"PUEBLOS WITHOUT NAMES": A CASE STUDY OF PIRO

SETTLEMENT IN EARLY COLONIAL NEW MEXICO

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"PUEBLOS WITHOUT NAMES": A CASE STUDY OF PIRO SETTLEMENT IN EARLY COLONIAL NEW MEXICO

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“Pueblos Without Names”: A Case Study of Piro Settlement in Early Colonial New Mexico

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Spanish colonization of New Mexico severely impacted the various Puebloan groups occupying the region at the time of contact. Contemporary sources provide a general picture of population losses and settlement shifts in the decades before the Pueblo Revolt of 1680. But the fragmentary nature of the sources leaves unanswered many questions about timing, scale, and variability, and it falls to archaeology to try to throw some light on these issues through analysis of relevant material remains. In this research, I examine post-contact settlement trends in the Piro area of south-central New Mexico. The focus is on Site LA 31744, Plaza Montoya Pueblo, a large plaza-type pueblo in the Rio Grande Valley south of Socorro. Extensive excavation data provide the basis for identifying abandonment contexts at Plaza Montoya and for addressing the question of how pressures emanating from the colonial system may have driven the abandonment process.

Historical records and archaeological surface data from other Piro sites form the basic frame of reference for this study. The establishment of the first Piro missions in the mid- to late 1620s, the near-simultaneous appearance of Spanish settlers, the potential first incidence of foreign infectious disease in the mid- to late 1630s, and the prospective

persistence of Piro settlements during those years are some of the key aspects of context that are discussed. Following from all this is the assumption that Plaza Montoya was occupied into the early mission period, but was not maintained, as were the Piro mission pueblos, up to the Pueblo Revolt. As Plaza Montoya's own surface record suggests that its late occupation was far larger than that of neighboring sites, a likely abandonment scenario centers on resettlement under the Spanish *reducción* (or *congregación*) policy. Historical references suggest that this policy of consolidating native settlements often targeted declining populations. With the mission pueblo of Pilabó/Socorro just 10 km away, a "guided" move of Plaza Montoya's residents to Socorro, perhaps in the late 1630s, is the chief hypothesis to be evaluated with the Plaza Montoya data.

Using basic anthropological concepts of abandonment behavior, the analysis of structural/stratigraphic patterns, artifact types, and refuse deposition points to planned abandonment within a relatively short time frame. A lack of intact artifacts in particular indicates that the pueblo's residents were able to save/curate most material of use/value, including objects difficult to transport over longer distances. The overall patterning does not preclude other factors contributing to the actual movement of people, yet it is most consistent with comprehensive, short-distance relocation suggestive of a *reducción.* With this, the Plaza Montoya study offers a key glimpse, otherwise unobtainable, of the complexity of native population and settlement trends in early colonial New Mexico.

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In memoriam

Barbara Remington, Luther Rivera, René Steensma, Bob Weber

"La vita…è affascinata dai cavalli alle corse di Ascot piuttosto che dagli asini sulle strade di campagna"

Claudio Magris, *Danubio*

CHAPTER 1

INTRODUCTION

In the spring of 1620, the viceroy of New Spain sent a letter to King Philip III in which he replied to a royal query about the state of affairs in the province of New Mexico. Among others things, he informed the king that up to that point 17,000 natives had been baptized, and that the natives "live in pueblos that do not have names known to anyone other than those who speak their language" *("Las personas que an receuido el baptismo son diesisiete mil, y auitan en pueblos que no tienen nombres conocidos, sino es para los que sauen su lengua")* (*Archivo General de Indias* [hereafter *AGI*], *sección Audiencia de México*, *legajo* 29; cf. Hammond and Rey 1953, 2: 1139-1140).[1]

That pueblo names still escaped Spanish minds two decades after the Oñate colonizing expedition is in many ways symptomatic of the nature of New Mexico's early historical record. Contemporary sources are generally sketchy and vague on everything pertaining to New Mexico's native residents. This is especially true of the Piros, who at the time of contact were the southernmost Puebloan group in the Rio Grande Valley. By the time of the Pueblo Revolt of 1680, population and social cohesion had declined to a point where the old tribal entity of the Piros fell apart. Despite the establishment of two expatriate Piro communities near El Paso, the abandonment of their original pueblos

[1] Viceroy marqués del Guadálcazar to Philip III, Mexico City, May 27, 1620. When using Spanish quotes from published material I follow the conventions of the author(s) or, if transcribed, transcriber(s). Quotes from unpublished documents retain the original spelling.

essentially removed the Piros from the Pueblo world as it is known today. Even historians and archaeologists show little awareness of the Piros' place in the traditional landscape of Puebloan culture.

The aim of this study is to explore the structure of 16^{th}-and 17^{th}-century Piro settlement. In this, the main focus is on occupation and, especially, abandonment of the site known today as Plaza Montoya Pueblo (listed in the Museum of New Mexico site files as LA 31744), a large plaza-type pueblo south of Socorro, New Mexico (Fig. 1.1). Like contemporary Puebloan communities elsewhere, Plaza Montoya was occupied at a time when its inhabitants were facing a series of severe sociopolitical, cultural, and biological challenges. Historical figures reveal something of the impact of these challenges on Puebloan population and settlement. Of some 100 to 150 pueblos in the late 1500s, less than 30 were still occupied in 1680/81 (Schroeder 1979; Haas and Creamer 1992; Barrett 2002).

Beyond this desolate picture of 17^{th}-century decline, the documents hold precious little information on Puebloan population and settlement. When pueblos are mentioned, it is usually in a wider administrative or legal context, or in reference to a mission establishment. This is not surprising, of course, for officials and missionaries were the primary record-keepers in colonial New Mexico. Nor can it be much of a revelation that bias in reporting presents a problem not only to efforts of documenting the historical consequences of colonization, but also in the analysis of the processes that produced these consequences (cf. Barber and Berdan 1998: 163-164).

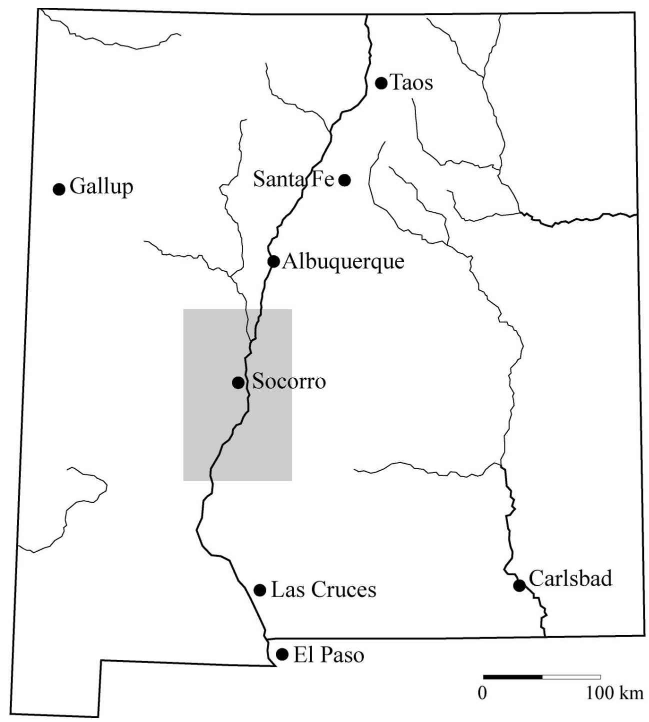

Fig. 1.1. New Mexico and the Piro area.

Given the nature of the historical information, the study of contact- and colonial-period settlement in the Southwest depends on archaeological data (Lycett 1995: 4). To address issues such as length and scale of occupation, use and organization of occupied space, settlement abandonment, and change in occupation patterns, archaeological sites dating to the period in question must be recognized and investigated. Insofar as documentary data are available, these may help identify variables in historical processes, and, together with existing archaeological information, help in formulating hypotheses on how those variables interacted to produce patterning in the archaeological record (Leone 1977; cf. Earls 1985: 86).

That the study of settlement trends needs suitable data seems at first glance a prosaic observation, yet the history of research at colonial sites in New Mexico suggests it is not all that trivial. Archaeologists have long focused on Spanish missions and mission pueblos, and in so doing have carried over into the realm of archaeology some of the bias inherent in the documents (Snead 2001, 2005; Preucel 2002: 9-12; Trigg 2005: 9-12; Ivey and Thomas 2005). While mission sites continue to be subject to research (e.g. Snead 2000; Pierce and Ramenofsky 2000; Ramenofsky and Pierce 2004; Ivey and Thomas 2005), there has been more recently some movement toward the study of smaller sites (Preucel 2002: 12-17; Kulisheck 2001a, 2003, 2005). This has been accompanied by a shift away from excavation- to survey-based (including remote-sensing) research (cf. Ramenofsky and Feathers 2002; Ramenofsky and Pierce 2004). Driven by practical, ethical, and theoretical concerns (Kulisheck 2005: 264-266; Cordell 2005: 110-118), this shift offers new opportunities in regional spatial analysis. Its limits are reached, however, when detailed sequential data become necessary as they do in studies of abandonment processes at both the local and regional level (Schlanger and Wilshusen 1993: 86, 90; Inomata and Webb 2003: 8-9).

Compounding the problem is a lack of data from contact- and colonial-period sites that were *not* mission pueblos. Documents from other parts of New Spain indicate that non-mission pueblos were usually the first to be given up in times of acute stress, with the Spaniards using the policy of *reducción* or *congregación* to resettle survivors in centralized mission pueblos (Cline 1949; Gerhard 1977; Quezada 1995). In the case of New Mexico, it is telling that not one of the 30 or so pueblos recorded as occupied in the late 1670s (i.e. just prior to the Pueblo Revolt) was a non-mission pueblo. While the surviving documents are all but silent on when or how non-mission pueblos were abandoned, the material record may be more forthcoming on these questions. At a number of large sites there is a spatial and quantitative drop-off in ceramics from the pre- to post-contact areas. This in turn suggests a contraction of occupied space from pre- to post-contact times (Marshall and Walt 1984: 139-141; Lycett 2002: 68). Yet without stratigraphic data the occupational histories of these sites remain vague at best, and without established sequences it is difficult to identify and compare changes in structural and depositional patterns within and between sites.

It is this last caveat that has been the chief impetus behind the Plaza Montoya project. The site is relatively undisturbed, has a surface ceramic assemblage different from those at neighboring sites, and is not one of the historically recorded Piro mission pueblos. This and the pueblo's proximity to the mission pueblo of Pilabó/Socorro present a frame of reference in which planned, *reducción*-driven abandonment is an intriguing scenario to be evaluated with archaeological data. Accordingly, a series of stratigraphic tests were required to produce a structural and material database that could be used to assess this and other assumptions about pre- to post-contact settlement trends drawn from historical records, surface observations, and limited data from other Piro sites. Six years of fieldwork have gone a long way toward meeting these expectations: basic construction and occupation sequences have been established, late material assemblages recorded, and depositional patterns identified which indeed point to a kind of population movement that is most consistent with what is known about historically recorded *reducciones.*

Background

Some of the first large-scale excavations at missions and mission pueblos in the U.S. Southwest were combined with historical investigation of archival sources. The sites selected were relatively well documented, still much in view, and very much part of Puebloan cultural landscapes (Lipe 1994: 141; Preucel 2002: 9-12). Work in the Galisteo Basin (Nelson 1914, 1916), the Zuni area (Hodge 1918, 1937; Smith et al. 1966), and at Pecos (Kidder 1916, 1917, 1926) was driven by the prominence of architectural remains (Fig. 1.2). The same is true of excavations in the Salinas area at Abó (e.g. Toulouse 1938, 1940, 1949; Dutton 1981, 1985), Quarai (Senter 1934; Ely 1935; Hurt 1990; Baker n.d. a, n.d. b), and Las Humanas (Gran Quivira) (Vivian 1964; Ivey 1988).

Interest in the Piro area, by contrast, has been at best sporadic (Marshall and Walt 1984). Like Abó, Quarai, and Las Humanas, the last Piro pueblos were abandoned 200 years before archaeologists first set foot in New Mexico. Unlike the Salinas sites, most Piro sites are just low, overgrown mounds of melted adobe. Compared to the mission pueblo of Abó, for instance, the ruins of Sevilleta (the only extant Piro mission pueblo) are virtually invisible (Fig. 1.3). Besides this lack of visibility, there is also the absence of a modern, distinctly Piro population. Despite occasional plans after the Pueblo Revolt to resettle the Piros in their homeland, they never returned as a group. Communities of Piro descendants still exist today near El Paso and Las Cruces. Their earliest roots go back to a number of Piro families that were resettled at El Paso in the early 1660s to support the establishment of a new Franciscan mission there (Morrow 1981; Vierra et al. 1999; Campbell 2005).

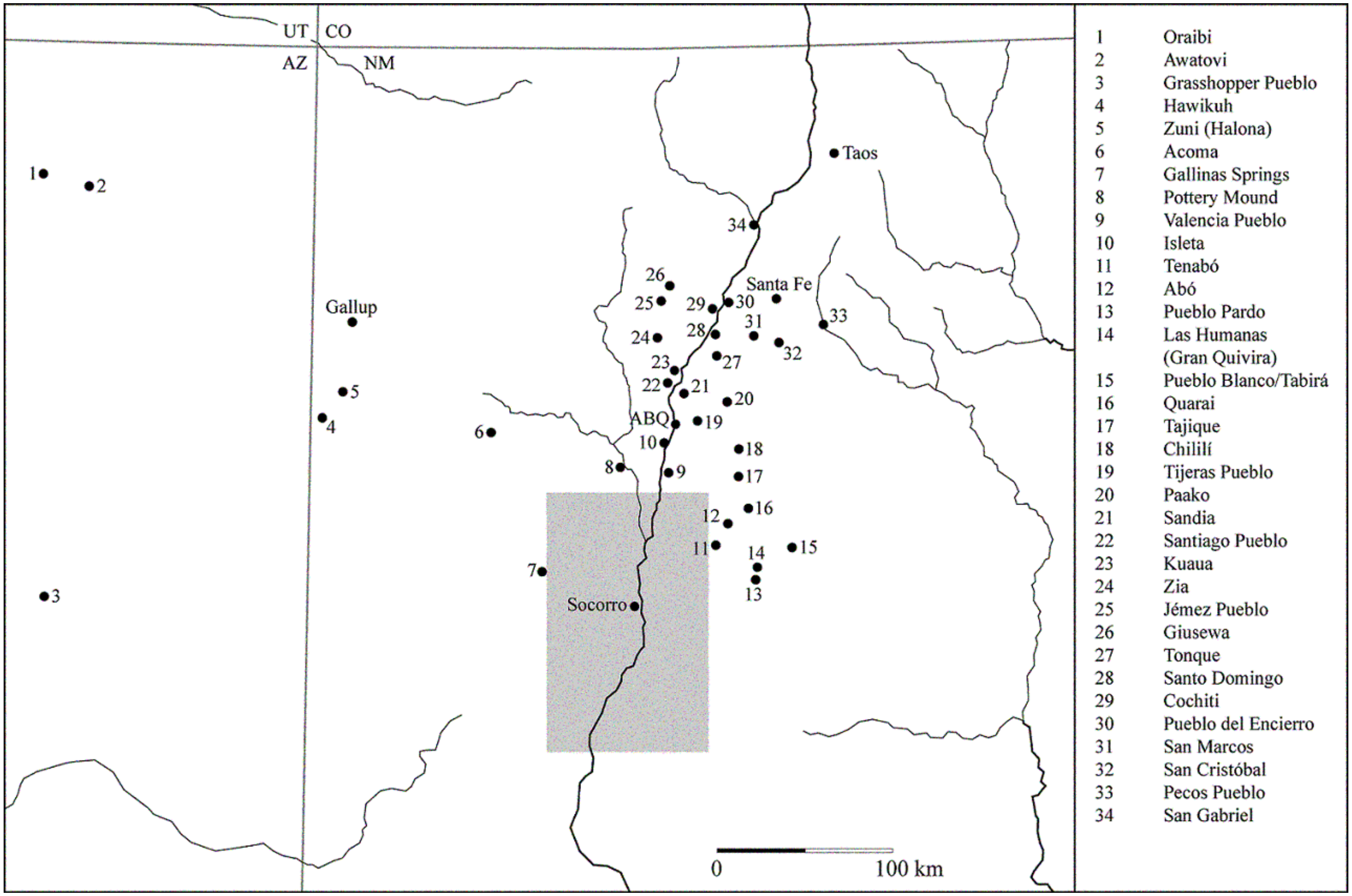

Fig. 1.2. Relevant sites outside the Piro area.

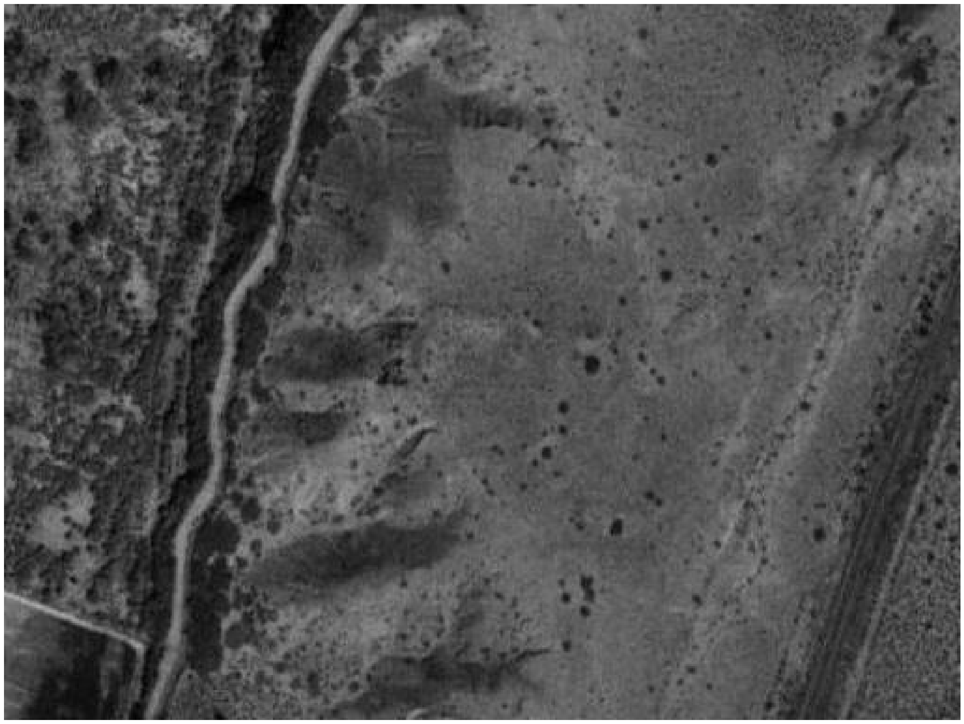

Fig. 1.3. Aerial views of Sevilleta (top, center of photo) and Abó (bottom) (USGS photographs, 1995/96).

