 1 indicate the use of both tobacco and wine. Indulgences in Feature 2 indicate only tobacco use.

Personal

Personal items for both features are identical. Both contain a single leather shoe fragment.

Hardware

Feature 2 lacked the hardware category. In contrast, Feature 1 contained a variety of hardware items

Indeterminate

The percentage of artifacts in the indeterminate category is similar in the two features. Feature 1 has a total of 53 percent indeterminate cans and 14.6 percent glass. Feature 2 has 60 percent indeterminate cans and 20.7 percent glass.

Discussion

Feature 2 lacks the attributes and artifacts that should be expected for a sheepherding camp (Maxwell 1981; Schlanger and Goodman 1993). In the area of the trash deposits, there were no indications of structural foundations or animal pens associated with sheepherding, nor were there signs of hearths or fragments of bone.

A comparative analysis of the artifact assemblage from Feature 2 and Feature 1 shows a high degree of similarities between the two features, as well as similar artifact percentages. This suggests that since Feature 1 is a household trash dump, Feature 2 is also a household trash dump.

Conducting an economic analysis of the artifacts from different households is problematic when dealing with redeposited trash. However, some general conclusions may be possible.

Feature 1 contained an abundance of artifact types that are not present in Feature 2. The variety of artifacts in the domestic category for Feature 1 contained three types of glass and three types of ceramics. Feature 2 had no glass in the domestic category and only one type of ceramic artifact.

The same differences in the variety of artifacts between the two features pertains to the food product category. Feature 1 contained three different types of artifacts (out of 8) that Feature 2 did not have. The indulgences category also showed more variety in Feature 1 (2 different types) than in Feature 2 (one type of indulgence).

The differences between these two features may represent the Clarke Effect (South 1977a), which states that when an occupation span is short, many items with a high rate of discard will be thrown out, and as an occupation span increases, an even greater variety of items having lower discard rates will be deposited. If these features are examples of the Clarke Effect, Feature 1 represents a long-term occupation, and Feature 2 represents a short-term occupation.

The greater variety of artifacts within Feature 1 may represent a more prosperous household than the one represented in Feature 2. Possible heirlooms are present in Feature 1. The presence of both a greater variety of items and luxury goods suggests the presence of at a small amount of disposable income for Feature 1, compared to the more frugal lifestyle represented by Feature 2. This suggests possible differences in social or economic status at the household level within the community of El Prado.

It is possible that the assemblages from these two features do not portray the original range of their contents. Materials may have been scavenged from one or both of these features, altering the ranges and total counts of artifacts present. These artifact deposits also may be redeposited from previous dumping areas (perhaps within a yard), also possibly limiting the varieties and categories of artifacts present.

The two historical components of LA 53678 represent single-episode domestic household trash dumps in the El Prado area. Both dumping episodes took place in the 1930s, and the majority of artifacts date from the 1930s to the present. Any further interpretation remains speculative.

CONCLUSIONS

Prehistoric Component

The data recovery efforts at LA 53678 focused on refinement of the area chronology, a determination of site activities and their relationship to site function, and an assessment of how the site fits into the subsistence and settlement patterns that have been suggested for the Taos Valley. Radiocarbon and archaeomagnetic samples are used in combination with architectural and ceramic data to aid in refining the area chronology. The range of site activities and their relationship to site function are based on artifact, pollen, and ethnobotanical analyses. Subsistence and settlement patterns in the Taos Valley are examined by inferences derived from the assembled data sets.

Site Chronology

The different efforts at dating the Valdez phase in the Taos Valley have varied in their assessments of the beginning and ending dates for the phase (Boyer 1995; Crown 1990). In the research design for LA 53678, Boyer (1995) stressed the need for precise dating to enhance the body of Valdez phase data and aid in the establishment of definite dates for the Valdez phase. It was also hoped (Boyer 1995) that precise dates would aid in the assessment of site use-life, population movements, settlement patterns, and community organization.

Attempts at precise dating were successful at LA 53678. The small amount of wood recovered from the site precluded the use of dendrochronology, and radiocarbon dating was attempted with little success.

On the other hand, archaeomagnetic dating proved to be successful. The archaeomagnetic samples collected from the hearth of Pit Structure 1 (Feature 6 or Floor 1) yielded a date of A.D. 935-1055. This date is at the early end of the Valdez phase.

Precise dating of archaeological structures or features can also be achieved through the use of radiocarbon dates. This dating techniques is based on measurements of the amounts of specific types of radioactive carbon isotopes within organic material. Burnt ponderosa pine collected from the Floor 1 surface failed to produce a date for the pit structure. Two samples suffered from the old wood problem. In such cases, scavenged wood is used or reused in a cultural context not directly related to the actual age of the wood. The third burnt wood sample proved to be recent, probably an intrusive artifact resulting from rodent activity.

The date of A.D. 935-1055 can be corroborated with a relative date for the site, based on the comparison of the ceramic assemblage and site architecture with other Valdez phase sites. The recovered ceramic artifacts not only exhibit the expected range of ceramic types for the Valdez phase, but also the expected ratio of large utility gray ware jars to large white ware bowls. The only nonlocal ceramics present in the LA 53678 assemblage are white wares with sand temper. These could be from the Colorado Plateau, where sand-tempered white wares are common, or perhaps from the Tewa Basin (Wilson and Lakatos, this volume).

It has been demonstrated that the higher the percentage of gray wares within an Anasazi ceramic assemblage, the older the site (Wilson and Blinman 1995: Fig. 3.2). Obviously these percentages will differ depending on the area, but the general trend should remain true anywhere within the Anasazi cultural sphere.

An analysis of 38 Valdez phase sites in the Taos Valley shows that the ratio of gray wares (95.8 percent) to white wares (4.2 percent) at LA 53678 is high for an Anasazi site (see Table 6). If Wilson and Blinman's thesis (1995) is accepted as correct (as it has proved to be in the San Juan region), this suggests that most of the Arroyo Hondo-Arroyo Seco sites are older than the other Valdez phase sites in the sample (the Pot Creek-Fort Burgwin sites and the Blueberry Hill sites). The earliest archaeomagnetic dates for the Valdez phase are from the Arroyo Hondo-Arroyo Seco area (Loose 1974; this volume), supporting this conclusion.

An analysis of gray ware and white ware frequencies by assemblage totals was also conducted for the 38 Valdez phase sites in the sample. This analysis shows that gray ware frequencies went up in direct proportion to the size of the total ceramic assemblage (Fig. 9). This appears to be true for sites anywhere in the Taos Valley.

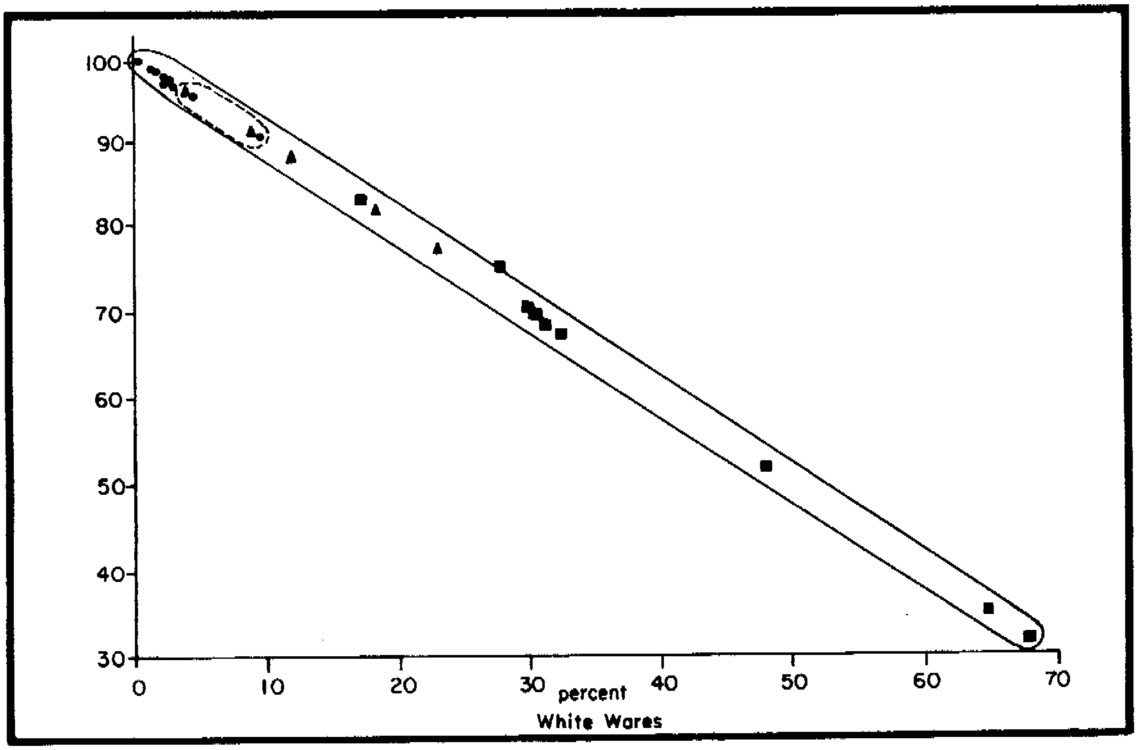

Figure 9. Taos gray wares and white wares, all sites (percentages).

