A Data Recovery Plan for Excavation at the New Mexico Museum of History Site: 700 Years of Human Occupation near the Palace of the Governors in Santa Fe, New Mexico

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Museum of New Mexico

MUSEUM OF NEW MEXICO

OFFICE OF ARCHAEOLOGICAL STUDIES

A DATA RECOVERY PLAN FOR EXCAVATION AT THE NEW MEXICO MUSEUM OF HISTORY SITE: 700 YEARS OF HUMAN OCCUPATION NEAR THE PALACE OF THE GOVERNORS IN SANTA FE, NEW MEXICO

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ADMINISTRATIVE SUMMARY

The director of the Museum of New Mexico, Thomas Wilson, has requested that the Office of Archaeological Studies (OAS) conduct a data recovery program on Museum of New Mexico property on the grounds of the proposed New Mexico Museum of History. The project area is located at 113 Lincoln Avenue in Santa Fe, New Mexico. The project area is owned by the Museum of New Mexico Board of Regents. Funding for the construction comes from the U.S. Department of Interior, National Park Service, and the State of New Mexico.

The Museum of New Mexico plans to remove two buildings and associated parking areas adjacent to the historic Palace of the Governors. One building is the current Museum Administration Building and the other houses administrative offices for the Palace of the Governors staff. A New Mexico Museum of History will be constructed on the property in their place. This document provides a historical and archaeological background and data recovery plan in compliance with *Cultural Properties Act of 1969* (§§18-6-1 through 17 NMSA 1978) and the *National Historic Preservation Act of 1966.*

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Museum of New Mexico Project No. 41.690

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INTRODUCTION

The director of the Museum of New Mexico, Thomas Wilson, has requested that the Office of Archaeological Studies (OAS) conduct a data recovery program on Museum of New Mexico property to be affected by construction of the proposed New Mexico Museum of History. The project area is located at 113 Lincoln Avenue in Santa Fe, New Mexico. The project area is owned by the Museum of New Mexico Board of Regents. Funding for the construction comes from the U.S. Department of Interior, National Park Service, and the State of New Mexico.

The Museum of New Mexico plans to demolish the Museum Administration Building, a portion of the current administrative offices for the Palace of the Governors, and associated parking areas. The project area, which is alos the area of potential effect, covers 2,065 sq m. The demolition will allow construction of a New Mexico Museum of History on the property. The parking areas include a vacant lot immediately north of the Museum Administration Building. The lot recently held a commercial building with a basement and, therefore, archaeological investigations (other than monitoring) will not take place in this disturbed area. The Museum Administration Building also contains a basement and this location will not be part of the excavation work for the same reason. The area designated for data recovery consists of a portion of a 3-m-wide driveway along the south side of the Museum Administration Building, a portion of the parking area to the east of the Museum Administration Building, and an open space behind the Palace of the Governors offices covering a total of 586 sq m (Figs. 1 and 2).

This document provides a historical and archaeological background and data recovery plan in compliance with *State Cultural Properties Review Act 1969* and the *National Historic Preservation Act 1966*. The Palace of the Governors is on the *National Register of Historic Places* (#66000489) and on the *New Mexico State Register of Cultural Properties* (District 260, #17). It is designated as a National Historic Landmark. The Palace of the Governors is assigned LA 4451 in the New Mexico Cultural Resource Information System files at the Archeological Records Management Section, Historic Preservation Division, in Santa Fe. Cultural properties encountered during this project will be assigned to LA 4451 because of the expected cultural-historical association.

A BRIEF HISTORICAL BACKGROUND OF THE PALACE OF THE GOVERNORS

The Palace of the Governors is distinguished as the oldest continuously occupied public building in the United States. Since its construction in 1610 by Governor don Pedro de Peralta, the Palace has housed governors from Spain, Mexico, and the Territorial United States, along with Pueblo Indians, the United States military, and eventually the Museum of New Mexico, providing for a rich cultural history and an important archaeological record for the State of New Mexico.

Known in the seventeenth century as the Casas Reales, the constellation of buildings served as government offices, a military post, and the home of designated governors and their families. With the exception of one twelve-year interlude, when Pueblo Indians occupied the buildings following the Pueblo Revolt of 1680, similar usage of the buildings persisted until the United States military takeover in 1846. Between 1789 and 1821, a Spanish presidio was constructed on the site. In 1846, the presidio was remodeled, new dwellings for U.S. officers and enlisted men were built, and in 1859 the military compound was renamed Fort Marcy. By 1895, the United States Army ceased operations on the Palace grounds at Fort Marcy and the fort was no longer in use (Seifert 1979a:5). After this, several new buildings were constructed behind the Palace of the Governors

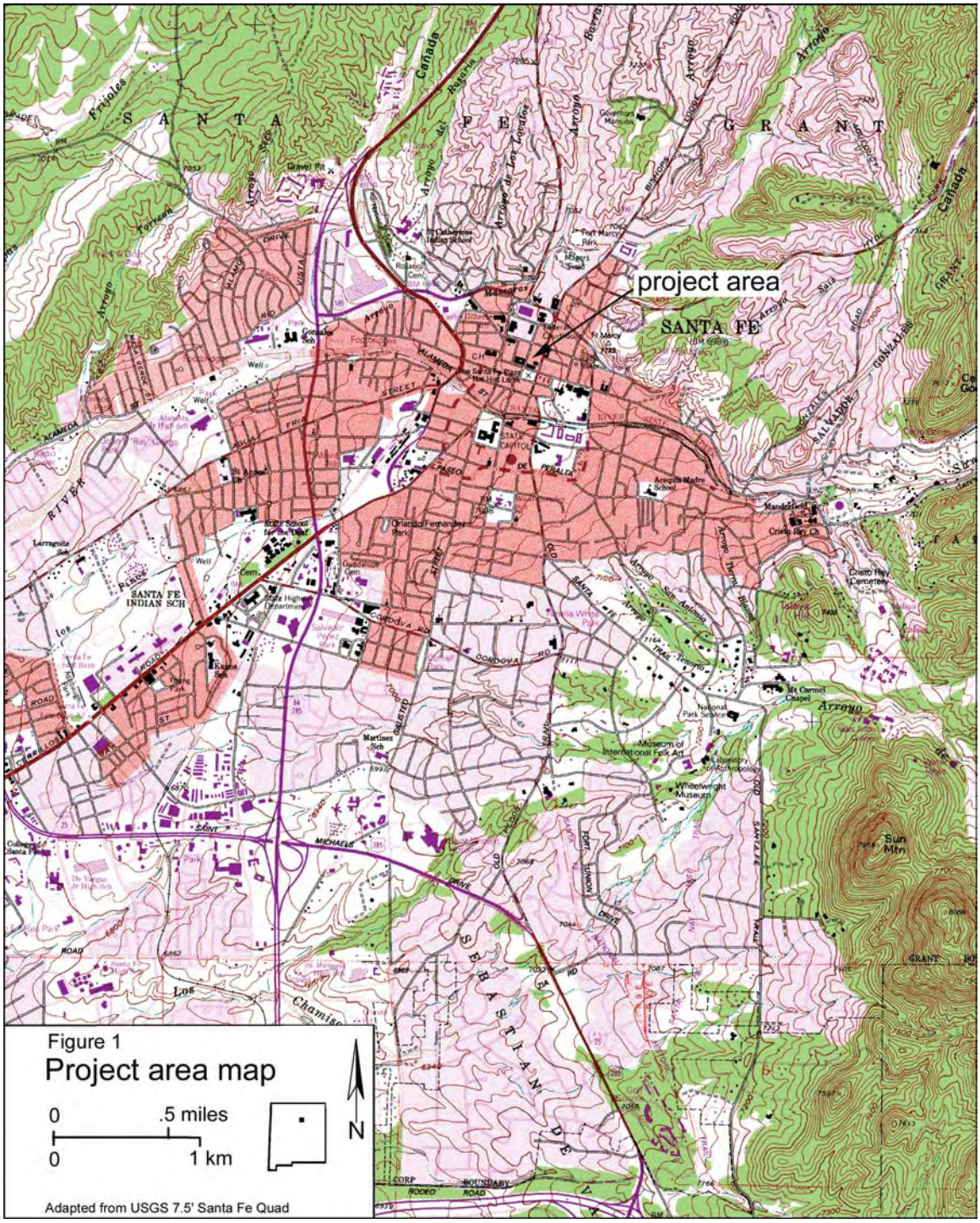
project area
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Figure 1
Project area map
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Adapted from USGS 7.5' Santa Fe Quad

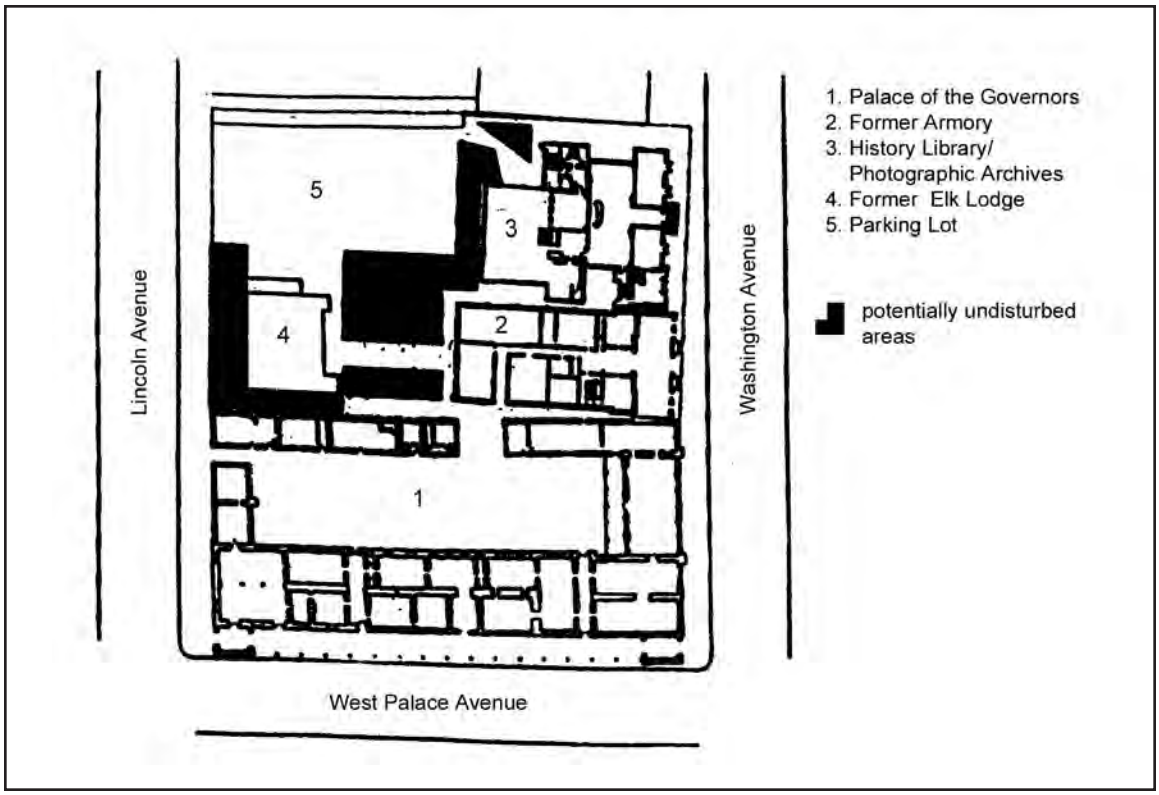


Figure 2. Schematic map of project area showing potentially undisturbed areas.

including the Elks Lodge (now the Museum Administration Building), a 1907 Womens Board of Trade Building (now part of a vacant lot), and the National Guard Armory (now part of the Palace of the Governors' offices and storage areas) from the 1930s. All were on or adjacent to the site of the proposed New Mexico Museum of History.

In 1898, the U.S. Congress donated the Palace of the Governors to the State of New Mexico because of the high maintenance costs. By 1909, the Museum of New Mexico was charged with the responsibility of maintaining the buildings and it continues to occupy the space today. A detailed history of the Palace of the Governors is provided by J. K. Shishkin (1972).

PREVIOUS ARCHAEOLOGICAL EXCAVATIONS IN AND AROUND THE PALACE OF THE GOVERNORS

The Palace of the Governors' building and surrounding vicinity, between Palace Avenue on the south and Marcy Street on the north, and Sheridan Avenue on the west and Washington Avenue on the east, have undergone a series of archaeological investigations within the last 100 years. However, in many cases investigated areas were small or narrow transects, controls were minimal, or the analysis and reporting was limited. These patchwork projects fulfilled the requirements of the moment, but have not resulted in the synthetic documentation and interpretation equal to the stature of a cultural property that is as culturally, regionally, and nationally important as the Palace of the Governors. Indisputable is the potential for intact cultural deposits within the current footprint of the Palace and its adjacent open space. Typically, excavations have revealed tantalizingly

small segments of walls, acequias, foundations, and floors that are difficult to reliably interpret relative to the complex occupation sequence. These partial views only allow educated guesses about construction events, remodeling, and the early history of the Palace; a circumstance that is echoed by historical scholars and archaeologists alike (Levine 1989; C. T. Snow 1974, 1993a; Tigges 1990; Willmer 1990).

One of the first excavations undertaken at the Palace of the Governors was under J. Nusbaum, who worked in several rooms in 1909-1910, recovering Pueblo Revolt period materials and six human burials of Indian descent (Peckham 1982). As part of the Palace renovation, "twenty-six hundred wagon loads of debris were removed from the placita, which in places was filled up to the level of the windows" (Hewett 1912:5). Undoubtedly some of the debris referred to in Edgar Hewett's *First Annual Report of the Museum of New Mexico* would be rightly characterized as an accumulation of seventeenth through nineteenth-century archaeological deposits. Subsequent investigators (C. T. Snow 1993a) attribute the absence of eighteenth-century materials in the Palace complex to this large-scale debris removal. One has to wonder where this voluminous material was deposited. Later, in 1934, roof beams from Nusbaum's work were dated by dendrochronological means and produced a range of dates from 1711 to 1849 (Smiley et al. 1953). However, many of the beams were purchased from Santa Clara Pueblo, obscuring the association between the tree-ring dates and Palace construction episodes (C. T. Snow 1993a:9-10).

In 1956, M. Lambert excavated a well in the southwest corner of the existing Palace courtyard as part of a plan to reconstruct the structure (Lambert 1985). Her excavation recovered nails, bottles, and horseshoes dating to approximately the 1860s, reflecting Territorial period military use. Lambert (1985:220) observed that Well 1 was not shown on the 1868 plan of the Palace of the Governors. This indicated to her that Well 1 was built after 1868 and the Territorial period artifacts indicated it was used for only 41 years. Tangentially, water was encountered at a depth of 5 m during the 1956 excavation. Another possible well at the eastern end of the courtyard may date to 1715 or earlier.

One room in the southeast corner of the Palace was excavated in 1965 by R. Alexander and P. Wells. Only field notes remain on this work (Alexander 1965). In the late 1960s, J. Wilson either monitored or excavated a trench in the eastern end of the Palace courtyard, but the work was never published.

A monitoring project apparently coincided with the installation of utility lines within the Museum Administration Building parking lot. At least two trenches were excavated to 1.5 m below the parking lot and were monitored by B. Ellis (1974). The sketch from the LA 4451 file is included as Figure 3. It shows the locations and configuration of three foundation remnants. An east-west trench perpendicular to the west wall of the current Palace offices (then known as the "Hall of Ethnology") contained an adobe brick and cobble foundation at 84 cm below the parking lot pavement. The foundation remnant was 1 m wide and consisted of a single course of two adobe bricks on top of a cobble footing. The height of the foundation was not recorded nor was the length of the segment. Two similar foundations were exposed in a diagonal trench that ran from the northeast corner of the current Museum Administration Building for an unknown distance to the southeast (see Fig. 3). The northernmost foundation was identified as a "possible corner" and was 82 cm below the parking lot pavement. The second foundation segment was oriented east-west and may be related to the wall corner remnant. This east-west remnant was exposed at 86 cm below the parking lot pavement. All three segments were exposed between 82 and 86 cm below the pavement suggesting that they are contemporaneous. They may date to the seventeenth or eighteenth century and are comparable to foundations exposed in the Palace of the Governors (C. T. Snow 1974). The importance of these foundations will be discussed later in the research design.

Excavations were conducted in 1974-1975 in three of the rooms on the west end of the Palace by C. T. Snow (1974) with the final report prepared by D. Seifert (1979a). Superimposed walls

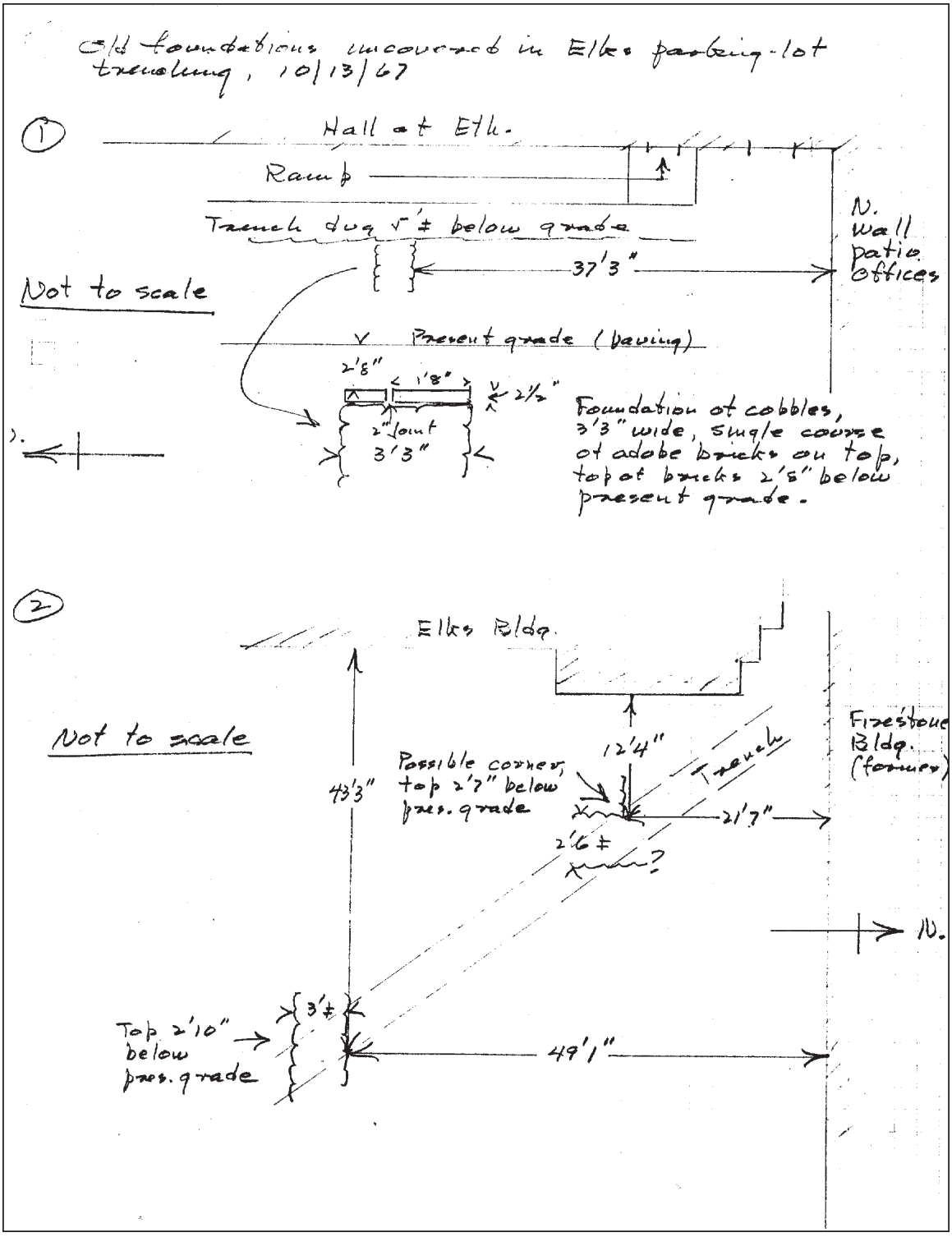


Figure 3. Bruce Ellis's 1967 sketch map of "old foundations uncovered in the Elks parking lot trenching."

and floors from the mid-seventeenth to the early eighteenth century were exposed, as well as large storage and processing features from the Pueblo Revolt period. These storage and architectural features were encountered 10 to 20 cm below the then-current Palace floor. The near-surface context of these features is attributed to the removal of fill by Jesse Nusbaum in 1910 and 1911 (C. T. Snow 1974). Abundant cultural material from ancestral Puebloan, Spanish, Pueblo Indian, Mexican, and American Territorial period occupations numbered in the tens of thousands. Rarely recovered vegetal and macrobotanical remains included corn, beans, squash, chile, as well as pottery and flaked stone from Coalition and Classic periods of the Rio Grande sequence (Wendorf and Reed 1955). Over 27,000 sherds of prehistoric and historic pottery were recovered, and Indian occupation during the Pueblo Revolt was clearly evident in the subsurface remains. This work represents the most extensive data recovery within the Palace of the Governors to date.

Also in 1979, D. Seifert tested the Gallery Addition space behind the Hewett House, directly across the street from the Museum Administration Building (Seifert 1979b). Stratified cultural deposits were present to a depth of approximately 1.5 m. Numerous artifacts were recovered, dating from the fourteenth to the late nineteenth centuries. No structural remains were found but because of the minimal testing, further excavations were recommended. Later in 1979, under the direction of S. Peckham and subsequently D. Snow, excavations were conducted on the site (Post and Snow 1982). Uncovered were the probable foundations of the Fort Marcy Quartermaster's Offices and an eighteenth-century occupation level. Of particular interest is the eighteenth-century occupation level because it was encountered at 130 to 145 cm below the modern ground surface and below the Fort Marcy Quartermaster's Offices. This indicated that intact seventeenth- and eighteenth-century deposits remained within the bounds of the military reservation despite multiple renovation, construction, and demolition episodes. Overall, within the Museum of Fine Arts Addition project area, cultural materials from the thirteenth to twentieth centuries were recovered from depths reaching down 1.9 m below the ground surface.

In 1982, the area now occupied by the First Interstate Bank building was excavated by C. Schaafsma and S. Peckham (Schaafsma 1982). An adobe brick wall running east-west was one of the important finds. It is believed to be the south garden wall from the late nineteenth and early twentieth centuries. The wall had been built on top of swamp clays. Excavators also found late Spanish presidio artifacts at 0.50-1.50 m below the present sidewalk.

OAS excavated a 1-by-1-m pit in the courtyard of the Palace of the Governors in 1987 in advance of a tree-planting ceremony in honor of the visiting King of Spain (D. Levine 1990). This 1-m-deep unit yielded 664 sherds of Pueblo-made pottery, 817 pieces of animal bone, 68 lithic artifacts, and lesser numbers of miscellaneous artifact classes. The dense deposit at 80 to 100 cm below the surface contained abundant sherds, animal bone, and a gunflint. The majority of the pottery dated to the seventeenth or early eighteenth century. This deposit apparently survived J. Nusbaum's clean-up efforts.

In 1989, OAS monitored the excavation of a utility line trench placed along Washington Avenue on the east side of the Palace (Willmer 1990). This 144-m-long trench revealed seven subsurface features older than 1900 and yielded a wide range of artifacts. Two pit features contained eighteenth-century pottery and no metal or glass, suggesting that intact deposits were present (Features 1 and 2). Feature 4 was a rock-lined (not cobble-lined) acequia or drain. Based on personal communication with David Snow, Willmer (1990) reports that the rock-lined ditch was not encountered in the parking lot to the east. It contained glass shards indicating that it was open at the end of the nineteenth or early in the twentieth century. Three other cobble features included a cobble pavement (Feature 5) and two alignments (Features 6 and 7). All three are immediately east of the First Interstate Bank building, where Schaafsma encountered considerable evidence of seventeenth- or eighteenth-century gardening and outdoor activity. The top of the cobble pavement was exposed at 1.25 m below the street grade, further indicating it dated to the Spanish Colonial

period. Artifact classes included Euroamerican manufactured items (n = 390), Pueblo-made pottery (n = 432), and 186 animal bones, of which the majority were domesticated species.

In 1990 and 1991, OAS staff monitored storm drain and drainage pipe installations across Lincoln Avenue between the Palace of the Governors and the Museum of Fine Arts and around the Hewett House (Martinez 1994). Trench profiles contained evidence of Territorial and Spanish Colonial architecture and artifacts from both periods. Nonsystematic artifact collection recovered 425 pieces of Pueblo and Euroamerican-made pottery, 518 animal bones (primarily domesticated cow and sheep/goat), and 64 miscellaneous artifacts including mica sheets, a strike-a-light flint, and a charred corn cob. Clearly, the trenches cut through a midden deposit that appeared homogeneous, but contained considerable seventeenth-century refuse. Also exposed were the remains of a disarticulated foundation constructed of river cobbles at a depth of 85 to 100 cm below the street level of Lincoln Avenue.

In 1994, C. Hannaford of OAS monitored a trench cut outside the northeast corner of the Museum of Fine Arts in order to expose the basement wall for needed repairs (Hannaford 1997). Cultural deposits of temporally mixed artifacts were encountered to a depth of 1.15 m. No structural remains or features were observed.

S. Post directed explorations prior to construction of the History Library Addition in 1995. This area is located immediately east of the proposed New Mexico Museum of History data recovery area. The work uncovered an acequia and a 4-m-long cedar plank at a depth between 1.40 and 1.60 m below the modern grade. These features were associated with and covered by eighteenth- and nineteenth-century refuse including Pueblo and Euroamerican pottery, metal artifacts, and animal bone. Metal artifacts included the handle of a "belduque," which is an ornate utilitarian knife from the eighteenth century recovered from the same level as the cedar plank (S. Post, letter to Historic Preservation Division, 27 Nov 1995).

In July and August of 2000, David H. Snow, Palace of the Governors' curator, directed the excavation of nine 1-by-1-m test units along the foundation of the Palace of the Governors in conjunction with an architectural condition assessment. Six units were located in the patio and three units were placed along the Palace north wall, which forms the south limit of the New Mexico Museum of History project area. Excavation Units 7 and 8 were excavated in 20-cm arbitrary levels 130 to 150 cm below the Administration Building parking lot pavement level. Even though this area was cut by a water line and telephone cable trenches at two different elevations, there appeared to be integrity to the lower deposits through which the trenches had been cut. A mixed seventeenth- to twentieth-century layer was 40 to 50 cm thick, overlying a possible seventeenth-century layer that was 35 to 60 cm thick and extended 1.80 m below the parking lot surface (based on auger tests in the bottom of the excavation units). A possible posthole associated with cobbles was encountered in Excavation Unit 8 and may be a horizon marker for the Spanish Colonial occupation level. The posthole and cobbles occur at 80 cm below the parking lot level. They are within the upper portion of the Spanish Colonial deposit and may be associated with the presidio occupation.