Although first Spanish explorers and then colonists began traveling up and down the Piro area in the 1580s, little is known of Spanish relations with, and activities among, the Piros until the mid-1620s. Starting in 1626, the written record for *"la Prouincia y nacion Pira* [sic]*"* picks up with several sources related to the establishment of the first of four permanent Piro missions.[2] For the 1630s and 40s, the record is highly erratic. Of the documents that I have seen, only a few mention the Piros, in passing, in legal or administrative (secular or ecclesiastical) contexts. An increase in references for the years after 1660 partly reflects the survival of Inquisition records, and partly an increase in correspondence relating to Spanish measures against Apache and Navajo attacks. For the period of the Pueblo Revolt, the documents give a broad account of the abandonment and destruction of the Piro mission pueblos, and the dispersal of the surviving Piros. Brief references to ruined pueblos by some 18th-century travelers conclude the record for the former Piro territory (cf. Marshall and Walt 1984: 245-257).

The archaeological record of the Piro area includes hundreds of sites spanning the entire spectrum of native occupation from Paleoindian to colonial times (e.g. Weber 1963; Anzalone 1973; Wimberly and Eidenbach 1980; Eidenbach 1982; Winter 1980; Hogan and Winter 1981; Levine and Tainter 1982; Tainter and Levine 1987; Marshall and Walt 1984; Oakes 1986; Earls 1985, 1987; Dello-Russo 2002). Sites with structural remains range from isolated pit-houses to plaza-type pueblos with hundreds of ground-floor rooms. The large pueblos are a phenomenon of the Pueblo IV/Classic and Pueblo V/Historic periods of the Rio Grande Pueblo archaeological sequence (cf. Cordell 1984,

[2] *Memorial...hecho por el padre fray Alonso de Benauides*, 1630 (Ayer 1916: 94). Through the various records (1626-34) relating to his missionary activities among the Piros, fray Alonso de Benavides is the earliest known source of the term "Piro".

1997). For the Piro area, these periods have been termed "Ancestral" and "Colonial Piro". Approximate dates are 1300 to 1540 for the Ancestral Piro phase, and 1540 to 1680 for the Colonial Piro phase (Marshall and Walt 1984: 135-142; Earls 1985, 1987: 12-17; Lekson et al. 2004: 54-58).

The period of interest here spans roughly the second half of the combined Ancestral and Colonial Piro phases. Wherever possible, I use historical points or periods of reference, since they reflect better the range of native-Spanish contact and therefore are more appropriate representations of historical processes. They are: (1) the pre-contact period, especially the decades of the late 1400s and early 1500s; (2) the period of sporadic Piro-Spanish contacts between 1540 and 1598; (3) the early colonial period, i.e. the first three decades of Spanish rule; (4) the early mission period with the establishment of permanent missions in the 1620s and 30s; and (5) the later colonial or mission period from c. 1640-50 until final abandonment of the area in the early 1680s.

Research Design

It is a truism that large habitation sites or pueblos occupy a central position in the Puebloan settlement pattern. However, both ethnographic and archaeological work in the Southwest shows that regional settlement systems are more complicated than simply the distribution pattern of the largest and most visible sites (e.g. Chapman and Biella 1977; Moore 1980; Lange 1990; Preucel 1990; Kohler 1992; Milo 1994; Kendrick and Judge 2000; Whalen and Minnis 2001; Driver 2002; Kulisheck 2005; Sullivan and Bayman 2007). Ben Nelson (1994: 4) gives a general definition of such a system, with a "large core pueblo" inhabited by a certain number of families, at least some of whom are likely to spend part of the year in "substantial dwellings near their fields" or in hunting camps away from the main site. As patterns go, this kind of settlement variability is not, unsurprisingly, restricted solely to the Pueblo world. Settlement studies in other parts of the world suggest similar relationships between large and small sites (e.g. Bernick 1983; Sinclair 1987; Schwartz and Falconer 1994; Pwiti 1996).

With more emphasis being placed on settlement systems and their smaller components, studies of large habitation sites are sometimes criticized for obscuring the role of smaller sites. While in terms of research effort such criticism is to a certain extent justified, few studies claim to be complete representations of local or regional settlement systems. Investigations of large sites are clearly important, for these are the only sites with the "complex and cumulative occupational histories" (Lycett 2002: 71) that allow analyses of long-term developments in settlement structure. This applies above all to regions which like the Piro area are largely archaeological *terra incognita.* The present study is a case in point. Through archaeological analysis of a large Piro pueblo it is possible to build up a basic database of occupation patterns which can then be used as a test case to evaluate more general assumptions about pre- to post-changes in population and settlement structure.

Dissertation Layout

In writing up this study, I chose to organize it in a way that would mirror the historical-archaeological inquiry on which it is based. Given the particular historical context, the analysis of settlement structure must include recognition of general material patterns of abandonment behavior, and of site-specific patterns that might provide clues to the circumstances under which Plaza Montoya was abandoned. How archaeologists approach the problem of settlement abandonment is the subject of Chapter 2. Questions examined more closely are the identification of abandonment assemblages; the connection between assemblages, discard behavior/refuse deposition, and mode of abandonment; and changes in assemblages due to post-abandonment formation processes. The setting of the pre- to post-contact transition calls for a closer look at what material patterns can be associated with contact-related changes. Foreign pathogens, imposition of an alien belief system, exploitative economic mechanisms, and settlement reshuffling through *reducciones* are some factors likely to have increased variability in population and settlement trends among the Piros and their Puebloan neighbors.

Though perhaps not much apparent at first glance, the old Piro province is also varied in its physical properties. Maximum elevation between large pueblos (i.e. pueblos with more than 100 rooms), for example, is more than 600 m (cf. Marshall and Walt 1984: 213, 229). This variability is illustrated in Chapter 3, where I describe the main land- and life-forms in the region. As disturbance or indiscriminate removal of archaeological sites impairs interpretations of past settlement structures, potential changes in the landscape are of particular interest to this study. Part of Chapter 3 considers what evidence for such changes exists in the Piro area, and how this can affect modern perceptions of the local and regional archaeological record.

In reviewing the archaeological impact of changing environmental conditions, Chapter 3 provides a general introduction to the next two chapters. Chapter 4 includes a summary of previous research at Ancestral/Colonial Piro sites and a detailed discussion of some key archaeological aspects in defining space and time in the Piro area. Against this backdrop, Chapter 5 offers material and structural descriptions of a sample of 14 Ancestral/Colonial Piro sites. The sample centers on the five sites with structural remains for which there are excavation data: Bear Mountain Pueblo (LA 285), Las Huertas (LA 282), Qualacú (LA 757), Pargas Pueblo (LA 31746), and the Gold Station site (LA 45885). Data from non-Piro sites (Fig. 1.2) also figure in the analysis and interpretation of the Plaza Montoya data. These sites are introduced at appropriate points throughout the study. In the overall narrative thread, Chapters 4 and 5 form the archaeological background of this study. As a result, they include (in Chapter 5) only a summary discussion of the original 1980s surface data from Plaza Montoya.

Chapter 6 is a regional historical overview divided into the periods of reference outlined above. Issues considered include early Piro-Spanish contacts, Piro and Spanish settlement and demography, Piro responses to the Spanish presence, and the deterioration of living conditions in the later colonial/mission period. In view of the lack of historical research on the Piro area, the Plaza Montoya project early on included a search for unpublished source material to supplement the known primary documentation. The process of merging such material into a halfway coherent whole requires a critical look at topical consistency. Along the lines of "internal analysis" (Barber and Berdan: 1998: 160-168), the narrative therefore incorporates a running commentary on context and significance of the documents used in the overview.

In Chapter 7, the information from the previous chapters is synthesized in a number of assumptions that form the basis for the analysis of the Plaza Montoya data. The assumptions and the historical/archaeological patterns underlying them concern the scale and structure of pre- and post-contact Piro settlement; the physical Spanish presence among the Piros; the possible incidence of infectious diseases like smallpox or measles; Piro conflicts with Spaniards and Athapaskan groups, plus Piro factionalism and internecine conflict; periods of subsistence shortfalls; and the extent to which each of these factors may have contributed to the overall process of decline.

Chapters 8 and 9 present the Plaza Montoya data. The chapters have several objectives. At the outset of Chapter 8, surface data and their usefulness in estimating length and scale of occupation, and time and scale of abandonment are summarized. Also summarized and discussed in more detail are earlier references to *reducción*-driven abandonment and its potential archaeological signature(s). Following this, site sequence and structure are traced through survey, remote-sensing, wall-tracing, and excavation data. Diagnostic ceramics, radiometric dates, and distribution of Spanish artifacts provide the chronological framework for the architectural sequence. Together, these data are used to establish a general occupation sequence. With sample data from every room block, partial assemblages and sequences can be analyzed for evidence of differential occupation, abandonment, and the impact on this evidence of post-occupation site formation processes. This allows one to assess the overall scale and continuity of occupation. It is then possible to isolate patterns of artifact distribution in early and late rooms, and to identify or at least approximate terminal assemblages in each room block. At the end of all this, structural-stratigraphic patterns, patterns of refuse deposition, and assemblage composition validate the weight placed on the *reducción* hypothesis. Throughout the analysis, review of data attributes is crucial and limitations are pointed out as data are discussed.

Also in Chapter 9, I place the Plaza Montoya data in a regional and trans-regional perspective. Archaeological patterns are outlined and compared with structural and chronological data from Piro and non-Piro sites. Based on the comparisons, I re-evaluate earlier assumptions about settlement history and site abandonment in the Piro area. The main goal is to establish how far archaeological patterns can be linked to historical patterns of post-contact population and settlement trends, and to what extend the former transcend the historical context. As only vague references to Spanish consolidation/ relocation of Puebloan settlements exist, definition of archaeological patterns relating to this aspect of post-contact change should be a welcome addition to the study of native settlement structure not only in colonial New Mexico, but in similarly under-documented contexts elsewhere.

The last chapter summarizes the significance of the Plaza Montoya data from a local and regional perspective. The summary includes a final evaluation of such aspects as temporal resolution and spatial representation. In this, I point out the shortcomings that did emerge over the course of the study, and the need for further research if the decline of the Piro province is ever to be understood in a way that will allow regionally representative modeling of demographic processes. Despite and because of these shortcomings, the data from Plaza Montoya provide important insight into some of the processes that could affect native populations during the early stages of European colonization.

CHAPTER 2

ARCHAEOLOGICAL APPROACHES TO SETTLEMENT ABANDONMENT

Demographic changes cause alterations in the use of settled space. Growing populations create demand for space, which is met through expansion and/or aggregation. In declining populations, no such demand exists and settled space breaks up and contracts. At a regional level, settlements decrease in size and density, while at the level of the individual settlement structures are left unoccupied and often untended. If there is no reoccupation, structural decay and ultimately collapse follow. Definitive abandonment occurs when the last members of the resident population move away or pass on. This applies to both regions and individual settlements. Studies of modern populations show that the factors pushing demographic and settlement decline vary in both time and space, and are generally part of complex causal chains (Bharadwaj 1996; Harris 2001).

Despite the fact that the vast majority of archaeological sites are abandoned places, studies focusing specifically on the process(es) of abandonment are not common (Cameron 1991a, 1991b, 1993: 3). In some regions (e.g. the circum-Mediterranean, Mesopotamia, Mesoamerica, the U.S. Southwest), archaeologists have long been working at large or very large sites, but only recently have questions of how these sites entered the archaeological record have begun to be addressed systematically. At the same time, the notion of the "lost city" continues to shape popular perceptions of archaeology, with places like Pompeii or Troy seen as symbols of rapid and cataclysmic demise of ancient urban communities (e.g. Mitton 1916; Cottrell 1957; Childress 1992; cf. Stefoff 1997). Not even professional archaeologists have been impervious to what has been called a "disaster movie mind set" (Cameron 1993: 3). In a rundown of abandonment theories for sites from late Mississippian Cahokia to Shang-Dynasty Anyang, William Adams in the mid-1970s noted that such theories were largely disaster-driven, with warfare, natural disasters, and environmental degradation ranking highest among projected causes of abandonment (Adams 1980: 26-42).

While abandonment at its most basic can be described simply as moving away, the act itself is a result of more complex processes (David and Kramer 2001: 110-113; Orser 2005: 46-47). Since Adams' review, archaeological approaches to abandonment have focused increasingly on the behavioral and material complexity of, and variability in, abandonment processes. Studies of historic and more recent abandonment behavior, associated material remains, and the potential effects of post-abandonment factors have shown that doomsday scenarios seldom suffice to explain site or regional abandonments. In this and other respects, the studies clearly illustrate the need for archaeologists to (1) identify material patterns relevant to specific abandonment "events" and (2) to establish plausible interpretive links between observed patterns and the processes behind them (Tomka and Stevenson 1993; Cameron 1991b, 1993, 2003).

This chapter focuses on diversity in forms of population decline, abandonment behavior and the implications this diversity has for archaeological research. Examples of recent abandonments demonstrate the ties between different causes, demographic responses, and patterns of abandonment behavior. While these examples are necessarily limited, they offer a general idea of the ways in which populations can decline and how decline impacts local and regional settlement. In all cases, causal relationships have had distinct material effects on how settlements were deserted. Primarily ethnoarchaeological studies of different abandonment contexts attest to the variability inherent in behavior and material remains (David and Kramer 2001: 93-114). The need to recognize the scope of this variability underpins the theoretical and methodological framework for general archaeological studies of settlement abandonment (Cameron 1993, 2003).

Demography of Settlement Abandonment

Space and time are basic parameters in every assessment of populations, past or present (Harris 2001, 2003; Chamberlain 2006). Depending on frame of reference, population patterns vary widely across different levels of analysis. A well-documented modern example is post-war demographic development in Europe. In 2005, Europe's population stood c. 35% above 1950 levels, but overall growth (excepting immigration) has now fallen to near replacement level and is projected to dip into negative levels in the coming decades (Cliquet 1993; Rothenbacher 2005). Continent-wide figures obscure the fact that negative levels already exist in countries like Germany (Kaufmann 2005; Kröhnert et al. 2006), Spain (Ferrer Regales and Calvo Miranda 1994), and Italy (Micheli 1995, 1999). Changing the scale of analysis from country to region to community reveals yet more varied patterns. If statistics show negative trends on the country level, some regions may score significantly worse than others, often to the extent that positive trends in other areas are obscured (Chesnais 1992; Punch and Pearce 2000; Birg 2001).

At all levels of analysis, two main categories of decline can be defined. Firstly, *relative* decline entails loss of population within a given area through out-migration. This form of decline is a function of mobility driven by economic, socio-political, and/or ecological push-pull processes (Chamberlain 2006: 38-41). It includes a recipient area (or areas), which may experience substantial population growth (Bharadwaj 1996). Relative decline is not characterized by net biological loss.

Absolute decline, by contrast, means biological loss. In the countries mentioned above, absolute decline occurs as attrition due to birthrates settling below the 1:1 replacement threshold (Rothenbacher 2005). Rarely, if ever, though, are relative and absolute decline discrete phenomena (Harris 2001, 2003). Many European regions are currently losing population through both out-migration and negative birthrates. Post-famine 19^{th}-century Irish demography offers a gruesome example of the interplay of catastrophic absolute decline, economic depression, socio-political repression, and mass emigration (Orser 2005; cf. Harris 2001: 146-185, 2003: 15-92).

RELATIVE POPULATION DECLINE

Long-Term Decline

Studies of long-term relative population decline in modern societies strongly implicate ecological and/or economic changes as primary causes of decline (Harris 2003; Unruh et al. 2004). Changes in socio-economic structure tend to run their course over many years, during which young people in particular are likely to leave the afflicted region(s) (Harris 2003). Archetypal is the decline of heavy manufacturing in the U.S. (Berry and Isaac 1984; Teaford 1993; Dublin and Licht 2005) and Europe (Müller et al. 2005), with its image of decaying "rust-belt" towns (Fig. 2.1). Though the economic processes underlying this loss of industrial and demographic prominence play out globally, there are many other changes and related population shifts operating chiefly on regional levels (Bharadwaj 1996). An example is the differential development of urban and rural areas. In industrialized countries, the decline of family-based agriculture has been linked to demographic marginalization of rural areas. The trend remains strong as real or alleged prospects of urban areas continue to drive country-to-city migrations even in countries with declining net populations (Ingold 1988; Dubarle 2002; Bartholy et al. 2004).

Fig. 2.1. "Rust-belt" abandonment: houses in Gary, Indiana.[1]

[1] Photo at http://weburbanist.com/2008/07/06/20-abandoned-cities-and-towns/ (accessed 8/2008). This site documents abandoned structures, settlements, and industrial installations throughout the world.

Similar variability marks ecologically-driven population decline (Kliot 2004). Changes like the desertification of sub-Saharan Africa can disrupt traditional subsistence systems to a point where relocation becomes the only viable prospect (Mortimore and Adams 1999; Hammer 2004). On a local level, place-specific factors can also be critical, as shows the abandonment of the town of Craco in southern Italy. A medieval hilltop settlement, Craco's semi-arid setting always posed a risk to its agricultural subsistence base. Droughts had people leave, especially in the late 19th and early 20th centuries when many residents emigrated to America. Those who remained faced an unstable existence as geomorphologic fragility caused several slope failures. In the 1960s, the government resettled Craco's residual population in a valley location (Craco Peschiera), and the old town was abandoned (Fig. 2.2) (Del Prete and Pretley 1982; Basso et al. 2002).