White ware frequencies, when compared to assemblage size, tell a different story (Fig. 10). Clear differences are apparent, based on area subdivisions within the Taos Valley. White ware frequencies from the Fort Burgwin and Pot Creek Valdez phase sites (represented by crosses) increase with the size of the assemblages in a manner similar to gray ware frequencies.

In contrast, for sites in the Arroyo Hondo-Arroyo Seco area of the Taos Valley (represented by rectangles), white ware frequencies are not simply a by-product of assemblage size. For very small ceramic assemblages, white ware numbers do increase with assemblage size. However, once ceramic assemblages from Arroyo Hondo-Arroyo Seco area sites number over 1,500 artifacts, white ware frequencies remain fairly constant, regardless of assemblage size. There are two exceptions to this on the graph, LA 9201-01 (1,339 ceramic artifacts) and LA 9203 (3,559 ceramic artifacts), both of which have higher frequencies of white wares than expected. They are also the only sites in the Arroyo Hondo–Arroyo Seco area with round pit structures. A later discussion will examine how this suggests that these sites are later than the other sites in the area.

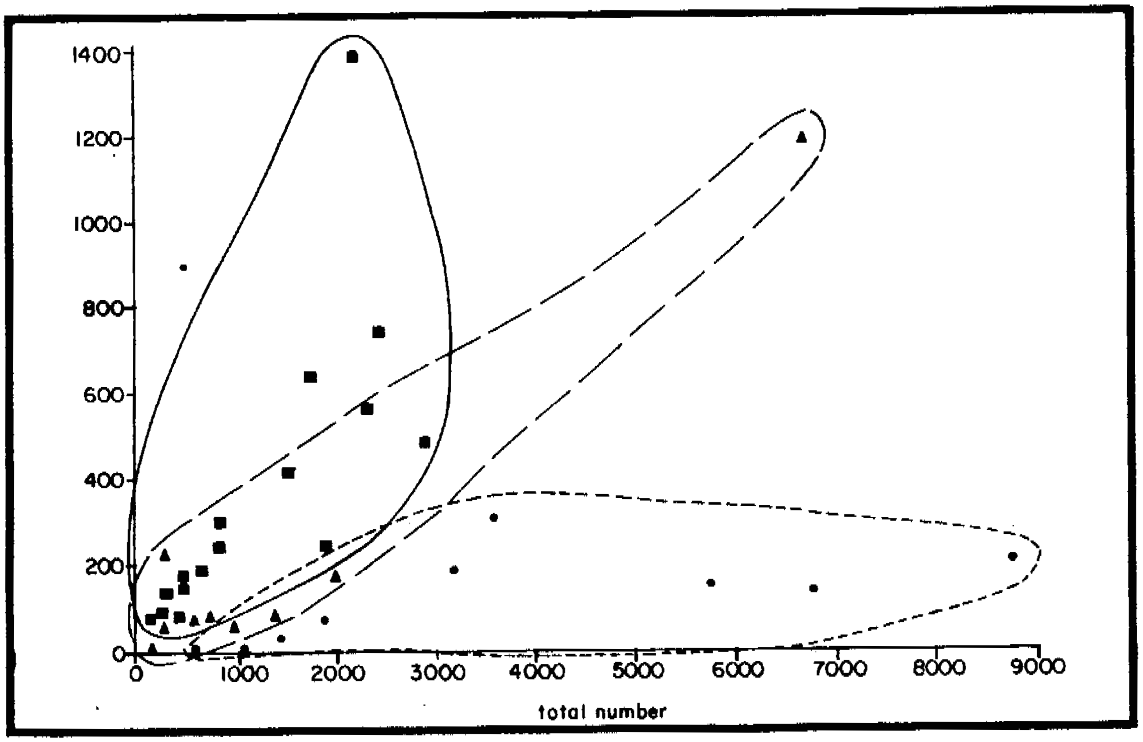

Figure 10. Taos white wares by assemblage total, all sites.

The Blueberry Hill sites make up the third subdivision of Valdez phase sites in the sample (represented by asterisks). White ware frequencies in these assemblages generally conform to those from the Arroyo Hondo–Arroyo Seco sites, remaining relatively constant regardless of assemblage size. There are three exceptions among the Blueberry Hill sites. LA 53689 (255 ceramic artifacts) represents a dual-component site with the prehistoric component obscured by later historic use. LA 53683 (1,974 ceramic artifacts) is comprised of a late Valdez phase roomblock. LA 102307 (6,678 ceramic artifacts) was recorded as a nonstructural artifact scatter (Boyer et al. 1995).

Patterns in white ware and gray ware sherd frequencies can be coordinated with pit structure shape. Gray ware frequencies above 94.0 percent are associated with rectangular pit structures. Gray ware frequencies below 94.0 percent are associated with round pit structures. This appears to be true regardless of location. For example, the two sites in the Arroyo Hondo–Arroyo Seco area with gray ware frequencies of less than 94 percent both have round pit structures.

This association of high gray ware frequencies with rectangular pit structures suggests a second form of relative dating for Valdez phase sites. Differences in pit structure shape and the geographic distribution of each type of pit structure has long been recognized in the Taos Valley. Rectangular pit structures make up a majority of the pit structures in the Arroyo Hondo–Arroyo Seco area in the northern portion of the Taos Valley. A majority of the pit structures in the Blueberry Hill and

Pot Creek areas in the southern part of the Taos Valley have round pit structures. Although Woosley (1986) demonstrated a possible connection between site location and site age, recent interpretations of this dichotomy (Boyer et al. 1994b) have focused on the possibility that these different pit structures represent two different and distinct populations.

If high gray ware frequencies indicate older sites within the Valdez phase, as Wilson and Blinman (1995) have pointed out, then the Valdez phase sites with rectangular pit structures are older than the Valdez phase sites that have round pit structures. This is confirmed by archaeomagnetic dates for Valdez phase sites. The two oldest dates are for rectangular pit structures: A.D. 935-1055 at LA 53678, and A.D. 1095-1145 at LA 9205 (Loose 1974).

The patterns observed in white ware frequencies also tend to correspond with pit structure shape and geographic location. As mentioned earlier, three patterns were observed in the data. White ware frequencies remained constant, regardless of the ceramic assemblage size, on sites with rectangular pit structures in the northern Arroyo Hondo–Arroyo Seco area. A similar pattern was present among white wares on most Blueberry Hill sites, with round pit structures, in the central portion of the Taos Valley. A different pattern of white ware frequencies reflecting ceramic artifact assemblage size was present in Valdez phase sites with round pit structures in the Pot Creek and Fort Burgwin area.

Differentiating site age by pit structure shape alone can be problematic. A variety of pit structure shapes were in use by the Anasazi at any one time (Truell 1987). However, there are regional patterns that do occur in pit structure shape (Vierra et al. 1993). The predominate shape of pit structures in the eastern Anasazi area is rectangular, specifically with rounded corners. This is particularly true of the Upper San Juan Region, where pit structures are round in the Basketmaker III period, but commonly rectangular from the Pueblo 1 period on (Kane 1986; Vierra et al. 1993). In the San Juan Basin, most pit structures are rectangular into the Pueblo II period (Bullard 1962). In the Middle Rio Grande Valley, they remain circular (Schmader 1994). Truell (1987) describes these asymmetrical rectangular pit structures as D-shaped, although they would be considered rectangular in other Anasazi areas. By the late A.D. 900s or early A.D. 1000s, a regular circular form developed that continued to be used throughout the Anasazi period (Truell 1989).