RESEARCH DESIGN AND DATA RECOVERY PLAN

Since the 1960s, all investigators agree on one thing: the archaeology and history of the Palace of the Governors is elusive, confusing, and compelling. Archival and archaeological studies have examined questions about the founding of Santa Fe, the location of the Palace of the Governors, the Plaza, and surrounding buildings, the effects of the Pueblo Revolt and Reconquest, and later

Spanish Colonial, Mexican, and Territorial period occupations. A cursory reading of the preceding historical background section gives the impression that the Palace of the Governors' building and the space that it occupied remained constant during the first 250 years of occupation. However, a detailed reading of the various disparate scholarly and technical reports on archival and archaeological investigations shows just the opposite and that our current knowledge of the first 250 years is incomplete and regularly debated (Arnold 1989; Ellis 1976; Hordes 1990; Pratt 1990; Shishkin 1972; C. T. Snow 1974, 1990, 1993a; D. H. Snow 1990, 1991, 1998). Investigations that clarify historical-based interpretations for the Spanish Colonial period are critical. Further, even though the United States military generated plans and maps of the Palace buildings and grounds, renovated or demolished old buildings and constructed new quarters and offices, and left a record that is more complete than previous periods, details of construction, consequences of repeated activities within the bounded space of the military grounds, and the role that the military presence and territorial government played in the local economy remain open to further examination. Barring investigation of the Palace patio and remaining room interiors that have not been investigated or substantially disturbed since the turn of the twentieth century, the New Mexico Museum of History excavations may be one of the last opportunities to address or substantively revisit these ongoing questions with new data.

The challenges of archaeological and historical investigation at the Palace of the Governors are many. The long history of construction, demolition, reconstruction, and remodeling, and perhaps, relocation, hamper predictions as to the nature, extent, and condition of cultural features and deposits that may remain within the Museum Administration Building parking lot and driveway footprint. Furthermore, analyses of artifact collections and samples recovered from previous investigations are incomplete or lack detail, limiting archaeological-based examination of local and regional economy and interaction.

This research design and data recovery plan acknowledges that definitive answers, 100 percent successful predictive modeling, and 100 percent excavation are unreasonable expectations or goals. Potential for heavily disturbed contexts, mixed cultural deposits, the previous removal of cultural deposits, and the inability to test hypotheses or interpretations by conducting investigations in other locations within the Santa Fe downtown area will strongly condition results, interpretative value, and explanatory power of the investigations. Nevertheless, intact and other potentially useful cultural deposits and features may remain from seventeenth-, eighteenth-, and nineteenth-century occupations. Through the integration of existing data, reanalysis of targeted artifact collections, and processing of samples that might provide fundamental data for integrating Palace and Palace grounds occupation and use through time, there is considerable potential for addressing questions related to changing Palace spatial organization and use, economic integration, and processes of urban change that accompanied changes in political control and economic fortunes of New Mexico.

Research Directions

Research will address three broad topics that can be examined for the potential 700 years of human occupation of the portion of the Palace of the Governors' grounds which are currently occupied by the Museum Administration Building parking lot. These three broad research emphases are: (1) examine temporal and spatial dimensions of changing land-use patterns through the location and excavation of architectural features and recovery of temporally diagnostic and functionally specific artifacts and samples; (2) examine changing economic strategies and technological organization as reflected in the material culture and subsistence data; and (3) develop a holistic consideration of the Palace of the Governors and its relationship to surrounding architectural and land-use patterns through the production of composite maps based on excavation and archival data.

Research questions are proposed that will guide investigations and that pertain to major temporal and historical events and episodes. Each question is broadly and succinctly addressed including background information, expectations, potential limitations, and possible data sources. Expanded discussions of data sources will follow the research directions. A description of the field and laboratory methodologies and their relevance to the research will follow the data sources.

Examine temporal and spatial dimensions of changing land-use patterns through the location and excavation of architectural features and recovery of temporally diagnostic and functionally specific artifacts and samples.

The following section poses and evaluates research questions relating to the occupation sequence of 700 years that may be reflected in architectural remains, ancillary features, and potentially extensive cultural deposits. This section is not presented in strict chronological fashion following accepted cultural-historical sequences because clean breaks in occupation may be difficult to identify archaeologically, even though certain events occurred on a given day or during the course of a month or single year. It is expected that architectural features did not change as rapidly. While the Palace of the Governors' occupations are characterized by the accepted chronological sequence in later sections of the research design, that convention is not strictly followed here.

1. When did occupation of the Palace of the Governors' site and adjacent grounds begin? What is the occupational sequence of the space? Do architectural or subsistence-related features remain?

First use of the Palace of the Governors' site and its adjacent grounds probably predated Spanish settlement between 1605 and 1610. Excavations within and surrounding the downtown area yield pottery and chipped stone artifacts and occasionally architectural, subsistence, or mortuary features from between A.D. 1200 and 1600, with the earlier half of the temporal range most frequently represented (Elliott 1988). To date, no indisputable pre-Hispanic features or surfaces have been documented on the Palace grounds or within the limits of the Spanish presidio or Fort Marcy Military Reservation. Artifacts from A.D. 1200 to 1350 in lower levels and mixed deposits within the downtown area commonly are attributed to the Old Schoolhouse site (LA 1051) (C. T. Snow 1993a:3). This site, reported by Mera, is reputedly north of the Palace at the Santa Fe City Hall and parking lot on Marcy Street (C. T. Snow 1993a:3). While the Old Schoolhouse site may be a source of Coalition period pottery in the Palace of the Governors and plaza area, it is likely that cultural deposits from other ancestral Puebloan roomblocks or residential sites have been buried, bladed, and redeposited throughout the downtown area. A community pattern of numerous small (10 to 20 room) structures within a 15,000 to 20,000 sq m area is known from the Cochiti area (Lange 1968), the Pajarito Plateau (Powers and Orcutt 1999), and south of Santa Fe (Allen 1973). Across the Santa Fe River and under San Miguel Church, S. Stubbs and B. Ellis excavated a small portion of a Coalition period structure (1955). Most recently Southwest Archaeological Consultants, Inc., encountered a series of Coalition period human burials interred in a thick sheet-trash layer at the corner of Johnson and Guadalupe Streets (Cherie L. Scheick, Southwest Archaeological Consultants, Inc. pers. comm., March 2002). No architectural remains were encountered, but it is very likely that a roomblock was located nearby. Combined, these sites within the downtown area reflect a dispersed settlement pattern consisting of small house mounds associated with substantial sheet-trash deposits and mortuary remains.

Post-A.D. 1350 deposits are rare in the downtown and Palace of the Governors' area. Biscuit ware and pre-Hispanic glaze ware pottery are commonly found in low frequencies, but no features or structures have been identified. Part of the Santa Fe lore in the late nineteenth century was that

the city was built on top of an ancient Pueblo village that was named Ogapoge (C. T. Snow 1993a:3). The intent was to link Santa Fe to the ancestral Puebloan villages of the Galisteo Basin, Rio Chama, and the extant Pueblo villages. This myth persisted and may still persist in the tourist literature, but it has no known basis in the archaeological record (C. T. Snow 1993a:3). Post-fourteenth-century ancestral Pueblo occupations are better known for the middle and lower Santa Fe River, the Galisteo Basin, and north into the heartland of the Tewa Basin and Pajarito Plateau (Peckham 1984; Ware 1984). That the downtown area was incorporated into seasonal subsistence activities and travel between major ancestral Puebloan villages is highly likely and may account for a wide but sparse spatial distribution of late pre-Hispanic pottery (Maxwell and Post 192).

While it is certain that ancestral Puebloan materials will be recovered, there is only a slight probability that the excavations will yield more than simply pottery that could be attributed to ancestral Puebloan occupations. Pottery types that have been identified include the full sequence of the mineral-, carbon-, and glaze-painted pottery known for the northern Rio Grande (Seifert 1979a:52). Decorated pottery types included Kwahe'e, Santa Fe, Poge, Pindi, Galisteo, and Wiyo Black-on-white, Biscuit A and Biscuit B, and Glaze A through Glaze F. From the manufacture dates typically assigned to these types, continuous, but perhaps sporadic occupations from A.D. 1200 to 1600 are indicated (Habicht-Mauche 1993; Warren 1977, 1979). The highest frequencies of pottery date from the Rio Grande Coalition and early Classic periods (as defined by Wendorf and Reed 1955; Dickson 1979; Peckham 1984). Temporally distinct assemblages with restricted spatial distribution may be the best indicator of activity areas. These may be recovered from the deepest cultural deposits within the excavation area and may be associated with other artifact classes, such as fauna, ground and chipped stone, and archaeobotanical remains that would inform on the nature of the occupation. Radiocarbon dating of charred archaeobotanical remains may be useful for refining occupation dates in instances where decorated pottery manufacture dates span more than one hundred years. Other classes of material such as projectile points and manos and metates provide poor temporal resolution. Obviously, recovering artifacts and samples from discrete contexts would be optimal, although no such contexts have been reported for the Palace of the Governors and surrounding area excavations.

2. What is the location of the first Palace and associated plaza? When was it built? Can the structure be defined in terms of size, layout, etc.? What range of activities may have occurred within this portion of the Palace grounds?

3. What is the size and configuration of the Pueblo Revolt occupation? Do structural elements and activity areas dating to the Pueblo Revolt remain and how do they contrast with earlier and later Spanish Colonial components?

These two research questions are posed separately, but can be addressed together. They acknowledge that the first 80 years of Spanish Colonial occupation is incompletely known. Architectural features and other spatial evidence of occupation may be difficult to segregate into discrete temporal units, and the ideal or prescribed Palace may not have been built, may have been built in stages, or was substantially altered by the Pueblo Revolt and the subsequent Reconquest and reestablishment of Spanish Colonial settlement.

The first Hispanic settlement of the Santa Fe area is traditionally assigned to 1609-1612, when don Pedro de Peralta moved the first colony from San Juan de los Caballeros to Santa Fe (Twitchell 1925; Sanchez 1989). Following the directions of the *Ordenanzas de Descubrimiento* of 1573, a location was chosen that was environmentally suitable, had sufficient space to establish the settlement and the required civil, military, and ecclesiastical buildings, and did not encroach on any existing Indian settlements (Hordes 1990:4; C. T. Snow 1990:55). While all current schol-

ars believe that there were no nearby Indian pueblos, they disagree on whether the area in the vicinity of San Miguel Chapel, south of the Santa Fe River, had been unofficially settled by Spanish or Mexican auxiliaries. Documents indicate that this early small-scale settlement was established by 1605 and deterred the establishment of the Casa Reales in a location that was higher, better drained, and less susceptible to flooding than the site selected in 1609. While there is dispute over when Santa Fe was first settled, all agree that the establishment of the villa occurred between 1609 and 1612 (Shishkin 1972:3; Twitchell 1914; Hordes 1990; C. T. Snow 1993a).

Still completely unresolved is the issue of the size and actual location of the first Palace and the associated plaza. Early records of the original size or layout of the Palace of the Governors do not exist, having been destroyed during the Pueblo Revolt of 1680. C. T. Snow observes that the early Palace was not exactly the "low, rambling structure, unpretentious and plain" imagined by France Scholes (1935) based on the ornate adobe floors uncovered by excavations in Rooms 7 and 13 (C. T. Snow 1993a:19). Traditional thought holds that the Palace formed a square-shaped compound extending north of the rear of the Palace buildings. C. T. Snow (1993a:20-21) suggests that the early Palace was neither square nor a fort before 1628 and never contained the four towers proscribed in the *Ordenanzas*.

If the early Palace buildings followed a square plan, they would have reached as far north as the southern edge of the current First Interstate Bank structure, placing the Museum Administration Building well inside the interior patio (Arnold 1989:131). This configuration is based on the current footprint of the Palace of the Governors. D. H. Snow (1991:1-2) concedes that the current location of the Palace of the Governors coincides with some component of the early Palace and plaza layout, but it may not contain the original Palace. He bases this hypothesis on documents that report on the size and condition of the Palace and the accepted convention that seventeenth-century churches were east of the present cathedral with the church's west boundary on the plaza, which was "formerly of this Villa." If the Palace of the Governors bordered the plaza on the north, then conceivably the Palace was located further to the east than today.

Further evidence is found in the description, subsequent treatment, and criticism of this treatment of the Palace after the Reconquest. During the Pueblo Revolt, the Palace was allegedly converted to a Tano-style pueblo with two plazas and kivas, believed by some large enough to house 1,500 Indians. Don Diego de Vargas described the pueblo complex in 1703 (Twitchell 1914) "as having ‘two Squares and its dwellings three stories high and many of four.' He complained that his successor, Governor Rodriguez, ‘with what intention or malice I know not destroyed [and] and in utter contempt ruined the said fort' [that is, the Indian dwellings which incorporated portions of the former government and administrative buildings of the villa]" (D. H. Snow 1991:1-2). Vargas also offers that the construction was not worth "a tenth part" of what existed before. Vargas's statements indicate that all or part of the original Palace buildings had been destroyed and rebuilt by his successor (D. H. Snow 1991:2).

A hypothesized demolition of all Palace buildings during the Pueblo Revolt, or shortly thereafter, does not coincide with the evidence found by C. T. Snow in her 1974-1975 Palace excavations. In Room 7, a massive foundation was exposed that has been interpreted as sufficient to support a two-story building (C. T. Snow 1993a:15). Adobe brick floors dated between 1640 and 1680 were exposed in Rooms 7 and 13 (Seifert 1979a; C. T. Snow 1974, 1993a). This previously mentioned style of floor construction was similar to examples found in Mexico and Spain, but only two other examples were known from Spanish Colonial sites in New Mexico (C. T. Snow 1993a:17). The elaborate adobe floors, substantial foundation, the presence of Pueblo Indian-made storage pits, and the abundance of seventeenth-century refuse strongly argue for a substantial portion of the seventeenth-century Palace built and partly demolished within the walls of its modern location. The location of the Palace in its present setting would indicate that D. H. Snow's findings relate to the burning and demolition of structures that were part of residential or other Casas

Reales buildings.

A larger rather than smaller configuration of the original Palace buildings and grounds is a view shared by C. T. Snow and B. Ellis, and partly adhered to by D. H. Snow (1998). Archival evidence indicates that the Palace was built in stages, may not have been one continuous architectural plan, and that it may have been bounded by residences that combined with institutional buildings forming the large enclosed plaza favored by C. T. Snow (1990). If D. H. Snow's hypothesis is more correct, then the seventeenth-century Palace materials and features may represent residential occupation, but not that of the governor of the villa. Excavation in open space, garden space, or residential space north of the Palace may inform on the former extent of the buildings and grounds and provide further insight into the Pueblo Revolt period occupation and reconquest by Vargas.

The trench excavations reported by B. Ellis in 1967 revealed three 1-m-wide adobe and cobble foundation segments (see Fig. 3). These segments are roughly the same size as the seventeenth-century foundations found in Room 7 of the Palace of the Governors. The foundation dimensions and construction indicate that these were not simple residential structures. Instead, they resemble institutional-scale foundations, such as would have been connected to the Casas Reales, lending further support to the model that the current Palace location was the main locus of the seventeenth-century Palace.

Determination of the year that the first Spanish occupation of the Palace grounds occurred relative to the construction of the Casas Reales began may only be resolved through chronometric dating. Few dating methods provide the less than 5-year resolution with little or no potential dating error. Tree-ring samples (probably burned specimens) from contexts associated with the B. Ellis-defined or other yet-to-be-discovered foundations may allow for dating between A.D. 1600 and 1605 and A.D. 1610 and 1615. Less substantial or morphologically different foundations overlaid or incorporated in the B. Ellis foundations would suggest an earlier occupation. If the B. Ellis foundations were dated to A.D. 1610 or later, then stratigraphically lower or structurally incorporated foundations would, by association, be earlier. Obviously, to speculate further would be premature. However, careful excavation and recording and the recovery of stratigraphically discrete tree-ring samples near or associated with the B. Ellis foundations and their adjacent space may provide information on the earliest settlement and founding of Santa Fe.

Complete excavation of the B. Ellis foundations and their nearby adjacent space (which is an explicit goal of this project) and the discovery of other to date unknown foundations may provide important information on the initial layout of the Palace of the Governors, remodeling episodes, demolition of Palace structures during the Pueblo Revolt and the spatial relationship of the second Palace complex to the pre-Revolt complex. At 70 to 80 cm below the pavement level, according to B. Ellis's drawing (see Fig. 3) and the results of the test excavations along the north wall of the Palace patio offices, there is the possibility of encountering burned adobe (perhaps from the demolition of the first Palace structure), patchy remnants of compacted adobe or adobe brick floors (as were found within the Palace of the Governors by C. T. Snow [1974]) or perhaps cobbles representing disarticulated remains of foundations that were disturbed by later construction activities or even modern utility line installation.

Identification, description, written and photographic recording, and cartographic documentation of wall segments, abutments, wall or foundation superpositioning, and wall construction variability may provide a range of data that will inform on construction sequences. Projection of the location of discovered wall segments relative to known segments exposed within the Palace of the Governors may allow some estimation of the size and layout of the first or second Palace building complexes. These observations may also lead to the recognition of remnants of the two-plaza pueblo constructed by the Tano Indians who occupied the Palace following the Pueblo Revolt in 1680. While it is assumed that the Tano-built pueblo used adobe and cobbles in its construction,

it is expected the foundations would be different from the Spanish-built Palace foundations.

Mechanical study of adobe samples may also provide insight into foundation associations. Adobes may have signatures that can be discriminated through mechanical and chemical characterizations. Samples from each series of foundations and multiple samples from related foundation segments will be collected and subjected to sedimentological analyses.

Obviously, chronometric data will be key to sorting out first and second Palace constructions and the Pueblo Revolt occupation. The first Palace occupation may be chronometrically discriminated through tree-ring, radiocarbon, or archaeomagnetic dating methods. For the period from A.D. 1610 to 1680, the resolution and built-in error factors for each method should allow discrimination of contexts that post-date this initial 70-year period. Pottery assemblages comprised of Tewa Polychrome and Posuge Red indicate a pre-Revolt occupation, unless other temporally diagnostic, perhaps European-made artifacts are recovered. For the Pueblo Revolt period from 1680 to 1692 period, fine-grained resolution provided by tree-ring dating will be necessary. Archaeomagnetic dating associated with a very narrow ceramic assemblage consisting solely of seventeenth-century pottery comprised primarily of Sankawi Black-on-cream, Glaze F, or Posuge Red from a discrete context (such as within a structure or subfloor pit within a structure) would be a strong indication of a Pueblo Revolt occupation. However, a similar ceramic assemblage may reflect a late seventeenth-century or early eighteenth-century occupation by Spanish settlers following the Reconquest.

Clearly, resolving differences between the Pueblo Revolt and early Reconquest periods will be difficult. European or Mexican-made (in this instance meaning made in Mexico, but not during the Mexican period) diagnostic ceramic, metal, or glass artifacts may be recovered in small quantities from discrete contexts that may strengthen a post-1700 temporal assignment. If Tewa Polychrome with Ogapoge or Powhoge Polychrome in association with an abundance of micaceous utility wares are recovered from these contexts, then a post-1720, but pre-1760 deposit or context date is most probable (Harlow 1973; Mera 1939; Warren 1979). Chronometric samples may yield date ranges that, combined with the ceramic assemblages, could provide stronger support for a 1692 to 1760 occupation rather than a Pueblo Revolt occupation. Unfortunately, the Pueblo Revolt materials that have been recovered from the Palace excavations (Seifert 1979a) could not be effectively segregated from those that date to the early 1700s. Comparison between the New Mexico Museum of Histsory materials and the Palace of the Governors' materials may shed light on the dating of both assemblages.

4. What is the location of the Palace and associated plaza after the Reconquest? Can the configuration and uses of the space be defined?

Following the Reconquest, Santa Fe was reestablished as the capital of Nuevo Mexico. During the early eighteenth century, scholars agree that the Palace was rebuilt on its current location. In 1708, the Duke of Albuquerque ordered Governor José Chacón to tear down the presidial castle in the villa (SANM II:142, in C. T. Snow 1993a:23). C. T. Snow suggests that if the order were followed, substandard replacement buildings were constructed. Part of the Palace may have been two stories high, and by 1716 it was supported by nine buttresses with only one serviceable large room that was used as a chapel (C. T. Snow 1993b). The remaining rooms had crumbling walls that were supported by buttresses and other added supports (SANM II: 253, in C. T. Snow 1993a:24). Other structures mentioned as part of the Palace grounds were a corral, two entrances on the south side of the Palace, a horse-driven flour mill, a coach room, and a well in the courtyard (C. T. Snow 1993a:24). Other documents indicate that the Palace had two towers, one of which stored gunpowder (SANM II: 169, in C. T. Snow 1993a:24). Since the locations of these various facilities are unknown, it is not improbable that some remnant of one or more may be found during the New

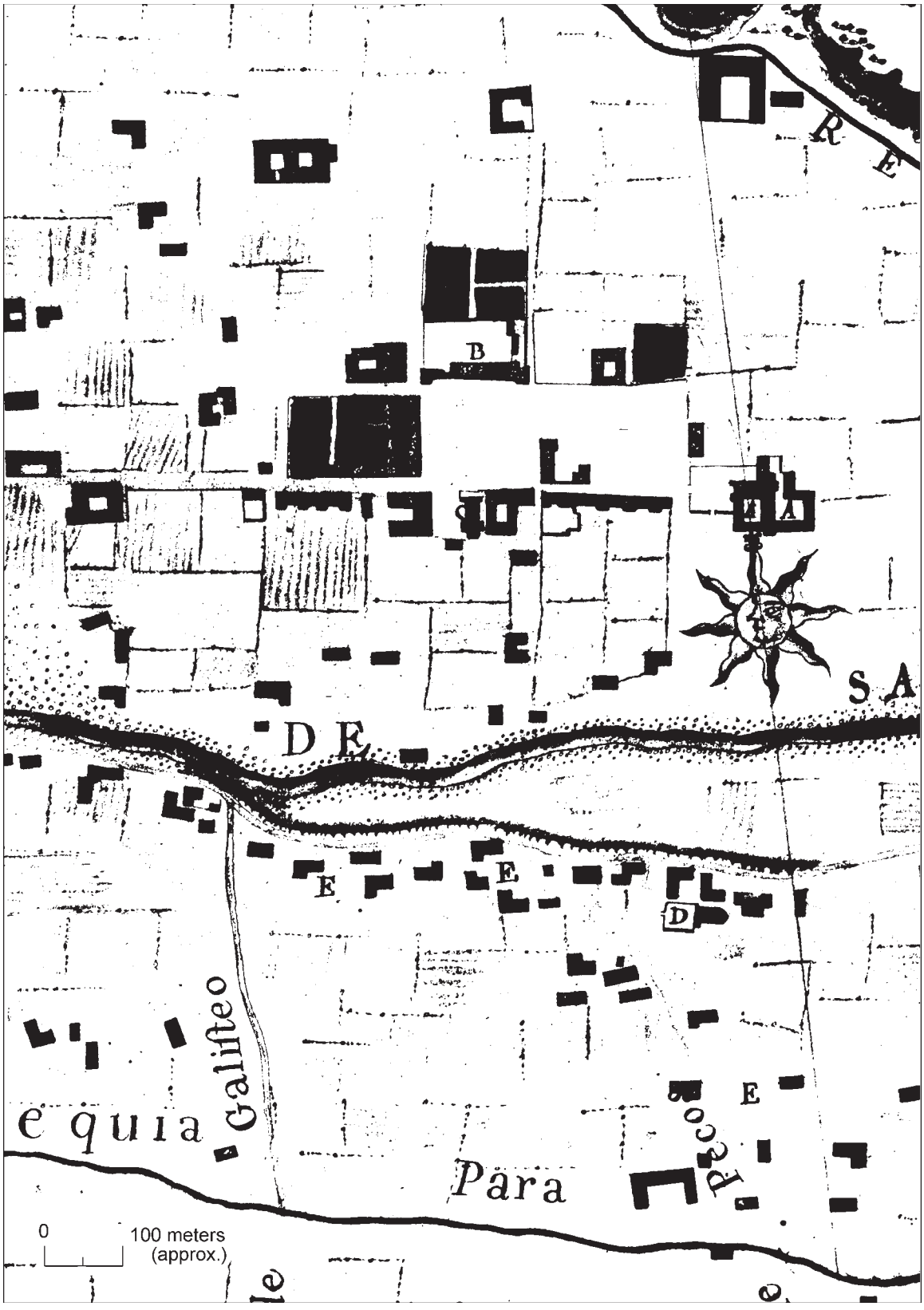


Figure 4. Urrutia map of 1766 (B marks location of the Palace of the Governors).

Mexico Museum of History excavation.

Other documents refer to the Palace and its grounds and surrounding buildings and streets, although the size and layout of the eighteenth-century Palace is poorly known. The Palace constantly needed repairs, which were sometimes funded by individual governors (C. T. Snow 1993a:26). In 1760, Dr. Pedro Tamarón y Romeral, Bishop of Durango, stated that, "there is no fortress there, nor any formal presidio building" (Adams 1954:46-47). This description of a rudimentary Palace complex is further corroborated by the Urrutia map of 1766-1768 (Fig. 4). This rendering shows the Palace as a single, elongated structure (of an unknown room count), oriented east to west. There was one east-west outbuilding north of the Palace's west end. To the north of the east end of the Palace there were two north-south oriented outbuildings. Neither the flour mill, corral, nor coach room mentioned in the 1716 document are shown on the map. Urrutia's map paints a fairly rudimentary Palace plan. Obviously, the Palace layout for the eighteenth century leading up to 1788 is only marginally better known than the seventeenth-century layout.

Again, the B. Ellis foundations and other foundations will be the primary evidence for investigating the middle to late eighteenth-century Palace grounds layout. Chronometric dating of samples directly or closely associated with the foundations may show that they are from this period or later. The detailed recording, as described above, of the foundations, feature associations, and perhaps the distribution of disarticulated structure debris may allow interior and exterior space to be defined. A variety of foundation styles or clusters of particular building debris may indicate the presence of ancillary structures or facilities that are known from the archival documents, but are not shown on any maps or precisely located by description. Less substantial foundations may be expected for buildings associated with the flour mill or its foundation. The corral may be represented by a series of postholes. Multiple postholes would allow some estimate of the corral dimensions, if nothing else.