Fig. 2.2. Old Craco, Provincia di Matera, Italy.[2]

[2] Photo at http://www.basilicata.cc/lucania/craco/08viale/page4.htm (accessed 3/2008)

Short-Term Decline

Craco's abandonment also illustrates that the rate of relative decline is a function of how individuals perceive a need to relocate. In acute cases of short-term decline perceptions of urgency may develop within days or weeks (Harris 2003). It is such "events" that come closest to a "disaster movie" scenario in that immediate causes tend to be natural or man-made catastrophes. While disasters come in all shapes and sizes, it is probably safe to say that at least in modern times rapid short-term decline is most often associated with local emergencies. Permanent, complete abandonment ensues infrequently, but when it does it is usually due to destruction of essential living conditions, for instance through industrial pollution. Two well-known examples of U.S. communities abandoned after catastrophic contamination events are Centralia, Pennsylvania (underground mine fire burning since May 1962) (DeKok 1986), and Times Beach, Missouri (dioxin poisoning in the 1970s, evacuated and quarantined 1983-85) (Reko 1984a, 1984b).

Doubtless the most dramatic contamination event to necessitate permanent relocation of people was the 1986 atomic accident in Kiev Oblast, USSR (Ukraine). After the April 26 meltdown of the No. 4 reactor at the Chernobyl nuclear power plant, 284,000 persons were moved out of an area of some 4,300 km^2. The town of Prypjat (pop. 48,000) near the plant was evacuated within 36 hours of the accident. Residents at first expected the evacuation to be temporary, but as the disaster's long-term implications sank in it became clear that quarantine would be indefinite (Figs. 2.3, 2.4). To replace Prypjat, the government established a new town, Slavutych. Even so, by 1998 about 700 people (almost all older than 65) had returned (some with official consent) to the "frozen zone" around the reactor (Medvedev 1990: 136-156; Mould 2000: 103-117).

Fig. 2.3. Prypjat, Ukraine, 2005.[3]

Fig. 2.4. Prypjat, Ukraine, 2005: kindergarten.

[3] This and the photo below (Fig. 2.4) are at http://pripyat.com/de/photo_gallery/pripyat/ (accessed 4/2007). More photographic documentation and descriptions of some of the more than 2,000 settlements abandoned after 1986 in Ukraine and Belarus is at http://www.elenafilatova.com (accessed 6/2008).

Its rapid escalation and long-term impact on a large regional population leaves the Chernobyl disaster without parallel in the annals of industrial catastrophes. Only some of the biggest natural disasters on record have had similar effects. From a comparative behavioral perspective, the 1991 explosion of Mt. Pinatubo in the Philippines is particularly interesting in that it provides an example of the response(s) to sudden existential crisis in a transitional hunter-gatherer society. The Aeta of western Luzon had lived in the Pinatubo region for centuries, but in the aftermath of the June 12-16 eruptions ash, lava, and especially lahar deposits devastated large swaths of their habitat (Seitz 1998, 2004). Government evacuation kept immediate casualties low, but preliminary shelters and subsequent resettlement took a heavy tool on some Aeta groups. Depending on differences in pre-eruption lifestyles, intensity and quality of contacts with Philippine society at large, and differences in evacuation procedures, Aeta strategies for dealing with the effects of the disaster varied. For some groups resettlement in locations distant from former territories came with a change to permanent (rather than seasonal *ranchería*-type) settlement and subsistence agriculture, and with this increasing interest in owning private property. Other groups, though, have clung to established family-based residential and subsistence patterns. Among certain upland groups this has included efforts to reclaim – if not reoccupy – traditional foraging areas (Dy 1994; Seitz 1998, 2004).

For all the perils of disaster-driven population shifts and permanent abandonment, these are rare phenomena. Excepting disasters with long-term ecological consequences like those just mentioned, only mining booms seem to have had comparable demographic effects (cf. Knapp et al. 1998). In the case of the Americas, discoveries of precious metals have been triggering mass migrations since the early days of European colonization. Scores of records describing hasty abandonment of communities on news of spectacular gold or silver strikes reflect the momentum and opportunistic nature of such rushes (e.g. Hulse 1971; Robinson 1980, 1990; Abbe 1985; Cleary 1990; Tchudi 1999; Vergara González 2005; Truett 2006). At work there were (in vastly accelerated form) the same dynamics that drive long-term changes in socio-economic structure, a congruence which underscores the diversity of economic push-pull factors in relative population decline (Hardesty 2003; Harris 2003). Indeed, recognition of differences in rate/scale of economic and demographic changes in mining communities has advanced understanding of how different kinds of abandonment behavior generate different kinds of archaeological patterning (see below).

ABSOLUTE POPULATION DECLINE

Long-Term Decline

In the absence of population gains from immigration, net biological loss means absolute demographic decline. While the quantitative effects for a population experiencing such decline may not appear all that different from relative decline, there is the fundamental difference that there is no population transfer. As with relative decline, complete biological loss is essentially a theoretical construct, at least at the global level. But even if "total disappearance is a fate that, thus far, has been observed only among species other than *homo sapiens*", at lower levels populations can be at risk of existence-threatening forms of absolute decline (Harris 2001: 6).

The impact of absolute decline on settlement in the form of contraction and abandonment is similar to that of relative decline. As the example of modern Europe shows, the processes of population loss and regression of settled space can stretch across generations. Where mortality outweighs reproductive rates, demand for housing, infrastructure, and other amenities of daily life decreases. Moreover, as below-replacement birthrates will in the long run result in an ageing population structure, different use profiles for settled space emerge. This in turn may accelerate decline by adding out-migration of individuals dissatisfied with age-specific changes in social milieu and economic prospects. The departure especially of young adults is a major factor in the long-term demographic attrition that some European regions are currently experiencing (Rothenbacher 2005).

Short-Term Decline

The "classic" notion of demographic collapse revolves around the abrupt demise of most or all inhabitants of a community or region in natural disaster, war, or epidemic. In Europe, plague epidemics like those portrayed in Giovianni Boccaccio's *Il Decamerone* (1353) or Daniel Defoe's *Journal of the Plague Year* (1722) have shaped perceptions of mass mortality and social disintegration (Bowsky 1971). Included in such perceptions is the image of villages and towns wiped out in recurring sweeps of plague. But while contemporary administrative records often attest to the severity of losses, total collapse with permanent abandonment of communities seems to have been relatively uncommon. Archival and archaeological work on deserted medieval villages (*Wüstungen*) has shown that a single agent rarely caused complete abandonment (e.g. Beresford 1954; Beresford and Hurst 1971; Abel 1955, 1967; Allison et al. 1965, 1966; Duby 1965; Janssen 1975; Stephan 1978/79; Austin 1989; Gerking 1995; Pesez 1999; Gardel 1999, 2004). Instead, losses sustained from war, disease, or natural disaster usually seem to have been replaced through immigration. Except for isolated rural communities, most cases of abandonment were probably only partial or temporary (cf. Hermann and Sprandel 1987).

Among known instances of rapid absolute decline, the most catastrophic are believed to have been those which hit native populations in the Americas after 1492. The arrival of an alien population with an alien disease history fatally changed indigenous microbial environments. This manifested itself most cruelly in waves of "virgin-soil epidemics" (Crosby 1976, 1986; cf. Dobyns 1983; Johnston 1987; Ramenofsky 1987; Reff 1991; Boyd 1999; Cliff et al. 2000; Jones 2006). There is much debate about which pathogens appeared where, when, and with what effects, but in central Mexico, the heart of the viceroyalty of New Spain, epidemics caused massive population losses on at least three occasions in the 16th century (Borah and Cook 1960; Cook and Borah 1960, 1971-79). New Spain's population curve has several steep drops before steadying in the 1600s at a fraction of pre-contact levels (Fig. 2.5). The historical demographer Peter Harris (2001: 97-175) sees in these "double dips" recurring patterns of "proportionally decelerating decline". Harris shows that mathematically the "D-curve" of decelerating decline is an inverted version of the standard curve of constantly decelerating population increase ("G"), which he bases on a historically derived growth coefficient of 0.3. From this reformulation of earlier growth equations, Harris (2001: 1-37) shows also that apart from G and D there are only four standard trends of demographic change, and that these, too, are mathematical variants of the basic G-pattern.

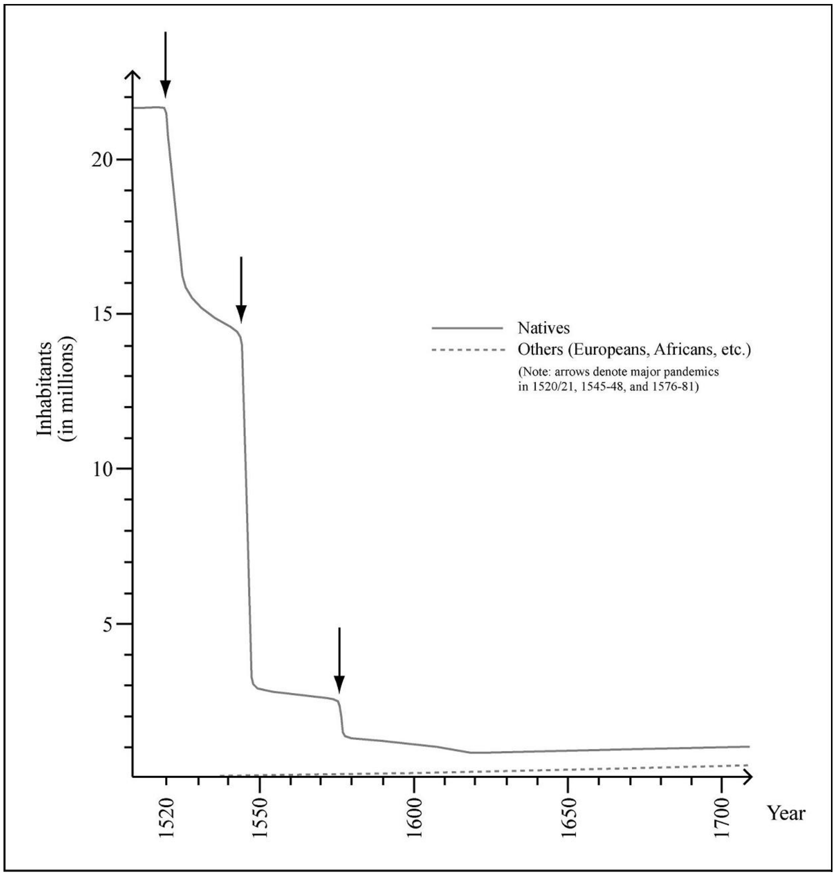

Fig. 2.5. Population trends, New Spain 1520-1700 (adapted from Gerhard 1993a, Fig. 1).

Some regions went through a single period of D-shaped decline; others endured, at different times, two or more such periods. Addressing this variability, Harris (2001: 101-109) looks to differences in location, population density, and timing/intensity of contact. While these and other factors doubtless affected the run of epidemics locally and regionally, Harris fails to mention disease variety. Survivors of one epidemic may gain immunity against further outbreaks of the same disease, but this will not prevent infection by other pathogens (Merbs 1992; Newson 2001; Jones 2006).

All this contributes to an intricate frame of reference for the archaeological study of site abandonment. It also presents a challenge to evaluate variability in population and settlement survival within a given region. Census records and other written sources may indicate a demographic collapse, but evidence of settlement persistence in the wake of medieval plague pandemics in Europe cautions against intuitively equating collapse with settlement abandonment. Many behavioral variables are difficult to evaluate without detailed data. One example is the custom among Puebloan and Athapaskan groups (and many other non-western societies) that structures are (were) abandoned on the death of the owner or a resident (Bendann 1930: 110-120; Cameron 1991a: 51-52, 1991b; cf. Veit 1997). Yet in a different context, survivors of epidemics in 17th-century Jalisco refused to abandon settlements even in the face of extreme mortality. Wrote the chronicler Domingo Lázaro de Arregui (1946: 27-28): "[A]lthough some pueblos have come to an end in these diseases, none have been abandoned for about 10 years, for in order to keep the lands and so that Spaniards not settle on them, as the people of one pueblo are diminishing, the residents of another send two or three Indians [to that pueblo], and there are thus many pueblos with and without people, and some that are half-empty".

Archaeological Approaches to Settlement Abandonment

In recent years, patterns of abandonment behavior and their material expressions have become subjects of problem-specific archaeological studies. Ethnohistoric research and work at (near-)contemporary sites have helped identify patterns in different abandonment contexts. Comparative analyses of such patterns provide the basis for developing models of abandonment processes that can be applied to prehistoric and other under-documented cases of local and regional abandonment (LaMotta and Schiffer 1999; David and Kramer 2001). One of the most important aspects of this research structure is a collective cross-cultural scale which goes beyond traditional notions of permanence of place as are common in European and other countries with long histories of "fixed" settlement. There is growing awareness among archaeologists that "absolute" categories of sedentism and mobility are often too simplistic even in contexts where either type of behavior may seem predominant. In the Southwest especially, settlement size and structural complexity have been shown to be not always reliable as proxies for inferring residential stability. Historical and ethnographic data reveal that seasonal and/or longer-term relocation of residents could empty substantial parts of pueblos for longer periods, especially during the growing season (Gerald et al. 1974; Hackenberg 1974; Ellis and Dunham 1974; Ward 1978; Rothschild et al. 1993). In addition, archaeological evidence suggests that even large settlements might be occupied for just a few decades (Schlanger and Wilshusen 1993; Adler 1996; Adler et al. 1996; Herr and Clark 1997; Nelson and Hegmon 2001; Nelson and Schachner 2002; Varien 1997; Varien and Wilshusen 2002; Lyons 2003; Adams and Duff 2004). This was the case at some of the sites (e.g. Grasshopper Pueblo, Arroyo Hondo Pueblo, Pueblo del Encierro) used as reference points for the Plaza Montoya data. Also, while occupation and abandonment episodes might alternate over several centuries, net time of occupation could still amount to only a fraction of the whole sequence (e.g. Reid 1973; Reid and Shimada 1982; Riggs 2001; Crown 1991; Creamer 1993; Snow 1976).

ABANDONMENT PROCESSES AND THE ARCHAEOLOGICAL RECORD

The following pages give a brief outline of archaeological approaches to structure and site abandonment. The outline proceeds from the more general issue of identifying patterns of material discard to the more specific of discard and structure abandonment. Two studies are examined more closely because of their special relevance to the subject matter. The first, Marc Stevenson's (1982) analysis of early 20th-century mining camps in northwestern Canada, is an early application of models of discard behavior to historically documented site abandonments. The second, Catherine Cameron's (1991a) analysis of 20th-century architectural change at the Hopi village of Oraibi is the only in-depth study of structure abandonment in a Southwestern pueblo. The special context of Oraibi's factionalist breakup, resultant loss of residents, decline in structure maintenance, and ultimately decay of large parts of the pueblo reveal a role of social tensions in abandonment processes that primarily archaeological studies may overlook (cf. Hegmon et al. 1998; Nelson and Hegmon 2001, Nelson and Schachner 2002).

Patterns of Material Discard

For a long time, archaeologists treated material assemblages as if they were contextually homogenous, paying surprisingly little attention to how "things" are abandoned, how they enter the archaeological record, and what patterns of distribution may reveal about the activities and processes that formed the record in the first place (Schiffer 1976, 1985; Binford 1981). Robert Ascher (1968, cf. 1961a, 1961b, 1962) summed up the problem in an article viewed now as a pioneering call for studying the role of abandonment behavior in site-formation processes (e.g. Cameron 1993: 3; Schiffer 1995: 8; Webb and Hirth

2003: 29-30), but it was not until the 1970s that archaeologists began to focus specifically on diversity in assemblage formation. Michael Schiffer (1972, 1973, 1976, 1978; Schiffer et al. 1981) in particular took up the issue with several studies of assemblage formation in abandonment and non-abandonment contexts. At the heart of these and other efforts lies the distinction between systemic and archaeological contexts (i.e. between location and physical properties of artifacts and their use and their entry into the archaeological record) and the realization that what is needed are explanatory links between both contexts (Schiffer 1996: 3-7; cf. Binford 1979, 1981, 1983).

Operating under the basic assumption that even a seemingly simple assemblage may be a "palimpsest of deposits" (LaMotta and Schiffer 1999: 20), Schiffer describes discard behavior at different stages in systemic context and the potential transformations of "refuse" after deposition. Many of Schiffer's terms have become standard in studies of assemblage formation. Fig. 2.6 illustrates the range of refuse accretion and depletion in systemic and archaeological context at habitation sites. Main categories are "primary," "secondary," and "de facto" refuse. The first category comprises objects discarded at location(s) of use (Schiffer 1996: 18, 58-59). With use and discard confined to the same space, primary refuse deposits tend to be small, as expediency and perhaps safety concerns set limits on how much refuse can accumulate before an activity area becomes too cluttered (David and Kramer 2001: 103-119, 255-283; cf. Hayden and Cannon 1983; Deal 1985). If an area can no longer be used, the activity must be pursued elsewhere or the discarded material removed. In the latter case, the "old" primary refuse is re-deposited, thereby becoming secondary refuse (Schiffer 1996: 59).

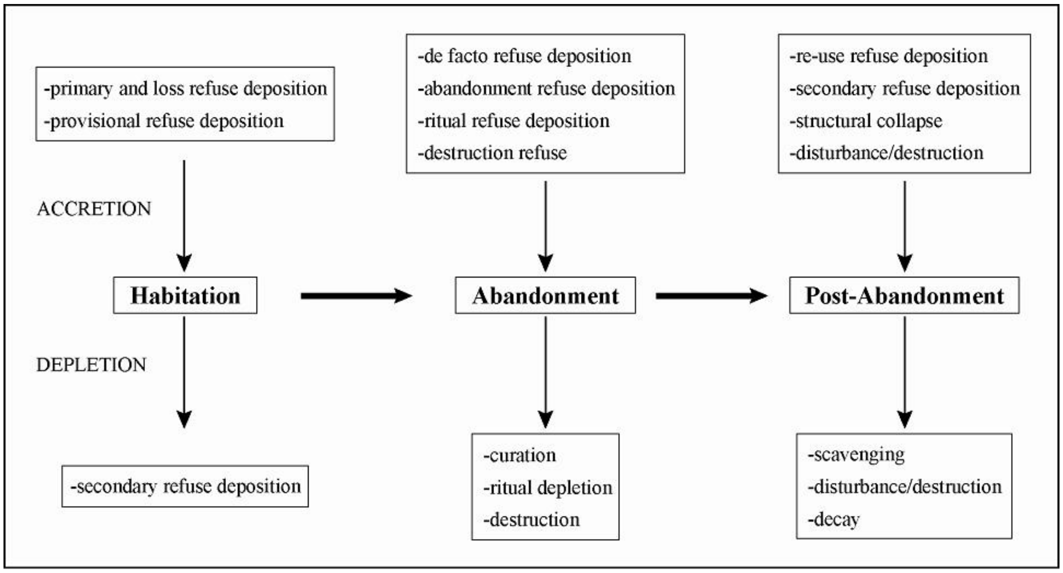

Fig. 2.6. Systemic and archaeological refuse accretion and depletion at habitation sites (modified after LaMotta and Schiffer 1999, Table 2.1).[4]

Waste materials from artifact manufacture or food processing typically form the bulk of primary refuse. As refuse deposits often cluster according to type of discarded material, spatial distribution can help identify special activity areas across a site. Overall volume of discard tends to correlate positively with length and scale of site use, but at special activity sites such as quarries or hunting camps certain kinds of primary refuse (lithic debris, bone, etc.) may predominate (e.g. Binford 1978; Kent 1987; Hudson 1993; Allison 1999). Primary refuse approximates modern household trash in that by and large it seems to have held little material or symbolic value for the people who deposited it (Schiffer 1978, 1989; David and Kramer 2001: 103-110; but see Hodder 1987).