This San Juan Basin pit structure shape change could herald a similar change of rectangular to circular pit structures in the Taos Valley. A connection between the two areas is suggested by the presence of sand-tempered white ware ceramics at LA 53678 (Wilson and Lakatos, this volume), although these could represent ceramics from the Tewa Basin.

Anasazi ceramics from the San Juan Basin and Cibola areas are also generally sand tempered. A connection between the two areas could represent the origin of population movement into the Taos Valley. A similar population migration resulted in groups from the Colorado Plateau moving into the Tewa Basin between A.D. 900 and 1050 (McNutt 1969). Both areas could have been settled at roughly the same time, as suggested by the ceramics of the two areas (Wilson and Lakatos, this volume).

Within the Taos Valley, the spacial distribution of differences in pit structure shape combined with archaeomagnetic dates, relative age differences indicated by ceramic frequencies, and pit structure shape support the correlation between population movement and settlement changes through time suggested by Woosley (1986). Wilson and Lakatos (this volume) suggest greater mobility for the earlier Valdez phase sites, as illustrated by greater gray ware ceramic frequencies.

Architectural elements of the pit structure at LA 53678 show additional similarities between it and pit structures in the San Juan Basin. Like most Anasazi pit structures, the pit structure at LA 53678 has a four-post roof support system (a type of structural support used with both flat or cribbed roofs) (Truell 1987). The usual suite of ventilator-related features is also present, including the ventilator, deflector, and hearth. This suite of floor features is also similar to what has been recorded at other Valdez phase sites.

Most floor features (both portable and nonportable) disappear from Anasazi pit structures in the early Pueblo II period (Vierra et al. 1993). In the Chaco area, this takes place in the early A.D. 1000s, a slightly later date than in other Anasazi areas (Truell 1987), prior to the shift in pit structure form. This simplification of pit structure interior space may herald similar developments in the Taos Valley.

The LA 53678 pit structure is extremely shallow. While unusual for known sites in the Taos Valley, the depth of this pit structure is within the range of Anasazi pit structures. Depths of Anasazi pit structures are known to vary, and the shallowest is only a few centimeters deep (Bullard 1962). Although there is no known correlation between size and depth (Bullard 1962), there does seem to be a correlation between depth and age (Truell 1987). The older Anasazi Basketmaker III pit structures usually are shallower than Pueblo I pit structures, and Pueblo II and Pueblo III pit structures are generally the deepest (Bullard 1962; Truell 1987). There are exceptions, however, since pit structure depth is easily affected by geological conditions in the site area (Truell 1987).

Relative dates for the large subterranean storage cist and the pit structure can be derived from the physical positioning of the two. The position of the storage cist at LA 53678, cut by Pit Structure 1, indicates that it predates the pit structure. Ceramics associated with the storage cist also date it to the Valdez phase.

The large storage cist at LA 53678 (Structure 2) resembles similar subterranean storage cists in the La Plata Valley and Shumway Arroyo areas of northwestern New Mexico (Bullock n.d.; Kemrer et al. 1980). The example from the La Plata Valley dates to the middle Pueblo II period, A.D. 1000-1100 (Bullock n.d.). The subterranean storage cists from the Shumway Arroyo area also date to the Pueblo II period (Powers et al. 1980). Despite structural differences between these examples, they all represent a similar concept: underground bell-shaped storage cists entered through the side rather than the top. While it is not possible to directly correlate the Valdez phase with the Pueblo II period, the Valdez phase pit structure shape transformations and the use of subterranean storage cists suggest a similar developmental sequence within a similar time period. This in turn suggests a degree of continuous contact between the two areas.

An earlier relative date for LA 53678, compared to the Pot Creek sites (Boyer et al. 1994b), is also suggested by the lithic artifact assemblage. The low frequency of nonlocal material, the high ration of core and biface flakes in the assemblage, and the high percentage of utilized flakes, cobble tools, and bifaces in the assemblage are not matched by the lithic assemblages from the three structural Pot Creek sites (LA 2742, LA 3570, and LA 70577) (Moore 1994). At LA 53678, this suggests that although an expedient reduction strategy was pursued at the site, its focus was on both the core and bifacial reduction of local materials.

Bifacial reduction, usually restricted on Anasazi sites to limited formal tool manufacturing, has an greatly expanded role at LA 53678. This is indicated by the large percentage of biface flakes in the lithic artifact assemblage, forming a much larger portion of the lithic assemblage at LA 53678 than at any of the three Pot Creek sites. The greater production of formal tools in turn suggests a much greater emphasis on hunting within the subsistence strategy at LA 53678. The high occurrence of biface flake utilization as informal tools shows that this hunting emphasis took place within the context of established Anasazi culture, with its emphasis on expedient tool use.

Despite the earlier archaeomagnetic date, it is possible that the artifact assemblage at LA 53678 simply reflects a site-specific variation such as craft specialization or specialized food procurement. The combination of elements within the lithic artifact assemblage suggests a subsistence strategy with an increased emphasis on hunting and gathering, rather than the typical Valdez phase agriculturally dominated subsistence base.

On-Site Activities

Defining site structure necessitates knowing the range of on-site activities that would have taken place at that specific locale. On-site activities can be deduced from the locations and functions of site features. Descriptive information on features, combined with analysis of the associated artifacts and other cultural material, can assist in determining feature type (Boyer et al. 1994b).

Two site occupations are represented within the prehistoric component at LA 53678. The first occupation involves the earliest feature on the site, the large subterranean storage cist (Structure 2). The number of artifacts recovered from this feature is small, and the ceramics clearly date it to the Valdez phase.

This cist is similar to examples from the Farmington area. The major difference is the form of entrance. The Taos cist has a tunnel entrance on the north side. The La Plata Valley and Shumway Arroyo examples were all entered from adjacent masonry subterranean rooms.

Since most storage cists are related to the storing of foodstuffs, the assumption is that this feature had a similar use. Whether this involved gathered wild plant, cultivated domesticated crops such as maize, or a combination of the two is not known. Macrobotanical samples failed to reveal the types of plant material used in conjunction with this storage cist. Unfortunately, just as little is known about the similar cists in the La Plata Valley and Shumway Arroyo.

The lack of any associated features or habitation raises questions about the logistics involved in this structure's use, particularly since this is the only example of this type of feature to have been found in the Taos Valley. It has been theorized (Powers et al. 1980) that these features served as granaries for the storage of maize, grown at a great distance from the settlement for the harvested crop to be transported home. The exact location of this possible related settlement remains a mystery. The relatively small amount of archaeology that has been done in the Taos Valley limits our knowledge of other sites in the area and their relation to this feature. Although the La Plata example was part of a habitation site, the Shumway Arroyo examples were isolated structures (Powers et al. 1980).

The second prehistoric occupation at LA 53678 is composed of the pit structure (Pit Structure

1). The data recovery plan stressed the need to determine what activities were pursued at what was originally believed to be a nonstructural agricultural site (Boyer 1995). The revelation that LA 53678 was a habitation site changed the thrust of subsequent investigations, but not its overall focus of determining the features present at the site and the activities that they represent.

The number of features associated with Pit Structure 1 is small, an occurrence common to pit structures of the period throughout the Anasazi cultural sphere. Most of the features that are present are connected with pit structure construction (such as postholes and the ladder rest) or the habitation-related ventilator system (hearth, deflector, ventilator). Two small postholes located on Floor 2 adjacent to the hearth represent a ladder rest.

One pit (Feature 2) on Floor 1 could be for storage, but it may also represent the posthole that was not located in that corner of the pit structure. A pit (Feature 3) on Floor 3 may be a storage cist, or possibly an earlier unused hearth. No unambiguous specialized features were found that were connected with the occupation of Pit Structure 1.