Dating the foundations and features from this period will rely on the same chronometric and cross-dating methods described above. Tree-ring, archaeomagnetic, and radiocarbon samples will yield dates of varying resolution. Manufacture dates for European-made or Mexican-made (in this instance meaning made in Mexico, but not during the Mexican period) metal, glass, or ceramic artifacts may allow resolution of one or two decades. Native American-made pottery is of uneven utility and is heavily dependent on the quality and integrity of the recovery context. Tewa Polychrome pottery manufacture decreases dramatically after A.D. 1725 and stops around A.D. 1750 (Warren 1979). Ogapoge Polychrome, which can be difficult to differentiate from the contemporary and succeeding Powhoge Polychrome, has a manufacture date span between A.D. 1720 and 1780 and can be a good indicator of middle to late eighteenth-century occupations (Warren 1979). Powhoge Polychrome was produced from around A.D. 1760 until the twentieth century. As the only decorated pottery type in an assemblage it may indicate a late eighteenth-century occupation contemporary with the presidio construction and occupation (Warren 1977).

5. Can the late eighteenth-century footprint be more clearly defined? Can differences in architecture and site function relating to late Spanish Colonial and Mexican period occupations be distinguished?

In 1780, construction of a new *cuartel* (presidio) was authorized for Santa Fe, and construction was begun in 1781 with paid citizen labor (Simmons 1968:14-15). Specifications for buildings and building materials and the presidio plan were detailed and intended to standardize the presidio system. Important to this study is the specified width of a vara for the walls of the church and the commander's house. The foundations and walls for these buildings were specified at 1 vara (roughly 39 inches), which would have been sufficient to support a two-story building (ASNM II: 814, in C. T. Snow 1993a:29). A *vara* is only slightly wider than the B. Ellis 1967 foundations in

the Museum Administration Building parking lot. In 1780, the old presidio was located west of the Palace, but the new presidio was to incorporate the Palace and existing presidio. To acquire sufficient land for construction, private houses and land were purchased, indicating that residences were located very close to the military grounds and governor's quarters. The new presidio was completed in 1791.

During the Spanish presidio era, barracks for about 100 men and a large parade ground were located somewhere north of the Palace buildings, perhaps encompassing part of the courtyard (Simmons 1968; Arnold 1989). The presidio had a massive wall extending as far north as the present Scottish Rite Temple and west as far as Grant Street (Arnold 1989). It had towers on the corners with an entrance where Lincoln and Palace Avenue now intersect. A jail house was located next to this entrance, not far from the current Museum Administration Building. By 1821, only a few soldiers remained in the presidio, of which much was then in ruins. There are records of chickens, horses, and cows occupying the former barracks (LeCompte 1989:79).

From 1791 to 1846, observations pertaining to the Palace and its adjacent buildings and grounds related primarily to the constant state of deterioration and minor aspects of construction and structural detail. Rotted canales were observed in 1810 and windows made from glass were noted in 1831 (Weber 1967:184-185). The first maps drawn by Emory and Gilmer in 1846 and Gilmer in 1848 for the United States Army give the impression that a large part of the Palace and presidio were in ruins and that serviceable buildings were limited (Figs. 5 and 6). These maps show little evidence of buildings within the area of the Museum Administration Building parking lot. The area north of the Palace is shown as open space and is labeled as corn fields on the Emory and Gilmer 1846 map.

Distinguishing the 1791 presidio buildings from the earlier Palace constructions may be difficult from foundations alone. The presidio foundation specification of 1 vara (about 1 m) coincides with the foundation widths observed in the Palace of the Governors' excavations that are ascribed to the seventeenth- and early to middle eighteenth-century construction episodes. Also, the existing Palace buildings were to be incorporated into the presidio rather than replaced (C. T. Snow 1974:11). Some evidence of remodeling was evident in Room 7 of the Palace, but the overall effects of presidio construction were not evident in the Palace excavations (C. T. Snow 1974:10). Structures or other enclosed spaces may have been added to the Palace grounds or existing ancillary structures modified by presidio construction, but they may be difficult to distinguish by architectural detail alone because of the long history of using similar construction materials and techniques.

Obviously, a scaled map of the presidio would advance projections of buildings located within the New Mexico Museum of History site and it would greatly aid on-site interpretations of potentially fragmentary or discontinuous foundation segments. Unfortunately, the primary map reference for the presidio may have the wrong scale or represents the ideal presidio, rather than the actual complex (C. T. Snow 1974:11, 1993a:30-31). Palace excavations provided limited architectural data that can be used to identify and interpret late eighteenth- or early nineteenth-century occupations, partly due to limited excavation scope, but also because of the Nusbaum renovations, which removed or altered Spanish, Mexican, and Territorial period characteristics of the structure and grounds.

Identification of presidio-era construction or features within the New Mexico Museum of History site will be poorly supported by archival maps. This means that identification and interpretation will rely primarily on stratigraphic evidence, and perhaps, comparisons with other presidio excavation data, during and after the excavations. Nusbaum's removal of late eighteenth- and nineteenth-century fill and refuse from the Palace grounds may have extended into the New Mexico Museum of History site. This might limit the abundance of artifacts and architectural debris that could aid in dating the foundations and other features. Potential relative dating sources

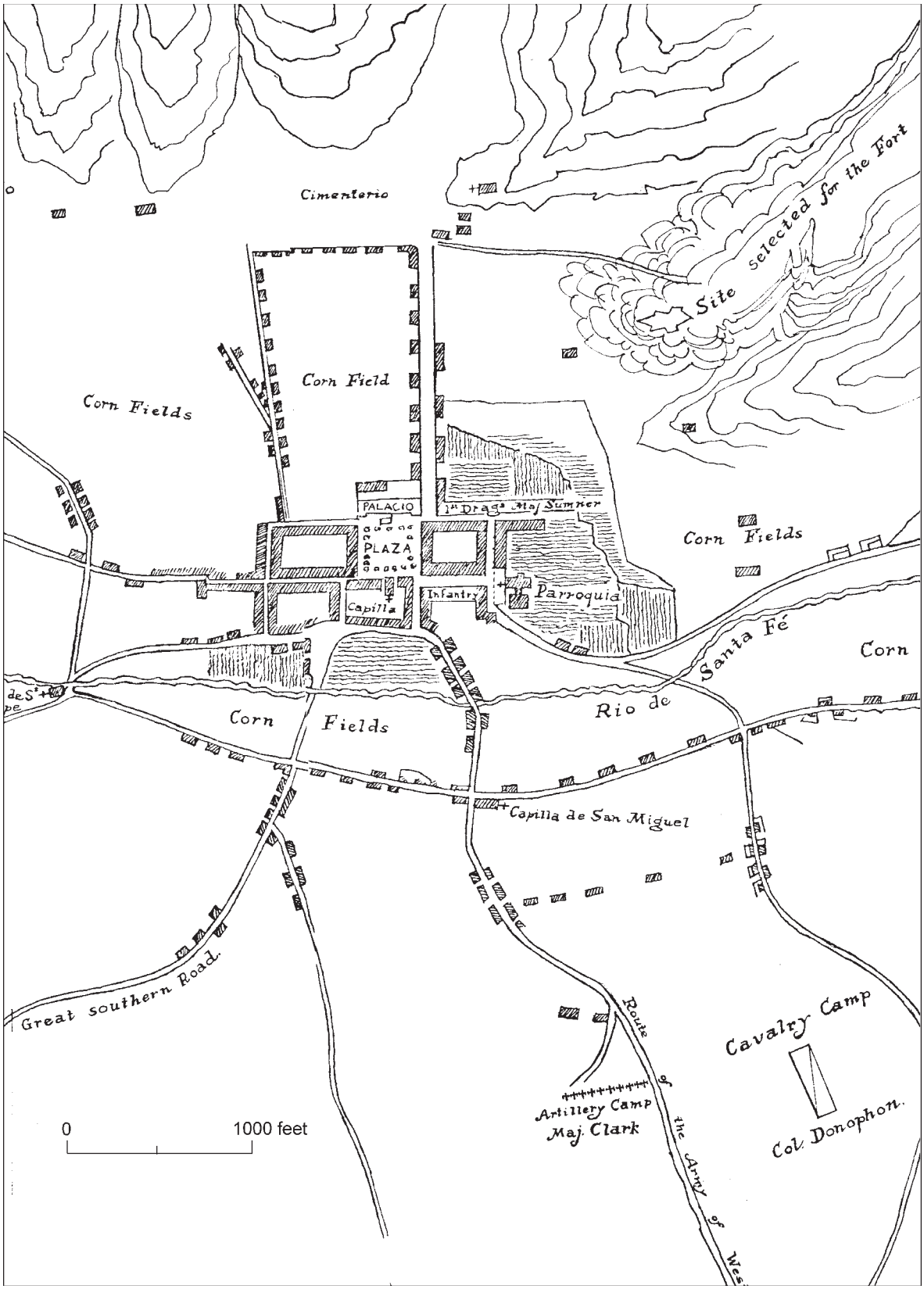


Figure 5. "Reconnaissance of Santa Fe and its Environs" by Lt. W. H. Emory and J. P. Gilmer, 1846.

Figure 6. 1846-47 plan of Santa Fe, New Mexico, surveyed and drawn by J.H.W. Gilmer, Sec. Lieut. U.S. Corps of Engineers.

are the deposits below B. Ellis's 1967 foundations or any other foundations that may be found. Obviously, if these foundations lie on top of eighteenth-century debris then is likely that they date to later portions of that century or the nineteenth century. Historic pottery manufacturing dates from levels below the foundations and from within any identified wall melt or collapse, as well as datable artifacts found within intact adobe bricks will also inform on the age of any foundations that are identified. Idiosyncratic construction techniques or materials that may be known for presidio-era buildings and ancillary structures may also provide chronological insight. Chronometric dating sources may also be available, and they would be employed and evaluated, as previously described.

Differentiating between Spanish Colonial, Mexican, and early Territorial use of the New Mexico Museum of History site is possible, but may be difficult. Renovations and remodeling that occurred may not have affected foundations or lower wall segments, unless buildings were completely razed and rebuilt. This is important because we expect that only foundations or wall stubs will be exposed by the proposed excavations. Substantial remodeling did occur within the existing Palace of the Governors during the Mexican period, but how widespread these alterations were is not known (C.T. Snow 1974:10-11). During this period, buildings north of the Palace had fallen into ruin or had been demolished. Uses of structures that may not have been recorded might include sheds of wood or jacal construction, expedient livestock stalls, fences, and acequias. Excavation may encounter evidence of these ancillary structures, but it may not be possible to directly date them. Excavation within the footprint of the History Library Addition exposed a 4-m-long cedar plank that may have remained from utilitarian structures related to livestock husbandry or garden maintenance (Post 1995). It was lying at a level commensurate with other late eighteenth-century or early nineteenth-century artifacts, suggesting that it remained from the presidio and may have been used during the early Territorial period military occupation.

The recovery and distribution of artifacts dating after the 1821 Santa Fe Trail opening may help rule out presidio-era occupation and construction of features. While American-made goods may have been trickling into Santa Fe prior to 1821, after 1821 they would have become more abundant. Careful identification of metal, glass, and non-Pueblo-made pottery may differentiate Spanish from Mexican or Anglo-American occupation. By the same token, increased proportions of American- manufactured goods relative to Mexican-made or aboriginal goods would indicate Territorial period deposits, perhaps dating architectural and other features by association.

6. Available maps and other data indicate that extensive remodeling/renovation occurred during the Territorial period, but good potential exists for the presence of Territorial period architectural features within the New Mexico Museum of History site. Can the Territorial "footprint" and uses of the space be more clearly defined?

From 1848 to 1909, the Palace of the Governors went through changes related to military and Territorial government occupation. During this period, the Palace and immediate grounds underwent regular and usually patchwork changes through renovation and remodeling. These changes are succinctly described in J. K. Shishkin's *The Palace of the Governors* (1972). Details of these changes are beyond the immediate scope of this data recovery plan. Instead, a review of selected maps provides the basis for identifying potential Territorial period architectural features within the New Mexico Museum of History site.

The earliest maps from 1846 and 1848 have been discussed above (see Figs. 5 and 6). They provide limited detail on outbuildings and no information on the condition of buildings. An 1853 map of the Fort Marcy Military Post shows the Palace and the "public grounds, the property of the United States or the Territory" (Fig. 7). Extending north from the west end of the Palace is a long building labeled "guard houses." This building is 115 yards long and can be estimated at 13.5

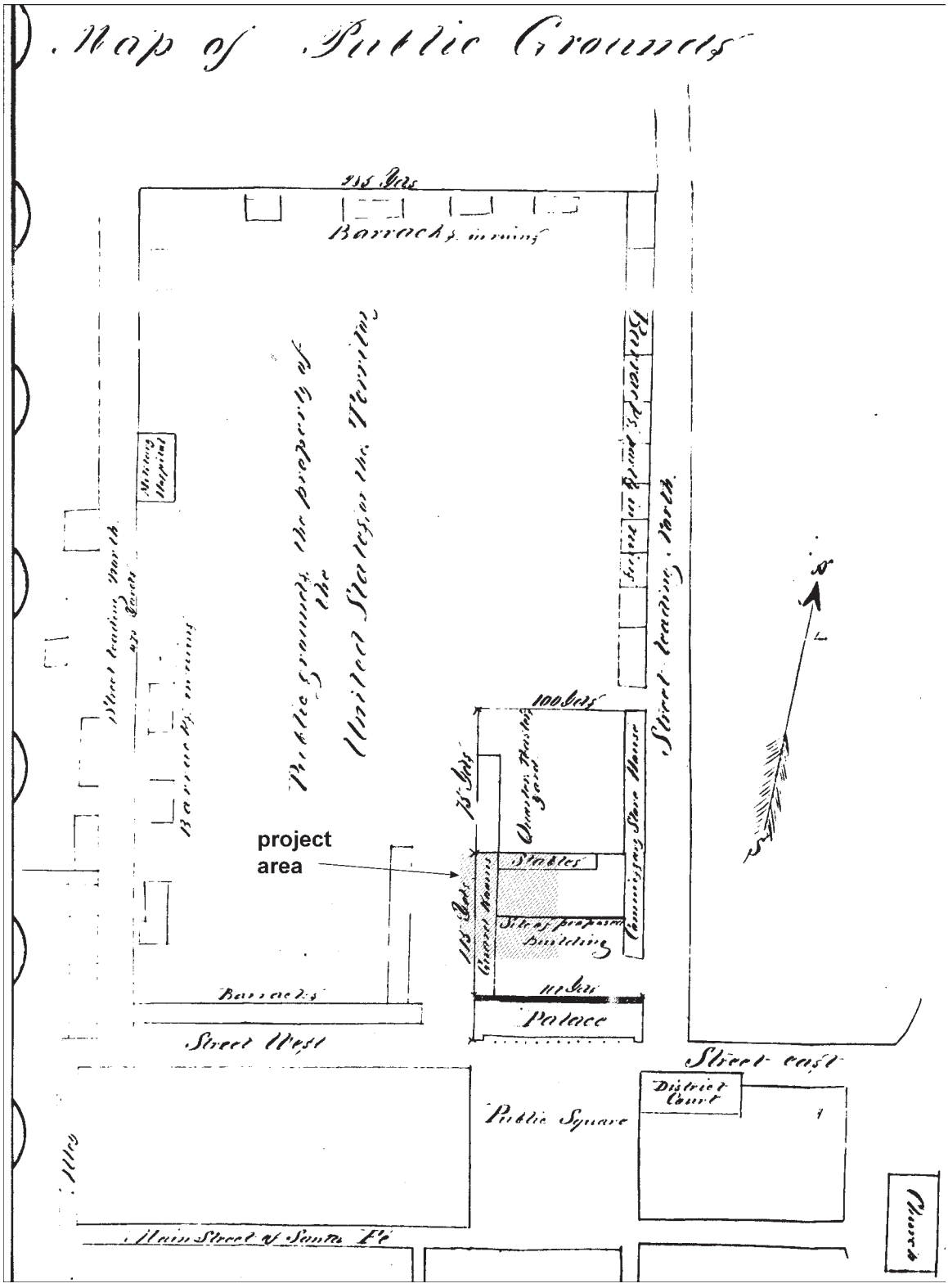
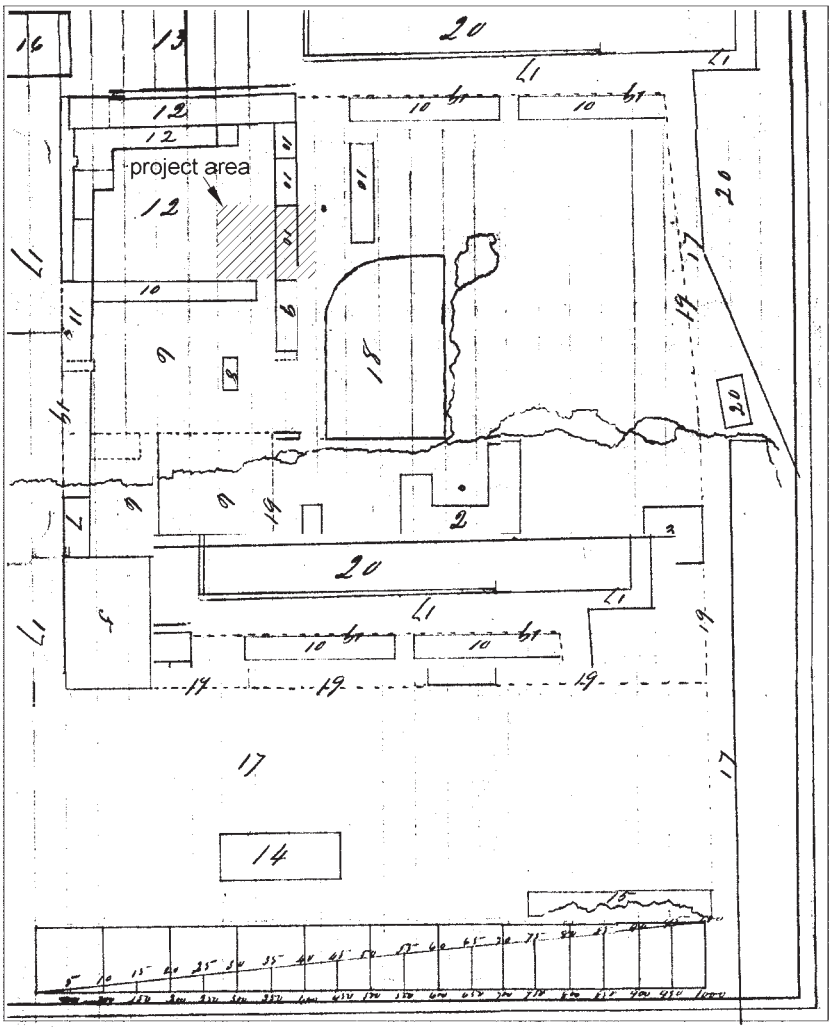


Figure 7. Fort Marcy Military Post, "Public grounds, the property of the United States or the Territory," 1853.



1. Officers Quarters
2. Mens Quarters
3. Hospital
4. Qr. Masters and Subsistence Store houses
5. Corral of Dept. Head Quarters
6. Post Corral
7. Corn house. new.
8. Old Corn house
9. Stables
10. Ruins
11. Site for Blacksmith and Carpenters Shop
12. Governors Residence and Yards
13. Public Plaza
14. State House
15. Penitentiary
16. Court House
17. Streets
18. Post Garden
19. Dotted lines.. Walls to be built
20. Private Buildings

Figure 8. 1859 map of the Fort Marcy Military Post.

yards wide. Using these dimensions to project the "guard houses" location, it would have crossed the current Museum Administration Building parking lot driveway and extended 5 to 8 m up the driveway to the east. Since this is an early Territorial period map, these structures probably represent presidio buildings that were adapted for military use or demolished during the military post construction. Also note that Lincoln Avenue had not been built by this time, so that the west wall of the "guard houses" was somewhere in the current Lincoln Avenue.

The 1859 map of the Fort Marcy Military Post shows the same layout as the 1853 map, but identifies the former "guard houses" as ruins (Fig. 8). The description of the ruins suggests that the buildings were not reoccupied by the United States Army. This also confirms the poor condition of the Palace grounds alluded to by Mexican and American observers prior to the Mexican-American War. An 1869 map of the "Ground Plans of the Palace at Santa Fé" shows that a large portion of the main Palace building was rebuilt or restored (Fig. 9). Unfortunately, this map does not extend far enough north to provide information on the New Mexico Museum of Hisotry site. Also in 1866, the dilapidated west end of the Palace was removed, facilitating the construction of Lincoln Avenue (Shishkin 1972:30). This action shortened the Palace by almost 10 m based on map-derived dimensions.

The Hartmann map from 1886 shows the Governor's Palace, the current patio, and the Museum Administration Building parking lot contained within a garden (Fig. 10). By this time the Palace had reverted to the Territory, and by 1898, Congress granted the Palace and its lands and appurtenances to the Territory of New Mexico (Shishkin 1972). The buildings shown north of the west end of the Palace may be remnants of the Fort Marcy structures or they may have been rebuilt after the construction of Lincoln Avenue. Given their location, foundations or building rubble from the demolition of these structures may remain within the Museum Administration Building parking lot driveway.

The 1908 Sanborn map precedes Jesse Nusbaum's renovation. It shows the Women's Board of Trade Building separated from the north wall of the Palace buildings by open space that is currently occupied by the Palace of the Governors' offices (Fig. 11). North of the west end of the Palace, in the Museum Administration Building location, there is the Fire Department, which was built between 1886 and 1902. There is open space coinciding with the current Museum Administration Building parking lot driveway, suggesting that the Fire Department building construction did not destroy what may remain below the surface from pre-twentieth-century occupation.

Finally, in 1909, the Museum of New Mexico was established by the Territorial legislature and was put in charge of the Palace of the Governors. From 1909 to 1912, Jesse Nusbaum undertook massive renovation and construction (Hewett 1912). The patio offices, which border the Museum Administration Building parking lot on the south, were constructed at this time. It does not appear that any structural vestige of the former military, presidio, or Casas Reales remained. As part of the renovation, 1,000 cubic yards of dirt were removed from the Palace grounds. Even though the soil was examined for archaeological remains, no artifacts or data remain from those efforts. Instead, Palace scholars believe that a large part of the eighteenth- and nineteenth-century archaeological record was removed (C. T. Snow 1993a). Consequently, the New Mexico Museum of History site may have some of the only remaining deposits from this period. From the construction work and utility installations throughout the twentieth century there will be mixing of deposits in upper levels and in linear blocks within the parking lot.

Evidence of Territorial period construction would include a range of architectural and construction debris and hardware that would not have been considered salvageable. Architectural debris might include cement, kiln-fired brick, and lime mortar, and maybe fragments of milled lumber. Construction hardware might include machine-made framing supplies (such as nails), door and window fasteners, locks, and handles, for example. Window glass will be more abundant

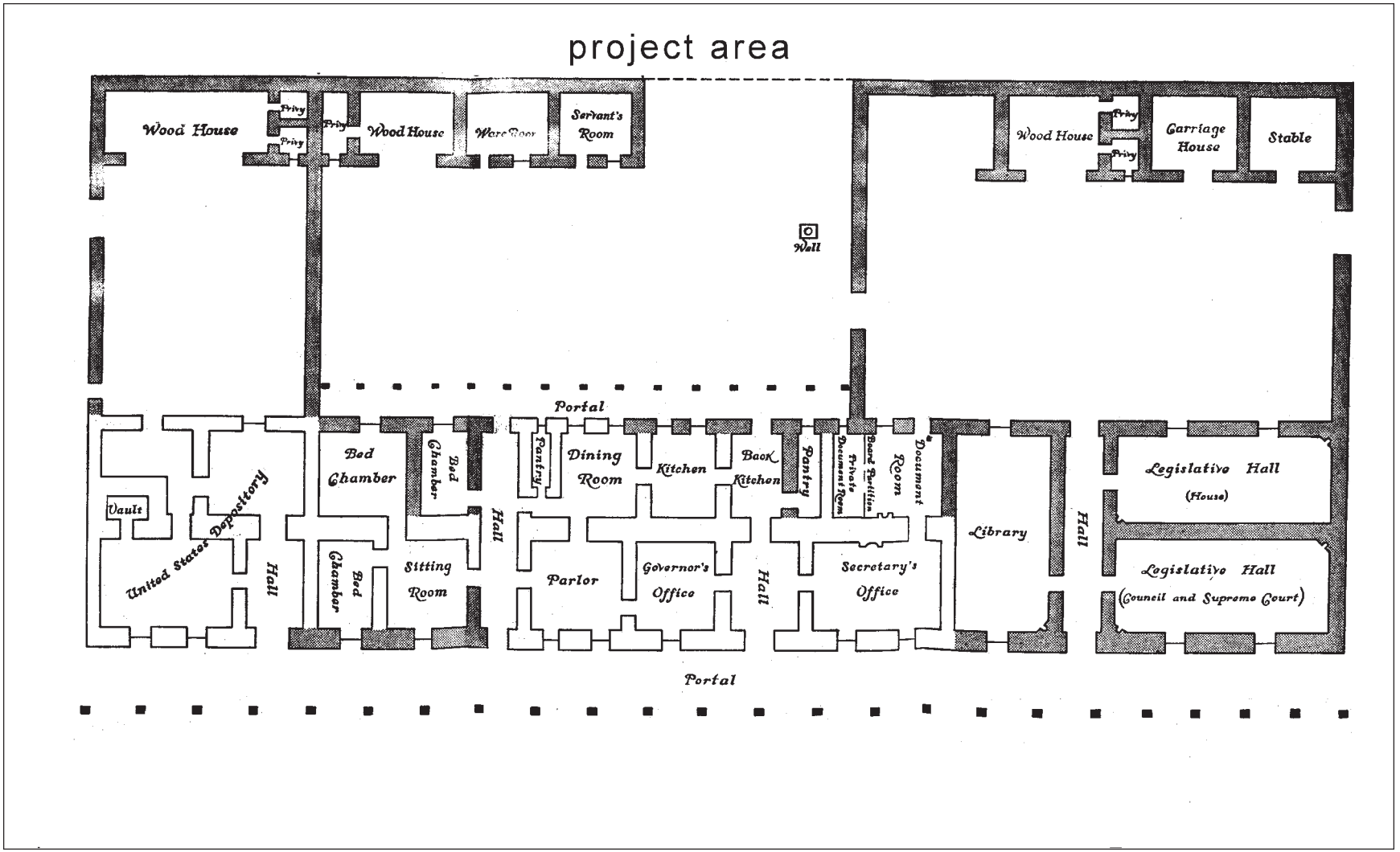


Figure 9. Ground plans of the Palace at Santa Fe, 1869 (History Library, Palace of the Governors, Museum of New Mexico).