[4] I have added the factors "abandonment refuse" and "destruction refuse". Especially if associated directly with the abandonment "event," destruction may add debris to the abandonment assemblage or deplete existing deposits.

Except for place of deposition, all this also applies to secondary refuse, which is usually discarded in a pit, midden, or other feature away from area of use/consumption. Owing to the wide array of materials of daily use that secondary refuse represents, analyses of midden and other deposits have always been essential to archaeological research. Even more so than primary refuse, deposition of secondary refuse is directly related to length and scale of site use. In many cases, secondary refuse deposition no doubt reflects a conscious effort at managing the flow of garbage within household and community (cf. Beck and Hill 2004; Hardy-Smith and Edwards 2004).

While primary/secondary refuse deposition as such is a routine activity unrelated to any abandonment-specific behavior, in structure abandonment it may involve areas not normally used for refuse disposal. In communities experiencing gradual decline, deserted structures frequently invite deposition of primary/secondary refuse, which thus becomes abandonment refuse (Murray 1980; Staski and Sutro 1991). As with primary/secondary discard, convenience and habit are strong impulses in abandonment refuse deposition (Hayden and Cannon 1983; Rathje and Murphy 1992; Beck and Hill 2004). In a study of vacant lots in modern Tucson, for instance, Wilk and Schiffer (1979) noted that trash tends to attract more trash – a pattern with enough folkloristic implications, apparently, to merit the label "Arlo Guthrie trash-magnet effect" (Wilk and Schiffer 1979: 533).

The concept of de facto refuse figures prominently in efforts to identify possible abandonment deposits. Schiffer (1972: 160, 1996: 89) defined de facto refuse as those objects (structures, facilities, artifacts) that are left behind during abandonment even though they may still be intact or useable. Time and residual utility/value are decisive factors in de facto refuse deposition. Given sufficient time people are likely to safe as many useable objects as possible, but if time is lacking even dear belongings may end up as de facto refuse. A prime example of the latter is the abandonment of Prypjat in 1986. In the immediate aftermath of the Chernobyl disaster, people could take only their most essential personal (and portable) belongings with them. The totality of the evacuation and subsequent realization that evacuation would be permanent in effect turned post-evacuation Prypjat into a vast assemblage of late Soviet-era de facto refuse, with objects ranging from toys in the children's hospital to barges docked at the city's port (cf. Figs. 2.3, 2.4) (Medvedev 1990: 40-190; Mould 2000: 103-117).[5] Despite the unique context, the dynamics of Prypjat's abandonment help illustrate the dynamics of disaster-driven abandonment in general. In this, the fate of Prypjat's residents ties in with that of the refugee displaced by war or natural disaster who finds his/her material existence reduced to a suitcase's worth of personal belongings (Mertus et al. 1997; Rastello 1998; Tolrà i Mabilon and Gutiérrez 2003).

As one extreme in a wide spectrum of abandonment scenarios, Prypjat highlights the function of time in de facto refuse deposition. Yet less clear even in this prominent case of settlement abandonment is the factor utility/value, which is defined primarily by socio-cultural and individual notions of what is useful or valuable (Appadurai 1988; Werner and Bell 2004; Skibo and Schiffer 2008). In modern "western" contexts, the two attributes often overlap in items of personal identification and monetary value. These are items most likely to be kept secure and be preserved during relocation, regardless of circumstances. They may also include keepsakes of sentimental or spiritual value,

[5] Due to radiation levels, salvage efforts were limited. After the late 1990s, however, much material was removed without authorization. Despite this "depletion," a vast array of material from office equipment to barges in the Port of Prypjat remains (Mould 2000; cf. http://pripyat.com/de/photo_gallery/pripyat/ and http://www.elenafilatova.com).

though not, presumably, objects of more mundane usage/association (cf. Rathje and Ritenbaugh 1984; Rathje and Murphy 1992; Staski and Sutro 1991). Similar ideas of utility and value apply in other, "non-western" contexts, but there are also important differences especially with societies living at or near subsistence level. For foragers and subsistence cultivators, utility and value are attributes related principally to activities considered essential to physical survival. Utility and value may coalesce in the tools of, and returns from, hunting or farming, and in ceremonial objects associated with rituals of group welfare (Binford 1962, 1978; Lenski 1984: 94-188; Wiessner and Schieffenhövel 1996). Associations of this sort have long been documented for the Pueblos, as has the fact that utilitarian and ceremonial attributes co-occur (e.g. Cushing 1883, 1886, 1990; Bandelier 1890-92; Harrington 1916; Parsons 1939; Lange 1990; Lange and Riley 1966, 1970). Recognition of such systemic attributes through ethnographic analogy can go a long way in differentiating different patterns of discard behavior (cf. Senior 1995).

What Is Abandoned, When, and How? Behavioral and Material Variability in Structure Abandonment

Discard Behavior and Structure Abandonment: Mining Camps in the Canadian Yukon

The range of potential combinations of relative and absolute population decline with individual and collective abandonment behavior suggests a great deal of variability in how sites are abandoned, and hence how abandonment is reflected in the archaeological record. Abandonment triggered by rapid population loss due to disaster moves chiefly on a need for speed. If there is no reoccupation and the material abandoned in the "event" remains *in situ* unchanged, the ensuing record probably comes closest to a "full" systemic inventory in archaeological context.[6] At the other end of the spectrum, long-term decline and abandonment may promote careful selection of objects to be saved, and, among other things, provide sufficient time to save more material overall. The result will be a material assemblage much different in composition than in the first scenario. Together, these two extremes outline the behavioral frame of reference within which Marc Stevenson (1982) in the late 1970s carried out an archaeological study of the abandonment of Canadian mining camps. Examining the interplay of time and other relevant factors, Stevenson's study reveals something of the complexity of the accretion and depletion processes that can affect the archaeological record of abandoned structures.[7]

The bulk of the structures Stevenson investigated were in two late 19th/early 20th-century gold-mining districts in western Yukon Territory. Historical records show that the two districts were occupied under "rush" conditions, but abandoned in different ways. In the Bullion Creek district, an opening in 1903 rush ended already in 1904 when news of a new bonanza further north lured prospectors away. The choice was probably made easier by severe flooding of Bullion Creek. Many who left seem to have contemplated returning once the waters subsided, but in the end, owing to distance (>60 km one way), difficulty of travel, etc., few did, and most Bullion Creek sites were never reoccupied. By contrast, the Mush Creek district some 100 km southeast of Bullion Creek saw its first gold strike in 1898, but deposits proved so unproductive that no one remained in the area a few years later (Stevenson 1982: 238-241).

[6] This is Ascher's (1961a) famous "Pompeii premise" (cf. Binford [1981]; Schiffer [1985]).
[7] For a few earlier studies of structure abandonment, see Nissen 1968; Longacre and Ayres 1968; and Lange and Rydberg 1972.

Within the context in which each district was abandoned, Stevenson (1982: 243-260) focuses on two main variables as contributing factors in abandonment assemblage formation: degree of planning and anticipation of return. The first really equals time, i.e. pace of abandonment (cf. Lightfoot 1993: 166). In the Bullion Creek district, deserted rapidly but with return generally anticipated, sites yielded many items classified as de facto refuse, and some sites showed signs of building or other work at the time of abandonment. For the Mush Creek sites, abandoned for good in more deliberate and thus slower fashion, Stevenson notes opposite patterns of discard and structure maintenance (Fig. 2.7). He then goes into a few more specific behavioral aspects such as curation and caching of objects. Importantly, he finds a strong correlation between planned structure abandonment with anticipated return and caching (storing/protecting from loss or deterioration in clustered locations) of items not to be taken to the new location but deemed valuable/useful enough to be saved for reoccupation. Caching and curating tend to include sweeps of activity and living areas, which can create a lack of de facto refuse in these locations. Less time/planning mean less effort is spent on such sweeps, which results in more de facto refuse being left in or near locations of use. Where abandonment is planned and expected to be permanent, more valuable objects are likely to be retained. Simultaneously, household (primary/secondary) refuse may be discarded in areas not otherwise used to that effect. Conversely, buildup of abandonment refuse will probably be avoided if abandonment is thought to be brief (Stevenson 1982: 240-263).

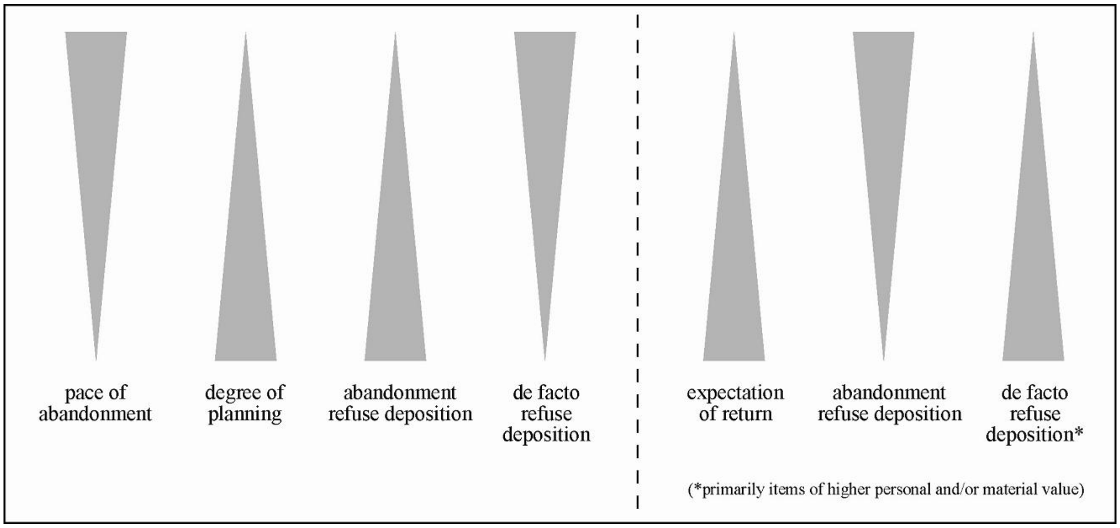

Fig. 2.7. Slider-type graphic of the links between time/planning, anticipation of return, and material discard in structure abandonment (based on Stevenson 1982).

Although Stevenson limits his discussion of the Bullion and Mush Creek cases to a small sample of behavioral and non-behavioral factors, his data show that abandonment is governed by highly variable gradations of many different factors (Stevenson 1982: 261-263). While the factor time may "influence the magnitude of effects" other variables have on, for instance, discard behavior (especially re de facto refuse) (Schiffer 1996: 91), site abandonment clearly is a multi-variate process that encompasses physical, emotional, and cultural spheres of existence. Even if there is extreme physical danger involved as there was at Prypjat in 1986, specific cultural/ideological and/or other factors can still feature significantly in the abandonment process.[8]

[8] Prypjat's evacuation was at least partly carried out under Soviet civil defense rules and thus cannot be considered wholly unplanned. Still, emergency management included few, if any, provisions for long-term removal of the population. As the disaster came to exceed all calculated scenarios, officials and residents continued to find it difficult to deal with the permanence of the situation (Medvedev 1990; Mould 2000).

Since the days of Stevenson's work on the Yukon mining-camps, abandonment studies have become more common especially in ethnoarchaeological and historical archaeological research, but prehistoric archaeologists have also begun to take a closer look at abandonment processes. Study contexts range from organization of hunter-gatherer campsites to seasonality of site occupation among transhumant agro-pastoralists, to structure abandonment among subsistence farmers, and in towns and cities of larger, more complex societies (e.g. Horne 1983, 1994; Gorecki 1985; Gould 1988; Cameron 1991a; Cameron and Tomka 1993; Cooper 1994; Armit 1997; Creighton and Segui 1998; González Ruibal 1998; Inomata and Webb 2003; Shahack-Gross et al. 2003; Orser 2005; Hauser 2006). Even a cursory review shows many of these studies expanding on analysis of depositional and/or structural patterns as outlined by Stevenson. Researchers address environmental variables (e.g. climate, resource availability, relocation distance), and other factors such as population size, infrastructure, technology, and socio-political and socio-cultural conditions at various levels to identify behavioral (and natural) processes forming abandonment assemblages. From recognized patterns more general relationships can then be posited for testing in other contexts.

<u>Population and Architectural Change: Oraibi 1870-1950</u>

In Southwest archaeology, ecological models are integral to many population/settlement (including abandonment) studies. This is not surprising, given the adaptive challenges facing human communities in arid or semi-arid conditions such as prevail in much of the southwestern United States and northern Mexico. Countless archaeological sites and a rich history of archaeological work attest to long and varied human occupation of the region (Cordell 1984, 1997). There is a strong tradition of research on land-use patterns and settlement aggregation including abandonment, the latter primarily at regional scales. Examples are the 12th-/13th-century retreat of Ancestral Puebloan settlement from the Colorado Plateau or similar retrenchments on the southern periphery of the Pueblo world. Advances in dendroclimatology in particular provide Southwestern archaeologists with an independent frame of references for assessing the impact on regional population and settlement structures of ecological and other potential push-pull factors (e.g. Dean and Robinson 1977; Dean et al. 1985, 1994; Cordell 1984, 1997; Cordell and Gumerman 1989; Lekson and Cameron 1995; Adler 1996; Adams and Duff 2004; Glowacki 2006).

Despite or perhaps because of the availability of full climate records, systematic studies of abandonment assemblages are still quite rare for prehistoric or historic sites. This is regrettable because a more dedicated approach to abandonment of structures and sites, many of which seem sufficiently well-preserved to warrant the effort, promises to add much to the understanding of Southwestern population and settlement dynamics. Studies of Puebloan social and economic organization have already benefited greatly from the integration of ethnographic, ethnoarchaeological, and "classic" archaeological data to investigate the physical and social organization of "domestic units" or households and related questions of resource/land use, mobility, technology, etc. (e.g. Reid and Whittlesey 1982; Netting et al. 1984; Nelson and LeBlanc 1986; Dohm 1990, 1996; Lowell 1991; Rothschild 1991; James 1994, 1997; Cameron 1996; Varien 1997, 2002; Hegmon et al. 1998; Kendrick and Judge 2000; Nelson and Hegmon 2001; Nelson and Schachner 2002).

Against this background, Catherine Cameron's (1991a) work on Oraibi stands out as a singularly well-documented investigation of demographic and architectural change at a large Southwestern site. Focusing on developments between 1871 and 1948, Cameron covers only a fraction of the roughly 800 years of Oraibi's occupation, but that fraction includes one of the key events in the pueblo's history, the "Oraibi split" of September 7, 1906. A climax of endemic factionalism, the split marked the departure of "hostile" residents who opposed the (in their view) overly receptive stance toward Euro-Americans among the "friendly" faction. Discord in the hostile camp brought some people back to Oraibi, yet old animosities lingered and a steady out-migration continued to erode the pueblo's population base (Cameron 1991a: 106-109).

The study is not an archaeological one, but relies on census and ethnographic data, maps, and more than 250 photographs of the pueblo (the first ones dating from the 1870s). Based mainly on image chronology, Cameron (1991a: 109-128) established six sub-periods (1871-87, 1887-1901, 1902-12, 1913-25, 1926-37, 1938-48) of study. Population figures provide the demographic context for analyzing changes in room use during the overall study period. The Federal Census of 1900 recorded 773 people and 188 households, plus 86 persons living outside the pueblo. There is some indication that these figures were the result of absolute (births outweighing deaths) and relative (in-migration) growth in the late 1800s. The split of 1906, however, saw 298 of 620 adults leave. In 1933, about 100 residents remained. The decline brought major changes in structure use, but while the main result was a pueblo-wide contraction of occupied space through room abandonment, some room blocks underwent more varied changes as rooms were remodeled, dismantled and remodeled, or built new.

Cameron's (1991a: 68-70, 115-148) data point to the household as the chief institution governing structural change. Archaeological identification of households is tricky not only for the kind of data needed to draw reasonably secure conclusions about household organization, but also because households in the Southwest and elsewhere are seldom static (e.g. Netting et al. 1984; James 1994, 1997; Cameron 1996 Coupland and Banning 1996; Allison 1999, 2004; Cutting 2006). At Oraibi at the time of the split, at least half of the households were nuclear families based on matrilineal segmentation, i.e. daughters and their husbands living in the mother's "house" before establishing their own households nearby. The role of the household in the wider social structure of the time is not entirely clear, due to functional/organizational overlap with higher-order entities like lineage and clan. Cameron (1991a: 115-137) notes, however, that room-block expansion was driven by "new" nuclear families establishing their residences as close to the wife's mother's household as possible. Space permitting, expansion took the form of ground-floor rooms appended to the same room block. Existing households seeking more space usually added upper-story rooms. Clusters of abandoned rooms within room blocks likely reflect loss/shrinkage of households.

Although split and subsequent out-migration vastly reduced Oraibi's population, by 1948 12 of the pueblo's 25 room blocks were still occupied. Structural patterns for this occupation enabled Cameron to identify and create a model of changes affecting structures during their entire use life (Fig. 2.8). In addition, the presence of a residual population, plus sporadic returns/visits by former residents, offered a chance to examine the post-abandonment human impact on abandoned structures (i.e. in archaeological context). Observations related to abandonment at Oraibi include lack of new construction accompanied by increased remodeling and/or dismantling of rooms. The latter was done to create larger households through elimination of old household boundaries (e.g. by moving wall alignments, doorways, etc). Such reorganized occupation tended to concentrate around areas of ceremonial importance, tended to be limited to ground-floor rooms, and frequently entailed curation ("recycling") of useable, hard to procure materials like roof beams (cf. Fig. 2.6) (Cameron 1991a: 149-264).