With little structural information on feature-related activities, site activities can be investigated through analysis of the artifacts present. Ceramic artifacts represent the large gray ware jar–white ware bowl combination identified as the Valdez phase habitation ceramic tool kit (Wilson and Lakatos, this volume). The presence of this combination of ceramic wares and forms indicates that the pit structure served as a habitation, rather than some type of specialized structure.

Lithic artifacts are the second method of identifying activities that may have been pursued at LA 53678. Specific forms of flakes are produced by different lithic material reduction strategies. Core flakes are produced on Anasazi sites as expedient and disposable tools. Biface flakes are produced during biface reduction, commonly in the production of specialized formal tools. Formal tools are produced for specific functions, although their use may not be limited to a single action. Lithic tools wear during use. Although attempts to show forms of wear to be task specific have proved inconclusive (Brose 1975), general interpretations of the range of activities represented by the lithic assemblage are possible.

Bifacial reduction, usually restricted on Anasazi sites to limited production of formal tools, has a greatly expanded presence at LA 53678. Greater production of formal tools is indicated by the larger than expected number of biface flakes within the lithic artifact assemblage. This unusually heavy emphasis on formal tools suggests a corresponding emphasis on hunting-based activities, including not only hunting, but also possible game and leather processing.

The heavy utilization rate of core and biface flakes as expedient tools at LA 53678 represents extensive processing of animal and/or plant material. Both cutting and scraping are represented in the lithic artifact assemblage. Animal processing is likely based on the existence of scrapers and cobble tools to butcher game or process leather. This could include basic leather processing and the creation and repair of garments.

Ground stone artifacts can also provide evidence of site activities. The presence of both two-hand mano and trough metate fragments are indicative of processing maize for consumption. This suggests that maize crops may have been grown in the general vicinity of LA 53678, probably through dry-land farming techniques, an assumption supported by the recovery of both maize pollen and cupules. While it is true that groundstone artifacts can have additional uses after their lives as grinding implements end, only one of these artifacts was reused. One mano fragment was used as a base support in the bottom of a posthole.

Subsistence studies can indicate types of activities that may have been conducted within a site, or portions of a site. Pollen samples were collected from the surfaces of the groundstone tools. In addition, ethnobotanical samples were collected from features and from a number of proveniences within the pit structure. These studies focused on the identification of plant remains and their significance with regard to economic and subsistence practices. This form of analysis is not limited to plants utilized for food. Activities such as the weaving of baskets and matting or the making of twine may be indicated by the results of this type of analysis.

Maize was identified at LA 53678 through pollen and macrobotanical analysis. Maize pollen was found to be present on the grinding surface of a trough metate found on the surface of Floor 3 (see Holloway, this volume). Maize cupules were recovered from the fill of the hearth on Floor 1. Maize cupules were also recovered from the fill of two postholes associated with Floor 2 and sealed by Floor 1 (see McBride and Toll, this volume). Additional cultivated plants present in this pit structure are tobacco and four-wing saltbush (McBride and Toll, this volume).

Faunal remains represent another avenue for studying possible activities represented at LA 53678. The presence of faunal remains, especially in light of the high utilization present on the site's lithic artifacts, could indicate types and forms of faunal consumption. Unfortunately, only 66 animal bones and bone fragments were recovered from the LA 53678. A majority of these bones are the remains of various types of burrowing rodents that commonly occupy abandoned sites (Akins, this volume).

Low numbers of bone were recovered from the stratified deposit within the pit structure. Similar low numbers of bone, possibly representing sheet trash, were recovered from surface stripping. Low bone frequencies in sheet trash deposits can result from both natural and cultural factors. Sheet trash deposits are subject to erosional and deteriorational forces, and to trampling and scavaging by resident dogs. The lack of a definable midden area at LA 53678 suggests that if the site's surface artifacts do represent sheet trash, it was a sparse deposit.

Known economic species present within the faunal assemblage include deer, cottontail, and jackrabbit. All of these species are attracted to agricultural fields, suggesting prehistoric hunters were able to take advantage of animals drawn to their fields (Akins, this volume). The site location, with the forested Sangre de Cristo Mountains a short distance to the east, could also be convenient for the hunting of deer, as well as the cottontails and jackrabbits common to more open county.

The possible activities represented by the artifact assemblage spans the range of activities expected at an Anasazi habitation site. These include the processing of foodstuffs (including domesticated maize) as well as other materials, and the production of stone tools.

The features and artifacts at LA 53678 are evidence of an early Valdez phase structural habitation site. Analysis of the artifact assemblages and structural features indicate that subsistence was probably maize based, supplemented by hunting and possibly the gathering of wild plants.

The practice of hunting as part of Anasazi subsistence is well known. The evidence from LA 53678, however, indicates hunting may have played an even greater role at that site than at other Valdez phase sites, particularly those at Pot Creek. Whether this is because LA 53678 is older or whether it simply reflects some specialized nature of the site is not known. The archaeomagnetic date obtained for LA 53678 combined with site ceramics from LA 53678 suggest the difference in site age within the Valdez phase may be one reason for this difference.

The dependability of maize cultivation in the Taos Valley has been investigated by Moore (in Boyer et al. 1994b). However, the difference in length of the growing season versus the frost-free season has escaped serious notice. Although plant growth is affected by frost, it is only limited completely by heavy killing frosts (Hays and Garber 1921). This means that the growing season for any area is longer than the number of frost-free days. In northern areas of the United States (such as Montana and the Dakotas), this adds fewer than 20 days to the frost-free total. In the Gulf states, the growing season is over 100 days longer than the frost-free period (Smith 1920).

Based on the latitude and elevation of the Taos area, the growing season averages between 140 and 160 days, depending on the specific location within the Taos Valley and the specific crop (Smith 1920). This is in contrast to the average of 80 to 120 frost-free days (Edwards et al. 1987). A realization of the difference between the length of the growing season and the frost-free period extends the acknowledged growing season of the Taos Valley considerably beyond what is usually considered available for agriculture. This suggests that an agriculture-based economy would have been less precarious for the Anasazi in the Taos Valley than has generally been assumed.

The subterranean storage cist at LA 53678 could support an argument of greater agricultural viability for the Taos Valley. The isolated position of this storage cist, combined with its adobe lining and large size, may reflect a crop-growing strategy based on the planting of multiple fields of maize. Some of these may have been located a great distance from the place of settlement, thus necessitating storage for the harvested crop at a point closer to its place of cultivation. It is also possible that unrecorded Valdez phase pit structures are present in the general area of the Blinking Light site.

A number of developmental sequences have been developed for the Taos Valley derived from a combination of dating techniques. All of these sequences are based on structural changes occurring through time. The theory of settlement-pattern changes based on a frontier model (Boyer et al. 1994b) considers all Valdez phase sites to be roughly equal in age, with spacial and structural differences reflecting different populations. A development sequence based on the development of communities and population aggregation through time has been proposed by Crown (1990). Woosley (1986) proposed a sequence based on the relative age of Valdez phase sites and demonstrated changes in space through time. Her work has been give short shrift in some quarters, however, because of her use of the Rio Grande developmental sequence names rather than Wetherington's (1968) local sequence (Boyer et al. 1994b).

A review of Valdez phase sites in the Taos Valley shows a variety of site types occurring at the same time. Isolated pit structures, pit structure communities, and small surface roomblocks all occur within the Valdez phase (Blumenshein 1956, 1958, 1963; Boyer and Bullock 1996; Green 1976; Herold and Luebben 1968; Loose 1974; Wiseman 1967; Woosley 1986; Morrison 1966; Wolfman et al. 1965). Despite this variability in individual site structure, settlement patterns are apparent within the Valdez phase. These patterns include an increase in community size resulting from aggregation with its corresponding reduction in total number of communities, changes in pit structure shape, and settlement shifts from the northern to the southern portion of the Taos Valley. They support Woosley's (1986) interpretation of a Taos District continuum of gradual cultural development within the local Anasazi sequence.

Comparative ceramic analysis of Valdez phase sites shows a correlation between site age, pit structure shape, and site location. As the relative ceramic dates indicate, differences in pit structure shape represent differences in age, not differences in populations. This seems to also be supported by archaeomagnetic dates.