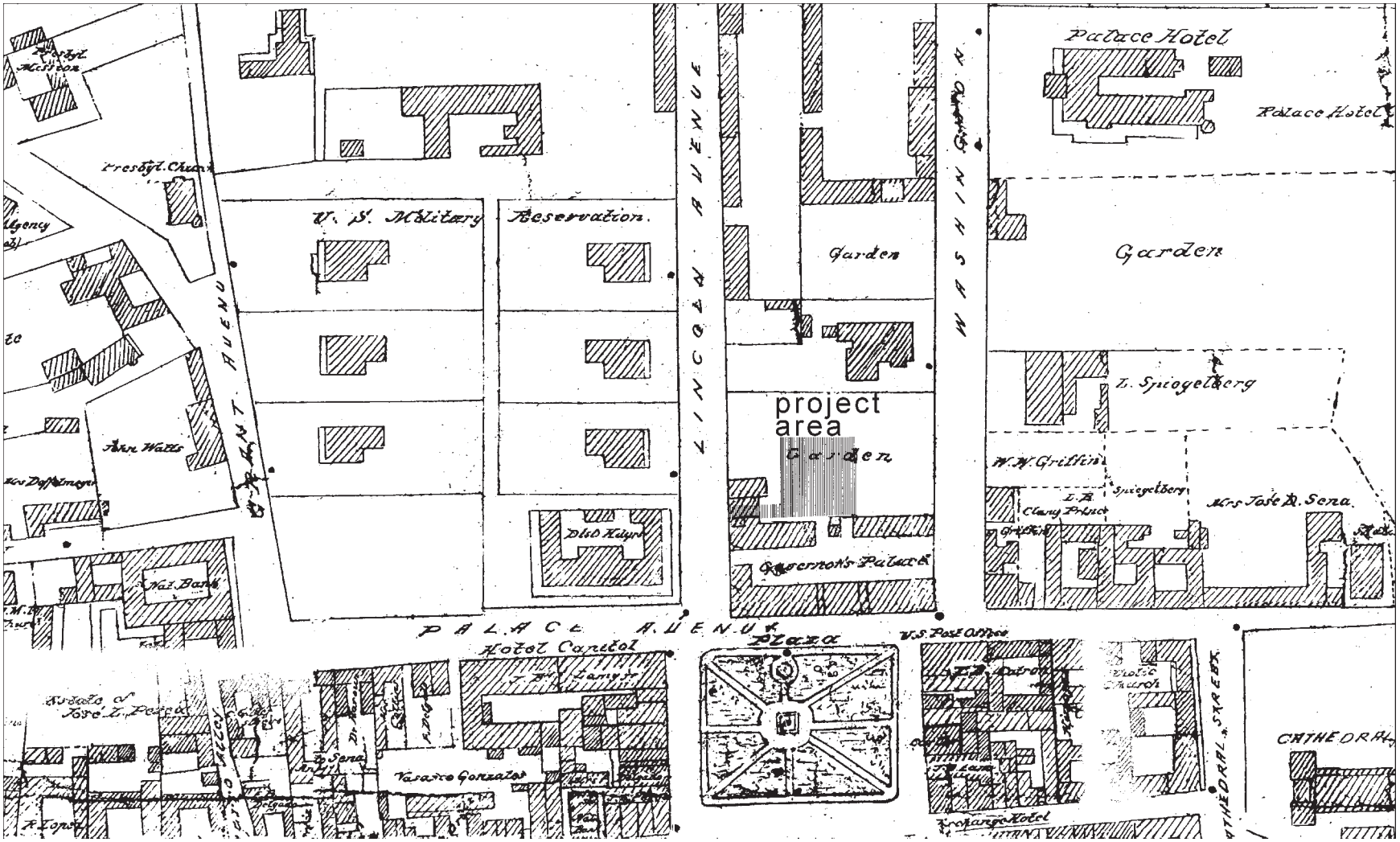


Figure 10. Portion of 1886 Hartmann map of Santa Fe showing Palace of the Governors and grounds (History Library, Palace of the Governors, Museum of New Mexico).

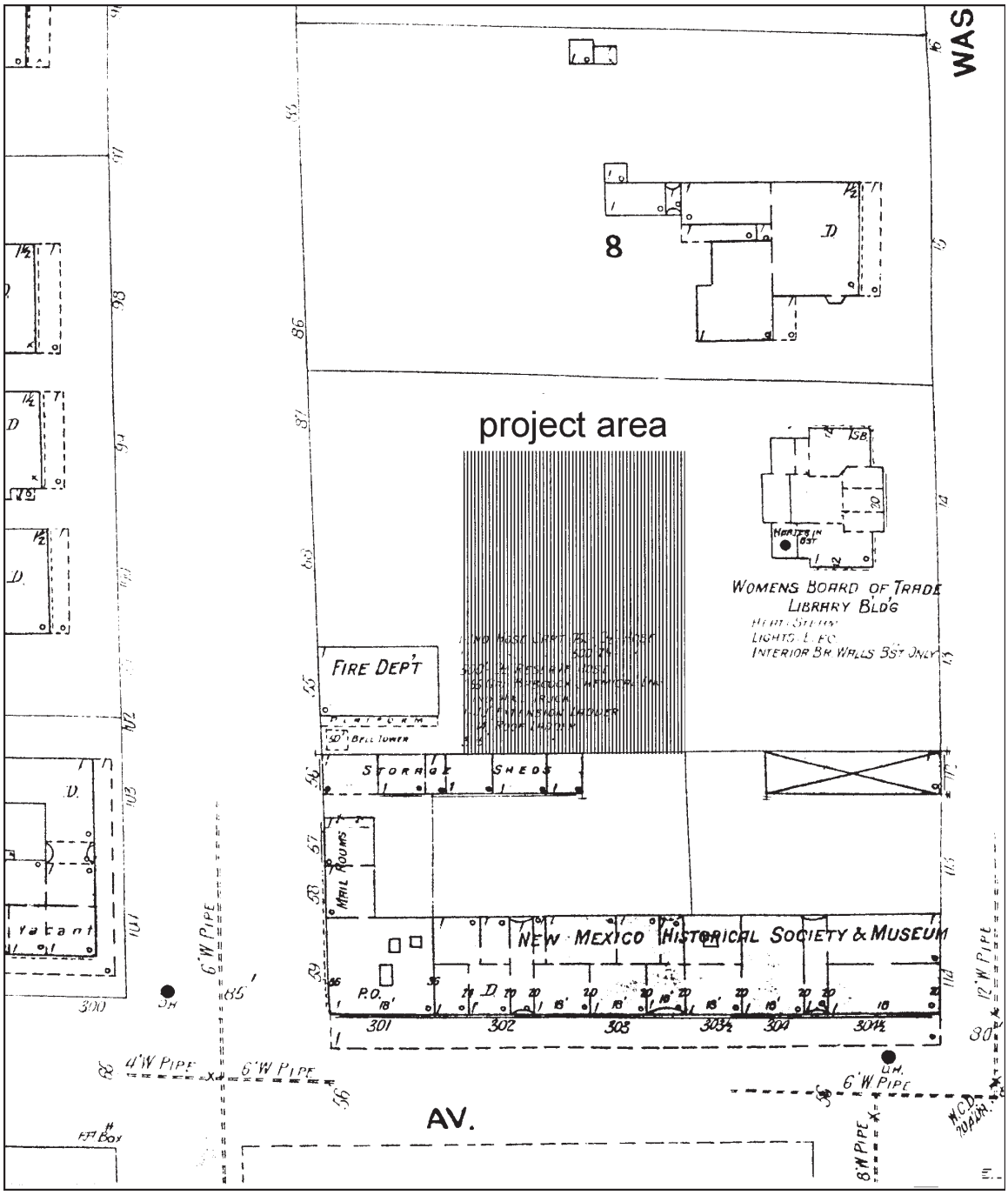


Figure 11. Sanborn Insurance map, 1908 (History Library, Palace of the Governors, Museum of New Mexico).

and standardized than earlier products. It is expected that late Territorial period features and deposits will be readily recognized from this dramatic change in source, quality, abundance, and variety of goods and materials.

Examine changing economic strategies and technological organization as reflected in the material culture and subsistence data.

During the 700 years of Palace grounds occupation, there were long periods of stability in the local economy as inferred from technological aspects of material culture and waste products from subsistence activities and pursuits. These long periods were punctuated by abrupt changes (abrupt defined as visible or measurable change within a generation) that redefined or reorganized economic interaction and behavior. Important changes can be summarized starting with the residential abandonment of the downtown area by ancestral Puebloan populations. In 1610, there was the establishment of the Villa at Santa Fe by don Pedro de Peralta and his successors, bringing with them a mix of caravan trade and reliance on local production and technology. The increased economic role of Santa Fe and New Mexico following the Reconquest and the steady influx of settlers along the Rio Grande gradually filled a vast region late in the eighteenth century. The opening of the Santa Fe Trail in 1821 provided a new outlet for New Mexico's agricultural products as well as access to larger quantities and varieties of manufactured goods. The establishment of the Territory following the Mexican-American War in 1848 integrated New Mexico into the United States' national and military economy, as westward expansion and settlement continued into the twentieth century. Finally, the completion of the Atchison, Topeka, and Santa Fe Railway, which decreased the time and cost transporting people and goods, further integrated New Mexico, and perhaps for the first time, ushered in a widespread reliance on the manufacturing economy that permeated rural economies, except for the most remote or minimally populated areas. The temporal interval separating major events shortens from hundreds of years to decades from early to late in the chronological sequence. Each change had material consequences that may be represented in the artifact and subsistence data that has been recovered from the Palace of the Governors by past excavations and will be recovered by future excavations. Rather than going into great detail on data that are available and current interpretations at this point, potential analytical and interpretive contexts for economic and subsistence data will be summarized for each major period. All expectations are limited by the long occupation history and attendant natural and cultural processes that have affected the archaeological record. These various processes and disturbances have reduced the proportions of materials that can be recovered from primary contexts relating to actual events in prehistory and history, leaving assemblages that represent a collective, mixed, and selectively incomplete record of economic and technological orientations.

Late Developmental to Classic Period, A.D. 1050 to 1600

1. How do features and artifacts from this period reflect changing ancestral Puebloan land use and the role that setting and environment of downtown Santa Fe played within a local and regional social and economic organization?

Artifacts from this period are rarely recovered from unmixed contexts within the Palace of the Governors or from much of the downtown area, for that matter. Nonarchitectural features are rarely exposed or reported. Architectural features, such as pit structures and puddled adobe structures with cobble footings have been found on the periphery of the Palace and downtown, but even the extensive First Interstate Bank excavation failed to yield substantial ancestral Puebloan archaeological deposits (Schaafsma 1982).

Pottery and chipped stone are the most likely artifact types that may be recovered (Post and D. H. Snow 1982; Seifert 1979a; C. T. Snow 1974). Probably occurring in low frequencies, pottery from this period can be compared with collections from the History Library Addition (Post 1995), the interior of the Palace of the Governors (Seifert 1979a), the Schoolhouse site (LA 1045), and selected locations from downtown and its periphery, especially along the Santa Fe River, the San Miguel Chapel area, and the Fort Marcy hill area. Some of the pottery manufactured within the A.D. 1050 to 1350 period is inherently temporally diagnostic and can be identified, analyzed, and interpreted within the realm of social and economic interaction between Santa Fe River communities or settlements and the eastern Galisteo Basin and southern Sangre de Cristo foothill communities, as exemplified by Arroyo Hondo Pueblo (LA 15) and Pueblo Alamo (LA 8), the Tesuque River communities of the southern Tewa Basin, and the Pajarito Plateau communities. Comparisons of technological and stylistical variables of this pottery subset will be used to integrate Palace assemblages into the regional context. Unless stratigraphically unmixed assemblages are encountered, other artifact types from this period that are not inherently temporally diagnostic (such as animal bone, some pottery, and flaked lithic artifacts, among others) cannot be reliably distinguished from similar types from other periods. Their comparative and interpretive contributions will be constrained as a result.

After A.D. 1400 much of the upper Santa Fe River was abandoned and populations shifted to the Galisteo Basin, the lower Santa Fe River, the Tewa Basin, and the Pajarito Plateau. From A.D. 1400 to 1600, the upper Santa Fe River would have been unsettled territory, seasonally exploited for its biotic and geologic resources in riparian, piedmont, foothill, and montane settings. Instead of evidence from the full range of economic and technological organization, the excavations may yield information about the identity of groups that were regularly or sporadically returning to, but not resettling the Santa Fe area. Glaze ware pottery suggests Galisteo Basin or middle Rio Grande orientation, while biscuit wares are more commonly associated with Tewa Basin and northern Pajarito Plateau influences. Both wares are found in the piedmont settings (Wolfman et al. 1989; Post 1996; Lang 1997) and from previous Palace excavations (Seifert 1979a; Post 1995).

Recovery of chipped and ground stone and faunal remains from unmixed A.D. 1200 to 1600 contexts will allow an assessment of changing subsistence strategies. From A.D. 1200 to 1400, a more sedentary, agricultural-based economy was practiced along the Santa Fe River. Diurnal foraging and hunting would have been more likely to occur along the river and on the margins of the cienega that may have been present (Tigges 1990; Post 1996). Production and use of stone tools should reflect residential occupations with higher frequencies of expedient core reduction debris, use of locally available raw materials, such as Madera chert (Lang 1993), and production, use, and refurbishing formal tools and grinding implements. Faunal remains may include a wide variety of small, medium, and large mammals with a predominance of field and riparian species.

After A.D. 1400, ancestral Puebloan occupations may have been sporadic and staged from more distant villages downstream along the Santa Fe River or north from the Tesuque Basin. An artifact assemblage reflecting more logistically organized populations might be expected. This change might be reflected in the occurrence of lower frequencies of pottery, especially utility wares, a higher incidence of formal tools and nonlocal lithic raw materials (such as obsidian), a decrease in grinding implements, since plants would not be processed but would be transported as food, and a decrease in faunal remains. Faunal remains might reflect exploitation of riparian species available along the river and on the margins of the cienega.

Although this model of 1400-1605 occupation is relatively well developed, the degree to which it can be addressed with excavation data will be dependent on the qualities of the archaeological deposits encountered in the excavations. Some of the pottery of this period will be inherently diagnostic and interpretable, but economic and organizational inferences from artifact classes that are not inherently temporally diagnostic will be totally dependent on the discovery of strati-

graphically unmixed deposits.

Early Spanish Colonial Period, A.D. 1605 to 1680

2. How were early residents of the Palace and Santa Fe integrated into local and long-distance economies prior to the Pueblo Revolt?

Perhaps as early as 1605 and definitely by 1610, Santa Fe was settled by Spanish colonists from San Gabriel and supplemented by new settlers from Mexico. While traditional histories characterize early settlement as rudimentary, more recent evidence suggests that Spanish homes did have amenities and that "status" items were probably more widely present than might be expected (C. T. Snow 1993c). In other words, majolica, fine woodwork, jewelry, fine clothing, and silverware, among other possessions, were commonly found in Spanish colonial households. The amount and quality of these items varied and identified the relative status of their owners (C. T. Snow 1993c:69-76). Some attribute the perception of a lack of luxury and refinement to a misinterpretation of the cultural milieu of the seventeenth-century settlers, not that they were crude or unrefined, but that they followed a somewhat prescribed pattern of colonization with regard to material culture (C. T. Snow 1993c:69). Others attribute this characterization to the *leyenda negra,* perpetuated to relegate the Spanish colonial contribution to North America to an underdog position (Thomas 1999:12). C. T. Snow's lists of goods brought with founding colonists dispel any impression of baseness or poverty, at least at the outset (C. T. Snow 1993c). However, the dynamics of acquiring replacement goods and supplies were a different story, since everything that could not be produced in Santa Fe had to be shipped in caravans by oxcart from Mexico. Though regularly scheduled, the caravans were separated by two to four years (Ivey 1993:41; C. T. Snow 1993c:73). They supplied both secular and church needs. Transport was expensive, and there were many opportunities along the way for goods to arrive at the wrong destination.

What constraints does this economic system place on the pre-Pueblo Revolt archaeological record of the Palace of the Governors? Many of the items described by C. T. Snow (1993c) were perishable and would not preserve in the archaeological record (even if they were deposited within a discrete or secure context). Metal fasteners, adornments, jewelry, and bone or ivory might preserve (C. T. Snow 1993c:71). Scarcity, especially of metal goods and raw material and luxury items, contributed to long-term curation, recycling, and hoarding. Metal from Mexico made it to Santa Fe but with irregularity, leaving inhabitants dependent on local technologies and products. Curation, recycling, and hoarding have had the effect of keeping metal artifacts from the seventeenth century out of the archaeological record, except in the smallest quantities. This can be observed in the collections from the excavations at San Gabriel (Ellis 1989) and the Palace of the Governors (Seifert 1979a; C. T. Snow 1974), where relatively few metal artifacts were recovered relative to the tons of metal that were reportedly transported to New Mexico with Oñate in 1598 (Post et al. 1999). Seventeenth-century metal artifacts recovered from the Palace are not listed in the Seifert report (1979a:108-110). All metal artifacts are grouped, and household and construction items are the most common category. Apparently, the bulk of the metal artifacts were never analyzed and remain in the Archaeological Research Collection of the Museum of New Mexico.

Undoubtedly, the bulk of the seventeenth-century material recovered will be locally or regionally produced pottery and domesticated and wild animal bone. These will be augmented by lesser frequencies of chipped and ground stone artifacts, which may have been used in daily maintenance and domestic activities as replacements for scarce metal tools and containers.

Pottery from secure seventeenth-century contexts may be productively linked to local and regional economic interaction. Excavations within the Palace and surrounding downtown area commonly yield seventeenth-century pottery. Typically, the pottery is recovered from trash-filled

pits on the edge of the downtown cienega (D. H. Snow 1991) or on the banks of the Rio Chiquito (Wiseman 1988). Frequencies range from tens to thousands of sherds from decorated and utility ware vessels. Analyses focus on the decorated pottery for its chronometric application, while limited effort has gone into examining pottery proportions relative to manufacture source and potential implications of economic specialization and access to goods. Cursory examination of the 1974-1975 assemblage suggests a Tewa source for the majority of the pottery with much smaller amounts of Keres-made glaze ware. Wiseman's La Fonda pottery analysis identified glaze wares as 22 percent of the assemblage, which is substantially higher than the Palace assemblage (Wiseman 1988:33). This difference may reflect the late seventeenth or early eighteenth-century discard of an unknown percentage of the Palace ceramics combined with a probable 1620 to 1680 discard time for the La Fonda ceramics. These two assemblages show sufficient differences, regardless of temporal considerations, to indicate that residents of the Palace and the other civilian or military downtown Santa Fe residents may have had differential access to Tano, Tewa, or Keres pottery-making villages. The pre-1680 site, LA 20000 in La Cienega, is dominated by polished Tewa Polychrome or Posuge Red, suggesting a reliance or access to Tewa potters. Glaze ware is almost nonexistent, suggesting limited access to Keres or Tano pottery-manufacturing centers. Do these distributions reflect secular control of access to Pueblo-made goods, or do they reflect differential access to goods determined by secular and ecclesiastical factionalism? Ceramic studies at San Marcos, San Lazaro, and preliminary observations at Galisteo Pueblo indicate a specialized production of glaze ware pottery, along with potential differences in decorative treatment of Pueblo-style and Spanish-style vessel forms (Blinman 2002). Additionally, there appears to be more Tewa pottery at Galisteo Pueblo than San Lazaro and San Marcos, indicating social and economic relationships that cross-cut or may integrate linguistic and ethnic lines.

Utility wares typically receive the least examination because paste composition and surface treatment variability are difficult to meaningfully quantify in terms of Spanish colonial social and economic interaction. Dividing paste classes into micaceous and nonmicaceous allows some examination of regional exchange patterns, but ignores locally important paste variability. Recent work at San Marcos identified sixteen surface treatments in nonmicaceous utility wares and eleven surface treatments in micaceous utility wares (Blinman 2002). Tremendous variability in geologic inclusions (natural or additive) in nonmicaceous utility wares may reflect mineral composition of local geological sources or it may reflect regional geologic variability, and by inference, production sources and exchange patterns within the Galisteo Basin and with villages outside the Galisteo Basin.

Historic utility wares from the seventeenth and early to middle eighteenth century are typically divided into nonmicaceous, micaceous-slipped, and micaceous classes. All three are widely distributed, but may be useful in examining exchange patterns. Nonmicaceous utility wares are the most abundant from R. Wiseman's La Fonda excavations (1988). He characterizes nonmicaceous utility ware as most similar to Vadito Plain, as described for the Abiquiu (Schaafsma 1979) and Taos-Picuris areas (Hurt and Dick 1946; Dick 1968). Where regional geological differences are exhibited in pastes, local and nonlocal production may be discerned. A. H. Warren observed that the majority of Las Majadas (LA 591) and the Torreon site's (LA 6178) nonmicaceous plain pottery (named Santa Cruz Plain) had a vitrophyre temper that was distinct from other areas (Snow and Warren 1973a, 1973b). Granitic or plutonic tempers may be most indicative of Sangre de Cristo west slope production, though Blinman (2002) observed plutonic-origin temper in the San Marcos plain wares. Micaceous-slipped pottery was recovered by Wiseman at La Fonda (1988) and from LA 591 and LA 6178 (Snow and Warren 1973a, 1973b). Micaceous-slipped pottery occurred in low frequencies in the seventeenth-century LA 591 deposits, but primarily in the post-1700 deposits at the Torreon site. Warren observed mica-slipped pottery from the Torreon site, but it had local paste and was most common after A.D. 1700. Roughly 10 percent of the micaceous-

slipped pottery from the LA 6178 was locally made, the remainder was speculated to come from the Tewa Basin (Snow and Warren 1973b). Mica-slipped pottery may precede micaceous pottery, making it a temporal indicator and a potential manufacturing source indicator. Micaceous pottery made in the Taos and Picuris areas was traded widely. Combined with early polished Tewa wares and glaze ware pottery, proportions of micaceous, micaceous-slipped, and plain utility ware should provide information on some aspects of goods exchange and acquisition within the seventeenth-century encomienda economy. The percentage of micaceous pottery relative to other plain pottery may also be a temporal indicator in the absence of or in combination with polished and matte paint pottery. Compositional analysis of utility ware pastes may allow us to examine manufacturing sources. Compositional analysis may also allow us to examine if pottery was differentially acquired by Palace residents and other Santa Fe residents from a range of regional sources, or if a limited range of manufacturing sources was used by all.

Other subsistence data that directly relate to diet and health are faunal and ethnobotanical remains. Faunal remains are expected to lean heavily toward domestic mammal consumption through all periods. However, preparation and consumption patterns as inferred from discarded bone may be difficult to isolate. This is primarily because the majority of animal bone from external Palace contexts have been from sheet trash or redeposited contexts. Patterns in processing and consumption reflecting strategies employed during different times of scarcity, abundance, or average availability, will or may be mixed. Degree of processing and the types of meat portions consumed may vary depending on availability or status of the consumer. Forgotten is the potentially large number of slaves or servants that can be assumed to have occupied the Palace grounds. Their consumption patterns and associated refuse may be substantially different from that of the governor and other administrative-military officials and their families. In other words, a high-stress diet may indicate a low-status group of individuals as much as higher-status groups sustaining rough times.

Ethnobotanical evidence is potentially compelling. Excavated contexts within the Palace have yielded a wide range of macrobotanical remains, including New World domesticates, Old World domesticates, and native wild plants. New World domesticates include maize, squash, and beans. Old World domesticates include plum, peach, cherry, and apricots, watermelon and grapes, wheat, walnuts, and hazelnuts. Native wild plants include cacti, broad-leaf yucca, piñon and juniper, cheno-ams, marsh elder, and bulrush (Seifert 1979a). The latter are especially interesting because they require a wet environment, such as that occurring along the cienega or the Rio Chiquito and Santa Fe River. The subfloor pits in Room 7 had primarily New World domesticates suggesting deposition soon after the Reconquest. Much of the material recovered from near the pits was suggested to be Pueblo Revolt era, primarily because of the high frequency of polished red wares. Evidence is contradictory, suggesting the deposits were mixed or represents the resettlement of the Palace by Spanish colonists. Until lands could be meted out and residences and farms reestablished, the Palace and the downtown area would have been an economic focal point.

The ability to detect and interpret this temporal and geographic variability in material-culture patterning is dependent on the presence of discrete, unmixed, and definable stratigraphic assemblages. Many of the artifact types of interest (such as utility wares, macrobotanical remains, and animal bone) are not inherently temporally diagnostic. They cannot be effectively used in cross-time period comparisons if they are recovered from temporally mixed assemblages. The outlook for recovery of unmixed assemblages from the pre-Revolt period is relatively good from trash pits, and the sensitivity of the temporally diagnostic artifacts should provide an adequate measure to both detect and assess the magnitude of any potential contamination.

Spanish Colonial Period, A.D. 1692 to 1821

3. How are changes in local and regional economies reflected in the artifact assemblages that may be recovered from late seventeenth-, eighteenth-, and early nineteenth-century contexts?

During this period, Santa Fe retained a distinctly agrarian economy based on livestock husbandry, subsistence, and tenant farming. Within a socially and economically stratified eighteenth-century economy, the upper class should have had wider access to higher quality goods, especially nonlocal products (Bustamante 1989). Compared to the governor and the other civil and military officers, lower status civil and military residents of the Palace and presidio may have had limited economic options. Limited access or ability to purchase other than locally made goods would have been a direct consequence of low pay for civil duties and wage labor. Some civil and military laborers have been described as "poverty-stricken" (Bustamante 1989). Whichever end of the socio-economic scale is represented by the Palace materials may be reflected in the frequency and range of nonlocal goods or the variety of locally made goods and quality of food resources, such as domesticated mammal meat portions.

The funneling of all economic profit into the Spanish treasury to support a faltering colonial position and trade restrictions that forced all economic interaction to the south were a severe disadvantage to the northern New Mexico economy. Lack of local capital or government spending and funding, a dearth of readily accessible mineral resources, scarce hard money, and regular and disastrous raiding of rural settlements also retarded economic opportunity and growth (Simmons 1968:71). Access to outside goods was gained through annual winter caravans to Chihuahua trade fairs that included 500 to 600 men and their goods (Simmons 1968:73).

Eighteenth- and early nineteenth-century Palace materials are poorly represented from previous excavations. During J. Nusbaum's 1909-1912 renovations, he removed a large amount of refuse that most Palace experts believed contained the bulk of the post-Reconquest occupation refuse. This deposit undoubtedly was a mix of subsistence, maintenance, and architectural debris. Lacking comparative material from this period, this project will seek to compare artifact and subsistence assemblages with more fully analyzed and reported assemblages from eighteenth- and early nineteenth-century local and regional sites.