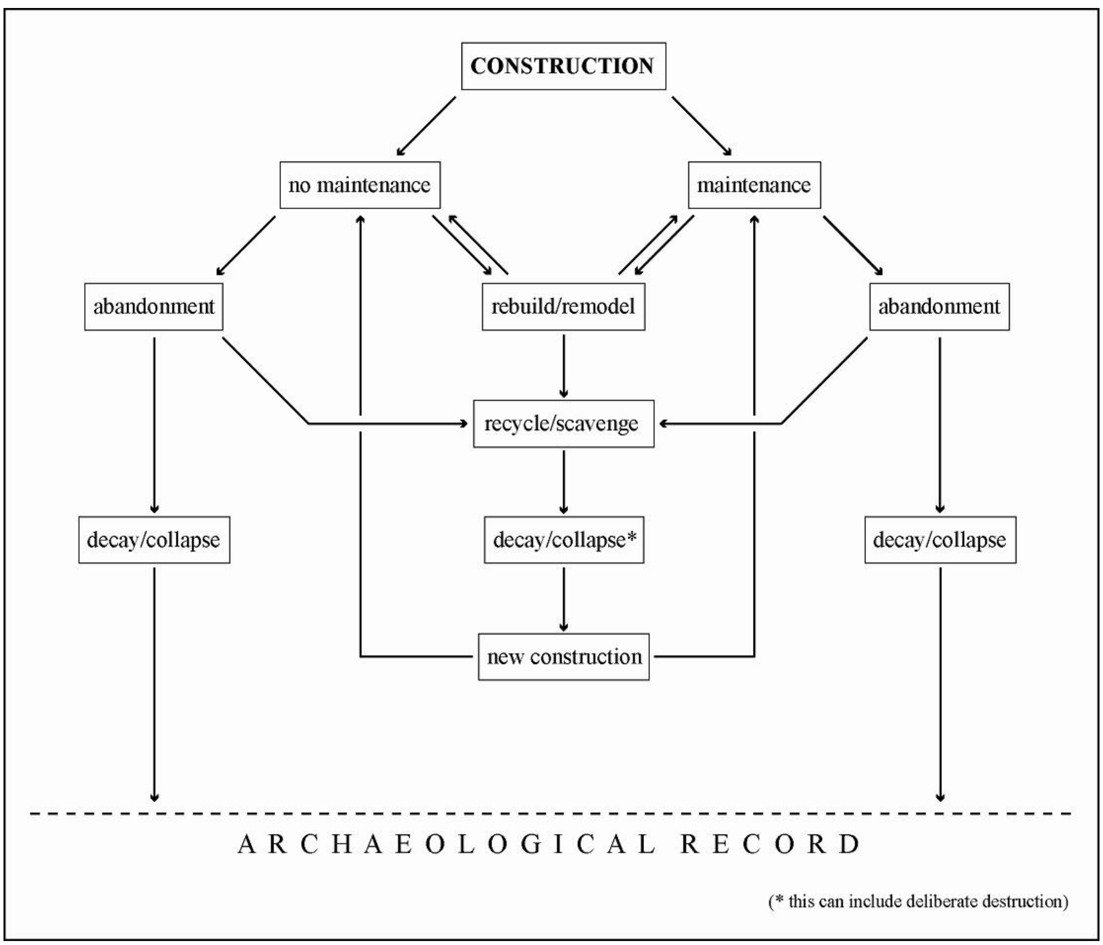

Fig. 2.8. Model of structure use life (adapted from Cameron 1991a, Fig. 5).

As for depositional patterns at Oraibi, the abruptness of the split probably resulted in a relatively large amount of useable materials (i.e. de facto refuse) left in/around the homes of the hostile émigrés. But as many hostiles settled near Oraibi, curation/recycling and scavenging doubtless changed (depleted) original abandonment assemblages. In this, the people who stayed at Oraibi can be assumed to have played a substantial role. For them, too, availability of abandoned rooms likely prompted changes in discard behavior, especially secondary refuse deposition as abandonment refuse deposition, a process documented in similar contexts throughout the world (see above). A related factor is the dismantling and/or filling of abandoned structures in remodeling extant households. In multi-room structures demolition and filling can be necessary for statical reasons. All told, the patterns from Oraibi present an instructive case of rapid, partial abandonment and short-distance out-migration in a context of communal discord. As similar cases may have been fairly common among other Puebloan communities, Oraibi provides a basis for comparison with abandonment assemblages at other Southwestern sites, and a basis for isolating causal links, social and otherwise, behind the abandonment of those sites (Cameron 1991a: 265-278).

Summary and Implications for Research at Plaza Montoya

Perhaps more so than in other areas of archaeological research, studies of site abandonment draw heavily on analyses of recent behavior, ethnographic data, and ethnoarchaeological work. At the time of Ascher's landmark observations and Schiffer's early research of site-formation processes, this analogy-driven association was still something of a novelty, connected logically to the concurrent rise of processualist views in the discipline at large. With the bulk of behavioral-material analogies and related terminology deriving from such largely "actualistic studies" (David and Kramer 2001: 13), these studies have come to supply the analytical foundation for modeling abandonment processes in prehistoric or other under-documented contexts (David and Kramer 2001: 6-54, 110-113).

Actualistic studies tend to confront the researcher with relatively few unknowns (or rather unknowables) in the overall study context. Stevenson's and Cameron's studies, though not strictly speaking actualistic, are each set within comparatively clearly defined and definable, historically documented frames of reference. This obviously illustrates the value of coherent data sets and clear context. The two studies are also indicative of the complexity of decision-making processes leading to site abandonment and of the wide range of potential factors driving these processes. Moreover, abandonment is commonly viewed as a negative, a failure to cope with problems in a way that secures continuity of place. External/internal pressures can of course put household and communal stability at risk; however, not every instance of abandonment amounts to ruin in time of crisis. The abandonment of a pueblo or even a mining camp (cf. Hardesty 2003) thus need not be viewed only as yielding to impossible odds, but as an option (though not the favored one necessarily) in a range of strategies aimed at realizing a range of economic, social, and other goals (Tomka and Stevenson 1993: 192-193; Nelson and Schachner 2002).

A review of the relevant literature suggests that notions of continuation and mobility have been steadily gaining more weight in Southwest archaeology, especially in studies of regional and site abandonment. In the case of the regional abandonments of the 12th and 13th centuries, correlations of site chronologies with paleoclimatological data have a history of being viewed as evidence of disastrous population decline caused by failing subsistence systems in times of environmental stress. Tough times for subsistence farming doubtless resulted in above-normal absolute population losses from famine, disease, and conflict. However, research at the site level in several areas suggests more relative demographic give-and-take in operation, with abandonment, mobility, and resettlement all playing a role in the larger processes of reorganization (e.g. Reid 1973; Reid and Shimada 1982; Schlanger and Wilshusen 1993; Lekson and Cameron 1995; Adler 1996; Spielmann 1998; Hegmon et al. 1998; Nelson and Hegmon 2001; Nelson and Schachner 2002; Varien and Wilshusen 2002; Lyons 2003; Adams and Duff 2004).

Predictably, such interlinked processes are hard to tease apart in the archaeological record. If nothing else, the effort requires detailed data on site structure and stratigraphy, especially for larger, more complex sites. What is needed is "a firm grasp of the sequence of construction throughout the settlement" (Cameron 1991a: 275). This can be gained only through analysis of wall bondings and abutments, floor and fill/debris sequences, and good chronological (preferably dendrochronological) control. While this is a "traditional" to-do list for tracing construction and occupation sequences at Puebloan sites (e.g. Rinaldo 1964; Snow 1976a; Crown 1991; Creamer 1993; Riggs 2001), it has in addition an analytical focus on identifying gaps in the sequence, layout and/or structure changes, and final abandonment level(s). The same applies to depositional patterning, especially the identification of de facto and/or abandonment refuse in likely habitation/activity areas (cf. Seymour and Schiffer 1987; Schiffer 1989; LaMotta and Schiffer 1999).

Particularly in contexts outside the researcher's own culture, analysis of refuse deposition entails some hypothesizing about the "value" of artifacts in systemic context. In this, ethnographic and ethnoarchaeological information can help by recognizing the functional and non-functional significance of different kinds of artifacts, i.e. their relative value (or lack thereof) as tools or status/ritual symbols or both. This provides a first idea of an item's retention potential. At Puebloan sites, archaeologists pay special attention to two artifact types: ceramics (especially decorated vessels) and groundstone implements (manos/metates). Both have clear practical functions, and the former also connect with the realm of social identity and ideology (e.g. Cushing 1886; Reed 1955; Lister and Lister 1978; Habicht-Mauche 1993; Capone 1995; Morales 1997; Powell 2002; Clark 2006). Grinding stones have been indispensable in traditional plant-gathering and agricultural societies all over the Americas. In rural Latin America, stone metates can still be found in household inventories (Lange and Rydberg 1972: 430-431, Tomka 1993; Graham 1993; Joyce and Johannessen 1993: 142; Gervais and Macario Calgua 2002),[9] and in some regions metate production may still be in the hands of specialized *metateros* (Cook 1970, 1973, 1976). Descriptions in Puebloan folklore/mythology of grinding corn and other materials (cf. Cushing 1920; Parsons 1939) add an abstract dimension to the metate tool kit. As large metates can take much time to grind into shape, specimens found on old sites seem to have had high re-use value. In unforced/planned abandonment, intact grinding stones are thus likely to be removed and/or, in case of short-distance relocation, to be scavenged during later site visits (Huckell 1986; Schlanger 1991; Diehl 1998).

[9] So also observed personally in the (largely Maya) community of San Antonio Cayo, Belize, in June 1997.

One of the first sites where these artifact types were examined for differences in assemblage composition is 14th-century Grasshopper Pueblo (Montgomery 1993: 157). Drawing on Schiffer's models of discard, J. Jefferson Reid (1973: 114-118) developed the "relative room abandonment measure," a cross-plot of the number of whole/restorable ceramic vessels on a floor and the number of sherds in the fill above the floor, or, in other words, a quantitative comparison of ceramic de facto and abandonment refuse. Basic to this is the premise that occupied rooms will not attract refuse fill, unlike abandoned rooms which may be used for discard by occupants of other rooms, and that in early abandoned rooms items of utility/value will be removed, with the effect that little de facto refuse (ceramic vessels) remains on the room floor (Reid 1973: 114). Comparison of room assemblages at Grasshopper revealed strong links between high sherd densities in room fills and low occurrences of vessels on room floors, and vice versa. Although the factor function must be controlled for in assemblage comparisons (Ciolek-Torrello 1978; Reid and Shimada 1982), the room abandonment measure suggests a general sequence of site abandonment (Reid 1973, Table 1; cf. Schiffer 1973, 1989; Seymour and Schiffer 1987; Montgomery 1993; Riggs 2001). In addition, it further supports the assumption that de facto refuse depletion under "normal" (i.e. planned) conditions entails removing "the most valuable [items] in terms of replacement costs" (Lightfoot 1993: 172-173).

A different approach applied to pit-house sites (AD 600-900) in southwestern Colorado focuses on floor assemblage weight (represented to over 90% by ceramics and groundstone implements) in different contexts of roof treatment (Schlanger and Wilshusen 1993). Similar to Grasshopper, roof and floor deposits correlate in different ways. Structures with roofs that had been burned (apparently intentionally, by their owners on abandonment) held the most substantial floor assemblages. Structures where roof beams had been salvaged for use elsewhere contained less floor material, and structures whose roofs had decayed in place had the least (Schlanger and Wilshusen 1993, Figs. 7.4, 7.5). While the researchers state that most houses were dismantled and/or useable objects salvaged or scavenged, quantities and descriptions of possible de facto and abandonment refuse are not given (Schlanger and Wilshusen 1993: 94). Even so, in changing the scale of analysis from the 300 years of regional occupation and its abrupt end around 900 to the level of the site and individual pit structure, they were able to identify several periods within the overall occupation span in which droughts could have caused people to relocate. Moreover, cutting dates from roof beams suggest that while new structures were built primarily during favorable climate conditions, structures were not abandoned only in adverse circumstances. Rather, with use-lives of perhaps a dozen years, structures may have decayed to a point where replacement became unavoidable (Schlanger and Wilshusen 1993: 90-95).

In view of these and other examples of abandonment research, an archaeological investigation of the abandonment of an Ancestral/Colonial Piro site promises to throw some light on population and settlement dynamics in a little known region and little known context. Spanish expansion put much pressure on Puebloan populations through a combination of socio-political, economic, ideological, and especially biological factors (Schroeder 1979, 1992; Barrett 2002). How did this play out at the regional, communal, and household levels? It has been suggested that the plaza-type pueblos emerging in the Rio Grande Valley during Pueblo IV times owed their existence to “coordinated social effort,” and that they were “a design for demographic (and social) stability” (Cordell

1989: 321-322; Rautmann 2000). If so, how did the residents of a plaza-type pueblo like Plaza Montoya respond to the Spanish presence? There is (ethno)historical (e.g. Dozier 1954; Sando 1982; Opler 1982; Kessell 1989; Kessell and Hendricks 1992; Kessell et al. 1995, 1998, 2000, 2002; Herr and Clark 1997) and archaeological evidence (Wedel 1959; Witty 1983; Ferguson 1992; Preucel 2000, 2002; Kulisheck 2003, 2005) that mobility played a strong role in short- and long-term Puebloan strategies of moving out of areas under Spanish control. This has also been suggested for the Piro area (Marshall and Walt 1984: 141, 215; Kulisheck 2003), but at present scale and permanence of such "refugee" movements, especially during early colonization/missionization, are wholly unclear.

In the case of Plaza Montoya, the problem that presents itself is the abandonment of a large non-mission pueblo located close to the principal Piro mission site. Surface ceramics suggest a later, more sizeable occupation than at neighboring sites. At Plaza Montoya, there is no recognizably limited distribution of late ceramic types that might indicate a gradual contraction of settled space. This suggests a smaller "window" of time within which abandonment could have played out. The basic assumption deriving from these observations is that in contrast to neighboring sites Plaza Montoya Pueblo seems to have lost a substantial number of residents relatively quickly. Whether this process was driven primarily by relocation (perhaps in the form of a *reducción*), or whether it entailed an absolute loss of population cannot be assessed with the surface data. With probable run times of diagnostic glaze forms measured in decades, if not centuries, a chronology derived entirely from surface ceramics has to be considered highly provisional. As a result, the possibility of a more gradual process of decline and abandonment with all its processual/behavioral implications should not be dismissed out of hand.

Given these issues, models of structure abandonment and assemblage formation as summarized in Figs. 2.6, 2.7, and 2.8 can be expected to help narrow down the spectrum of possible abandonment scenarios at Plaza Montoya. Primary indicators to be analyzed are patterns of structure decay/maintenance and artifact/refuse deposition. In terms of de facto refuse, for example, a relatively high floor volume of intact/complete ceramic vessels and groundstone implements (especially metates) would suggest rapid abandonment and lack of post-abandonment access, whereas low volume would indicate (post-)abandonment conditions favorable to retaining/salvaging such objects. In the specific local context of time, scale/planning and assumed distance of move, and possibility of (periodic) return, the latter association is probably more consistent with a *reducción*-type scenario, particularly if low-volume patterning can be shown for deposits in different parts of the site. Before this and other questions about site occupation and abandonment conditions can be addressed, however, it is necessary to outline physical, archaeological, and historical setting in sufficient detail to provide a clear context for data analysis and interpretation.

CHAPTER 3

PHYSICAL SETTING

The environment of the old Piro province is more diverse than may be apparent at first glance. Archaeologically, the known distribution of Ancestral and Colonial Piro sites to some extent mirrors this diversity. Both the archaeological and historical records point to the Rio Grande lowlands as the focus of Ancestral and Colonial Piro settlement. The pattern seems genuine, and doubtless reflects something of the appeal of a resource-rich riparian habitat (Earls 1985). Nonetheless, several sites (including two pueblos with more than 100 rooms each) can be found in upland locations at considerable distance from the river (Marshall and Walt 1984: 135-141). Faunal and botanical data from some of the lowland pueblos show that the Piros utilized a wide range of resources not only from lowland but also from upland areas (Cordell et al. 1984; Earls 1985; Oakes 1986; Toll 1986, 1987a, 1987b; James 1987; O'Laughlin 2001-8). A few Spanish sources allude to Piro movements in the western uplands, and there is at least one reference to one of the two known upland pueblos (Chapters 5 and 6). More specific data on the scale and permanence of an upland Piro presence are lacking, however, especially from archaeological surveys.

The following pages provide a summary overview of the natural setting of the Piro area, and of some of the changes that have affected lowland and upland zones during the last 400 years. Ecological factors relating above all to subsistence needs no doubt played a key role not only in the pre-contact development of the Piro pueblos, but also, as historical and paleoclimatological data indicate, in the demographic and organizational decline of Piro settlement in the later 17th century (cf. Earls 1985: 54-84, 1992; Scurlock 1998: 7-81; Barrett 2002). Subsistence organization and its impact on local and regional settlement is not a primary concern here; this will be part of more specific discussions of archaeological patterning in subsequent chapters. My intent here is to describe an area whose geographical and ecological diversity may easily be overshadowed by the general contrast between the "green" Rio Grande lowlands and the dusty "gray-brown" valley margins. In this, specific points of interest are the extent to which modern landscapes differ from their pasts, and how such differences may affect current perceptions of the material record of Piro settlement.