The established presence of a localized Taos Valley ceramic tradition (incised gray ware) at Valdez phase sites suggest that they do not represent the earliest phase of Puebloan settlement within the Taos Valley (Miller n.d.) and that an earlier unrecorded transitional phase should exist. Incised gray ware is indicative of the early Woodland ceramic traditions of the Central High Plains. Although it has been argued that incised ceramics do not occur on the plains prior to the 1200s (Boyer et al. 1994b), Woodland ceramics initially appear on the Central High Plains by A.D. 1 and are well established by A.D. 400 (Wood and Blair 1980).

Plains Woodland culture, with its incised pottery, is represented in southeastern Colorado by the Late Greneros Culture, dating to A.D. 900-1050 (Gunnerson 1987), and the Sopris phase of the Upper Purgatoire Complex (Initial Sopris A.D. 1000-1100, Early Sopris A.D. 1100-1150, and Late Sopris A.D. 1150-1225) (Ellwood 1995). On the eastern slope of the Sangre de Cristos, early Woodland related cultures utilizing incised pottery are represented by the Vermejo phase (A.D. 400-700), followed by the Pedregoso phase (A.D. 700-900) (Gunnerson 1987). The later Escritoires (A.D. 900-1100) and Ponil (A.D. 1100-1250) phases may be either a Plains Woodland phase or a Anasazi derived cultural development in the Cimarron area (Gunnerson 1987). The incised gray ware of the Valdez phase sites probably is derived from one of these Woodland phases.

Because incised pottery is an early Taos Valley specific Anasazi adaptation that does not occur in the middle Rio Grande Valley until after A.D. 1300, sites should exist that represent a transitional ceramic tradition prior its adaption. This need for a transitional ceramic period, combined with known Anasazi use of the Taos Valley during the Basketmaker II-Pueblo I periods (Rudecoff 1982), suggests the existence of an unrecorded pre-Valdez phase in the Taos Valley.

In theory, an earlier Anasazi phase in the Taos Valley would be represented by a ceramic assemblage containing a high percentage of nonlocal white wares, combined with corrugated nonlocal gray wares and a small percentage of incised gray wares. The archaeomagnetic dated gray ware and architectural correlations in this study suggest that any pit structures connected with this type of transitional ceramic assemblage should be rectangular.

As additional Valdez phase sites are excavated, it becomes more apparent that varieties of site forms (pit structures, small roomblocks, and large Pueblos), believed represent separate discrete stages in cultural development (Boyer et al. 1995), are all present continuously throughout the Valdez phase. Yet despite this variety in site structure, patterns are present that represent changes through time in settlement patterns, pit structure shape, developments in site complexity, and changes in material culture as part of a continuum of local Anasazi cultural development (Woosley 1986). Site differences attributed to different populations actually represent age differences between sites within the Valdez phase. One earlier Anasazi phase in the Taos Valley, predating the Valdez phase, may exist.

Historic Component

The research design for the historic component at LA 53678 emphasized three aspects--site chronology, site activities, and their relation to site function--and an assessment of how the historic component of the site fit into the local historic subsistence and settlement patterns for the area, particularly sheepherding.

Once it became apparent that the two features comprising the historic component at LA 53678 represented two discrete dumping episodes, neither of which was associated with sheepherding, a change in focus was needed regarding how these questions would be addressed. It became necessary to make the interpretation of the historic component less specific and more generalized.

Although one feature was originally thought at testing to represent a sheepherder's camp (Boyer 1995), this proved not to be the case. Artifact analysis indicates that each of the two features comprising the historical component at LA 53678 is an isolated occurrence, a single discreet dumping episode of domestic household trash. Analyzed artifacts date both dumping episodes to the early 1930s. Interviews with local residents of the area revealed that LA 53678 served as a traditional dumping area for residents of the community of El Prado, to the southeast.

This use of the site as an area for the dumping of trash and garbage is confirmed by the content of these two historic assemblages. Differences between the two features, particularly in the range and variety of materials present, suggest they may reflect differences in the social or economic levels of the households involved. The presence of possible heirlooms and a larger range of luxury goods in one deposit suggests the presence of at least a small amount of disposable income in one household in El Prado, versus a more frugal lifestyle in the second.

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APPENDIX 2: TABLES

Table 1. Wall specifications, Pit Structure 1

Wall	Height (cm)	Width (cm)	Thickness (cm)
North wall	47	253	12-15
East wall	46	272	10-11
South wall	47	270	11
West wall	42	284	13

Table 2. Features, Floor 1, Pit Structure 1

Feature Number and Type	Length (cm)	Width (cm)	Depth (cm)	Shape (cm)	Comments
Feature 1, ventilator	60	44	23	rectangle	upper portion of interior opening is gone
Feature 2, pit	64	55	22	oval	feature may have contained northwest posthole
Feature 3, posthole	22	20	18 min.	cylinder	southwest structural support
Feature 4, posthole	20	20	28 min.	cylinder	northwest structural support
Feature 5, posthole	30	24	24 min.	cylinder	southeast structural support
Feature 6, hearth	100	92	19	circular	adobe lined with coping
Feature 7, deflector slot	47	8	16	rectangle	slab deflector missing

Table 3. Features, Floor 2, Pit Structure 1

Feature Number and Type	Length (cm)	Width (cm)	Depth (cm)	Shape (cm)	Comments
Feature 1, posthole	28	20	20 min.	cylinder	northwest structural support
Feature 2, posthole	15	15	9 min.	cylinder	southwest structural support
Feature 3, posthole	42	30	22 min.	cylinder	southeast structural support
Feature 4, posthole	19	19	14 min.	cylinder	between hearth and deflector
Feature 5, deflector	33	21	25	rectangle	slab deflector missing
Feature 6, ventilator	64	55	45	rectangle	half filled with adobe before use
Feature 7, posthole	18	12	7	cylinder	northwest corner, against wall
Feature 8, hearth	40	40	20	bowl	masonry lined
Feature 9, pot rest	17	12	2	bowl	ash-filled depression north of hearth
Feature 10, posthole	6	6	2	bowl	ladder rest
Feature 11, posthole	7	7	3	bowl	ladder rest

Table 4. Features, Floor 3, Pit Structure 1

Feature Number and Type	Length (cm)	Width (cm)	Depth (cm)	Shape	Comments
Feature 1, hearth	45	39	22	bowl	cobble lined
Feature 2, posthole	23	18	18 min.	cylinder	southwest structural support
Feature 3, pit	54	42	18	bowl	shallow pit, north of hearth
Feature 4, ventilator	64	55	45	rectangle	half filled with adobe before use

Table 5. Ceramic artifacts by provenience, Structure 1

	Feature 0		Feature 0		Feature 3		Feature 5		Feature 6		Feature 0		Feature 1		Feature 2		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Prehistoric Gray Wares																		
Plain rim (utility)	90	4.9	11	.6	.	.	.	.	.	.	1	.1	.	.	1	11.1	103	5.5
Taos Gray Plain	1216	65.7	136	7.3	.	.	1	100.0	3	60.0	27	1.5	2	100.0	8	88.9	1393	74.5
Parallel incised	188	10.2	14	.8	.	.	.	.	1	20.0	4	.2	.	.	.	.	207	11.1
Clapboard neck	6	.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	.3
Exuberant indented corrugated	1	.1	1	.1	.	.	.	.	.	.	.	.	.	.	.	.	2	.1
Smeared indented corrugated	.	.	.	.	.	.	.	.	.	.	1	.1	.	.	.	.	1	.1
Smeared plain corrugated	20	1.1	8	.4	.	.	.	.	.	.	9	.5	.	.	.	.	37	2.0
Plain incised	15	.8	.	.	.	.	.	.	.	.	1	.1	.	.	.	.	16	.9
Indeterminate texture	8	.4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	.4
Punctuate incised	1	.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.1
Punctuate	15	.8	1	.1	.	.	.	.	.	.	.	.	.	.	.	.	16	.9
Gray ware subtotal	1560		171				1		4		43		2		9		1790	
Prehistoric White Wares																		
Unpainted white ware	23	1.2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23	1.3
Mineral undifferentiated	12	.6	.	.	1	100.0	.	.	.	.	.	.	.	.	.	.	13	.7
Taos Black-on-white PII indeterminate	1	.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.1
Taos Black-on-white solid design	5	.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.3
Taos Black-on-white thin parallel	4	.2	1	.1	.	.	.	.	.	.	1	.1	.	.	.	.	6	.3
Taos Black-on-white thick parallel	.	.	.	.	.	.	.	.	.	.	1	.1	.	.	.	.	1	.1
Taos Black-on-white Dogozhi	2	.1	1	.1	.	.	.	.	.	.	.	.	.	.	.	.	3	.2