The middle eighteenth and nineteenth centuries were well represented by the LA 16769 test excavations (Levine et al. 1985). LA 16769 is located along the Santa Fe River, near the Santa Fe Municipal Airport. Substantial artifact and subsistence-related assemblages were recovered that can be compared with collections from the Palace. The assemblage shows that residents were integrated into the local or subsistence economy and had access to imported goods that would have been brought to Santa Fe by the trade caravans. Blacksmithing may have provided residents with specie to buy nonlocal goods. Residents of this site appear relatively prosperous, making the assemblage ideal for comparison with the Palace materials where we anticipate that some residents were prosperous, while servants and military personnel were very low on the economic scale.

Economic integration on a wider scale can be viewed by examining the assemblage data from the La Puente site near Abiquiu. This site was also occupied during the late eighteenth and nineteenth centuries (Moore 2001). The assemblage included discrete refuse pits from residential occupations centered around the placita at La Puente. It is likely that the deposits originated with residents who had relatively equal access to food and other economic resources. This assemblage should provide significant contrast to the Palace and LA 16769 assemblages.

South of Santa Fe at Cochiti Dam, the Torreon site, which dates to the eighteenth century, was a defensive rancho site occupied by a family and servants (Snow and Warren 1973b). Substantial quantities of artifact and subsistence remains were recovered from trash contexts. As household refuse, these deposits should be directly comparable to LA 16769 and they should contrast with

the Palace and La Puente assemblages.

Overall, comparison between these assemblages will test the assumption of a broad-spectrum subsistence economy with few manufactured goods. It should also allow some evaluation of political and social status and the effect this status might have on access to luxury and basic subsistence goods. It may also provide some insight into the integration of northern Rio Abajo, Rio Arriba, and northern Rio Arriba into the Nuevo Mexico economy. Again, these comparisons will be valid only to the extent that relatively unmixed deposits from this time period can be isolated within the excavations.

Mexican and Territorial Periods, 1821 to 1912

4. How did major changes in political sovereignty and transportation affect the economy of Santa Fe? In what way are these changes reflected in the material record of the Palace of the Governors and the New Mexico Museum of History site?

Two of the biggest changes in the New Mexico and Santa Fe economy were the opening of the Santa Fe Trail and the completion of the Atchison, Topeka, and Santa Fe Railway. These transportation milestones increased New Mexico merchant access to outside markets, increased access to manufactured goods for New Mexico citizens in quality, quantity, and variety, and served as important mechanisms for American population influx. The United States military became a major player in the Palace and downtown economy, since Fort Marcy occupied and expanded the existing presidio and Palace of the Governors.

These historical events changed local and regional economy and subsistence in dramatic ways. However, archaeological evidence of economic change may be limited. Increased access to or use of manufactured goods may be primarily from the military occupation. Metal, glass, ceramic, leather, rubber, and other materials should occur in higher frequencies than were recovered from earlier levels or feature contexts. Artifacts may not reflect subsistence activities as much as maintenance activities related to quartermaster, blacksmith, livery or stable, and perhaps, gardening.

In the past, metal artifacts recovered from the Palace of the Governors' excavations were only analyzed if they could be attributed to the Spanish Colonial period occupation. Apparently, considerable Mexican or Territorial period metal has been recovered by previous excavations that lacked funds for complete analysis (Seifert 1979a:108). Obviously, these artifacts are an important comparative data source that might greatly inform on the New Mexico Museum of History materials. Seven hundred and nineteen metal artifacts from the Historic Library Addition excavations were analyzed and mainly classified as unidentified or related to construction/maintenance activities. Two hundred fifty-six hardware items including nails, strap fragments, lock pieces, hinges, etc., were primarily from the Territorial period, and a few military arms specimens were recorded from the eighteenth century. Metal artifacts from D. H. Snow's 1999 excavations along the north wall of the patio office yielded 175 metal artifacts from the upper 120 cm. The majority of the artifacts were recovered from the upper 60 cm, which is a mixed Territorial and post-Statehood deposit. These artifacts have not been analyzed, but if they are similar to the History Library Addition assemblage, they should reflect construction, maintenance, and military activities. Rather than local manufacture of metal products, they should be mass-produced products from the East that were available to the military by the 1850s and available to everyone by the early 1880s.

Artifacts that represent household or domestic activities are expected to be relatively rare for the Mexican and Territorial periods. While the Territorial governor did live in the Palace periodically, the military residences were located peripheral to the Palace grounds. Expected low frequencies of domestic refuse are based on the tentative results of the same projects discussed in the

previous paragraph. D. H. Snow's testing in the Palace patio yielded 36 American-made white ware dish sherds and 670 glass shards for which the artifact types are not known because analysis is incomplete. It is likely that the majority are window glass, although 2 or 3 percent were milk glass shards. The History Library Addition excavation yielded 58 pieces of American-made dish ware, primarily soup bowl and plate fragments. These were primarily from upper excavation levels. Two hundred and sixty-six glass fragments, primarily bottle and window glass, were also recovered. The average excavation unit yielded less than five glass or ceramic artifacts per level, which is a low artifact density.

Animal bone occurs in the second highest frequency after Pueblo-made pottery from most Palace excavation contexts. Apart from the historic implications of European domesticated taxa, animal bone is not inherently datable. As a result, animal bone recovered from mixed contexts may not inform on subsistence or economic status of Palace occupants. However, concentrations of animal bone recovered from architectural or feature contexts may have direct bearing on subsistence practices and economic status. From the patio testing, 2,233 animal bones were recovered from the upper 100 to 120 cm. A majority of these may be from Territorial period contexts. It is possible that excavated levels, where more than 200 bones were recovered, may actually represent trash pits or deposits. From the History Library Addition excavations, 3,000 animal bones were recovered from all contexts. When compared with the patio testing assemblage frequency, there is a quantitative difference between the two. The patio-testing animal bone was recovered from three 1-by-1-m test pits, while the History Library Addition assemblage was recovered from 30 sq m. The patio-testing assemblage may originate from primary trash disposal or a bounded context, while the History Library Addition assemblage may be a sheet-trash deposit. These will be the main assemblages for comparison with the New Mexico Museum of History assemblage. Sheet-trash deposits may be used as a general indicator of economic and consumption behaviors, the integrity of which can be assessed by mixture evidence provided by associated temporally diagnostic artifact types. Primary or discrete trash deposits may allow for more confident examination of economic and consumption behaviors during the Mexican and Territorial periods.

A holistic consideration of the Palace of the Governors and its relationship to surrounding architectural and land-use patterns will be addressed through the production of composite maps based on excavation and archival data.

Each new project in downtown Santa Fe, specifically in and around museum facilities, must overcome the same methodological obstacle–a lack of data compilation and integration. Data sources include archival data, excavation results, artifact inventories, analytical results and interpretations, and final reports. For each undertaking, these data sources are compiled and somewhat integrated, but typically they are not integrated into a holistic framework from which meaningful interpretation and explanation can be developed. A compilation of Palace data was conducted in connection with a Getty Conservation Institute grant application. However, that document has had very limited distribution, which diminishes its utility to researchers and scholars as a guide to data and resources on the archaeology and history of the Palace of the Governors and its adjacent lands. Admittedly, the volume of material that has accumulated from the disparate and underfunded projects is considerable, and a complete inventory is probably not practical, even though it would be very desirable and useful. However, data sources can be compiled to direct future research, manage cultural resources that may remain on museum property, and would be valuable for curation and exhibit-focused activities. The following is a list of data that could be compiled within a reasonable budget and time frame.

1. Inventory all projects completed within Museum property in downtown Santa Fe since 1912. Each entry would include the project location, the year or years in which the work was com-

pleted, the project director, description of work completed, inventory or assessment of materials recovered and their current curation status, brief summary of the results and the contribution to the archaeology and history of the Palace.
2. Compile an annotated reference guide to the Palace of the Governors' maps, so that the historical map information can be readily used with the project inventory. This reference guide will include the map year, cartographer's name, the map title (actual or derived), map scale (actual or derived), and any pertinent discussion of the maps' deficiencies or strengths.
3. Create a spatial database. This spatial database may consist of data layers including map reference information, excavation locations and linked information, location of known architecture and features, temporal data for known architecture and features, and known and hypothesized plans of the Palace and surrounding grounds. Creation of these layers will require digitizing a variety of historical and archaeological excavation map sources. Disparate scales are likely, thus, map data will be matched as closely as possible within existing limitations. The spatial database will be created as an ArcView 8.1 project, will be made widely available (with technological and financial limits), and maintained at a central location within the Office of Cultural Affairs.

Data Sources

There are a variety of data sources that may be used to guide excavation and analysis. These sources include, but may not be limited to previous excavation data, archival written and map records, architectural data, and artifact, subsistence, and chronometric sample data. How these sources may be applied and some discussion of potential biases and limitations are provided. This section is intended to introduce and summarize the sources.

Pottery

Pueblo-made pottery may be recovered from the excavation in large quantities. Based on previous investigations at the Palace of the Governors and the surrounding area, historic Pueblo pottery, particularly utility wares, will be the most abundant (Levine 1990; Seifert 1979a; Post and Snow 1982; Post 1995). Lesser amounts of ancestral Puebloan pottery have been typically recovered. Identification and analysis of ancestral and historic Puebloan pottery from typological and functional/technological perspectives yield data that can be applied to the research questions proposed for the first two research directions, for all periods leading up to and partly including the Territorial period. Even though this and subsequent discussions focus on ancestral Puebloan and Pueblo-made pottery, the potential occurrence of Hispanic-made or Athabaskan-made pottery will not be ignored. They may also provide important temporal and economic information when they can be segregated from the larger Puebloan assemblage. The contribution of Hispanic and Athabaskan-made pottery to this assemblage may be less than has been found by investigations focused on Hispanic communities to the north (Moore 2000, 2001; Carrillo 1997).

Distributions of ceramic types and ware groups may contribute to temporal assignments to deposits, features, and structures encountered during the New Mexico Museum of History excavation. Assemblages containing temporally diagnostic pottery types of local and nonlocal production recovered from spatially discrete contexts may be separated into 50 to 100-year ranges for prehistoric and historic period occupations in the northern Rio Grande. Naturally, these assignments rely on established typological classifications and associated or relative manufacture dates. Pottery will be analyzed for type frequencies from all analytic proveniences to establish date range inferences, temporal integrity, and potential source periods that contribute to mixed proveniences.

For historic Pueblo-made pottery there are some general observations that may be useful for

dating mixed or poorly differentiated assemblages (Moore et al. 2000). These observations have been used to recognize several ceramic-based dating periods including the early Spanish Colonial (1598 to 1680), late Spanish Colonial (1692 to 1821), Santa Fe Trail (1821 to 1880), and Railroad (post 1880) periods. Trends noted include a decline in frequencies of decorated wares and polished red wares, and an increase in frequencies of polished black wares and micaceous wares (Moore et al. n.d.). Other trends include a gradual decline in the frequency of jars and soup plates, and a corresponding increase in the percentage of bowls (Moore 2000).

Pottery manufacture may also inform on economic issues and the direction and intensity of trade or acquisition between residents of the Palace and surrounding areas. This would be accomplished through the study of technological and functional attributes that are sensitive to manufacture location. Investigations will include detailed visual and microscopic characterizations, and petrographic analysis of selected sherds will be undertaken to guide and supplement these characterizations.

Decorated and utility historic Pueblo pottery recovered from the New Mexico Museum of History, Palace, and Palace patio offices projects will allow internal comparisons, comparisons with other downtown Santa Fe assemblages, and examination of differences between Santa Fe and outlying Spanish sites. These investigations will reexamine social and economic networks, evaluating and building on work completed more than 25 years ago (Mera 1940; D. H. Snow 1982; Warren 1979). Decorated historic Pueblo pottery should be recovered from contexts spanning the complete historic period sequence.

Euroamerican Artifacts

The Euroamerican assemblage will provide information in several critical areas including chronology, activities performed at these sites, site functions, trade contacts, and social standing throughout the historic period (Moore et al. 2000). The range of artifacts recovered will give us an idea of the types of activities conducted on the Palace grounds between 1610 and 1912. If they are recovered as refuse deposits that reflect general activities and behaviors associated with the Palace, or if they occur in association with identifiable facilities or structures, they may reflect the age and range of activities conducted at a particular time. For all periods, manufacture sources of various artifacts may provide an idea of the scale of the mercantile system. Types and amounts of imported goods may reveal information on the relative wealth of site occupants, especially when compared with data from sites of similar date in northern New Mexico (Moore 2000, 2001).

Other Euroamerican artifact analyses have shown that they can often provide fairly precise dates for a site or deposit (Moore [2000] and Post [1995] are northern New Mexico and Palace examples). For example, flat glass and ceramics imported from the eastern U.S. can be very sensitive temporal indicators for the Mexican and Territorial periods. Seventeenth-century majolicas may be critical in providing early dates for historic deposits (Seifert 1979a; Deagan 1987). Later Mexican majolicas and other earthenwares often have very long temporal spans and provide less precise or resolved dates. However, the presence of this type of artifact in relatively high percentages is indicative of a pre-1850 date, and a few types have fairly limited production spans and can provide temporal data as accurate as those available from other Euroamerican wares. Bottle glass and certain classes of metal artifacts may also be useful, but these types of artifacts also often had very long production ranges, which only allow the derivation of relative dates. Obviously, coins, religious medals and paraphernalia, and some personal items may yield precise dates. These artifacts, if found in contexts with good integrity, may improve overall dating of other similar, but spatially discrete contexts. The OAS historic artifact analysis is formulated to allow the recording of a wide range of manufacturing and functional attributes that individually or combined may provide increased or improved chronological control.

Obviously, Euroamerican artifacts from all periods have the potential to inform on economic patterns and behaviors. The range, quality, abundance of metal, glass, ceramic, leather, fiber, and other potential Euroamerican artifacts will be most productive for examining economic interaction through time. Palace of the Governors' excavations recovered metal artifacts representing household goods, building materials, military equipment, horse gear, and religious objects. Glass beads, colored bottle glass, container and window glass (both factory-made and hand-blown) have been recovered from a variety of contexts reflecting seventeenth- and post nineteenth-century occupations. A full range of late sixteenth- to early eighteenth-century majolica was recovered from the Palace excavations (Seifert 1979a). Little or no nineteenth-century majolica was recovered indicating either that acquisition slowed or that this material was lost with the removal of the nineteenth-century deposits during the 1910 renovations. Other imported pottery recovered from the Palace has included Spanish Olive jars and oriental porcelains (only 31 sherds). Association between Palace occupations and the New Mexico Museum of History site would be strengthened by the recovery of a similar range of materials. Significant departure from the Palace assemblage might indicate that the refuse was deposited by other military or civilian occupants of the space or nearby Palace, presidio, or Fort Marcy quarters. Some assessment of the social and economic status of residents might be possible. Further assessment of social and economic status may be advanced by comparisons with excavation assemblages from other seventeenth-, eighteenth-, and nineteenth-century Spanish, Mexican, and Anglo-American civilian or military sites.

Faunal Remains

Previous excavations within the Palace area indicate that a large amount of bone should be recovered during the proposed archaeological work. The majority of the animal bone has been recovered from historic period contexts. Some prehistoric animal bone may be recovered, although none was reported from discrete contexts within the Palace of the Governors (Seifert 1979a). Chronological inferences that can be made from faunal data within the historic period are minimal. The following discussions focus on economic and subsistence-based analyses.

Ancestral Puebloan faunal remains may reflect different levels of mobility or sedentism depending on the occupation period. Expectations of the faunal assemblage can be stated in terms of relative levels of sedentism and mobility. If some or all of the site residents were permanent residents, then faunal assemblages would be expected to exhibit the greatest species diversity with a particular emphasis on those species associated with a garden-hunting strategy. From a residential base, anchored by farming, species at long distances could be taken in season to fulfill the critical dietary requirements of high-quality animal protein. These long-distance species would be brought to the site as meat packages, possibly resulting in a restricted range of skeletal elements, especially those with highest meat yields or those with important secondary uses as tools or ritual items.

If the site residents were very mobile or there were episodes of high mobility, then there should be fewer species evident, dependent on the season and length of occupation. For instance, if part-time residents focused on riparian and grassland species, then there would be fewer montane species expected. This might be the expected pattern if the hunting was coincidental with farming. If montane hunting forays were staged from the sites, then montane species would be expected to be recovered along with some riparian species.

For the historic period, the research framework is adapted directly from Morore et al. (2000:114-115). This framework is based in part on one outlined by Huelsbeck (1991:62) that focuses on availability and consumer behavior. It will emphasize the impact of social and economic forces on the acquisition and consumption of animal products, as well as on aspects of site structure. Comparisons with faunal assemblages representing demonstrably different types of sites, such as isolated homesteads and urban Santa Fe, those from other areas but of the same time

period, those generated by different ethnic and social groups, and those from earlier and later time periods are our best means of evaluating the collections from these sites as part of the New Mexican frontier adaptation.

Availability refers to the range of animals available to the household and the community. This will depend, at least in part, on the range and kinds of contacts site inhabitants had with those outside the immediate area. Location on or near communication and trade corridors should increase the variety of animals available as well as the likelihood that site inhabitants participated in and were influenced by market forces. For example, an assemblage from a group who raised animals simply for household and community consumption should differ from one that also raised animals for export. When animals were raised for export, there should be differences based on whether they were raised for food or for other products, such as wool. Beyond simple availability, acquisition by purchase or trade raises questions of form (e.g., live animals, cuts of meat, etc.), questions concerning the respective relationship between parties (family, community, patron and peon, alliance maintenance with other groups), and questions concerning the quality of the product available.

Consumer choice addresses what species and portions were chosen for consumption or use. By looking at the cuts represented and the age of animals selected we may be able to determine the status of the consumer. Animal selection also informs on the role of the animals themselves. Was there selection for certain age and sex groups that are better eating or were older individuals culled when their usefulness as draft or transportation animals declined? Seasonality also plays a part. Before refrigeration, larger animals like cows were either divided among many households or butchered during the cold season. Choice of preparation method can be indicative of group size and composition. Dietary preferences and butchering practices also inform on ethnicity.

Site structure is reflected in household and community disposal practices. Trash distribution is seldom a random process. Initial butchering refuse might be deposited in areas distinct from household garbage. The former and other noxious refuse might be burned or taken farther from the residence than material generated by household sweeping or cleaning hearths. Household and community size, spatial arrangement, and local topography will also influence disposal practices. Looking at distributions of taxa, body parts, fragmentation, and the length and type of exposure can help to distinguish where different activities took place.

The success of this analysis will depend on the context and dating of the assemblage. With strong temporal controls (both for dating and for assessing assemblage integrity), changes in animal selection and consumption may provide significant new perspectives on Spanish Colonial, Mexican, and Territorial period consumption.

Chipped Stone

Chipped stone artifact analysis will focus on reduction technology and tool-use patterns to determine the range of activities in which stone tools functioned, and whether they were produced on-site or procured elsewhere. It is expected that ancestral Puebloan and Hispanic stone tool use and manufacture will be substantially different. However, based on the Palace excavations, chipped stone artifacts are expected to occur in low frequencies. It is also expected that except for the recovery of projectile points that can be related to known typologies, chipped stone will inform primarily on economy and subsistence. The comparative potential of the New Mexico Museum of History's assemblage may be greater than its own intrinsic value.

For ancestral Puebloan assemblages, chipped stone as an indicator of subsistence activities relies heavily on analytically defined technological trajectories for core reduction, and tool production, use, and maintenance. As has been demonstrated in hunter-gatherer studies, different levels of mobility often result in the employment of situation-dependent lithic technologies. Distance

from residential sites and the source of suitable material for production of tools needed for anticipated tasks often condition stone tool technology (Andrefsky 1994; Kelly 1988; Binford 1979). Models proposed by Binford (1979) and Kelly (1988) may apply to ancestral Puebloan residents. Assemblages accumulated during long-term, residential occupation may reflect a wide range technological repertoire with a full range of expedient core reduction debris, limited formal tool production, and broken and discarded formal tools. More mobile, shorter-length occupations may leave lesser frequencies of chipped stone debris and the debris and accompanying tools will reflect highly targeted food acquisition and processing efforts. Any ancestral Puebloan chipped stone assemblage will be examined in terms of reduction strategy, assemblage diversity, tool use, and maintenance. These data should reflect the on-site subsistence activities and the position of the site within a larger system.

Chipped stone artifacts are common at Spanish sites in the Southwest, and they tend to reflect an array of activities including fire-making, hunting-warfare, and the manufacture and maintenance of tools made from perishable materials (Moore 1992, 2000:86). The ubiquity of this artifact class at Spanish sites dating from the early Spanish Colonial period through the early Railroad period is evidence that chipped stone artifacts are not necessarily indicative of historic Pueblo or Plains Indian occupation, nor is their presence in so many assemblages evidence of earlier occupations or contamination from nearby prehistoric sites. The association of chipped stone artifacts with Spanish occupations is demonstrated by the presence of tool types indicative of fire-making activities mixed with debitage, cores, and occasional formal tools in stratified deposits at confirmed Spanish residences (Moore 2000:85). Sites that fall into this category include the La Fonda Parking Lot site (LA 54000) in Santa Fe, the Pedro Sánchez site (LA 65005) near San Ildefonso, and the sites of La Puente (LA 54313) and the Trujillo House (LA 59659) near Abiquiú (Moore 1992, 2001; Moore et al. n.d.). Use of chipped stone tools by Hispanics in New Mexico was undoubtedly related to the shortage and high cost of metal tools, and the irregular and undependable supply system (Moore 2000:85). Chipped stone tool manufacture and use appear to represent the assimilation of native technology to supplement or replace metal tools. The assemblage will be analyzed to isolate subassemblages that reflect adoption and use of weapon, fire-making, and tool replacement technologies.

Ground Stone

Ground stone tools may be recovered from contexts dating from prehistoric and historic contexts and potentially as late as the middle nineteenth century. It is expected that ground stone tools will inform on economy and production. Because of this substantial time depth and the changes in economy and subsistence production that occurred, changes in ground stone tool morphology and function are expected. These morphological and functional changes may reflect processing of agricultural and wild plant products during the prehistoric period and continued use of New World domesticates and the addition of Old Word domesticates during the historic period.

Assemblages from Coalition and Classic period sites in the northern Rio Grande typically yield quantities of two-hand manos with a variety of cross sections and primarily slab metates associated with a heavy reliance on corn. One-hand manos occur less frequently and reflect a continued reliance on seasonally available nuts, seeds, and fruits (Stubbs and Stallings 1953:113-115; Phagan 1993).

During the historic period similar forms are found in pre-Revolt contexts with the interesting addition of greater frequencies of one-hand manos that may reflect the introduction and processing of Old World domesticates, such as wheat and barley (Seifert 1979a). Quantities of one-hand manos have been recovered from the historic period component at San Lazaro Pueblo in the Galisteo Basin (Eric Blinman, pers. comm. 2001). Interestingly, few identifiable ground stone

implements were recovered during the Palace excavations (Seifert 1979a). Milling rooms or ground stone storage areas may not have been encountered or ground stone may have been recycled when the Spanish returned in 1692.

Following the Reconquest, grinding implements may have been an important part of Hispanic household equipment. While dependence on agricultural products continued well into the nineteenth century, the locus and methods of processing may have changed. Historic documents indicate that a grinding mill was built within the Palace grounds during the eighteenth century (as mentioned in the Research Directions). Introduction of mills would have reduced large-volume domestic processing, leaving manos and metates for smaller scale use. Less use may have resulted in longer lifespans for grinding tools, thereby reducing their discard rate and entry into the archaeological record. Therefore, abundant ground stone may not be found in post-eighteenth-century contexts. Its presence within a structure or bounded work space may indicate specialized processing areas or domestic areas.

Ground stone morphology can be used to infer general processing behaviors. Ground stone surfaces can be sampled for pollen, which may inform further on the range of grains or plant foods that were processed. Metates and manos from discrete contexts may be selected for pollen washing and analysis.

Archaeobotanical Data

Archaeobotanical data are expected to contribute to the first two research directions. Obviously, charred macrobotanical remains and pollen grains will inform primarily on issues related to economy and production for all periods. Chronological issues will be supported by the recovery of charred macrobotanical specimens that can be submitted for standard radiocarbon dating or Accelerator Mass Spectrometry dating.

Ethnobotanical evidence is potentially compelling. Excavated contexts within the Palace have yielded a wide range of macrobotanical remains, including New World domesticates, Old World domesticates, and native wild plants. New World domesticates include maize, squash, and beans. Old World domesticates include plum, peach, cherry, and apricots, watermelon and grapes, wheat, walnuts, and hazelnuts. Native wild plants include cacti, broad-leaf yucca, piñon and juniper, cheno-ams, marsh elder, and bulrush (Seifert 1979a). This potential range of specimens may inform on the range of subsistence options selected by Palace residents during the historic period. These data can be compared with other Spanish Colonial, Mexican, and Territorial period sites in northern New Mexico to evaluate the Palace residents' position in the local and regional economy.

Depending on the excavated contexts, one other avenue may be investigated that may inform on historic use of space and its portrayal in archival sources. This is the use of the parcels north of the Palace of the Governors for gardening and small-scale farming.

Open or nonarchitectural space is shown north of the Palace of the Governors in the Urrutia and Territorial period maps. This space, at different times, may have housed gardens or small fields maintained by Palace residents. While we can speculate about the gardens and defer to generalized characterizations, such as orchard, patio garden, field, there are little or no data that have been collected outside the Palace that directly or indirectly inform on the nature of these planted spaces. Even though a typical western garden is nonarchitectural, except for borders or fences, it can still be considered a potentially valuable source of archaeological information. Ancestral Puebloan fields and gardens have long been the subject of archaeological study. However, Spanish Colonial and Territorial period horticulture, at least in an urban setting, is virtually unknown. Casual or nontreatment of horticulture or gardening can be attributed partly to the relative richness of archival sources, which will list or describe orchards or gardens or show them in photographs. However, archival records are only one source of information. The New Mexico Museum of

History Excavations excavations may provide an opportunity to examine gardening and small-scale farming through the collection of soil samples from horizontal and stratigraphic contexts. Macrobotanical and pollen studies can be compared with each other and the archival sources. Through such a study, we may be able to refine conjectures about open-space use, match archaeobotanical data against archival data, and provide a dataset that may be valuable to other Spanish and Territorial period researchers working in urban, military, or ecclesiastic settings.