Defining the Piro Area

The absence of a modern Puebloan occupation makes the Piro area difficult to define accurately (cf. Earls 1985: 18-21). The word "Piro" does not appear in the extant historical record until the mid-1620s. Prior to, and for the first 80 years after colonization the Piro province was the southernmost area with a permanent Puebloan occupation. Archaeological terminology illustrates this culture-geographical fact in the use of the term "Rio Abajo" in reference to the Piro area (e.g. Marshall and Walt 1984; Cordell 1989; Kulisheck 2003; Lekson et al. 2004; but cf. Earls 1985; Barrett 2002). However, the term has a much broader historical connotation (Marshall and Walt 1984: 1-3). To 17th-century Spaniards the entire Rio Grande Valley from below the La Bajada escarpment south of Santa Fe to the Black Mesa area south of Socorro, a distance of some 250 kilometers, was *"el Rio Abajo"* – "the Lower River" (cf. Sánchez 1987). Subject to the authority of a Spanish *teniente de gobernador* (lieutenant-governor) (e.g. *AGN*, *Civil*, *tomo* 511),[1] this stretch of the Rio Grande Valley then encompassed, in native ethnic/cultural terms all the Keres, Tiwa, and Piro settlements between the Keres pueblo of Cochiti and the Piro pueblo of Senecú (Fig. 3.1) (Simmons 1968: 81, 159; Gerhard 1993: 317-318). Following abandonment in the Pueblo Revolt of 1680, the Piro portion of the Rio Abajo remained devoid of permanent settlement until the early 1800s, when Hispanic colonists gradually reoccupied the lowlands between the old Piro pueblos of Sevilleta and Socorro (Marshall and Walt 1984: 259-287). With these disparities of reference, I chose to use both the somewhat pedestrian term "Piro area" when referring to developments in Piro territory proper, as well as the term "Piro province", which echoes the Spanish *"la provincia de los Piros"*, a term that can be found in various 17th-century documents (e.g. Ayer 1916: 97; *AGN*, *Inquisición*, *tomo* 372).[2]

[1] Declarations of Juan Domínguez de Mendoza, Santa Fe, June 19, 1675; Diego López Sambrano, Santa Fe, June 20, 1675; and Cristóbal Enríquez, Santa Fe, June 21, 1675.

[2] Declarations of Francisco Márquez, San Francisco de Sandia, October 1, 1631; and Maria Núñez, San Francisco de Sandia, October 14, 1631.

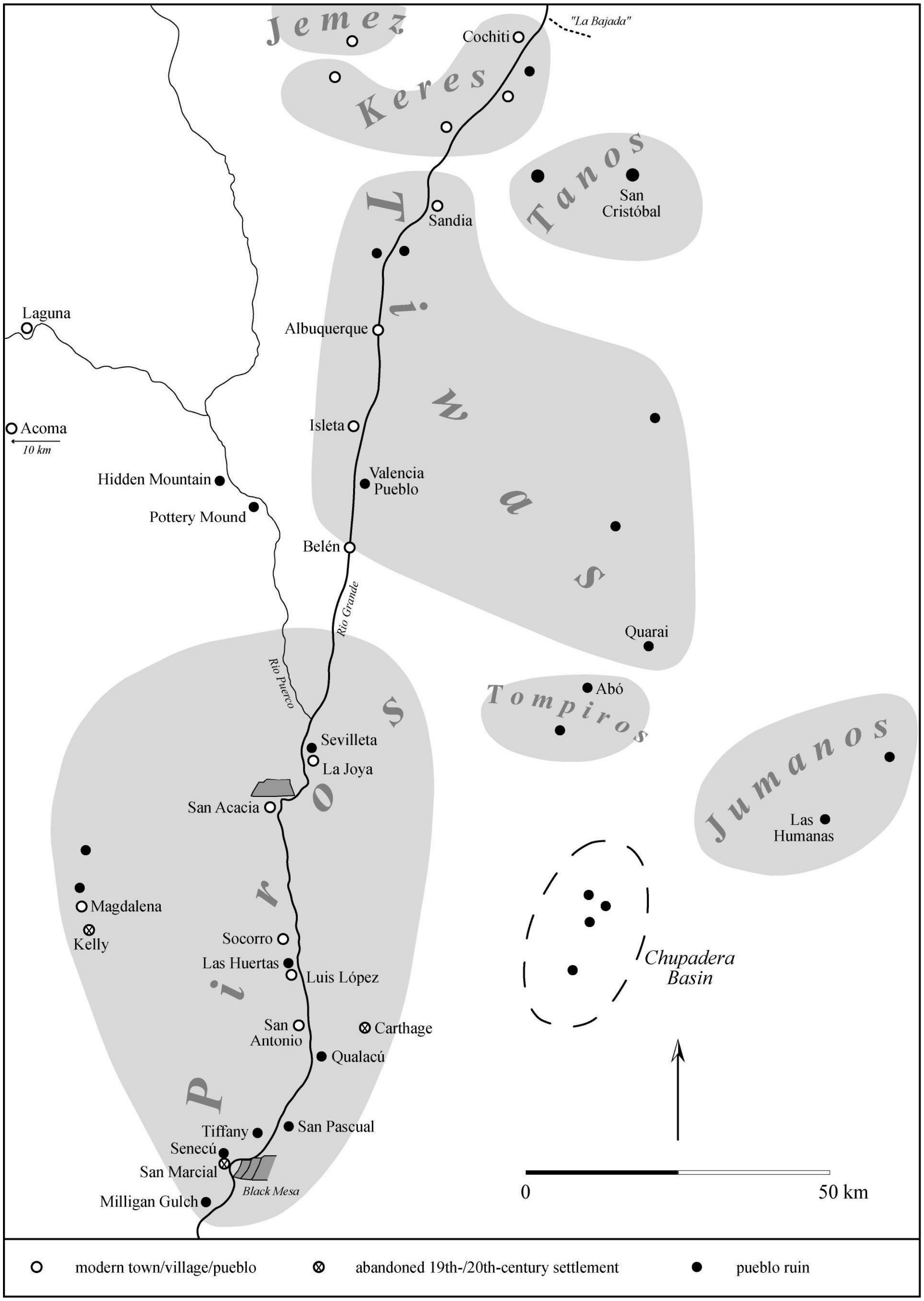

Fig. 3.1. Approximate distribution of Puebloan groups in and adjacent to the historic Rio Abajo with reference to selected modern settlements and archaeological sites.

Overall, defining the Piro area vis-à-vis the larger Rio Abajo region is not as straightforward an undertaking as one might wish. To draw a clear dividing line between the Piros and their Tiwa neighbors has so far been neither historically nor archaeologically feasible (cf. Earls 1985: 21; Barrett 2002: 28, 49). Spanish accounts from the 16th and 17th centuries point out differences in settlement size, architecture, and other aspects of material culture (e.g. Hammond and Rey 1953, 1966; Obregón 1997), yet based on these accounts the nearest sites that can be assigned definitively to either group are Sevilleta (Museum of New Mexico, Laboratory of Anthropology Site Number LA 774, Piro) and Isleta (Tiwa) some 70 km to the north (Fig. 3.1). Several archaeological sites can be found along this stretch, but which of them represents the last Piro or the first Tiwa pueblo is not clear. There are a few documentary references to a gap between the Piro and Tiwa settlements, variously estimated to have been between one and seven leagues (c. four and 30 km) wide. This seems to indicate a fluid boundary, which in turn may help explain its archaeological elusiveness (Riley 1995: 230; Barrett 2002: 28). Pioneering archaeologist, historian, and ethnologist Adolph F. Bandelier in the early 1880s tried to address the problem with the help of Tiwa informants from Isleta, who pointed out archaeological sites and assigned them to either of the two groups (Lange and Riley 1970: 21-24). Despite or perhaps just because of this effort, Bandelier (1890-92, 2: 233-235) concluded that it was impossible "to establish which was the last Tigua [sic] pueblo on the Rio Grande below Isleta". As far south as La Joya "it is uncertain which pueblos were Tiguas and which belonged to the Piros", for the two tribes "were near neighbors – unusually near to each other for the custom of tribal seclusion and isolation peculiar to Indian institutions".

The problem of boundaries also applies to other points of the compass. Although there is evidence that Piro settlement extended beyond the valley proper, this evidence is extremely localized (see Chapter 4). Most conspicuous are the two large upland pueblos mentioned above. Both are located near the modern town of Magdalena (Fig. 3.1) (Marshall and Walt 1984: 141, 213-217). To the north and northeast, there are a few smaller sites in the lower Rio Salado and Rio Puerco drainages (Wimberly and Eidenbach 1980; Eidenbach 1982), but with no comprehensive survey data. A coherent estimate of range, scale, and nature of Piro settlement in this upland zone is for the future. The same is true of the eastern uplands. During a visit to the Socorro area in June 1882, for instance, Bandelier was told of "a big ruin in the Cañada de la Parida...four miles inland", i.e. east of the Rio Grande (Lange and Riley 1966: 324). To my knowledge, there has never been an attempt to verify the existence of this site, even though the distance given would still place it in some proximity to the river. This uncertainty is symptomatic of the archaeology of the entire eastern upland zone. Archaeological survey work has yet to reach beyond the first gravel benches above the Rio Grande floodplain (cf. Marshall and Walt 1984: 1, 6). Several small sites and rock shelters are known in the area, and some have been examined, but apart from these sites nothing is really known about the archaeological record of this part of the Piro area (Winter 1980; Hogan and Winter 1981; Oakes 1986: 110-112; Earls 1987: 10-11).

Notwithstanding this lack of archaeological information, it is probably safe to say that during most of the Ancestral and Colonial Piro periods the eastern uplands were not a true settlement periphery. On the far side of the Pinos Mountains, the terrain descends into the broad Chupadera Basin. There are in this basin several archaeological sites which, based on surface ceramics, seem contemporary with the Ancestral/Colonial sites in the Rio Grande Valley. The sites range from small isolated room blocks to large pueblos with more than 1,000 ground-floor rooms (Mera 1940: 6-13; Baldwin 1988; Kyte 1988; Shelley 1989). Surface ceramics also indicate that some of these sites were most likely occupied or reoccupied during colonial times (cf. Kulisheck 2003: 44-45). Not a single documentary reference to the area has yet been found, however, and the identity of the basin's occupants remains unknown (Hayes et al. 1981: 74; Lekson et al. 2004: 57; Bletzer 2005: 49-50; cf. Montgomery et al. 1989: 39-40; Kyte 1989b: 148-149).

The Chupadera Basin lies about halfway between the Rio Grande Piro pueblos and the Jumano, Tiwa, and Tompiro pueblos of the Salinas area. Coupled with a lack of archaeological information, this intermediate position provides no obvious clues as to group affiliation (but cf. Mera 1940: 6-13). Bandelier, for his part, in the 1880s and 90s viewed the entire area from the Jumano pueblos to the Rio Grande as the original Piro province. Las Humanas Pueblo (LA 120) he identified as "the Piro village and mission of Tabirá" (Bandelier 1890-92, 2: 282). He went so far as to claim sites in the Sierra Blanca region, some 100 km further east and south, for the Piros. In comparing this "macro-region" with the extent of the Piro area as documented in the 17th century, he then suggested a "withdrawal" of the Piros "from the north, east, and south towards the Rio Grande, in times anterior to the first appearance of the Spaniards" (Bandelier 1890-92, 2: 282-292). Yet decades of historical and archaeological research on the Salinas pueblos (e.g. Kubler 1939; Scholes and Mera 1940; Vivian 1964; Hayes 1981; Hayes et al. 1981; Baldwin 1981, 1982, 1988; Spielmann 1982, 1983, 1989, 1998; Hurt 1990; Hickerson 1994; Rautman 1995, 2000; Graves 2004; Clark 2006), and areas east and south (e.g. Mera 1943; Lehmer 1948; Wiseman 1976; Wimberly and Rogers 1977; Breternitz and Doyel 1983; Kelley 1984; Laumbach and Kirkpatrick 1985; Clark 2006) contradict such monolithic assumptions and present a much more varied picture of regional settlement and group affiliation.

In contrast to the eastern periphery, the southern limit of Piro settlement can be traced with relative ease. Documents from the 17th century consistently refer to the pueblo of Senecú as *"es el primero de la gobernación del Nuevo México"* – i.e. the "first" pueblo to be seen by New Mexico-bound travelers on the Spanish wagon trail, the *camino real.* Although Senecú's remains have not been found, the documents are fairly specific on its location on the west side of the river, just across from the massive Black Mesa basalt flow (Figs. 3.1, 3.2, see also below). In the archaeological record of the Black Mesa area, the southernmost sites with Ancestral or Colonial Piro material are located south of the mesa, near the mouth of Milligan Gulch. The sites are Milligan Gulch Pueblo (LA 597), very likely the first pueblo seen by Spanish explorers who came up the Rio Grande in the early 1580s (see Chapter 5), and Site LA 1110, a cluster of about 10 isolated rooms, located a short distance further south on the east side of the river (Mera 1940: 7, 9; Marshall and Walt 1984: 229-230, 232; Marshall 2005: 21). No traces of Puebloan settlement have been found south of these two sites (Marshall and Walt 1984: 135-136, 140).

Fig. 3.2. Rio Grande bottomlands at Black Mesa. This is the general locale of Senecú Pueblo. View is to the south, towards the Fra Cristóbal Mountains (visible in the distance) (M. Bletzer, 2/2004).

In light of all this, it is clear that every archaeologically- and/or historically-derived sketch of 16th- and 17th-century Piro territory is an approximation. To bypass repetitive and imperfect descriptions of site distribution, it is perhaps best to base regional discussions on a more practical frame of reference, geography. A closer look at geographical features that approximately match the known distribution of possible Piro sites yields in the north the course of Abó Arroyo, an ephemeral stream which joins the Rio Grande some 15 km south of modern Belen (Fig. 3.3). Judging by the available historical and archaeological evidence, the arroyo cannot be too far off the old Piro-Tiwa boundary. Marshall and Walt (1984: 1, 227; cf. Earls 1985: 21) consider a small pueblo ruin (LA 780, Abeytas Pueblo, now mostly destroyed) on the west side of the Rio Grande and just a short distance south of the mouth of Abó Arroyo to have been the northernmost Piro pueblo. In the south, Milligan Gulch is close to the known historical and archaeological limit of Piro settlement.

In the west, the two pueblos near Magdalena essentially define the western extent of Ancestral/Colonial Piro settlement. Based on their location, an approximate boundary is the line of the Magdalena Mountains, Bear Mountains, and Sierra Ladrones (Figs. 3.1, 3.3) (Earls 1985: 21). Further north, Marshall and Walt (1984: 186-193) include in their register of Ancestral and Colonial Piro settlement a complex of small sites atop Hidden Mountain (LA 415), a basalt butte on the Rio Puerco some 40 km above its junction with the Rio Grande (Fig. 3.1). Below Hidden Mountain lies the site of Pottery Mound (LA 416), a large pueblo occupied mainly in the 14th and 15th centuries (Ballagh and Phillips 2006, 2008). These sites are located near the peripheries of the historic Piro, Tiwa, and Acoma (Keres) provinces. Although today Acoma Pueblo residents claim ancestral relations (Lister 2000: 123), such claims need not represent exclusive affiliation (cf. Dittert and Brunson-Hadley 1999: 66-67; Ballagh and Phillips 2006: vii). After some 500 years all this is difficult to assess in any detail, especially from an outside perspective. Primarily for this reason, the Rio Puerco sites are not included in the Piro area as defined here, nor are on the eastern periphery the sites in the Chupadera Basin. Information from the uplands east of the Rio Grande is too scant to examine possible ties between Piro and Chupadera pueblos. In view of this, I use as the eastern limit of Piro territory the crest of the Los Pinos range and adjacent mountains to the south.

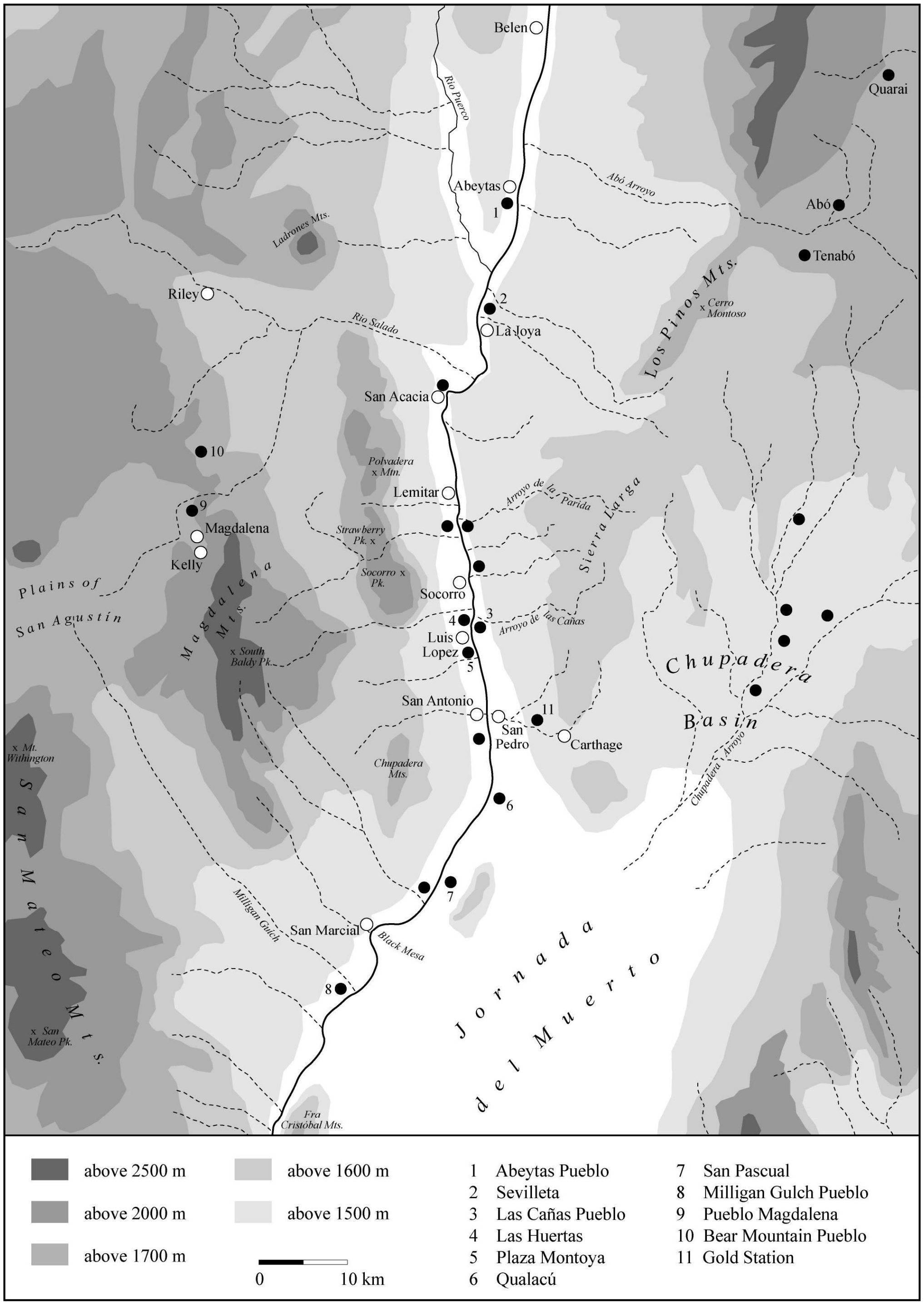

Fig. 3.3. Topography of the Piro area. White circles mark modern or recent settlements, black circles archaeological sites. Sites frequently mentioned in the text are numbered. Not all settlements/sites are shown.