	Feature 0		Feature 0		Feature 3		Feature 5		Feature 6		Feature 0		Feature 1		Feature 2		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Organic paint undifferentiated	1	.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.1
White ware undifferentiated	9	.5	1	.1	.	.	.	.	.	.	.	.	.	.	.	.	10	.5
Mineral undifferentiated	5	.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.3
PII indeterminate mineral	3	.2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.2
PII thin parallel	3	.2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.2
Escavada thick parallel	1	.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.1
Escavada hachure	3	.2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.2
White ware subtotal	72		3		1						2						78	
Historic Decorated																		
Red-slipped Tewa	1	.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.1
Historic ware subtotal	1																1	
Nonvessel																		
Taos Gray Plain	.	.	.	.	.	.	.	.	1	20.0	.	.	.	.	.	.	1	.1
Nonvessel subtotal									1								1	
Total	1633	88.2	174	9.4	1	100.0	1	100.0	5	100.0	45	2.4	2	100.0	9	100.0	1870	100.0

Table 6. Distribution of Valdez phase wares by site and pit structure shape

Site Number (number of artifacts)	White Wares %	Gray Wares %	Pit Structure Shape
Arroyo Hondo-Arroyo Seco			
LA 9200 (3167)	6.0	94.0	square
LA 9201-02 (1339)	9.1	90.0	round
LA 9201-02 (575)	1.0	99.0	square
LA 9201-03/04 (1437)	2.4	97.6	square
LA 9203 (3559)	8.7	91.3	round
LA 9204 (16943)	0.2	99.8	roomblock
LA 9205 (6832)	2.1	97.9	no structure
LA 9206 (8751)	4.2	95.8	square
LA 9207 (1066)	1.2	98.8	square
LA 9208 (5767)	2.8	97.2	square
LA 53678 (1868)	4.2	95.8	square
Blueberry Hill (testing)			
LA 53680 (575)	13.6	86.4	round
LA 53681 (1654)	13.6	86.4	no structure
LA 53682 (1359)	6.1	93.9	round
LA 53683 (1974)	8.5	91.5	round
LA 53684 (739)	11.6	88.4	round
LA 53689 (255)	22.7	77.3	round
LA 102302 (134)	3.7	96.3	no structure

LA 102304 (121)	5.8	94.2	round
LA 102305 (6678)	17.9	82.1	no structure

LA 102307 (969)	6.3	93.7	round
Pot Creek-Fort Burgwin			
LA 2742 (2856)	17.0	83.0	round
LA 3570 (425)	19.8	80.2	round
LA 70577 (2295)	24.7	75.3	round
TA-1 Pit Structure A* (641)	29.5	70.5	round
TA-1 Pit Structure B* (2156)	64.6	35.4	round
TA-10 (466)	37.8	62.2	round
TA-18 Pit Structure A (479)	32.2	67.8	round
TA-18 Pit Structure B (291)	47.8	52.2	round
TA-18 Pit Structure C (808)	30.2	69.8	round
TA-18 Pit Structure D (124)	67.7	32.3	round
TA-20 Pit Structure A (256)	36.7	63.3	round
TA-20 Pit Structure B (814)	37.2	62.8	round
TA-32 (1728)	36.9	63.1	round
TA-47 "Kiva 1" (2428)	30.9	69.1	round
TA-47 "Kiva 2" (2125)	19.5	80.5	round
TA-47 Upper Pueblo (1884)	13.2	86.8	roomblock
TA-47 Lower Pueblo (574)	13.9	86.1	roomblock

* one level mixed with Pot Creek ceramics

Table 7. Gray ware by decoration

Count Row Pct Col Pct	Plain	Incised	Clapboard	Corrugated	Other	White Unpainted	Mineral Undiffer-entiated	Solid Design	Thin Parallel	Thick Parallel	Hachure	Diffuse Organic	Row Total
Prehistoric gray wares	1500 83.8 99.9	236 13.2 100.0	6 .3 100.0	40 2.2 100.0	8 .4 88.0								1790 95.7
Prehistoric white wares						33 42.3 100.0	15 19.5 100.0	5 6.5 100.0	9 11.5 100.0	3 3.8 100.0	6 7.7 100.0	7 9.0 100.0	78 4.2
Historic decorated wares	1 100.0 .1												1 .1
Prehistoric nonvessel					1 100.0 11.1								1 .1
Column Total	1501 80.3	236 12.6	6 .3	40 2.1	9 .5	33 1.8	15 .8	5 .3	9 .5	3 .2	6 .3	7 .4	1870 100.0

Table 8. Distribution of surface textures on gray wares by site

Site Number (N)	Plain	Incised	Corrugated	Neckbanded	Other
LA 53678 (1790)	83.8	13.4	2.2	.3	.4
Blueberry Hill Testing					
LA 53680 (497)	78.5	18.7	.2	1.8	.8
*LA 53681 (1429)	89.5	10.4	0	.1	0
LA 53682 (1276)	75.9	23.7	0	.4	0
LA 53683 (1806)	69.0	30.3	.1	.6	0
LA 53684 (653)	81.5	17.8	0	.6	.2
LA 53689 (198)	88.8	10.7	.5	0	0
*LA 102302 (129)	79.8	18.6	0	1.6	0
LA 102304 (114)	84.2	7.9	4.4	3.5	0
*LA 102305 (5481)	73.3	26.3	.1	.4	0
LA 102307 (908)	90.7	8.9	.1	.2	0
Pot Creek					
LA 2742 (2370)	82.8	14.9	.2	.6	1.4
LA 3570 (341)	84.2	12.3	0	2.6	.9
LA 70577 (1728)	90.9	7.6	.1	0	1.5
Arroyo Hondo-Arroyo Seco					
LA 9200 (2976)	65.5	23.5	.2	6.7	4.2
LA 9201-01 (1217)	69.3	21.5	4.9	4.3	0
LA 9201-02 (569)	67.1	26.2	1.2	5.4	0
LA 9201-03/04 (1403)	62.9	33.0	0	3.6	.4
LA 9203 (3249)	86.2	9.0	0	2.5	2.3
LA 9204 (16917)	88.8	9.0	0	1.5	.7
LA 9205 (6688)	87.7	11.1	0	1.2	0
LA 9206 (8542)	82.1	9.1	0	3.1	5.7
LA 9207 (1047)	69.2	17.0	0	13.3	.4
LA 9208 (5608)	80.8	11.8	0	7.3	.1
Fort Burgwin Research Center					
**TA-1 Pit Structure A (452)	77.2	3.3	20.1	0	.7
**TA-1 Pit Structure B (764)	67.0	1.6	31.2	0	.3
TA-10 (290)	92.1	5.2	2.1	.7	0
TA-18 Pit Structure A (325)	78.2	11.7	0	0	9.8

Site Number (N)	Plain	Incised	Corrugated	Neckbanded	Other
TA-18 Pit Structure B (152)	82.2	17.8	0	0	0
TA-18 Pit Structure C (564)	85.3	14.7	0	0	2.3
TA-18 Pit Structure D (40)	80.0	20.0	0	0	0
TA-20 Pit Structure A (162)	84.6	13.0	0	0	.4
TA-20 Pit Structure B (511)	87.5	10.4	.6	0	1.6
TA-32 (1091)	69.6	25.8	.6	.6	3.4
TA-47 "Kiva 1" (1677)	80.5	16.0	0	3.3	.2
TA-47 "Kiva 2" (1710)	82.3	16.0	0	1.7	0
TA-47 Upper Pueblo (1635)	86.1	12.4	0	1.5	0
TA-47 Lower Pueblo (494)	82.6	14.0	0	3.4	0