Chronometric Data

Obviously, all of the comparative studies are dependent on our ability to assign dates or date ranges to features or deposits and to detect and assess the effects and sources of mixed deposits. Resolution of different typical dating methods determines their applicability to specific contexts. Excavation may result in the potential recovery of a wide range of chronometric samples. These may yield absolute dates or they may involve relative dating, such as through the use of ceramic or projectile point typologies or historic artifact manufacture date ranges. Absolute dates are desirable because they are objective, although each technique carries strengths and weaknesses in both precision and accuracy. Absolute dating methods that may be used in this project include dendrochronology, archaeomagnetism, radiocarbon assays, and obsidian hydration measurements. Relative advantages and drawbacks for these methods are provided in the Analytical Methods section of this report.

Tree-ring dating may be applied to both construction and fuelwood sources. Samples from contexts from all periods will be collected and evaluated for dating potential. Naturally, sample context and condition will heavily influence its utility.

Archaeomagnetic samples will be collected from burned or oxidized contexts that have not changed position since the burning event. This method is especially applicable to thermal features from all periods. Depending on the sample quality, it may be able to provide dates for Pueblo Revolt and Mexican period occupations.

Radiocarbon dating is most applicable to the ancestral Puebloan and post-Pueblo Revolt Hispanic and Territorial period contexts. Pueblo Revolt and Mexican period occupations were too brief for assay error factors. Charred wood and plant material are most likely to be considered for radiocarbon dating. Charred seed and nut fragments are considered optimal for yielding dates with the least risk of "old wood" error. Samples collected from thermal features, bounded refuse deposits, and well-defined sheet-trash deposits will be considered for dating.

Architectural Data

Recovery of architectural data will be critical for addressing the first research direction. It is expected that at a minimum Spanish Colonial era foundations will be encountered based on B. Ellis's 1967 findings. These foundations and other architectural features combined with reliable absolute dates and stratigraphic position will support examination of the changing Palace plan and general use of space.

Architectural data from structures from all periods will be recovered or recorded. These data may occur as in situ foundation remnants and floors of residential, production or administrative structures, or intramural and extramural thermal and processing features. Corral, ramada, or shed remnants may be detectable as posthole alignments and surfaces. Distributions of construction debris including adobe and adobe melt, bricks, cement, mortar, wood fragments, and roofing material may remain from demolished structures or as the discard of debris from demolished structures. Hardware, wood, and glass or selenite may be intermixed with structural debris or associated with in situ structural elements suggesting the locations of windows, doors, and other architectural

details. Hardware may improve or support dates derived from nonarchitectural or construction sources.

Recording and mapping of structure remnants and debris will allow some reconstruction of the changing spatial structure and use of the New Mexico Museum of History site within the Palace grounds. Since archival information is limited and fragmentary, these data may make substantive contributions for all periods.

Analysis of the techniques and materials used to build a structure can provide interesting and potentially important data concerning basic construction technology and occupational history. Certain samples may also help date the period of initial construction, while others could provide information on subsistence activities. Comparison between New Mexico Museum of History architectural features and those excavated at the Palace of the Governors will aid in identifying potentially early Spanish Colonial, Pueblo Revolt, post-Conquest, and Territorial period structures or activity space. Excavations at the Museum of Fine Arts Addition exposed Territorial period walls and foundations that can be used for comparison.

Soil, adobe, wood, plaster, and mortar samples may allow for relationships between disparate foundations to be determined or hypothesized. Further analysis of samples may provide economic information through the identification of different sources of stone, lime, adobe, and wood.

Human Remains

Human remains have rarely been recovered or fully reported from downtown historical contexts. If human remains are recovered they will be handled administratively in compliance with state laws and regulations concerning unmarked human burials. Analytically, they will be examined in a manner consistent with current paradigms regarding heath, diet, activity patterns, and cultural relationships.

Descriptions of mortuary treatment are fairly standard, but few go beyond placing the individual burial into the site context. The potential for understanding social behavior and organization gained from mortuary practices, which change in response to social, demographic, and economic conditions (Brown 1995:7; Larsen 1995:247), is rarely pursued.

Studies of human remains have shifted from constructing cultural sequences and identification of racial groups to identifying broad patterns of social organization and change. Mortuary remains are often highly patterned and reflect social organization more directly than other classes of archaeological remains (Trinkaus 1995:53). Recent mortuary analyses have approached a variety of topics, ranging from individual, gender, ethnic, political, and social identity to interpersonal conflict, resource control, labor and organization, ritual and meaning, social inequality, trade, population dynamics, and residential patterning (Larsen 1995:260).

Advances in the study of human remains provide important insights on heath, diet, genetic relationships, microevolution, and population characteristics. Inherited skeletal features are being used to address conflicting land claims by indigenous groups, and studies of past human populations have provided information on inherited predispositions for diseases like diabetes and anemia (Buikstra and Ubelaker 1994:1).

Even the most basic analyses of human remains have the potential to contribute significant information on past lives. Human bones and teeth record conditions during life as well as at death (Goodman 1993:282). Several indicators of physiological stress are routinely monitored to assess general health. These include adult stature, which may result from undernutrition, and subadult size, which can indicate the timing of stress events. Sexual dimorphism tends to decrease with increased stress, and increases with greater divisions of labor. Enamel defects, hypoplasias or pitting, are associated with specific physiological disruptions and can be relatively accurately assigned an age of onset. Dental asymmetry begins in utero and reflects developmental stress

while dental crowding can be nutritional or genetic. Dental caries reflect refined carbohydrates in the diet and can lead to infection and tooth loss. Dental abscessing can become systemic and life-threatening. Osteoarthritis and osteophytosis can indicate biomechanical stress. Osteoporosis, related to calcium loss and malnutrition, can be acute to severe during pregnancy and lactation, and can also affect the elderly. Porotic hyperostosis is related to iron-deficiency anemia and leaves permanent markers. Periosteal reactions result from chronic systemic infections (Martin 1994:94-95).

EXCAVATION STRATEGY AND METHODS

The New Mexico Museum of History excavation is a complex undertaking that must reconcile scheduling and cost issues with research goals. To mesh economic and temporal considerations with the research effort will entail a variety of decisions regarding scheduling, sampling, and the focus and direction of the excavation and analytical activities. Within this complex web, all possibilities cannot be known or necessarily predicted. Therefore, the following section attempts to provide a framework for the excavation and analysis with the knowledge that changes in scope and direction will occur throughout the life of the project.

Scope of Work and Decision Criteria

Excavation will be coordinated with the architect, contractor, and the Museum of New Mexico's needs and schedules. As currently designed, the excavation will proceed in two phases that support Palace preconstruction stabilization efforts, provide for staged reduction in Museum staff access to the Museum Administration Building parking lot, and allow the excavation time and effort to be optimized relative to weather conditions. As currently conceived, the project will have an early fall 2002 field phase (Phase I) and a spring and summer 2003 field phase (Phase II).

An important issue that should be addressed before presenting the excavation strategy is the spatial scope of the project. As described in the Introduction of this report,

> The Museum of New Mexico plans to demolish the Museum Administration Building, a portion of the current administrative offices for the Palace of the Governors, and associated parking areas. The project area, which is alos the area of potential effect, covers 2,065 sq m. The demolition will allow construction of a New Mexico Museum of History on the property. The parking areas include a vacant lot immediately north of the Museum Administration Building. The lot recently held a commercial building with a basement and, therefore, archaeological investigations (other than monitoring) will not take place in this disturbed area. The Museum Administration Building also contains a basement and this location will not be part of the excavation work for the same reason. The area designated for data recovery consists of a portion of a 3-m-wide driveway along the south side of the Museum Administration Building, a portion of the parking area to the east of the Museum Administration Building, and an open space behind the Palace of the Governors offices covering a total of 586 sq m (Figs. 1 and 2).

The area described in the above paragraph is shown in Figure 12. Based on verbal communication with C. T. Snow and D. H. Snow, the area north of the Museum of New Mexico Administration Building is known to have housed the former "Firestone Building," which has been demolished. This building had a basement that presumably was a least 2 m deep. This depth would be below the known depth of cultural resources identified by S. Post in 1995 and D. H. Snow in 1999. It is assumed that any cultural deposits have been removed by the demolition of the building.

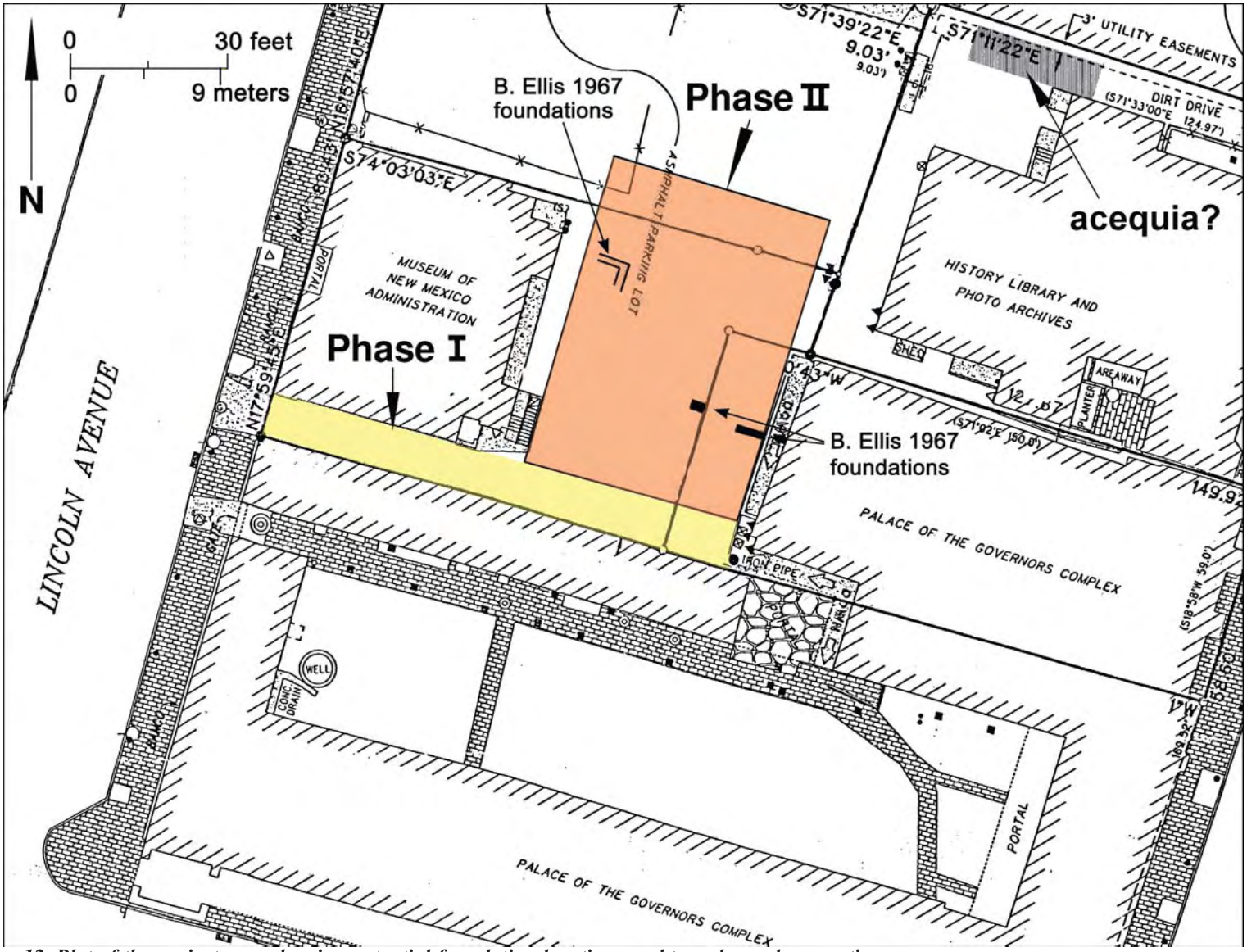


Figure 12. Plat of the project area showing potential foundation locations and two planned excavation areas.

As stated in the Introduction, the Museum of New Mexico Administration Building also has a basement. This basement floor is more than 2 m below the current grade, which is deeper than cultural deposits documented by S. Post and D. H. Snow. It is assumed that any cultural deposits that formerly existed in this location have been removed. It is also assumed, based on experience from the History Library Addition excavation, that an area of at least 1 m surrounding the building has been disturbed by the original footing and basement excavation. Disturbance would have extended to the depth of the basement floor; therefore, this area has poor potential for yielding intact deposits and will not be investigated.

The current Palace offices, shown as the Palace of the Governor complex in Figure 12, also has a basement that is accessed by a ramp located along the west wall of the building. This basement is 2 m deep and it is likely that its excavation removed any associated cultural deposits.

It is also known that installation of utility lines in the area to the northwest of the History Library and Photo Archives, as shown in Figure 12, has disturbed a substantial portion of the 9-by-6-m area. There is also a large elm tree in that portion of the parcel that will be cut down and removed. It is likely that the elm tree roots and the utility line installation have substantially disturbed subsurface deposits to a depth of 2 to 3 m below the modern ground surface. No systematic excavation will occur in this area, except to retrieve more information about the acequia located along the north property line as described by S. Post (1995).

Although significant cultural deposits are not expected within these three areas, demolition of the existing buildings and initial excavations for the New Mexico Museum of History outside of the Phase I and Phase II areas will be monitored by an Office of Cultural Affairs archaeologist supplied by the Palace of the Governors or the Office of Archaeological Studies. If during the demolition and initial excavation cultural deposits are encountered, then work will halt and New Mexico Historic Preservation staff will be consulted.

The portion of the parking lot selected for excavation in this study is the area that we expect will have the least disturbance and best potential to yield data to address research questions. The Phase I area is 2 m wide north-south and 41 m long east-west, covering 82 sq m. The Phase II area is 24 m long north-south and 21 m wide east-west, covering 504 sq m. The additional area west of the History Library addition is 2 m wide north-south and 9 m long east-west, covering 18 sq m. Even the selected excavation areas will have their share of problems related to subsurface disturbance. There are an unknown number of utility lines criss-crossing this parcel at unknown depths that are both agents of mixture and that will affect our ability to link or follow cultural deposits and features. As these lines are encountered, their trench limits will be defined, and systematic artifact recovery will be suspended. The fill from the utility line trenches will be removed, but not screened. Artifacts that lack contextual information, but that are rare and have inherent interpretive potential (such as majolica), or that may be useful in educational programs will be collected.

Based on the testing observations, a large proportion of surficial deposits in the parking lot consists of combinations of materials from multiple components, mixed through the history of construction and reconstruction of the Palace of the Governors, as well as through the installation of the previously discussed utility lines. To the extent that the agents of mixture have blended analytically separable materials, 100 percent recovery is justifiable up to the point of redundancy in the qualitative and quantitative aspects of the collection. To the extent that the mixed materials are not analytically separable, 100 percent recovery does not further the interpretive goals of the data recovery plan (as opposed to a sufficiently large proportion to adequately characterize a particular cultural deposit or feature).

Exact prescriptions for determining degrees of mixture and the potential to contribute to the research efforts cannot be specified with the information at hand. Ultimate criteria will require a combination of stratigraphic assessment, monitoring the full suite of artifacts recovered from exploratory excavation units, and consultation between field archaeologists, OAS staff analysts,

and Palace of the Governors' staff. Artifacts from each stratigraphic or arbitrary level will be examined for their relative age in the field and during artifact processing concurrent with field excavation. Out-of-place temporal markers will be noted and will be used to develop an argument for the temporal homogeneity or heterogeneity of the cultural materials. Stratigraphic context will be closely noted for features that would explain mixtures and would help define the potential sources of those mixtures. Once initial or exploratory excavation units have documented the full depth of deposits with 100 percent recovery, the nature of mixtures will be explicitly assessed, and subsequent recovery between the exploratory units will be adapted according to the amount of mixture and the potential of the deposits to contribute to the research questions. Alternatives to 100 percent screening include opportunistic recovery of specific artifact types (such as European ceramics, diagnostic rim sherds, other temporally diagnostic materials, or unique interpretable items) that are discovered during monitoring activities.

Whether or not cultural deposits are mixed, the potential artifact yield is expected to be very high. Based on the patio testing, an estimated 1,500 artifacts will be recovered from each square meter of excavation area. Depending on the feature and stratigraphic distribution of these artifacts, the volume of recovered material could rapidly reach a point of information redundancy relative to the interpretive needs of the research questions. Redundancy is not by itself negative, but these excavations will need to be phased, and in the face of budget constraints, we cannot allocate all of our resources toward redundant recovery early in the excavation phasing. For this effort, redundant recovery will be defined as a similar stratigraphic sequence across the excavated area and a similar range of artifact types and frequencies with limited variability that does not substantively change analysis and interpretation. The first priority will be to ensure that the research design can be addressed with the materials and samples that are recovered from the defined features and stratigraphic units. The second priority will be to ensure that sufficient sample sizes are recovered to adequately represent the archaeological record for our present needs and any future research needs. The third priority will be to ensure that the artifact sample will be of sufficient size to be comparable with previously completed work within the Palace of the Governors.

We anticipate that decisions to cease 100 percent recovery will have to be made during the course of the project. Because we cannot specify criteria for arguing redundancy or coping with mixture in advance of having both stratigraphic and content information, these decisions will be made in consultation with Museum of New Mexico and HPD staff. The anticipated decision points will be highlighted in the discussions of the excavation phasing that follow.

Late Summer-Early Fall 2002 Field Phase (Phase I)

The late summer-early fall 2002 field phase will coincide with the stabilization of the north wall of the Palace of the Governors' patio offices. Wall stabilization entails undercutting the existing wall, removing unstable foundation elements, and inserting a combination of stabilization materials and devices. To prevent the wall from collapsing, undercutting and stabilization will be staged, which means that archaeological examination of buried deposits also will be staged. This initial effort will extend from the Museum Administration Building parking lot driveway along the north wall of the Palace of the Governors' patio offices and extend east to the corner of the Palace patio offices and the original Palace Annex, which forms the southeast corner of the parking lot. The length of this initial section is 41 m long and 3 m wide, covering 123 sq m (Fig. 13).

For safety and access reasons, and because of potential subsurface disturbances resulting from the Museum Administration Building construction, only a 2-m- wide strip extending north from the north wall of the Palace patio offices will be investigated within the driveway, covering 82 sq m. Once excavations in this Phase I area are completed, it will be backfilled. Phase II excavations will continue to expose intact features or deposits extending more than 2 m north of the Palace

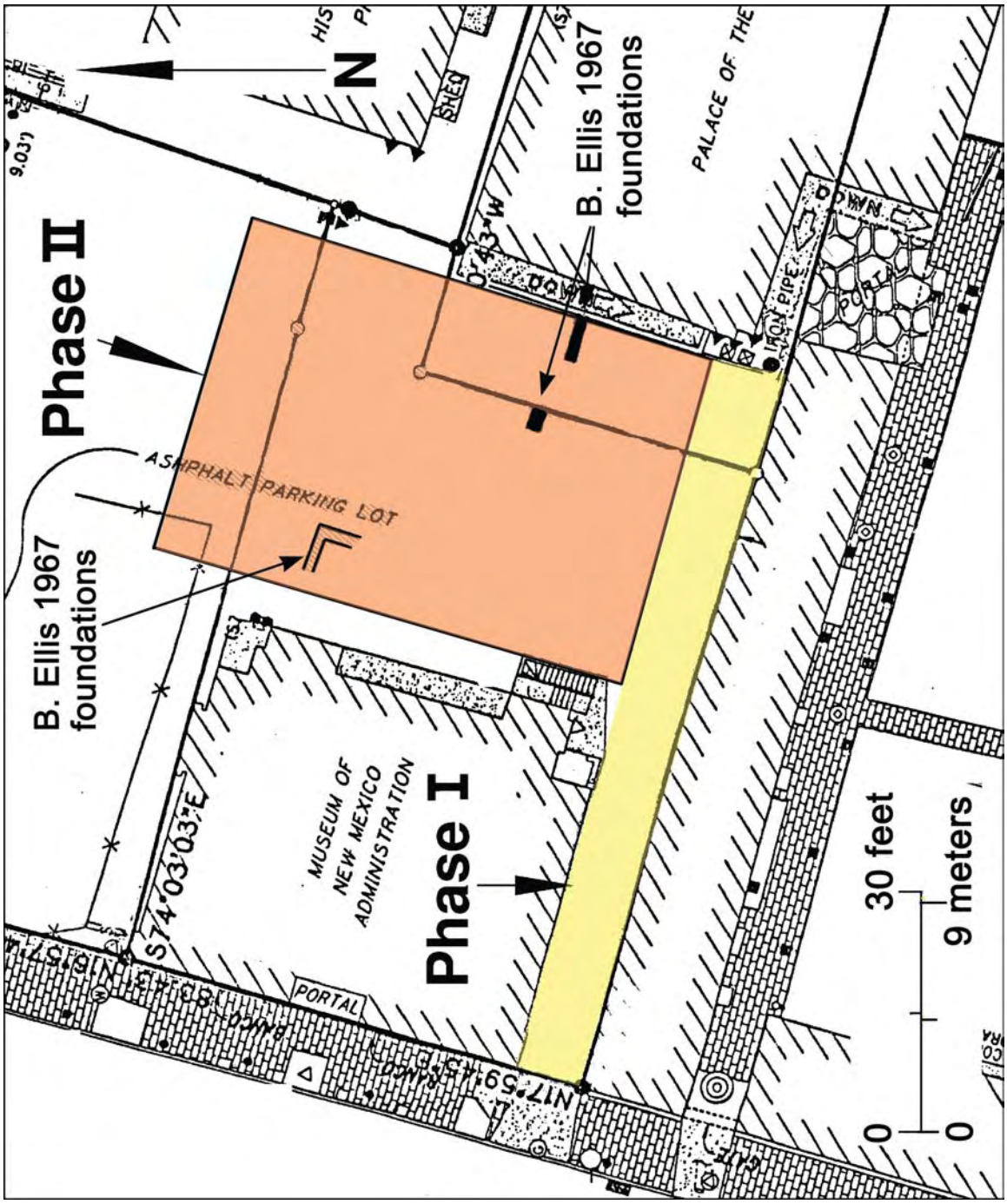


Figure 13. Detail of two planned excavation areas.

patio offices wall, beginning where the driveway becomes the parking lot. Phase II excavations will occur within a 504-sq-m area.

The following are proposed field procedures for Phase I.

1. **Remove asphalt and establish a grid system.** Before any work is begun, all asphalt will be removed from the driveway and parking lot within Phase I and Phase II excavation areas by the contractor. This work will be monitored by an archaeologist to ensure that there is minimal disturbance of the underlying cultural deposits.
2. **Establish a 1-by-1-m Cartesian grid** for the entire Museum Administration Building parking lot. A primary datum will be set and an electronic mapping unit will be used to establish a grid system and to establish base elevation points. These points will be used to produce a detailed excavation map of the site and to link this excavation with previous archaeological projects on Museum property. Excavation units will be established and expanded within the grid system. Subdatums for vertical control will be established as necessary.
3. **Geophysical Remote Sensing.** Geophysical remote sensing is planned for the areas shown as Phase I and Phase II on Figure 13. One or more geophysical techniques may be useful for providing additional information on known features, as well as identifying new features with a minimum of initial manpower investment. Geo-Testing of Albuquerque has provided information on soil types and stratigraphy in the parking lot. At least four borings penetrated the cultural deposit (Bore Holes 7-10 in Fig. 14). A fine- to coarse-grained brown-black or black, clayey sand, moist with low to medium plasticity was encountered at a depth of 1.5 m (5 ft). This description matches the cultural strata encountered during the 1995 and 1999 projects. No artifacts were reported during the coring, but the soil color and texture are consistent with the upper 1.5 m encountered by excavations. These tests indicate that there is potential for cultural deposits within a 586-sq-m area, at least. They also indicate soils that are conducive to electromagnetic techniques.

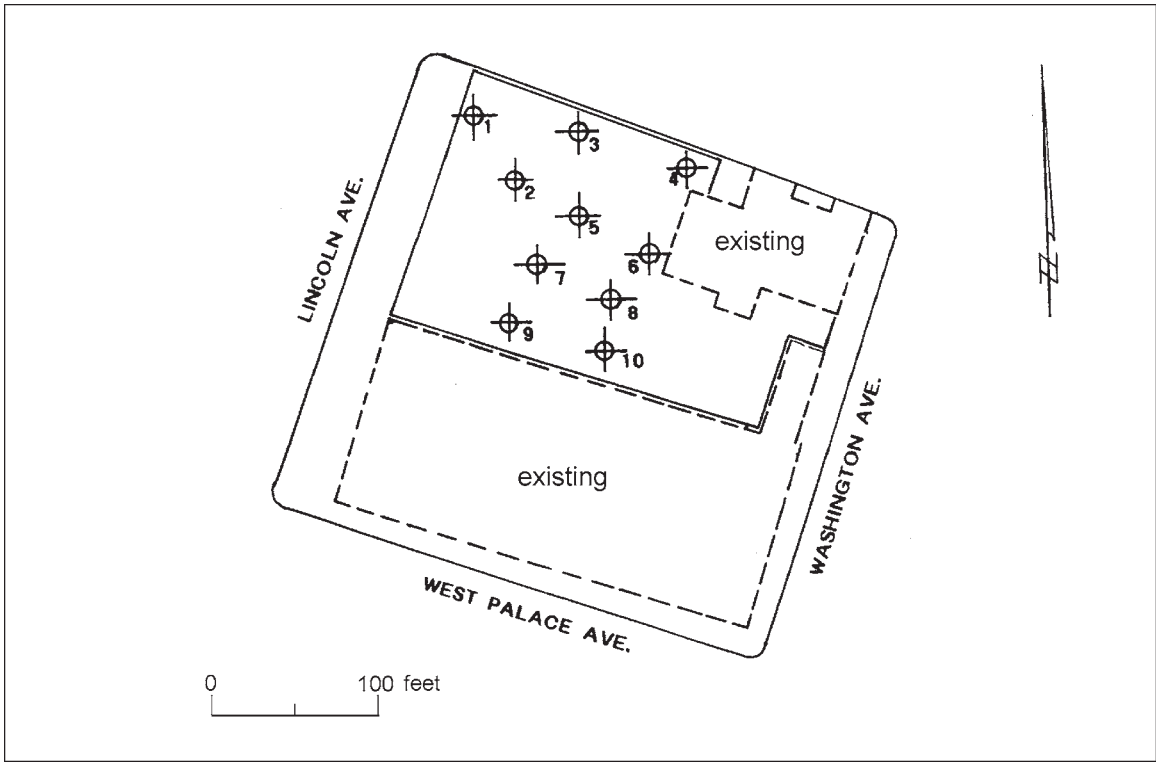


Figure 14. Location of bore holes.

Geophysical work will increase productivity of the early efforts to locate and define features (both archaeological and modern utilities), allowing for more efficient excavation of significant features and deposits. In consultation with a geophysicist, appropriate methods will be selected. Results of the geophysical work at San Marcos Pueblo in 1999 will be provided to the geophysicist to aid in the decision-making process. Soil testing data will also be provided to the geophysicist.