Physiography and Climate

GEOLOGY AND TOPOGRAPHY

The central geological feature of the Piro area is the Rio Grande Valley. It is a rift or *graben* on average 40 to 50 kilometers wide, created in Miocene and early Pliocene times with the collapse of an earlier uplift (Gossett 1984: 3-5). Its size and complexity are immense. The upper Rio Grande watershed extends from the San Juan Mountains of southwestern Colorado to Fort Quitman below El Paso, a distance of more than 1,100 km (CUAHSI 2004: 1-2). Along this stretch, uplift and collapse created a series of basins of varying sizes. Sediments with a depth of several thousand meters define much of the geological makeup of these basins (Fox et al. 1995: 52-54; Scurlock 1998: 181). The Rio Grande as seen today runs in a channel entrenched about 30 m into the uppermost sedimentary deposits (Wimberly and Eidenbach 1980: 4; Gossett 1984: 5).

The part of the Rio Grande Rift of interest here is the Middle Rio Grande Basin. In terms of general landscape classification, the basin is part of the Basin and Range Physiographic Province (Gossett 1984: 3; Scurlock 1998: 181). It stretches from White Rock Canyon above Cochiti to the Black Mesa area south of Socorro (Scurlock 1998: 182-83), and thus largely coincides with the 17th-century Rio Abajo region described above. Similar to the historical region, the basin does not delineate a homogeneous whole. It includes several sub-basins, two of which – the Socorro and Belen sub-basins – cover the lowland portion of the former Piro area. The most obvious topographical markers of these sub-basins are narrow passages in the Rio Grande channel. In the Piro area, such passages are at Black Mesa (Fig. 3.2) and above San Acacia (Fig. 3.4) (Gossett 1984: 4; Earls 1985: 49; Scurlock 1998: 181-184). The latter, a close formation of several large basalt ridges, marks the transition from the Belen to the Socorro sub-basin. Both passages are conspicuous landmarks and repeatedly appear in 17th-century documents (Chapter 6) (Marshall and Walt 1984: 238-240, 256; Marshall 2005: 47).

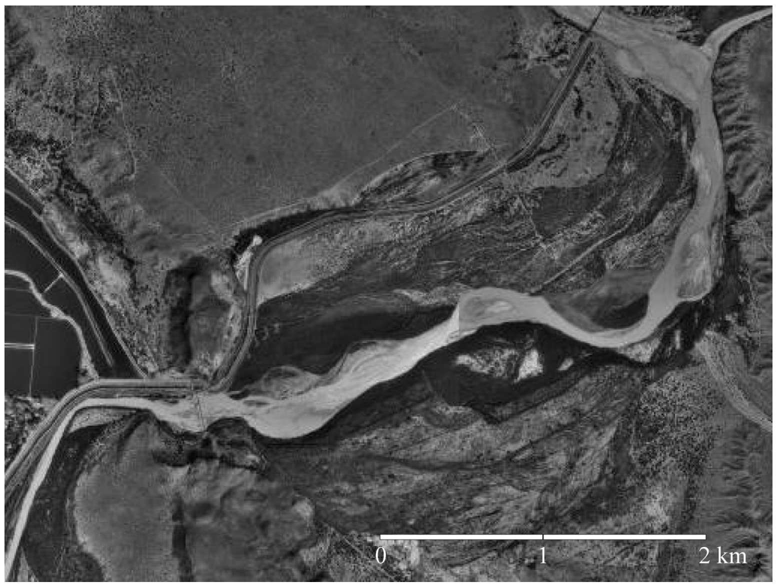

Fig. 3.4. The San Acacia narrows (modified USGS photograph, 1996).

Beyond the basalt masses of the Black Mesa and San Acacia narrows, the topography of the Rio Grande bottomlands is characterized by an extensive alluvial floodplain. Between one and three kilometers wide, the floodplain comprises a mix of riparian forests *(bosques)*, wetlands, and agricultural land (Figs. 3.5, 3.6). Substantial gravel benches mark its eastern and western edges (Gossett 1984: 4; Earls 1985: 50). It is on these benches that most of the known Piro pueblos are located (Fig. 3.3). Bench elevations in relation to the floodplain differ. The remains of Sevilleta Pueblo, for instance, sit atop a bench formation on the east bank of the Rio Grande some 30 m above the riparian *bosque* (Fig. 3.5) (Marshall and Walt 1984: 203). Las Huertas Pueblo (LA 282), just south of Socorro (Fig. 3.1.), occupies a 15-m-high gravel bench immediately west of the floodplain. Further south, towards Black Mesa, bench elevation is 10 m at Tiffany Pueblo (LA 244) on the west side of the river, but barely a meter or two at Qualacú (LA 757) and San Pascual (LA 487) on the east side (Marshall and Walt 1984: 182, 207, 209; Marshall 1987: 11). Here, however, increased silt accumulation resulting from modern changes to the local riverine environment has substantially raised the floodplain level (see below) (Marshall 2005: 20-22).

Fig. 3.5. Rio Grande bottomlands at Sevilleta. View is to the west, towards the Ladrones Mountains (M. Bletzer, 8/2002).

Fig. 3.6. Rio Grande floodplain near San Antonio (modified USGS photograph, 1996).

Throughout the Piro area, ephemeral streams (arroyos) run down to the Rio Grande floodplain from the eastern and western uplands. The two largest streams, the Rio Puerco and the Rio Salado, join the Rio Grande from the west in a 15-km stretch opposite and south of Sevilleta Pueblo (Figs. 3.1, 3.3). Like all other tributaries, they run only intermittently. Arroyos are prominent features of the east-bank topography between the San Acacia narrows and San Antonio (Fig. 3.3). Deeply entrenched gullies *(cañadas)* give the landscape here a rugged appearance even near the river margins (cf. Earls 1985: 49-50). Locally, the area is known as the *Quebradas* (from *quebrado*, broken) (Figs. 3.7, 3.8). Ever since the early days of Spanish rule, this has been an area ill-suited for vehicular traffic (Schroeder 1993: 178; Marshall 2005: 51).

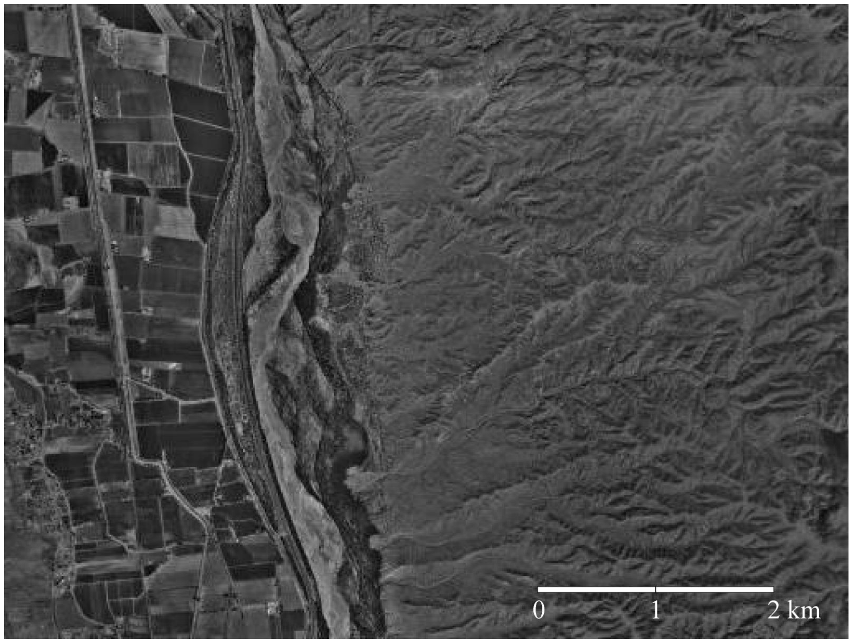

Fig. 3.7. The *Quebradas* area northeast of Socorro (modified USGS photograph, 1996).

Fig. 3.8. Arroyo del Tajo east of Socorro (B. Wilkinson, 7/2004).

The many arroyos reaching the floodplain in general give a first impression of the varied topography of the eastern and western valley margins. On the west side, above the junction of the Rio Puerco, extensive gravel benches mark the edge of an upland plain of probably Pliocene origin. This area is a veritable jumble of basaltic and silicic rocks, granite, sandstone, limestones, and travertines of diverse origins (Young 1982). South of the Puerco the profile changes dramatically in the form of the Ladrones Mountains, which – set back 15 to 20 km from the valley bottom proper – reach nearly 2,800 m at Ladrón Peak (Figs. 3.3, 3.5). The center of this compact range consists of an uplifted Precambrian granite block and fossiliferous limestones of Pennsylvanian age (Pollock 1994). Further south, across the Rio Salado, the transition from valley to uplands becomes more abrupt with the steep slopes of Polvadera Mountain and Strawberry and Socorro Peaks. These mountains, the remains of an old caldera cluster, are at their core composed of basaltic lavas, which are overlain by shale and limestone sediments, as well as igneous and metamorphic basalts and tuffs (Chamberlin 1980, 1981, 1982a, 1982b; McLemore 1980). All exceed 2,000 m in elevation; all, too, are located within 10 km of the floodplain margins. Paralleling these mountains to the west are the Magdalena Mountains, a north-south-trending range comprising a large block of Precambrian granite buried under carboniferous sediments, extrusive igneous rocks, and more recent alluvial deposits (Figs. 3.3, 3.9). The high point here is South Baldy Peak (elevation 3,287 m) (Bauer and Williams 1994). Viewed from the top of South Baldy, the Rio Grande Valley is but a thin green strip in an otherwise vast grayish-brown expanse of land.

3.9. Upland juniper savanna north of Magdalena. View is to the south, towards the Magdalena Mountains (M. Bletzer, 7/2005).

In the past especially the northern portions of the Magdalena Mountains were exploited for mineral resources, mainly lead and copper sulfides, as well as – after 1900 – a zinc carbonate called smithsonite (Lasky 1932; Renault et al. 1995). There is some vague archaeological and documentary evidence of 17th-century Spanish mining in the area (see Chapter 6), but as is true for other areas of New Mexico such activities were mostly sporadic and limited in scope. It was not until the late 1860s that mining did take off with a series of lead and silver strikes. Rudimentary mining camps quickly grew into the boomtowns of Kelly and Magdalena, around which developed an extensive mining infrastructure (Ashcroft 1988). Except for a few tailings, derelict structures, and the occasional piece of rusting hardware the mines are gone today. Only stock farming remains, albeit on a much reduced scale, in the region north and west of Magdalena. This is high desert country, with elevations ranging from 1,700 to 2,500 m. The most prominent topographical feature here are the Plains of San Agustín, a collapsed graben bordered by uplifted Precambrian to Quaternary volcanic ranges (Fig. 3.3). At an elevation of roughly 2,000 m, the plains extend some 90 km east-west and 80 km north-south. Several shallow lakes whose sediments dominate the modern land surface covered a good portion of the area in late Pleistocene times. Rounding out the picture are several Holocene playas of alluvial and eolian origin along the fringes of the old lakebed (Stearns 1956; Foreman 1956; Markgraf et al. 1984). The plains today are exceedingly barren, yet in a few places this was apparently not so several thousand years ago. At Bat Cave on the plains' southwestern edge, archaeologists uncovered some of the earliest known specimens of domesticated maize in the Southwest. Problems with stratigraphy and provenience have hampered interpretations, but there can be little doubt that the cave's occupants were consuming maize – possibly locally grown – during the first millenium B.C. (Woodbury and Zubrow 1979: 47-48; cf. Dick 1965; Mangelsdorf et al. 1967; Wills and Huckell 1989).

An easy though today little-used route connects the far eastern edge of the Plains of San Agustín to the Rio Grande Valley. This is the already mentioned Milligan Gulch, the head end of which forms a gap between the western foothills of the Magdalena Mountains and the eastern flank of the San Mateo Mountains (Fig. 3.3). The latter range is geologically similar to the Magdalena Mountains and runs approximately 60 km north to south (Smith 1992). High peaks are Mount Withington (elevation 3,080 m), near the northern end of the range, and San Mateo Peak (elevation 3,091 m), 30 km to the south. Beyond the southern tip of the Magdalena Mountains the gap opens into a broad alluvial basin. To the northeast are the relatively low (elevation 1,900 m) Chupadera Mountains, another range of volcanic origin (Eggleston 1982). To the south, some 20 km below the point where the gulch meets the Rio Grande, the foothills of the San Mateo Mountains descend to the edge of the floodplain. Across this wide-open stretch of land elevations barely exceed 1,500 m. It is here, on the south side of the Milligan Gulch junction, that the remains of Milligan Gulch Pueblo are located. As briefly outlined above, this pueblo in the 15^{th} and 16^{th} centuries marked the southern end of permanently occupied Piro territory (Marshall and Walt 1984: 229, 248).

East of the Rio Grande structure and contour of the high country differ considerably from the western uplands. The major landforms here are Los Pinos Mountains and, further south, Sierra Larga. Separated from the Sandia-Manzano uplift by narrow Abó Canyon, both ranges are between 1,500 and 2,200 m high, with the overall gradient dipping from north to south (Figs. 3.3, 3.10). Precambrian granites also form the base of these mountains, but visible formations are limestone, sandstone, and shale, exposed in many places in sharply defined layers (Stark and Dapples 1946; Beers 1976; Shastri 1993). From about the San Acacia narrows southward the main west-facing escarpment becomes more fragmented, and is fronted by an irregular string of alluvial foothills which gradually descend towards the river. There is archaeological evidence that at least the eastern floodplain margins were well occupied into the Spanish period, but more recent settlement has been sparse, especially when compared to the modern occupation of the western floodplain margins (cf. Marshall and Walt 1984: 137-138; Gossett 1984: 4).

Fig. 3.10. Desert grassland and Pinos Mountains northeast of Sevilleta. View is to the southeast (M. Bletzer, 7/2003).

East of the Pinos Mountains and Sierra Larga, a sharp drop in elevation marks the beginning of the Chupadera Basin. Small ephemeral streams run towards the center of the basin to join the roughly northeast-southwest-trending Chupadera Arroyo. The basin is an area of internal drainage, with the arroyo petering out in a shallow depression in the dry country of the Jornada del Muerto (Baldwin 1988: 61-63; Shelley et al. 1989). The Jornada covers an area of approximately 5,600 km^2 (Earls 1985: 51). Low hills and gravel benches separate it from the Rio Grande lowlands, as do, some 20 km south of Black Mesa, the Fra Cristóbal Mountains (Figs. 3.2, 3.3), a structurally complex range of plutonic, metamorphic, and sedimentary rocks (Cserna 1956; Jacobs 1956; Thompson 1961; Foulk 1991). At Fra Cristóbal Peak the range reaches a height of 1,890 m. The peak figures prominently in the record of Juan de Oñate's colonizing expedition of 1598. Its topography reportedly bore some semblance to the face of fray Cristóbal de Salazar, cousin of Oñate and head of the expedition's Franciscan contingent, and his name came to be attached to the range and a nearby campsite or *paraje* on the *camino real.* Fra Cristóbal was the last campsite before northbound travelers would reach Piro territory (Marshall and Walt 1984: 240-241; Marshall 2005: 49-50, 67; cf. Boyd 1984, 1986).

CLIMATE AND ECOLOGY

Regional and Local Climate

Beginning with the Coronado expedition of 1540-42 and running through modern times, the historical record of New Mexico's climate is full of references to regional and local weather extremes (Scurlock 1998: 43-81). Early references may not always reflect objective observation, but they suggest a variability which today can be documented in systematic meteorological research. Very generally, summers are hot and moist, winters cool and dry (Gossett 1984: 4). Temperature and precipitation are strongly conditioned by location (cf. Tuan et al. 1973: 20-34). As a rule of thumb, temperature decreases between 1.5 and 2.5º F with every one-degree increase in latitude, and a 5º-drop accompanies every 300-m rise in elevation (Earls 1985: 55; cf. Tuan et al. 1973 65-68; Scurlock 1998: 11, 15). The period of maximum precipitation is June to September. Rainfall during these four months can amount to as much as 60% of total annual precipitation (Earls 1985: 59, 1987: 6).

Summer precipitation comes primarily from cyclonic thunderstorms which unload moisture taken up over the Gulf of Mexico, and from more localized convectional storms whose rain loads derive from updrafts and cooling of heated ground air (Cordell 1984: 24-25). During every summer field season at Plaza Montoya, convectional storms occurred daily in the Socorro area. Though often intense, duration and range of these storms were always limited. Winter precipitation is brought mostly by orographic storms originating over the Pacific and, to a lesser extent, the Gulf of Mexico (Cordell 1984: 25; Scurlock 1998: 11). Snowfall averages for the Rio Grande Valley are below 127 mm (5 inches) (Gossett 1984: 4; Earls 1985: 59), but can reach peaks of more than 250 mm (10 inches) in the uplands around Magdalena.

Spring and autumn see extensive dry spells in the area. In late winter and early spring, cyclonic winds from the west and southwest often whip up dust and sand storms throughout the Rio Grande Valley (Tuan et al. 1973: 105-110). In the past, such storms were sometimes likened to the famous North African *khamsin* or *scirocco.* "Clouds of sand came driving against our backs, and the whole atmosphere was dark with the heavy clouds of sand", a Confederate soldier described a storm south of Albuquerque in March 1862. For another soldier, the storm brought to mind "a description that I have seen of the sand storms of the great desert of the Sahara" (Scurlock 1998: 58; cf. Alberts 1993: 66; Hall 1960: 121).