* nonstructural assemblage
** one level mixed with Pot Creek phase ceramics

Table 9. Ware by temper type

Count Row Pct Col Pct	Sand	Fine Volcanic Ash	Sandstone	Taos Granite	Taos Self-Tempered	Fine Sand	Self-Tempered with Black Inclusions	Row Total
Prehistoric gray				1790 100.0 99.7				1790 95.7
Prehistoric white	21 26.9 100.0		9 11.5 100.0	5 6.4 .3	8 10.3 100.0	26 33.3 100.0	9 11.5 100.0	78 4.2
Historic decorated		1 100.0 100.0						1 .1
Prehistoric nonvessel				1 100.0 .1				1 .1
Column Total	21 1.1	1 .1	9 .5	1796 96.0	8 .4	26 1.4	9 .5	1870 100.0

Table 10. Ware by vessel form

Count Row Pct Col Pct	Indeter-minate	Bowl Rim	Bowl Body	Jar Neck	Cooking or Storage Jar Rim	Jar Body	Jar Body with Strap Handle	Jar Body with Lug Handle	Jar Body with Handle	Coil Handle	Miniature Jar Body	Cooking or Storage Jar Rim with Lug Handle	Lug Handle	Perforated Coil	Row Total
Prehistoric gray	1 .1 8.3			126 7.0 100.0	102 5.7 100.0	1536 85.8 99.8	3 .2 100.0	4 .2 100.0	8 .4 100.0	6 .3 100.0	1 .1 100.0	1 .1 100.0	2 .1 100.0		1790 95.7
Prehistoric white	11 14.1 91.7	21 26.9 100.0	43 55.1 97.7			3 3.8 .2									78 4.2
Historic decorated			1 100.0 2.3												1 .1
Prehistoric nonvessel														1 100.0 100.0	1 .1
Column Total	12 .6	21 1.1	44 2.4	126 6.7	102 5.5	1539 82.2	3 .2	4 .2	8 .4	6 .3	1 .1	1 .1	2 .1	1 .1	1870 100.0

Table 11. Lithic artifacts by material type

	Metamorphic Sandstone		Chert		Obsidian		Siltstone		Quartzite		Basalt		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core flake	4	100.0 13.3	9	36.0 30.0			1	100.0 3.3	3	33.3 10.0	13	31.0 43.3	30	35.7 100.0
Biface thinning flake			14	56.0 31.1	2	66.7 4.4			4	44.4 8.9	25	59.5 55.6	45	53.6 100.0
Uniface									1	11.1 100.0			1	1.2 100.0
Biface (1st) phase					1	33.3 50.0					1	2.4 50.0	2	2.4 100.0
Biface (3rd) phase			2	8.0 100.0									2	2.4 100.0
Bidirectional core											1	2.4 100.0	1	1.2 100.0
Multifaceted core											1	2.4 100.0	1	1.2 100.0
Unmodified cobble									1	11.1 100.0			1	1.2 100.0
Chopper											1	2.4 100.0	1	1.2 100.0
Column Total	4	4.8 100.0	25	29.7 100.0	3	3.6 100.0	1	1.2 100.0	9	10.7 100.0	42	50.0 100.0	84	100.0

Table 12. Cortex by material type

Cortex	Metamorphic Sandstone		Chert		Obsidian		Siltstone		Quartzite		Basalt		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0	3	75.0	23	92.0	3	100.0			5	55.5	28	66.7	62	73.8
10														
20											1	2.4	1	1.2
30	1	25.0							1	11.1			2	2.4
40														
50											2	4.8	2	2.4
60														
70											1	2.4	1	1.2
80									2	22.2	1	2.4	3	3.6
90											1	2.4	1	1.2
100			2	8.0			1	100.0	1	11.1	8	19.0	12	14.3
Total	4	100.0	25	100.0	3	100.0	1	100.0	9	100.0	42	100.0	84	100.0

Table 13. Flake type by portion

	Whole		Proximal		Medial		Distal		Total	
	N	%	N	%	N	%	N	%	N	%
Core flake	19	57.6	3	13.6	3	33.3	4	40.0	29	39.2
Biface thinning flake	14	42.4	19	86.4	6	66.7	6	60.0	45	60.8
Total	33	100.0	22	100.0	9	100.0	10	100.0	74	100.0

Table 14. Flake type by platform

	Absent		Cortical		Multiple		Collapsed		Total	
	N	%	N	%	N	%	N	%	N	%
Core flake	7	38.9	17	100.0	4	22.2	1	11.1	29	39.2
Biface thinning flake	12	61.1			26	77.8	7	88.9	45	60.8
Total	19	100.0	17	100.0	30	100.0	8	100.0	74	100.0

Table 15. Artifact function by material type

Primary Function	Metamorphic sandstone		Chert		Obsidian		Siltstone		Quartzite		Basalt		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Utilized debitage											2	25.0	2	12.5
Retouched debitage			1	25.0	1	50.0					2	25.0	4	25.0
Hammerstone									1	50.0	1	12.5	2	12.5
Chopper											3	37.5	3	18.8
Scraper (side)			1	25.0					1	50.0			2	12.5
Knife					1	50.0							1	6.3
Projectile point			2	50.0									2	12.5
Total	0	100.0	4	100.0	2	100.0	0	100.0	2	100.0	8	100.0	16	100.0
Secondary Function														
Utilized debitage											1	25.0	1	25.0
Hammerstone											2	50.0	2	50.0
Chopper											1	25.0	1	25.0
Total											4	100.0	4	100.0
Third Function														
Utilized debitage											1	33.3	1	33.3
Hammerstone											1	33.3	1	33.3
Chopper											1	33.3	1	33.3
Total											3	100.0	3	100.0

Table 16. Chipped stone artifact material frequencies by site

Material	LA 53678		LA 2742		LA 3570		LA 70577	
	N	%	N	%	N	%	N	%
Chert, undifferentiated	25	29.7	285	58.6	117	62.9	619	46.8
Pedernal chert			50	10.3	10	5.4	133	10.1
Obsidian, undifferentiated	3	3.6	3	0.6	15	8.1	47	3.6
Polvadera obsidian			4	0.8	13	7.0	152	11.5
Igneous, undifferentiated			43	8.9	3	1.6	26	2.0
Basalt	42	50.0	49	10.1	21	11.3	280	21.2
Rhyolite			2	0.4	1	0.5	4	0.3
Limestone			30	6.2	3	1.6	22	1.7
Quartzite	9	10.7	13	2.7	3	1.6	27	2.0
Quartzitic sandstone			1	0.2			5	0.4
Schist			1	0.2			2	0.2
Quartz							4	0.3
Metamorphic sandstone	4	4.8						
Siltstone	1	1.2						
Concretion							1	0.1
Totals	84	100.0	481	100.0	186	100.0	1323	100.0

Table 17. Percentage of local versus nonlocal lithic materials by site

Site	Local Materials	Nonlocal Materials
LA 53678	97.58	2.42
LA 2742	88.0	12.0
LA 3570	79.6	20.4
LA 70577	74.5	25.5

Table 18. Tool assemblages by site

Site	Angular Debris	Core Flake	Core Flake, Utilized	Biface Flake	Biface flake, utilized	Cores	Cobble Tools	Unifaces	Bifaces	Total
LA 53678	1 1.2		29 34.5		45 53.6	2 2.4	2 2.4	1 1.2	4 4.8	84 100.0
LA 2742	113 23.2	320 65.8	25 5.1	2 0.4		17 3.5	1 0.2	1 0.2	7 1.4	486 100.0
LA 3570	48 25.8	119 63.9	1 0.5	6 3.2		7 3.7			5 2.7	186 100.0
LA 70577	401 30.3	791 59.8	47 3.5	21 1.6	5 0.4	24 1.4	1 0.07	3 0.2	30 2.2	1323 100.0