It is expected that techniques will be selected for their ability to detect adobe and cobble walls, and to detect depressions or troughs that have filled with soils that diverge in texture, moisture, and density from the parent or construction material. Methods may include ground-penetrating radar, ground conductivity or electrical resistivity, or proton magnetometry.

4. **Excavation Units.** Within the 41-m-long strip, 2-by-1-m excavation blocks will be placed perpendicular to the north wall of the patio offices at 4-m intervals. Excavated materials and samples will be recovered and provenienced in 1-by-1-m units. The initial excavation depth will be 1 m as required for the stabilization effort. The 2-by-1-m excavation unit will be excavated to the initial depth with vertical controls maintained in arbitrary or stratigraphically defined units. Once the 2-by-1 m unit is excavated, architectural stabilization will proceed within the physical limits of each unit. A 1-m-wide strip along the south wall of the Museum Administration Building will remain unexcavated because it has been disturbed by the original building construction, as discussed above.

   Once the first series of up to 10 2-by-1-m excavation units are excavated 1 m deep, the stratigraphy and artifacts will be evaluated to determine if an intact chronological sequence is represented by all or part of the upper cultural deposit. Systematic excavation will proceed until the field director determines that redundant or disturbed deposits exist, then HPD will be notified and consulted. If HPD concurs with the field director's assessment, then the remaining disturbed or redundant upper deposits will be removed, by the contractor crew, but closely monitored by OAS archaeologists and crew. If during monitoring, features or dense midden deposits not present in the initial sample are encountered, they will be excavated systematically.

   After the 41-m-long stretch of the Palace patio offices' north wall is stabilized, the remaining 50 to 80 cm of cultural deposit will be systematically excavated in 1-by-1-m units. Until stratigraphic control can be established for the lowest cultural deposits, arbitrary excavation levels will be maintained. Stratigraphic excavation will be instituted when sufficient units have been excavated to define temporally distinct layers. Intact cultural deposits and features will be excavated at a 100 percent recovery rate within the 2-m-wide area until a pattern of redundancy is observed and confirmed in consultation with HPD. Features or deposits that extend beyond the 2-m-wide Phase I area will be completely excavated as part of Phase II. All anomalies identified within the Phase I area by geophysical remote sensing will be investigated to determine if they are cultural. If they are cultural features or deposits, then they will be completely excavated.

   Upon completion of the first phase of excavation, mapping and final recording will be followed by backfilling the excavation areas. The vertical and horizontal controls will be left in place for use during the second phase of excavations, which will begin in February 2003. HPD will be apprised on the results and any potential changes to the Phase II data recovery effort.

Spring-Summer 2003, Phase II

The Spring-Summer 2003 phase will begin in February and potentially continue through the end of June. Excavation will focus on the 18-by-12-m main excavation area shown in Figure 13 and the narrow strip immediately west of the 1995 History Library Addition (HLA expansion). First, known or expected architectural and landscape features will be investigated, followed by exami-

nation of features or anomalies identified during Phase I excavations and anomalies identified by the geophysical survey.

Known or expected architectural features within the main excavation area are the three foundation segments documented by B. Ellis in 1967 (Fig. 13). Each segment's location will be projected from B. Ellis's sketch map and examined with a 4-by-4-m excavation block. A 1-by-4-m trench will be excavated in 1-by-1-m units across the projected wall segment location to a depth of 0.76 to 0.90 m. These units will be excavated in arbitrary levels to determine if an intact stratigraphic sequence is present. An intact stratigraphic sequence should be discernible from the vertical distribution of temporally sensitive artifacts, careful examination of soils, and comparison with similar stratigraphic levels exposed by Phase I excavations. If disturbed layers are identified or redundant data comparable to Phase I are observed, the sediments will be removed without screening for the remainder of excavation within each block, and if a block(s) is expanded to follow a wall segment or associated surface. Before fill is removed without systematic recovery, HPD personnel will be consulted. Following nonsystematic removal of overburden, the remaining intact or less disturbed deposits will be systematically excavated exposing the wall segment and associated surfaces, features, and deposits.

After the three 4-by-4-m excavation blocks are excavated, the upper disturbed layers, if any are identified, will be removed by mechanical equipment to within 10 cm of the intact cultural layer in the main excavation area. Mechanical equipment use will allow excavation to focus on exposing a large area surrounding the wall segments. Use of mechanical equipment will proceed following consultation with HPD.

Following the mechanical removal of overburden, at least three more 4-by-4-m excavation blocks at the projected intersection of the two main wall segments will be excavated to determine the structure layout. Excavation will expose the structure outline or outlines, depending on the number of foundations that are ultimately exposed. Excavations will follow standard excavation procedures.

Once the structures and other features are defined and any floor area has been cleared, additional 1-by-1-m units will be excavated where anomalies were detected by the geophysical survey. If the anomalies were in a disturbed stratigraphic layer, they will have been removed by the mechanical equipment. However, disturbed layers may have limited contextual integrity from which upper fill anomalies can be interpreted. Anomalies that occur below the wall segment level at more than 0.76 to 0.90 m deep may have integrity and relate to seventeenth- and eighteenth-century occupation. HPD staff will be consulted upon the completion of the upper-level excavation and before proceeding into deeper cultural deposits.

Within the initial 4-by-4-m units, the 1-by-4-m unit that was first excavated will be excavated to the bottom of any deeper cultural deposits. Excavation will proceed in arbitrary levels, unless distinct strata are observed and can be followed. If features or surfaces are encountered, the units will be expanded to define and expose their extent and nature. If redundant or disturbed deposits are encountered, then HPD will be consulted and systematic excavation of this area will be halted.

Finally, four 1-by-2-m wide units will be excavated along the projected location of the acequia identified during the History Library Addition. The acequia was encountered 1.4 m below the modern ground surface. Its presence should be confirmed by the geophysical survey, and the excavation units will be located based on the previous excavation and geophysical information. Excavation of a sample of acequia cross sections will provide for better dating and more detailed information on its morphology and use history.

All initial construction activities will be monitored following the completion of the systematic excavation. OCA archaeologists will be present for all excavations that occur at depths consistent with the excavated cultural deposits. If cultural deposits or features are encountered, then

work will be halted and HPD will be consulted before work may continue.

Excavation Procedures

All excavations will maintain horizontal control within the established Cartesian grid system of 1-by-1-m units. Excavation of units will proceed in 10- to 20-cm arbitrary levels, until stratigraphic layers are defined. Within stratigraphic layers, excavation will proceed in no more than 20-cm increments. All fill that is not classified as disturbed or redundant will be screened through ¼-inch or -inch hardware cloth, depending on the context. For example, pit feature fill will be screened with -inch mesh. Structure floor fill will be screened through -inch mesh.

Recording will include descriptions of soil, artifact variety and frequency, evidence of disturbance, horizontal and vertical location and associations, and temporal associations. At least one wall of each excavation unit will be profiled. Stratigraphic recording will include soil type, texture, color, natural and cultural inclusions, and estimated age.

Defined features will be excavated by hand, using standard archaeological hand tools. All fill will be screened through -inch mesh. Half of the feature will be excavated in arbitrary 10-cm levels. The exposed cross section will be profiled and the soil strata described using a Munsell Color Chart and standard geomorphological terms. The remaining half of the feature will be excavated by the strata defined in the profile.

Once defined, features will be completely excavated, feature maps and profiles will be drawn and tied into the grid system, and site elevations will be taken. Drawings will include a scale, north arrow, and key to abbreviations and symbols. Written description will be on standard forms that will include provenience, dimensions, soil matrix, artifact content, construction details, time frame, excavation technique, and other data. Architectural features will be recorded and sampled as described in the Architectural Data section. Excavation records will include photographs of the feature excavation progress and the final appearance. Photographs will include a metric scale, north arrow, and mug board with the LA number, feature number, and date. All photographs will be recorded on a photo data sheet.

Photographs will be taken of the site, excavated units, and all features found within the units. Profiles will be drawn of all excavated units. A final site map will document excavation limits, architectural and other cultural features, and existing buildings adjacent to the excavation area.

Archaeobotanical Sample Collection

This sampling procedure is primarily adapted from Toll et al. (2000). The potential contribution of botanical analyses to this study is maximized by attention to reasonable and appropriate sampling in the field. It is helpful to recognize a fundamental difference between floral data collected in soil samples and virtually every other artifact category. Standard field procedure now dictates collection and curation with provenience information of every sherd, bone, and lithic artifact encountered during most excavation situations; sampling of this universe may take place later in the laboratory. Doing the equivalent for botanical materials would mean bringing home the entire site. This makes every soil sample collected in the field a sampling decision. Samples not taken are generally gone forever. On the other hand, a systematic decision to sample widely and intensively to guard against such information loss can generate hundreds or even thousands of unanalyzed samples. Lacking infinite time and resources, we must try to garner maximal information from judicious sampling.

Two aspects hallmark the most effective sampling protocols: awareness of which depositional contexts are most productive of floral remains, and recognition of site areas from which subsistence data will be of most interpretive use for the research foci of the project. Both are funda-

mentally selection processes. The following guidelines for sampling specific provenience categories provide some simple directives for choosing flotation sampling locations.

Botanical Sampling Guidelines. Excavators should concentrate on covering the most informative contexts. By coping with less-informative proveniences with minimal sampling (a small number of well-placed samples), we can maintain the option of sampling more complex and informative proveniences in greater detail, generating finer scale information where it will be appropriate and helpful.

Prime among differentiated, potentially informative contexts are intact interior floor surfaces protected by fill and roof fall. Sampling multiple locations on interior floors contributes data for mapping cultural activities involving plant materials. This patterning informs on the organization of economic and cultural behavior at a household level. Analogous exterior surfaces, such as extramural work areas with associated cooking and storage features, are of equal interpretive interest, but tend to have very poor preservation of perishable remains, and consequently do not merit intensive sampling.

Trash fill and roof fall, though voluminous and originating from cultural behavior, are of considerable interest, but as an entity. Except in the rare case of a burned roof falling intact on the floor below and being quickly covered by protective fill, horizontal differences in floral debris are really only a sampling problem. Sampling from contexts without good cultural affiliation (for example, disturbed areas) will be minimized.

Botanical Sampling Procedures. Botanical samples from floors can be a very important source of information, especially when taken from around thermal features. However, data on other work areas that might not be as well defined are also desired. For a clearer picture of what plant materials are associated with specific work areas, we need samples from floor contents unassociated with feature concentrations. The best way to ensure adequate coverage is to take samples from alternate grids, with the idea that analysts will later be able to select floor loci that will represent major activity areas, as well as one or more controls.

A single sample will be taken from near the bottom of primary deposits in interior features. Multiple samples will only be taken when primary deposits are clearly stratified. Samples may be taken from secondary deposits, with the understanding that they do not reflect the function of the feature itself. Single 2-liter samples will also be taken from roof fall zones and from trash deposits, if linked to a later or continuing occupation of the site.

Extramural features will be sampled in the same way as features inside structures: a single sample will be taken from near the bottom of primary deposits, and multiple samples will only be obtained when primary deposits are clearly stratified. Outbuildings like root cellars and sheds are particularly important because of their association with the storage of plant foods for people and livestock. Floor fill will be sampled for these types of nonresidential structures, and multiple samples will be taken if warranted (for instance, if a shelf or banco are present). Corrals and extramural middens will be sampled similarly. In both cases, a single 2-liter sample will be obtained from each clearly definable cultural stratum. If the sample is large enough and was taken accurately from the provenience it is meant to represent, multiple samples from the same stratum are redundant.

Human Remains

If human remains are encountered, the following process will be implemented. On state land, state law (NMSA § 18-6-11.2, 1989 and HPD Rule 4 NMAC 10.11) requires a permit for excavation of unmarked burials. Human remains will be excavated under the current annual burial permit issued to the Office of Archaeological Studies. Following the permit provisions, if human remains are discovered, the intent to use the annual permit, including a legal description of the location of

the burial, the written authorization to remove the burial from the landowner, a description of the procedures to be implemented to identify and notify living relatives of the burials, certification that the law enforcement agency having jurisdiction in the area has been notified, a list of personnel supervising and conducting excavations of the human burial, and the NMCRIS LA Project/Activity Number for the permitted excavation will be submitted in writing to the State Historic Preservation Officer (SHPO) before excavation of the burial begins. The local law enforcement agency with jurisdiction over the area will be notified to contact the state medical investigator who will determine if the burial is of medico-legal significance. Within 45 days of completing the permitted excavation, recommendations for the disposition of human remains and funerary objects will be made to the SHPO. These recommendations will take into consideration the comments of living persons who may be related to the deceased and the wishes of the landowner. The plan will provide a proposed location for reburial or approved curatorial facilities and an inventory of funerary objects or other artifacts found in association or collected in the course of excavation. The SHPO, after consulting with the State Office of Indian Affairs, will determine the appropriate disposition of the human remains and associated funerary objects. If a final report cannot be completed with a year of the completion of fieldwork, an interim report will be submitted along with an estimated completion date for a final report.

Following notification and concurrence by the State Police, Medical Examiner, and SHPO, the following procedures will be applied to the finding of human bones in any excavations at the Palace of the Governors.

Isolated Human Bones. When an isolated and disarticulated human bone or bones are recognized in context and we have clearance to proceed from the applicable agencies, the element(s) will be located vertically and horizontally on a detailed plan map and photographed. The plan will include a point plot number and sufficient detail to determine the orientation, possible associations, and whether the interment was natural or intended. The excavator will pay exceptional attention to recording observations that may be pertinent to interpreting how the element came to rest in this location. Any evidence of rodent, insect, root, carnivore, or other types of disturbance will be recorded in detail. If a large number (ten or more) of disarticulated or partially articulated human bones are found, the excavation will stop until personnel trained in human osteology can aid in the excavation. If human bones are found in the screen, excavation in that unit will be by trowel until it is determined that it is indeed an isolated incident.

Human Burials. As soon as a burial is suspected, enough will be exposed to confirm the discovery and calls will be initiated to the appropriate agency officials. Once these officials have concurred that the remains are nonforensic in nature, the following procedures will be followed.

To the extent possible, the burial pit will be defined by clearing the area of the pit and sufficient working space to a uniform level as near the point of origin of the pit as possible. During this clearing the excavator will observe and record any information pertinent to the origin of the pit with respect to other features and surfaces at the site. Grid corners or other datums for use in locating the burial in three-dimensional space will be established. Once an outline has been defined, the pit will be photographed.

Once the pit is defined, a line will be established though the center of the long axis and half of the pit will be excavated. Fill will be carefully removed with tools that will not damage the bone. Broad-tipped bamboo and wooden tools are preferred along with fine tipped metal tools. Pointed wooden tools leave marks that are more difficult to distinguish from old marks than do metal tools that leave a black or metal signature. To the extent possible, bones will be left in place, excavating only enough to expose the outline of the element. A profile along the pit axis will be drawn. This may have to be in stages, progressing as the entire burial is exposed and layers of elements are removed. Pollen and flotation samples will be taken from near the head and in the stomach area.

Once the profile is recorded, the other half of the pit will be excavated, again exposing the bones only to the extent necessary for recording the burial. When the burial is adequately exposed, digital and black-on-white photographs will be taken. These photos will record the burial from an number of angles, including directly above to help clarify the field drawings. A detailed plan of the burial, burial goods, areas of disturbance, and aspects of the pit will be drawn and when possible a print of the digital photograph will be extensively annotated.

Forms completed concerning the burial include the usual feature form to detail the attributes of the burial pit, fill, and other information in the same format at other pit excavations. The OAS Burial Form (Appendix 1), which is completed for every burial, incorporates the following information: project, site, recorder, and other administrative information; detailed provenience information; details concerning the grave or feature where the burial was found (relationship to primary feature, placement in the feature, soil matrix the feature or grave is excavated into, pit description, dimensions, construction, sealing or plugging, pit fill description); characteristics of the burial (whether it is primary, secondary, etc., details concerning the body position and orientation of the individual); details concerning the position of each major element or part (e.g., left leg and foot); estimates as to the age and sex of the individual; comments concerning the preservation of the bone and any disturbance noted during the excavation; a list of all material recovered from the burial excavation both as point plots and screening; the size screen used and how much fill was screened through that size; and a list of all plans, plots, photographs, and other documentation. The Human Field Inventory and Disturbance form lists each bone or type of bone (e.g., right ribs) and records the presence, type of disturbance, and location of disturbance.

During and after the recording process, bones will be removed carefully without excessive cleaning and will be wrapped in acid-free tissue. Related elements, e.g., the left arm bones, will be placed in bundles, especially when fragmentary, to aid in identification of small fragments. These bundles will be placed in an individual box containing only the burial and transported to locked storage at OAS.

LABORATORY ANALYSES

Laboratory analysis will be conducted by the staff of the OAS and by specialized professional consultants where necessary. Analysis procedures will follow those standards established by the OAS. When brought in from the field, artifacts will first be washed or cleaned, sorted according to type, and then catalogued. Any remains that do not appear to be stable will be treated in consultation with the Museum of New Mexico's Conservation Unit. Many of the analysis procedures and formats have been developed by OAS staff for prehistoric and historic sites in the northern Rio Grande. These discussions are adapted directly from Moore et al. (2000:97-125).

Ceramic Analysis

A large quantity of ceramics are expected to be recovered by excavation. They will be analyzed at the Office of Archaeological Studies laboratory under the direction of C. Dean Wilson. Both ancestral and historic Pueblo or Native American-made pottery should be recovered, in addition to a range of Euroamerican ceramics. Euroamerican ceramics will be analyzed as part of the historic artifact analysis.

Detailed and systematic examination of various attributes is needed to fully determine the timing and nature of the deposits and features exposed by the excavations. Ceramic studies may contribute to these studies by using distributions of ceramic types and attribute classes from dated contexts to examine patterns related to ethnic affiliation, place of origin, form, and use of ceram-

ic vessels. In order to examine these issues, it is necessary to record a variety of data in the form of both attribute classes and ceramic type categories. These technological and stylistic attributes apply to pottery from all periods

Attribute categories used in this study are similar to those employed in recent OAS projects in the northern Rio Grande (Wilson 2002). All sherds will be examined and recorded for temper type, paint type, surface manipulation, modification, and vessel form. Traditional typologies will be used to classify sherds where possible. Examples of known typologies for ancestral Pueblo pottery that will be employed include the Rio Grande, Jemez, Pajarito, Galisteo, and Pecos series (as defined by Habicht-Mauche 1993) for the matte paint pottery. For ancestral Pueblo and early historic Pueblo glaze-paint pottery, the Rio Grande Glaze Ware series as defined by Mera (1940) and refined by Warren (1979) will be employed. For the late ancestral Pueblo and historic Pueblo matte paint pottery traditions, the Tewa series as defined by Harlow and revisited by McKenna and Miles (1991) will be used. In addition, recent advances by Office of Archaeological Studies analysts will be incorporated into both prehistoric and historic pottery-based dating (Wilson in Moore 2000).

Other studies planned for data recovery involve more detailed characterizations of selected subsamples of sherds. Such studies will include analysis of refired paste color, petrographic characterizations, design style, and construction methods. Studies of the distributions of these descriptive attributes will be used to examine various issues discussed below.

Trends that reflect chronology and economic patterns can also be examined using ceramic type categories. Ceramic types, as used here, refer to groupings identified by various combinations of paste and surface characteristics with known temporal, spatial, and functional significance. Sherds are initially assigned to specific traditions based on probable region of origin as indicated by paste and temper. They are then placed in a ware group on the basis of general surface manipulation and form. Finally they are assigned to temporally distinctive types previously defined within various tradition and ware groups.

While a number of historic Tewa ceramic types have been formally defined and described (Batkin 1987; Frank and Harlow 1990; Harlow 1973; Mera 1939), most of these type definitions are based on whole vessels and tend to emphasize decorated types. Historic Tewa decorated types are often distinguished from each other by characteristics such as overall design field or shape that are only observable in complete vessels. Such distinctions are of limited use in studies of pottery from archaeological assemblages, which tend to be dominated by plain ware sherds. Thus, this analysis will focus on the definition and use of sherd-based categories more suitable for sherd collections.

Sherd-based definitions of historic Tewa types have been used to examine historic archaeological assemblages (Dick 1968; Lang 1997; Snow 1982). In addition, a number of descriptive categories have been proposed for sherds that exhibit ranges of characteristics that differ from those used to define types from whole vessels. These categories are defined by a range of characteristics that may be ultimately connected to but are not necessarily equivalent to types previously defined for whole vessels. The degree of correlation between vessel- and sherd-defined categories varies for sherds from vessels of the same type, and depends on how much stylistic or decorative information is present. For example, unpainted sherds from a Powhoge Polychrome vessel would be placed into an unpainted historic slipped category, while sherds exhibiting some paint but without distinct decorations would be classified as "Tewa" Black-on-cream undifferentiated. In such cases, the assignment of sherds to Powhoge Polychrome would be limited to examples with distinct design styles indicative of that type. Still, a broken vessel of a specific pottery type should produce a recognizable pattern of sherds assigned to various formal and informal types. Information on this type of patterning may be derived from looking at how types are assigned to sherds that are eventually reconstructed into whole or partial vessels.

Most informal types reflect a range of characteristics indicative of sherds derived from vessels of previously defined types or groups of types. These characteristics are often self-evident in the type name. They are not described in detail here because of the preliminary nature of this study and the relatively small number of sherds examined. Analysis of the large number of sherds expected from data recovery will undoubtedly result in the addition of new categories as well as the refinement of categories already in use. The ceramic report produced from that study will include detailed descriptions of all sherd-based historic types recognized during the project, as well as illustrations and discussions of combinations of characteristics observed for each type. These descriptions will be presented in a manner that should serve as an important source of information for future analysis of historic northern Rio Grande pottery.

Examination of very basic ceramic patterns may be most efficiently served by creating a small number of ceramic ware groups by lumping types which share characteristics. Such groups include decorated "Tewa" Polychrome, red-slipped utility, plain utility, black utility, micaceous utility, as well as a nonlocal group. The use of these basic broad categories will permit determination of coarse-grained patterning in ceramic assemblages, as opposed to the more basic patterning available from type distributions.

Chipped Stone Analysis

This analysis will be conducted by OAS staff under the direction of James L. Moore. Mr. Moore has considerable experience and is uniquely qualified to study prehistoric and historic lithic assemblages in northern New Mexico.

All chipped stone artifacts will be examined using a standardized analysis format (OAS 1994a). This analytic format includes a series of mandatory attributes that describe material, artifact type and condition, cortex, striking platforms, and dimensions. In addition, several optional attributes have been developed that are useful for examining specific questions. This analysis will include both mandatory and optional attributes. While originally developed for prehistoric lithic assemblages, it has been adapted to include the range of morphological and functional variability representative of Spanish Colonial assemblages.

The primary areas that our analysis format explores are material selection, reduction technology, and tool use. These topics provide information about ties to other regions, mobility patterns, and site function. While material selection studies cannot reveal how materials were obtained, they can usually provide some indication of where they were procured. A study of mobility patterns is not integral to this project, but our analysis of the chipped stone assemblages will provide baseline data useful for evaluating information from other sites. By studying the reduction strategy employed at a site it is possible to compare how different cultural groups approached the problem of producing useable chipped stone tools from raw materials. The types of tools in an assemblage can be used to help assign a function, and to aid in assessing the range of activities that occurred at a site. Chipped stone tools provide temporal data in some cases, but unfortunately they are usually less time-sensitive than other artifact classes like pottery and wood.

Each chipped stone artifact will be examined using a binocular microscope to aid in defining morphology and material type, examine platforms, and determine whether it was used as a tool. The level of magnification will vary between 20x and 100x, with higher magnification used for wear-pattern analysis and identification of platform modifications. Utilized and modified edge angles will be measured with a goniometer; other dimensions will be measured with a sliding caliper. Analytic results will be entered into a computerized data base to permit more efficient manipulation of the data, and to allow rapid comparison with other data bases on file at the OAS.

Attributes that will be recorded for all flakes, angular debris, cores, and tools include material type, material quality, artifact morphology, artifact function, amount of surface covered by cor-

tex, portion, evidence of thermal alteration, edge damage, and dimensions. Other attributes are aimed specifically at examining the reduction process, and can only be obtained from flakes. They include platform type, platform width, evidence of platform lipping, presence or absence of opposing dorsal scars, and distal termination type.

Ground Stone Analysis

Ground stone tools may be recovered from contexts dating from prehistoric and historic contexts and potentially as late as the middle nineteenth century. It is expected that ground stone tools will inform on economy and production. Ground stone identification and analysis will be conducted by OAS staff.

Ground stone artifacts will be examined using a standardized methodology (OAS 1994b), which was designed to provide data on material selection, manufacturing technology, and use. Artifacts will be examined macroscopically, and results will be entered into a computerized data base for analysis and interpretation. Several attributes will be recorded for each ground stone artifact, while others will only be recorded for certain tool types. Attributes that will be recorded for all ground stone artifacts include material type, material texture and quality, function, portion, preform morphology, production input, plan view outline, ground surface texture and sharpening, shaping, number of uses, wear patterns, evidence of heating, presence of residues, and dimensions. Specialized attributes that will be recorded in this assemblage include information on mano cross-section form and ground surface cross section.

By examining function(s) it is possible to define the range of activities in which ground stone tools were used. Because these tools are usually large and durable, they may undergo a number of different uses during their lifetime, even after being broken. Several attributes are designed to provide information on the life-history of ground stone tools, including dimensions, evidence of heating, portion, ground surface sharpening, wear patterns, alterations, and the presence of adhesions. These measures can help identify post-manufacturing changes in artifact shape and function, and describe the value of an assemblage by identifying the amount of wear or use. Such attributes as material type, material texture and quality, production input, preform morphology, plan view outline form, and texture provide information on raw material choice and the cost of producing various tools. Mano cross-section form and ground surface cross section are specialized measures aimed at describing aspects of form for manos and metates, and because these tools wear, they undergo regular changes in morphology that can be used as relative measures of age.

Historic Artifact Analysis

Euroamerican artifacts will be examined using a standardized analysis format (OAS 1994c). It will be conducted by OAS staff, and experts from the New Mexico Office of Cultural Affairs and the National Park Service will be consulted for identification and analysis of materials that may be extraordinary or highly idiosyncratic. The OAS analysis format and procedures should be particularly effective for the New Mexico Museum of History assemblage and other comparative collections that may be analyzed. It has been developed over the last ten years and incorporates the range of variability found in sites dating from the eighteenth to twentieth centuries throughout New Mexico. The detailed recording allows for direct comparisons with assemblages from contemporary sites from other parts of New Mexico and throughout the Greater Southwest.