Table 19. Taxa recovered

Taxon	Common Name	Counts		Minimum/ Maximum MNI
		N	%	
Small mammal/medium-large bird	jack rabbit or smaller	1	1.5	
Small mammal	jack rabbit or smaller	2	3.0	
Small-medium mammal	jack rabbit to coyote	2	3.0	
Medium to large mammal	coyote to deer	1	1.5	0/1
Large mammal	deer or larger	1	1.5	
Small squirrel	ground squirrel or chipmunk	2	3.0	1/1
Large squirrel	large squirrel or prairie dog	4	6.1	1/1
cf. *Spermophilus lateralis*	golden-mantled ground squirrel	1	1.5	1/1
Cynomes gunnisoni	Gunnison's prairie dog	21	31.8	2/3
Thomomys sp.	pocket gopher	14	21.2	3/5
Dipodomys cf. *ordii*	Ord's kangaroo rat	3	4.5	1/1
Peromyscus sp.	*Peromyscus*	3	4.5	1/1
Small rodent	pocket gopher or smaller	2	3.0	
Sylvilagus sp.	cottontail rabbit	4	6.1	3/4
Lepus sp.	jack rabbit	1	1.5	1/1
Small carnivore	fox or smaller	1	1.5	1/1
Medium artiodactyl	deer size	1	1.5	
Odocoileus hemionus	mule deer	1	1.5	1/1
Large bird	turkey size	1	1.5	1/1
Totals		66	100.0	17/21

Table 20. Taxon by provenience

Taxon	Surface Stripping		Pit Structure 1		Extramural Area 2, Feature 1	
	N	%	N	%	N	%
Small mammal/large bird	1	11.1				
Small mammal	1	11.1			1	2.3
Small-medium mammal			1	7.7	1	2.3
Medium-large mammal					1	2.3
Large mammal	1	11.1				
Small squirrel			1	7.7	1	2.3
Large squirrel					4	9.1
Golden-mantled ground squirrel					1	2.3
Gunnison's prairie dog			1	7.7	20	45.5
Pocket gopher	1	11.1	7	53.8	6	13.6
Ord's kangaroo rat					3	6.8
Peromyscus					3	6.8
Small rodent			1	7.7	1	2.3
Cottontail rabbit	1	11.1	1	7.7	2	4.5
Jackrabbit			1	7.7		
Small carnivore	1	11.1				
Medium artiodactyl	1	11.1				
Mule deer	1	11.1				
Large bird	1	11.1				
Total/percent of sample	9	13.6	13	19.7	44	66.7

Table 19. Fragmentation by taxon

Taxon	> 75% complete		25 to 75%		< 25 %	
	N	%	N	%	N	%
Small mammal/large bird					1	100.0
Small mammal			1	50.0	1	50.0
Small-medium mammal					2	100.0
Medium-large mammal					1	100.0
Large mammal					1	100.0
Small squirrel	2	100.0				
Large squirrel	2	50.0	1	25.0	1	25.0
Golden-mantled ground squirrel	1	100.0				
Gunnison's prairie dog	9	42.9	4	19.0	8	38.1
Pocket gopher	7	50.0	1	7.1	6	42.9
Ord's kangaroo rat	3	100.0				
Peromyscus	2	66.7	1	33.3		
Small rodent	1	50.0			1	50.0
Cottontail rabbit	2	50.0	1	25.0	1	25.0
Jackrabbit					1	100.0
Small carnivore					1	100.0
Medium artiodactyl					1	100.0
Mule deer	1	100.0				
Large bird					1	100.0
Site total	30	45.5	9	13.6	27	40.9
Surface stripping	2	22.2	1	11.1	6	66.7
Pit Structure 1	8	61.5			5	38.5
Extramural Area 2, Feature 1	20	45.4	8	18.2	16	36.4

Table 22. Environmental and animal alteration

Taxon	Pitting		Root Etching		Carnivore		Scat	
	N	%	N	%	N	%	N	%
Small mammal/large bird							1	100.0
Small mammal	1	50.0					1	50 0
Small-medium mammal	1	50.0						
Medium-large mammal	1	100.0						
Large mammal	1	100.0						
Small squirrel			1	50.0				
Large squirrel								
golden-mantled ground squirrel								
Gunnison's prairie dog	2	9.5	2	9.5	2	9.5		
Pocket gopher	4	28.6					1	7.1
Ord's kangaroo rat								
Peromyscus								
Small rodent			1	50.0				
Cottontail rabbit	2	50.0	2	50.0				
Jackrabbit	1	100.0						
Small carnivore								
Medium artiodactyl	1	100.0						
Mule deer	1	100.0						
Large bird					1	100.0	1	100.0
Site total	15	22.7	6	9.1	3	4.5	4	6.1
Surface stripping	3	33.3	1	11.1	1	11.1	4	44.4
Pit Structure 1	6	46.1	3	23.1	1	7.7		
Extramural Area 2, Feature 1	6	13.6	2	4.5	1	2.3		

Table 23. Raw counts and concentration values (grains/cm), FS 208

FS 208 Metate	Pinus	Ulmus	Fabaceae	Poaceae	Cheno-am	Asteraceae (High Spine)	Asteraceae (Low Spine)
Raw count	23	1	1	2	70	6	1
Concentration	25.18	1.09	1.09	2.19	78.81	6.57	1.09

Table 23. (continued)

	Indeterminate	*Zea mays*	Pollen Sum	Marker Count	Percent Indeterminate	Total
Raw Count	4	1	111	111	3.60	121.5
Concentration	4.38	0.46				100.0

Table 24. Full-sort flotation analysis results

Feature	Pit Structure 1 Floor 1 Hearth	Pit Structure 1 Floor 2 Posthole 1	Pit Structure 1 Floor 2 Posthole 2
CULTURAL Domesticates: *Zea mays* maize	c+*	c+*	c+*
Perennials: *Atriplex canescens* four-wing saltbush	4f fragments*/4 f fragments*	1f*/0.5f*	1f*/1.25f*
POSSIBLY CULTURAL Annuals: *Nicotiana attenuata* tobacco			4/5
NONCULTURAL Annuals: *Amaranthus* pigweed	1/1		
Chenopodium goosefoot	1/1	1/0.5	
Helianthus sunflower	1/1		
Portulaca purslane	1/1	2/1	2/2.5
Grasses: *Sporobolus* dropseed grass			2/2.5
Other: *Euphorbia* spurge	1/1		
TOTAL TAXA	11	8	9

* = charred; c = cupule; f = fruit.
Note: Plant parts are recorded as actual count/count per liter.

Table 25. Species composition of flotation sample wood charcoal

Feature	Pit Structure 1 Floor 1 Hearth	Pit Structure 1 Floor 2 Posthole 1	Pit Structure 1 Floor 2 Posthole 2	Total
NONCONIFERS: *Artemisia* sagebrush	8/0.0g	6/0.0g	3/0.0g	17/0.0g
Atriplex/Sarcobatus saltbush/greasewood	6/0.0g	1/0.0g	2/0.0g	9/0.0g
Salicaceae/Aceraceae willow family/maple family		1/0.0g	1/0.0g	2/0.0g
CONIFERS: Indeterminate conifer	4/0.0g	2/0.0g		6/0.0g
Pinus pine			14/0.4g	14/0.4g
TOTAL TAXA	3	4	4	48/0.4g

Note: Wood data are recorded as actual count/weight in grams.

Table 26. Species composition of C-14 samples

Pit Structure Floor	Floor 1					Floor 2			Floor 3	TOTAL
FS #	202	203	205	206	208	304	310	311	401	
NONCONIFERS: Artemisia			.2 [2]						.2 [1]	.4 [3]
Atriplex/ Sarcobatus	1.0 [1]		.9 [3]			.3 [1]		.7 [1]	.7 [2]	2.34 [8]
Salicaceae/ Aceraceae		.5 [5]								.5 [5]
CONIFERS: Indeterminate Conifer		.9 [7]		6.7 [1]	1.3 [1]		.4 [1]		.2 [3]	9.5 [13]
Pinus			.5 [2] cf. Ponderosa							.5 [2]
Pinus ponderosa		2.2 [9]								2.2 [9]
TOTAL TAXA	1	2	3	1	1	1	1	1	3	15.44 [40]

Weights are expressed in grams and n of pieces in [brackets].

Note: The majority of wood identified in the category Salicaceae/ Aceraceae had characteristics closely resembling *Acer negundo* (box elder), but some fragments also resembled *Salix* (willow), forming a continuum between the two taxa of different families, thus necessitating their placement in a combined category.