The main emphasis will be the identification of artifact function. One of the major benefits of this type of analysis is that ". . . the various functional categories reflect a wide range of human activities, allowing insight into the behavioral context in which the artifacts were used, main-

tained, and discarded" (Hannaford and Oakes 1983:70). It also avoids some of the pitfalls of an analytic framework that focuses on categorizing artifacts by material type. Material-based analyses frequently include attributes that are appropriate for only some of the functional categories that might be included in a single material class. For instance, variables that are often chosen for analysis of glass artifacts are usually appropriate for glass containers, but may be inappropriate for flat glass, decorative glass, or items like headlights.

This analytic framework was designed to be flexible, which hopefully enables it to avoid these and other problems. The function of each artifact is described by a hierarchical series of attributes that classifies it by functional category, type, and specific function. These attributes are closely related, and provide a chain of variables that will specify the exact function of an artifact, if known.

Eleven functional categories will be used in this analysis including economy/production, food, indulgences, domestic, furnishings, construction/maintenance, personal effects, entertainment/ leisure, communication, and unassignable. Each category encompasses a series of types, and includes classes of items whose specific functions may be different but are related. An example is a pickle jar and a meat tin, both of which would be included in the food category, but which are made from different materials and had different specific functions.

The exact use to which an artifact was put will be recorded as a specific function within a type. In essence, this attribute represents a laundry list of different kinds of artifacts that may be familiar to most analysts, and is the lowest level of the identification hierarchy. Other variables are recorded to amplify the hierarchy of functional variables, and to provide a more detailed description of each artifact that warranted such treatment. Included in this array of attributes are those that provide information on material type, dating, manufacturer, and what part(s) are represented.

Chronological information is available from a variety of descriptive and manufacturing attributes, especially from the latter. If the array of available variables provide enough information to assign beginning and ending dates to an artifact, it is recorded as date. Manufacturer is the name of the company that made an artifact, when known. This type of information can be critical in assigning a specific date to an artifact, because dates for the opening and demise of most manufacturing companies are available. A related attribute is the brand name associated with a product. Many brand names also have known temporal spans. At times, the manufacturer or brand name can be determined from the labeling/lettering present on an artifact, which was used to advertise the brand name or describe its contents or use.

The technique used to manufacture an artifact will be recorded, when it can be determined. Since manufacturing techniques have changed through time, this attribute can provide a relative idea of when an artifact was made. A related attribute is seams, which records the way in which sections of an artifact were joined during manufacture. Like manufacturing techniques, the types of seams used to construct an artifact are often temporally sensitive. The type of finish/seal will be recorded to describe the shape of the opening in a container and the means of sealing it. Many finishes and seal types have known temporal spans of limited duration. Related to this attribute is opening/closure, which records the method of retaining or extracting the contents of a container.

In some instances, attributes such as color, ware, and dimensions can provide information on artifact dating. Thus, the current color of an artifact will be recorded if of diagnostic value. A good example of where this attribute applies is glass, where the various colors present at a site can be used to provide some idea of date. Ware refers to ceramic artifacts, and categorizes the specific type of pottery represented, when known. Since temporal information exists for most major ware types, this attribute can provide critical dating information. Dimensions are also of chronologic value, especially when examining artifacts like nails or window glass, where lengths or thicknesses vary through time.

A few attributes will be used to provide information on the manufacturing process. In some

instances these attributes also have descriptive value, and can be used to verify functional information. Material records the material(s) from which an artifact was made. Paste describes the texture of clay used to manufacture ceramic objects, and is differentiated by porosity, hardness, vitrification, and opacity. Decoration describes the technique used to decorate an artifact, including pottery. A simple description of the decoration on an artifact is recorded as design.

In addition to most of the attributes already discussed, several others will be used to provide a more comprehensive description of each artifact. Fragment/part describes the section of artifact represented. Artifacts or fragments of artifacts within a single excavation unit whose functions and descriptions are identical will be recorded together, and the number of specimens present will be listed under count.

Cultural and environmental changes to an artifact will also be recorded. Reuse describes evidence of a secondary function, and any physical modifications associated with that use will be described as condition/modification. If environmental conditions have had any effect on the surface of an artifact, it will be recorded as aging.

Other variables will be used to describe the appearance of an artifact. Shape describes physical contours, and will generally only be recorded if an artifact is whole. Several different measurements will be taken to complete descriptions including volume, length/height, width/diameter, thickness, and weight. Measurements will be taken using industry standards, where appropriate. The entire range of measurements are rarely applicable to a single artifact, and only those that are deemed appropriate will be taken.

Faunal Remains Analysis

Previous excavations at the Palace indicate that large amounts of bone will be recovered. Fauna are especially critical for addressing economy and production. Analysis will directed by Nancy J. Akins, OAS Osteology Laboratory Director. Ms. Akins has 25 years of experience in analyzing faunal assemblages from prehistoric and historic period sites located throughout New Mexico.

Specimens from proveniences chosen for analysis will be identified using the OAS comparative collection supplemented by those at the Museum of Southwest Biology, when necessary. Recording will follow an established OAS computer coded format that identifies the animal and body part represented, how and if the animal and part was processed for consumption or other use, and how taphonomic and environmental conditions have affected the specimen.

Most variables will be used to address more than one of the research issues within the suggested framework. Each data line will be assigned a lot number that identifies a specimen or group of specimens that fit the description recorded in that line. Lot numbers also allow for retrieving an individual specimen if questions arise concerning coding or for additional study. A count will also be included to identify how many specimens are described in a data line.

Taxonomic identifications will be made as specific as possible. When an identification is less than certain, this will be indicated in the certainty variable. Specimens that cannot be identified to species, family, or order will be assigned to a range of indeterminate categories based on the size of the animal and whether it is a mammal, bird, other animal, or cannot be determined. Unidentifiable fragments often constitute the bulk of a faunal assemblage. By identifying these as precisely as possible, information from the identified taxa is supplemented.

Each bone (specimen) will be counted only once, even if broken into a number of pieces during excavation. If the break occurred prior to excavation, the pieces will be counted separately and their articulation noted in a variable that identifies conjoinable pieces, parts that were articulated when found, and pieces that appear to be from the same individual. Animal skeletons will be considered single specimens so as not to inflate the counts for accidentally and intentionally buried taxa.

The skeletal element will be identified then described by side, age, and portion recovered. Side will be recorded for the element itself or for the portion recovered when it is axial, such as the left transverse process of a lumbar vertebra. Age will be recorded at a general level: fetal or neonate, immature, young adult, and mature. Further refinements based on dental eruption or wear will be noted as comments. The criteria used for assigning an age will also be recorded. This will generally be based on size, epiphysis closure, or texture of the bone. The portion of the skeletal element represented in a particular specimen will be recorded in detail to allow determination of how many individuals are present in an assemblage and to investigate aspects of consumer selection and preservation.

Completeness refers to how much of that skeletal element is represented by a specimen. It will be used in conjunction with portion to determine the number of individuals present. It will also provide information on whether a species is intrusive, and will inform on processing, environmental deterioration, animal activity, and thermal fragmentation.

Taphonomy is the study of preservation processes and how they affect the information obtained by identifying some of the nonhuman processes that affect the condition or frequencies found in an assemblage (Lyman 1994:1). Environmental alteration includes degree of pitting or corrosion from soil conditions, sun bleaching from extended exposure, checking or exfoliation from exposure, root etching from the acids excreted by roots, and polish or rounding from sediment movement, when applicable. Animal alteration will be recorded by source or probable source and where it occurs.

Burning is also a taphonomic process. Burning can occur as part of the cooking process, part of the disposal process, when bone is used as fuel, or after it is buried. Here, the color, location, and presence of crackling or exfoliation will be recorded. Burn color is a gauge of burn intensity. A light tan color or scorch is superficial burning, while bone becomes charred or blackened as the collagen is carbonized. When the carbon is completely oxidized, it becomes white or calcined (Lyman 1994:385, 388). Burns can be graded over a specimen, reflecting the thickness of the flesh covering portions of the bone when burned. Dry burned bone is light on the exterior and black at the core or has been burned from the interior. Graded burns can indicate roasting. Completely charred or calcined bone and dry burns do not occur as part of the cooking process. Uniform degrees of burning are possible only after the flesh has been removed and generally indicate a disposal practice (Buikstra and Swegle 1989:256).

Evidence of butchering will be recorded as various orientations of cuts, grooves, chops, abrasions, saw cuts, scrapes, peels, and intentional breaks. This type of evidence is much less ambiguous in historic assemblages where metal knives, axes, and cleavers leave more distinct marks than stone tools. The location of butchering will also be recorded. Additional detail will be obtained by indicating the exact location on diagrams of the body parts.

Fauna recovered from historic sites is typically so fragmented that few attempts have been made to collect measurement data. Yet this information has the potential to differentiate varieties of sheep and goat, perhaps distinguish beef from draft cattle, and differentiate species of equids, along with the social and economic consequences thereof. Because this data has such potential, all possible measurements will be taken on domestic fauna. Measurements will be taken following von den Driesch (1976), who provides a comprehensive list of measurements for virtually every element. While these sites may not provide enough data to confidently answer questions concerning the varieties represented, they will begin to build a data base for comparisons with earlier and later sites.

Chronometric Dating

Absolute dating methods that may be used in this project include tree-ring dating, archaeomagnetism, and radiocarbon assays. Other relative dating methods, particularly ceramic stylistic and

technological variation, projectile point typologies, and historic artifact manufacture dates are discussed in the appropriate analytical section.

Tree-ring dating produces extremely precise and accurate dates when appropriate samples are available. Ideal samples should have 15 to 20 years of growth rings, a sensitivity to climate variation that allows the sample to be matched with the regional chronology of climatic variation, qualities of outer surface that allow the outer ring to be interpreted as the death year of the tree, and an archaeological context that supports a linkage between tree death and the cultural behavior that is the target event of the dating effort. Tree-ring dating is most reliable when multiple samples are collected from structural remains where timbers were cut to length. Although construction timber reuse and stockpiling can cause inaccuracies (Graves 1983; Crown 1991), patterns of dates from multiple samples usually reveal the presence of remodeling or reuse of wood (Ahlstrom 1985). Although wood samples from nonarchitectural contexts can be dated, samples from fuel wood in hearth contexts risk the same "old wood" problem that affects radiocarbon samples (Schiffer 1987:309-312; Smiley 1985). The University of Arizona Tree-Ring Laboratory in Tucson is the preeminent laboratory for this method and they will be used if tree-ring samples are recovered.

Archaeomagnetism does not have either the potential precision or accuracy of tree-ring dating, but it does have other advantages. Heating allows the field orientations of magnetic particles in earth or rock to become reoriented to the prevailing geomagnetic field when the particles cool (Sternberg 1990; Wolfman 1990). Since the geomagnetic field is constantly changing, features that are burned and cool will retain a distinctive magnetic orientation that is determined by the date of the cooling. Whereas tree-ring dating works best for recording the dates of construction events, archaeomagnetic dates apply to the final use of burned features and is one of the only dating techniques that can inform about abandonment events. Archaeomagnetic samples are collected from burned cultural features or contexts, the geomagnetic orientation of the sample is measured in the laboratory, and the geomagnetic pole recorded by the feature is compared with the regional pattern of polar movement through time. Problems with archaeomagnetism stem from both measurement factors and interpretation factors, both of which can affect the precision and exclusivity of date interpretations. The precision of a given result is determined by the coherence of the orientations of the individual specimens (usually eight) that make up the sample. Variables affecting coherence include the type, size, and density of magnetic minerals in the earth, the temperature of the burn, and any sources of post-burning disturbance of the feature. Even a very coherent result may have imprecise or multiple date interpretations based on the intersection of the result's oval of confidence with the polar curve for the region. A time of particularly slow polar movement can result in a broad date range, or a region of the pole that is transected by several segments of the polar curve will result in multiple possible date ranges. When an archaeomagnetic sample results in multiple date ranges, independent dating evidence will be required to determine which of the possible date ranges is correct. The greatest advantage of this technique is that the sampled material is usually unambiguously related to the component being dated, but potential ambiguity of the technique requires that it be used in conjunction with other sources of chronology. The Office of Archaeological Studies Archaeomagnetic Laboratory, directed by Eric Blinman, will be used if appropriate contexts are encountered.

Radiocarbon dating has similar limitations as the first two methods, but it has the advantage that carbon is one of the most abundant sample materials in archaeological contexts (Taylor 2000). Plants incorporate carbon into their tissues through photosynthesis, drawing on the pool of carbon in the atmosphere. Radioactive isotopes of carbon are produced by cosmic radiation in the upper atmosphere, resulting in a relatively constant proportion of 14C in the atmospheric pool. When plant tissue is no longer actively incorporating carbon, the amount of radioactive carbon declines at a rate consistent with the relatively short half-life of the isotope. The measured amount of

radioactive carbon in a sample, the expected amount given the assumed atmospheric pool concentration, and the half-life value for the isotope can be used to calculate a radiocarbon age for the sample. Precision of radiocarbon age estimates is determined by the measurement error associated with determining the radioactive isotope proportions. However, the assumption of a constant value for the 14C pool concentration has been shown to be inaccurate, and the radiocarbon age of a sample can only be translated into a calendric age estimate by comparison with carefully derived calibration curves (Stuiver and Reimer 1993). These curves reflect fluctuating pool values, increasing dating accuracy but affecting both precision and exclusivity of radiocarbon date interpretations. A single precise date expressed in radiocarbon years can yield an imprecise calendar date or multiple possible calendar date ranges.

Independent of the technical aspects of dating, radiocarbon samples often are not unambiguously associated with cultural contexts. Although unburned organic materials deteriorate in most archaeological sites, charcoal is inert, and once it is produced, it is only subject to physical damage. Most charcoal results from heating and cooking fuel, but it can also result from the burning of structures and artifacts. Individual pieces of charcoal rarely carry any qualities that can be unambiguously related to a particular cultural event, therefore the integrity of potential samples is dependent on feature contexts. If samples are collected from potentially disturbed contexts, then the resulting dates can only be interpreted in relation to other independent dates. Other problems with radiocarbon dating are the "old wood" issue previously mentioned for dendrochronology and cross-section effects. Long-dead (dry) wood tends to be harvested for fuel, and on Southwestern landscapes, standing dead trees may be sources of fuel for centuries after their death (Smiley 1985). In addition, slow-growing species, such as piñon and juniper, can incorporate centuries of growth into small branches (cross-section effect). These qualities can result in erroneously early radiocarbon dates, even though the sampled material is unambiguously associated with a particular cultural feature and behavior. To lessen the potential risks of these problem, the charcoal selected for dating can be sorted by species and plant part. Small twigs or branches contribute less to cross-section effects because they incorporate fewer years of growth and they persist for shorter periods on standing dead trees. Annual plants and perennial shrubs are better material for radiocarbon dating because they incorporate carbon over smaller numbers of years and are not likely to survive on the landscape a long time after dying. Care in collecting, selecting, and characterizing radiocarbon samples will increase their relevance to particular cultural contexts, but the other limitations of the technique and date interpretation will constrain use and interpretation regardless of sample quality. The Office of Archaeological Studies uses Beta-Analytic, Inc. of Coral Gables, Florida, for all radiocarbon dating.

Archaeobotanical Analysis

Archaeobotanical analysis will include macrobotanical and pollen studies. Pollen analysis will be conducted by a recognized professional palynologist experienced with prehistoric and historic sites in New Mexico, and particularly, New World domesticates. Pollen analysis methods are not presented here, because they may vary depending on the analyst. The full range of methods that may be applicable to the identification of New and Old World domesticate pollen will be explored in consultation with contract specialists and specialists that are on the Office of Cultural Affairs staff. Pollen wash procedures are included in the following discussion.

Macrobotanical Studies

Macrobotanical studies will be directed by Mollie S. Toll, OAS Ethnobotany Lab. All processing and analysis will be completed on site at OAS.

Macrobotanical studies of archaeological deposits will include flotation analysis of soil samples, species identification, morphometric measurement of macrobotanical specimens (where appropriate), and species identification of wood specimens from both flotation and macrobotanical samples. Flotation is a widely used technique for separation of floral materials from the soil matrix. It takes advantage of the simple principle that organic materials (and particularly those that are nonviable or carbonized) tend to be less dense than water, and will float or hang in suspension in a water solution. Each soil sample is immersed in a bucket of water. After a short interval of rest, heavier particles settle out, and the solution is poured through a screen lined with "chiffon" fabric (approximately 0.35 mm mesh). The floating and suspended materials are dried indoors on screen trays, then separated by particle size using nested geological screens (4.0, 2.0, 1.0, and 0.5 mesh), before sorting under a binocular microscope at 7 to 45x.

This basic method has been used as long ago as 1936, but did not become widely used for recovery of subsistence data until the 1970s. Seed attributes such as charring, color, and aspects of damage or deterioration are recorded to help in distinguishing culturally affiliated materials versus post-occupational contamination. Relative abundance of insect parts, bones, rodent and insect feces, and roots help to isolate sources of biological disturbance in the ethnobotanical record.

All macrobotanical remains collected during excavation will be examined individually, identified, repackaged, and catalogued. Condition (carbonization, deflation, swelling, erosion, damage) will be noted as clues to cultural alteration or modification of original size dimensions. When less than half of an item is present, it will be counted as a fragment; more intact specimens will be measured as well as counted. Corn remains will be treated in greater detail. Width and thickness of kernels, cob length and mid-cob diameter, number of kernel rows, and several cupule dimensions will be measured following. In addition, the following attributes will be noted: over-all cob shape, configuration of rows, presence of irregular or undeveloped rows, and post-discard effects.

Pollen washes will be conducted in the laboratory, necessitating certain precautions. Ground stone tools from trash deposits will be placed in plastic bags after removal from the ground and will be lightly brushed to remove loose soil. A thin cover of dirt will be left on tools found on floors until they are ready for photographing. Loose dirt will be removed prior to photographing, and the artifacts will be placed in plastic bags as soon as is feasible after that procedure is completed. Laboratory processing will proceed as follows: the entire surface of the tool will be brushed before samples are collected. Using distilled water and a tooth brush, grinding surfaces will be scrubbed to collect embedded materials. The size of the area sampled will be measured and noted. Wash water will be collected in a pan placed under the sample and packaged for storage. Samples selected for analysis will receive a short (about 10 minute) acetolysis wash. Under certain circumstances, this may help preserve the cytoplasm in some modern pollen grains, allowing recent contaminants to be distinguished from fossil pollen. Pollen samples from ground stone artifacts will be subjected to full analysis to attempt to distinguish economically used wild plants as well as cultigens. The analyst will monitor for the occurrence of broken and whole grains and clumps of grains during counting. In addition, evidence for the presence of corn starch in samples will be noted.

Architectural Data

Analysis of the techniques and materials used to build a structure can provide interesting and potentially important data concerning basic construction technology and occupational history. Certain samples may also help date the period of initial construction, while others could provide information on subsistence activities. A study of construction techniques is integral to providing basic site descriptive information. We feel that it is not enough to simply characterize how a structure looked, archaeologists should also collect information on how structures were built, the types

of materials used in construction, and modifications made during occupation.

We will collect a series of standard samples and observations to enable us to analyze construction methods and structure use. Plans and profiles will be drawn for every feature and structure investigated. When possible, perpendicular profiles will be drawn, preferably showing north to south and east to west cross sections, or those that present the greatest amount of information. All such drawings will be tied into the grid systems imposed over these sites. Standard forms will be completed for each feature, room, and structure excavated. They will include information on contents, construction techniques, and associated artifacts and samples.

In order to gather as much information as possible on building techniques, structures will be partly dismantled after they are photographed, plans are drawn, and associated features are excavated and documented. We will cut through walls and floors in order to determine their original configuration. Samples of adobe will be obtained from each room, and from associated features when deemed necessary. While it is possible that not all samples will be processed because of time and financial constraints, they will be available for future research. Whenever possible, approximately 2 liters of material will be obtained. Specimens will be as large as possible when this is not feasible. Samples of native soils will be taken as controls, allowing us to compare them with the adobe used in construction.

Samples will also be taken from floors. If multiple floors are encountered, each will be sampled separately. If possible, specimens of wall plaster will also be collected. Individual features will be sampled when they evidence remodeling. Samples of artificial fill under floors will be collected, if present, for comparison with native soils. Variables that will be examined include color, particle size distribution, plasticity, and soluble salts. These analyses should provide information that will allow us to assess similarities and differences between samples, and determine whether soil from on site was used for construction. If so, these studies may provide data on how they were altered by the addition of other materials to achieve the proper amount of plasticity. They will also allow us to look at remodeling episodes (if any are reflected in the construction sequence) and determine whether there are temporal relationships between episodes of feature or floor modification.

Wooden architectural elements will be sampled and described, if encountered. Diameter measurements will be taken for all wooden building elements found, focusing on those with relatively intact cross sections. If suitable specimens are available, we will collect samples. Analysis of these specimens will be aimed at identifying the types of woods used for building and collecting chronometric data. The latter will consist of collecting samples for tree-ring and radiocarbon dating, as discussed in the section on Chronometrics.

Human Remains

Human remains will be analyzed by Nancy J. Akins, OAS Fauna and Human Osteology Laboratory. Ms. Akins has 25 years of experience in analyzing human remains recovered from the North American Southwest.

The human analysis will follow the procedures set out in *Standards for Data Collection from Human Skeletal Remains* (Buikstra and Ubelaker 1994). This comprehensive system focuses on the need to gain the maximum amount of comparable information by recording the same attributes using the same standards. A series of 29 attachments and documentation on how these should be recorded include the following information.

1. A coding procedure for each element that makes up a relatively complete skeleton is provided. Diagrams of skeletons and anatomical parts allow for the location of any observations concerning these parts. Another form codes commingled or incomplete remains.

2. Adult sex is determined by examining aspects of the pelvis and cranium. Age changes are documented on the pubic symphysis using two sets of standards, on the auricular surface of the ilium and through cranial suture closure.
3. For immature remains, the age at death is determined by scoring epiphyseal union, union of primary ossification centers, and measurements of elements.
4. Recording of dental information includes an inventory, pathologies, and cultural modifications. Each tooth is coded and visually indicated for presence and whether it is in place, unobservable, or damaged, congenitally absent, or lost premortem or postmortem. Tooth development is assessed, occlusal surface wear is scored, caries are located and described, abscesses are located, and dental hypoplasias and opacities are described and located with respect to the cemento-enamel junction. Any premortem modifications are described and located.
5. The secondary dentition is measured and dental morphology scored for a number of traits.
6. Measurements are recorded for the cranium (n=35), clavicle, scapula, humerus, radius, ulna, sacrum, innominate, femur, tibia, , fibula, and calcaneus (n=46).
7. Nonmetric traits are recorded for the cranium (n=21), atlas vertebra, seventh cervical vertebra, and humerus.
8. Postmortem changes or taphonomy are recorded when appropriate. These include color, surface changes, rodent and carnivore damage, and cultural modification.
9. The palaeopathology section groups observations into nine categories: abnormalities of shape, abnormalities of size, bone loss, abnormal bone formation, fractures and dislocations, porotic hyperostosis/cribra orbitalia, vertebral pathology, arthritis, and miscellaneous conditions. The element, location, and other pertinent information is recorded under each category.
10. Cultural modifications such as trepanation and artificial cranial deformation are recorded on another set of forms.

Standards (Buikstra and Ubelaker 1994:174) recommends curating the following samples for future analysis on burials that will be repatriated. The middle portion of a femur midshaft (at least 100 g) that can be used for radiocarbon dating, trace element analysis (diet), stable isotope ratios (climate and diet), strontium (population movement), bone geometry (activity patterns), histomorphometry (age and health), and aspartic acid analysis (age and health). Several teeth (the upper central incisor, lower canines and premolars, and lower second molar) for histomorphometric analysis, cementum annulation (root), aspartic acid (dentin), isotope studies (enamel), and future studies of linear hypoplasias and enamel microwear patterning. Five grams of trabecular bone for DNA extraction, the middle third of a clavicle and rib six for age at death, health studies, and morphological age assessments. Finally, two sections of the right femur and one section each of the humerus or CT scans of both to assess the level and type of behavior. No samples will be collected without the express permission of the landowner.

RESEARCH RESULTS

A final report on the data recovery program and analyses will be published by the Office of Archaeological Studies in the Archaeology Notes series. This report will describe the excavations, types of analyses, and present interpretive results. It will include photographs, site and feature maps, and data summaries. Field maps and notes, analytical data sheets, and photographs will be deposited with the Archeological Records Management Section of the State Historic Preservation Division. Artifacts will be stored at the Museum of New Mexico Archaeological Research Collection facility.

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APPENDIX 1. OAS BURIAL FORM

BURIAL FORM

Project: 41._____ Recorded by:_____
LA _____ Dates:_____
Burial Number: _____ F.S.Number:_____

Grave Characteristics:
Relationship to primary feature (e.g. intrusive pit, existing subfloor pit):

Placement in primary feature (e.g. upper fill, middle fill, floor, subfloor):

Excavated into (e.g. undisturbed soil, natural fill, cultural fill):

Pit description:
Dimensions: _____ Elevations (top & bottom):_____

Shape:

Construction:

Sealed? (method):

Fill description:

Provenience: Feature or structure no.:_____ Feature type: _____

Grid: _____N _____E to _____N _____E Level/Layer: _____

Datum: _____ Depth below datum: _____

Element position (and note if bone is displaced from anatomical position):
Cranium:

Vertebral column and pelvis:

Right arm and hand:

Left arm and hand:

Right leg and foot:

Left leg and foot:
Burial Characteristics:
Type: Single ___ articulated primary ___ disturbed primary ___ secondary

Multiple __ articulated primary ___ disturbed primary ___ disturbed secondary

Position:
Overall: ___ extended ___semiflexed ___ flexed ___ disarticulated ___ sprawled

Other:_____

Arms: ___ extended ___semiflexed ___ flexed (<45) ___ disarticulated

Hips: ___ extended ___semiflexed ___ flexed (<45) ___ disarticulated

Knees: ___ extended ___semiflexed ___ flexed (<45) ___ disarticulated

Orientation of vertebral column to cranium (straight, twisted, turned right, etc.): _____
_____

Face direction (up, down, east, west, etc.): _____

Burial orientation (direction spine or pelvis to cranial base):

Sketch (stick figure):Age of individual: _____ How aged?: _____

Sex of individual: _____ How sexed?: _____

Condition of bone:

Amount and type of disturbance (backhoe, rodent, carnivore, etc.):

Tools used in excavation (metal dental pick, bamboo stick, etc.):

Material collected from grave fill: Screen size _____ % Screened _____

FS Layer/level Material/sample

Material associated with the burial:
FS Point plot Item Placement

Photographs (roll and number): _____

Other records: ___ plan ___ profile ____feature form ____ inventory and disturbance form