Weather and location – above all elevation – govern climatic and biotic variability in the Middle Rio Grande Basin (Scurlock 1998: 7-11; cf. Lycett 1995: 48). Areas with less than 254 mm (10 inches) of annual precipitation are classified as arid. For the most part, they coincide with the valley bottomlands below 1,500 m. Upland areas generally fall within the category sub-arid. Only the highest elevations (above c. 2,700 m) in the Magdalena and San Mateo Mountains receive sufficient moisture to be classified as sub-humid (Tuan et al. 1973: 185-195; Scurlock 1998: 11-15). Weather data from six sites illustrate this lowland-upland division in the Piro area. The 80-year records from Socorro, Magdalena, and the Bosque del Apache National Wildlife Refuge south of San

Antonio cover approximately the center, western periphery, and southern periphery of Ancestral/Colonial Piro settlement (Fig. 3.11, Tables 3.1a, 3.2a). Three sites in the Ladrón foothills, on the lower Rio Salado, and in the Pinos Mountains provide additional records for the northern lowland and upland periphery (Tables 3.1b, 3.2b).

Aside from revealing local and regional temperature and precipitation patterns, climatic data and historical observations of "events" like floods and droughts document major discrepancies in these patterns. For some time now, large-scale fluctuations associated with the El Niño-La Niña cycle are known to affect climate in the Southwest (Quinn et al. 1987; Diaz and Markgraf 1991). "Abnormally" wet years can often be linked to El Niño and dry years to La Niña oscillations. A severe drought, for instance, gripped New Mexico during a period of multiple La Niña years in the 1660s and 70s (Scurlock 1998: 24-26, 47-48; Barrett 2002: 74-77). Between 1920 and 2000, Socorro experienced 15 El Niño, nine La Niña, and 56 medial years. During El Niño years, precipitation averaged 275.8 mm, during medial years 239.4 mm, and during La Niña years 162.5 mm. Seasonal splits for the months October to May (when the bulk of precipitation comes in from the Pacific) show for El Niño years an average of 156.2 mm; for medial years 102.3 mm, and for La Niña years 49.9 mm. For the months June to September (when precipitation comes in from the Gulf of Mexico or originates locally), differences were far less pronounced: 119.6 mm in El Niño years, 137.1 mm in medial years, and 112.5 mm in La Niña years (Dahm and Moore 1994).

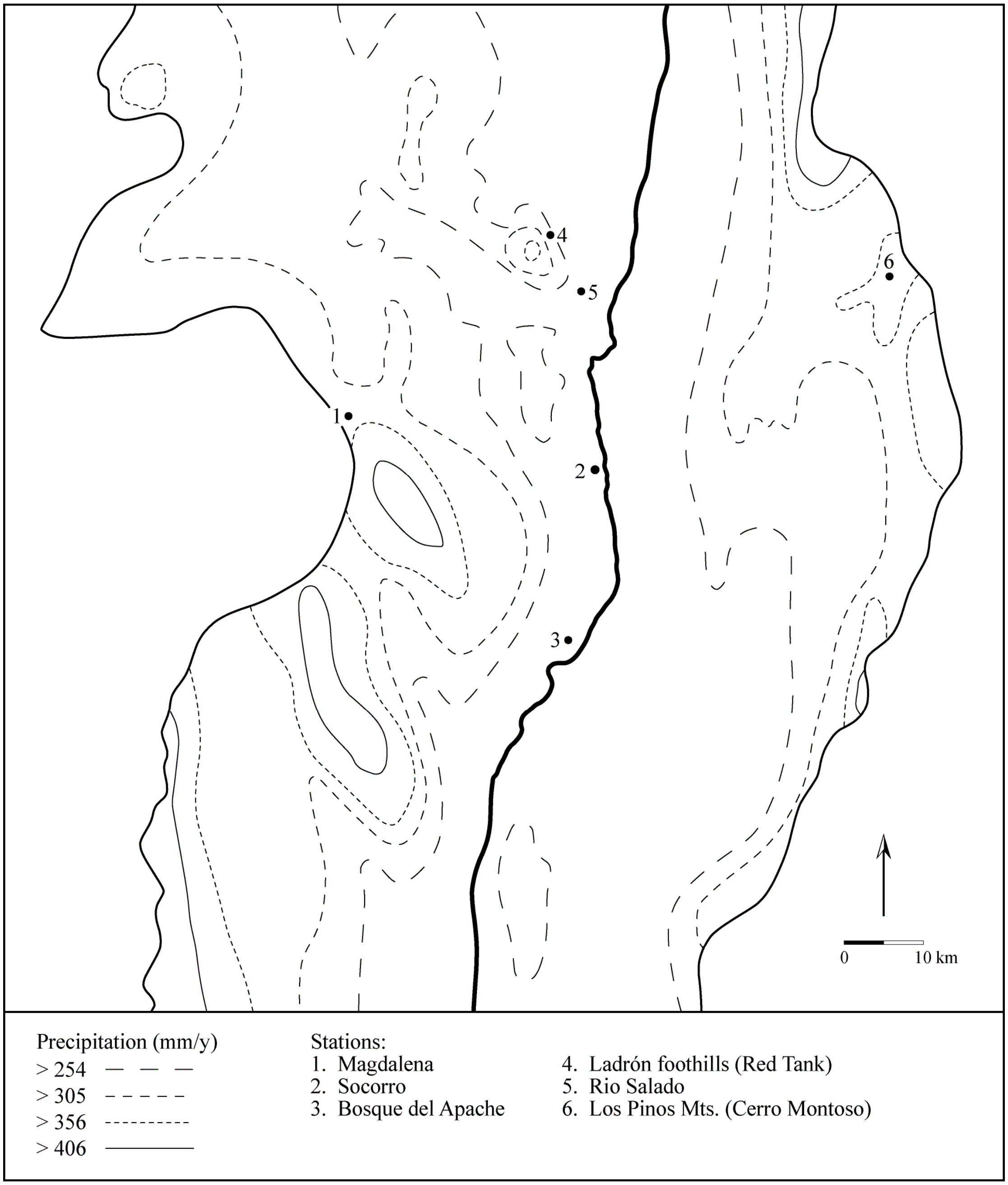

Fig. 3.11. Isopleth map of climatic zones in the Piro area, showing locations of selected weather stations (adapted from Scurlock 1998, Fig. 6, with meteorological data from the Sevilleta Long-Term Ecological Research [LTER] Project).[3]

[3] Sevilleta LTER climate data are available at: http://sev.lternet.edu/research/local/climate/meteorology

Table 3.1a. Annual mean temperatures for selected Piro-area locations.[4]

Year	Magdalena (el. ~2,000 m)		Socorro (el. ~1,400 m)		Bosque del Apache (el. ~1,375 m)	
	Min	Max	Min	Max	Min	Max
1914-2000	37.3	68.1	40.9	74.1	39.0	76.8
1961-1990	37.3	68.5	39.9	73.4	39.0	76.0
1971-2000	38.1	68.6	39.6	74.3	38.6	77.0

Table 3.1b. Recent mean temperatures for additional Piro-area locations.

Year	Ladrón Foothills (Red Tank) (el. 1,766 m)		Lower Rio Salado (el. 1,503 m)		Los Pinos Mts. (Cerro Montoso) (el. 1,971 m)	
	Min	Max	Min	Max	Min	Max
1989-2004	45.4	69.5	45.1	74.1	42.7	67.4

Table 3.2a. Annual precipitation means for selected Piro-area locations.

Year	Magdalena (el. ~2,000 m)	Socorro (el. ~1,400 m)	Bosque del Apache (el. ~1,375 m)
1914-2000	302 mm	237 mm	223 mm
1961-1990	325 mm	243 mm	241 mm
1971-2000	347 mm	265 mm	249 mm

Table 3.2b. Recent precipitation means for additional Piro-area locations.

Year	Ladrón Foothills (Red Tank) (el. 1,766 m)	Lower Rio Salado (el. 1,503 m)	Los Pinos Mts. (Cerro Montoso) (el. 1,971 m)
1989-2004	276 mm	229 mm	368 mm

[4] Tables are based on data from Sevilleta LTER (see n. 3 above) and the Western Regional Climate Center (http://www.wrcc.dri.edu).

Plant and Animal Life

The combination of topographical and climatic factors naturally has a direct bearing on the ecological makeup of the study area. As in arid and semi-arid regions elsewhere, the amount of available moisture is the chief limiting factor of plant and animal life (Cordell 1984: 24). Prehistorically, the Rio Grande's (near-) constant flow and the existence of large bodies of standing water in overflow areas and old river channels created the *bosque* ("forest"), a wetland habitat which then covered most, if not all, of the Rio Grande floodplain (Scurlock 1998: 201-203). Although the *bosque* no longer exists in its original form, it is possible to get some idea of what it looked like at the Sevilleta and Bosque del Apache National Wildlife Refuges. Both refuges maintain extensive *bosque* wetlands. Their preservation requires, among other things, suppression of invader plants such as the ubiquitous salt cedar (*Tamarix* sp.). As salt cedar lowers the water table, its removal greatly benefits the native riparian plant community, especially the cottonwood (*Populus* sp.) which traditionally forms the plant overstory along the river margins (cf. Robinson 1965; Hay 1972; Ellis et al. 1996, Tetra Tech 2004, 3, App. A).

Archaeological evidence provides some clues of the significance of the *bosque* habitat for the Piros. Riparian animal and plant remains found on Piro sites include various kinds of (most now regionally extinct) fish (e.g. longnose gar *[Lepisosteus osseus]*, shovelnose sturgeon *[Scaphirhynchus platorynchus]*, American eel *[Anguilla rostrata]*), reptiles (e.g. spiny softshell turtle *[Trionyx spiniferus]*, western box turtle *[Terrapene ornata]*), birds (e.g. crane [*Grus* sp.], duck [*Anas* sp.], wild turkey *[Meleagris gallopavo]*), mammals (e.g. badger *[Taxidea taxus]*; beaver *[Castor canadensis]*, river otter *[Lutra canadensis]*), wild plants (cottonwood, willow [*Salix* spp.], cattail *[Typha* *latifolia]*, carrizo *[Phragmites australis]*), and cultivated plants (corn *[Zea]*, squash *[Cucurbita]*, bean *[Phaseolus]*, and possibly cotton *[Gossypium hirsutum]*) (Earls 1985; James 1986, 1987; Toll 1986, 1987a, 1987b; Bertram 1987; Clary 1987; Fish 1987; Garcia-Bustamente 2000; O'Laughlin 2001-8). This underscores the fact that in terms of ecological diversity and biomass the *bosque* far outweighs its physical extent – a basic characteristic of this kind of habitat (Gossett 1984: 5). In the western U.S., plant biomass in riparian environments can be four times higher, and the number of nesting bird species as much as 450% and nesting bird density more than 1,000% higher, than in adjacent areas (Clary and Medin 1999).

Outside the two wildlife refuges, the *bosque* in the Piro area survives only in small patches. Located mostly on the east side of the river, these patches tend to be very narrow because the current river channel runs close to the eastern floodplain margins. Between San Acacia and the Bosque del Apache refuge, the much wider western part of the floodplain is almost completely given over to large fields of alfalfa and pasture grasses (Figs. 3.6, 3.7). An extensive ditch system fed by a large conveyance channel that parallels the Rio Grande from San Acacia to a point south of Milligan Gulch supplies the necessary water. During the summer and fall, the river often runs dry as too little water is left in its natural bed to keep up a constant stream flow.

Beyond the floodplain, no permanent sources of surface water exist (Gossett 1984: 3-4; Earls 1985: 49-50). As mentioned, all tributary streams of the Rio Grande, including the two largest, the Rio Puerco and Rio Salado, are ephemeral. Stream flow is channeled runoff and thus subject to fluctuations in local/regional precipitation and solar radiation (cf. Molles et al. 1992; Kahya and Dracup 1993). Springs and seeps can be found scattered across the valley margins and uplands (Earls 1985: 50-52). Precipitation, solar radiation, soil type(s), and bedrock geology all impact volume and permanence of spring discharge, and can produce different discharge patterns from one spring to the next (Summers et al. 1972; Wroblicky et al. 1998; Earman et al. 2006). Compared to surface runoff, subterranean water takes much longer before it re-emerges from springs or recharges the riverine water table. One study of mountain-front water recharge found that precipitation entering rock fissures in the Pinos Mountains at an elevation of 2,700 m takes c. 50 years to reach the lowland water table at 1,300 m (Duffy 2004).

Upland vegetation generally varies with elevation (Manthey 1977). The arid floodplain margins south of Socorro (below c. 1,500 m) once carried grama grasses (*Bouteloua* spp.) and dropseeds (*Sporobulus* spp.), but today are desert scrubland (Fig. 3.12). Plant cover is thin and dominated by creosote *(Larrea tridentata).* Saltbush (*Atriplex* spp.), sagebrush (*Artemisia* spp.), snakeweed *(Gutierrezia sarothrae)*, prickly pear and cholla (*Opuntia* spp.), and mesquite (*Prosopis* spp.) occur in varying densities. Sub-arid plant communities range from plains-mesa grasslands (at c. 1,500-2,000 m) to juniper savanna (c. 2000 m), to pinyon-juniper (c. 1,800-2,300 m) and Ponderosa pine woodlands (c. 2,200-2,700 m). Grasslands are characterized by grama and other grasses, but also include sagebrush, mesquite, yucca (*Yucca* spp.), Mormon tea *(Ephedra torreyana)*, and one-eyed juniper *(Juniperus monosperma).* The latter is common in the juniper savanna ecotone that marks the grassland-woodland transition (Fig. 3.9). Less common are grama grasses, scrub liveoak *(Quercus turbinella)*, and tree cholla *(O. imbricata).* Pinyon pine *(Pinus edulis)* appears as one moves upward into pinyon-juniper woodland. Blue grama grass *(B. gracilis)*, scrub liveoak, Gambel oak *(Q. undulata)*, gray oak *(Q. grisea)*, tree cholla, and banana yucca *(Y. baccata)* are also part of the pinyon-juniper community. Above 2,200 m, Ponderosa pine *(P. ponderosa)* becomes the dominant tree species. As elevation increases, Gambel and gray oak, yucca, and cholla disappear from the Ponderosa pine community. The 2,700-m contour coincides with the 406-mm (16-inch) precipitation isopleth, which is the lower limit of the sub-humid life zone (Fig. 3.11). Vegetation here changes to a mixed coniferous forest composed of white and corkbark fir *(Abies concolor, A. lasiocarpa)*, Engelmann spruce *(Picea engelmannii)*, and, intermittently, Douglas fir *(Pseudotsuga menziesii)*, Rocky Mountain maple *(Acer glabrum)*, boxelder *(A. negundo)*, and quaking aspen *(Populus tremuloides)*. Undergrowth is diverse; grasses alone are present in 32 species. In the Piro area, coniferous woodlands are found only in the Magdalena and San Mateo Mountains (Fig. 3.13) (Dick-Peddie 1993: 51-132; Scurlock 1998: 201-207).

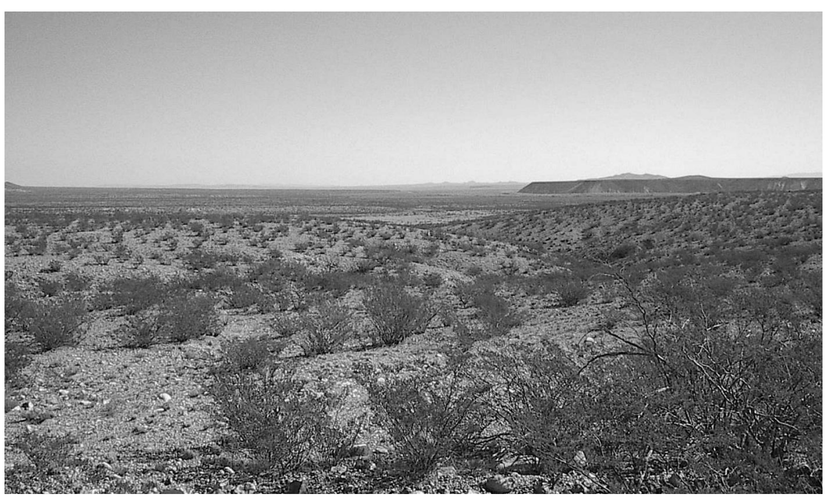

Fig. 3.12. Desert scrubland west of Black Mesa (visible in the distance) (M. Bletzer, 2/2004).

Fig. 3.13. Sub-humid coniferous forest near Mt. Withington (el. 3,080 m), San Mateo Mountains (picture taken at 2,800 m) (M. Bletzer, 7/2005).

In all zones, faunal diversity and abundance is massively reduced when compared to prehistoric and early historic times. Reconstructions from archaeological data and colonial records suggest a minimum of 140 native mammal, 400 bird, several dozen reptile and as many as 31 fish species for the Middle Rio Grande Basin. Large mammals in the Piro area included bison *(Bison bison)*, elk *(Cervus elaphus)*, mule and white-tailed deer *(Odocoileus hemionus, O. virginianus)*, bighorn sheep *(Ovis canadensis)*, pronghorn *(Antilocapra americana)*, gray and Mexican wolf *(Canis lupus, C. l. baileyi)*, mountain lion *(Puma concolor)*, and black and grizzly bear *(Ursus americanus, U. arctos horribilis)* (Earls 1985: 71-73; Scurlock 1998: 207-208). There is evidence that bison may have ranged into southeastern Arizona, but after the 18th century bison were rarely seen west of the Pecos River (cf. Mead and Johnson 2004; Rickel 2005).

The early disappearance of bison from the area was followed in the 19th and 20th centuries by the extinction or near-extinction of most other large mammal species. As elsewhere, this was caused by increased human intrusion into previously unexploited habitats. The rise of stock farming in particular decimated the local carnivore population. Seen as threats to cattle and sheep herds, wolves, bears, and the larger felines were hunted whenever possible, a fate shared by some of the native ungulates (especially pronghorn). Only recent preservation efforts have revived some species (James 1987: 106; Scurlock 1998: 209-212, 294-299).[5]

Smaller mammals, reptiles, and birds have fared better than the larger ungulates and carnivores under the pressure of human expansion. Rodents are plentiful throughout the lowland margins and much of the uplands. Among the most common species are woodrat (*Neotoma* sp.), kangaroo rat (*Dipodomys* sp.) pocket gopher (*Thomomys* sp.), prairie dog (*Cynomys* sp.), cotttontail (*Sylvilagus* sp.), and jackrabbit (*Lepus* sp.). Also frequent are coyote *(Canis latrans)*, grey fox *(Urocyon cinereoargenteus)*, badger, and striped skunk *(Mephitis mephitis).* Snakes and lizards form the bulk of the reptile population. Bird species, though less varied than in the lowlands, range from Gambel's quail *(Callipepla gambelii)* to Swainson's hawk *(Buteo swainsoni)* and golden eagle *(Aquila chrysaetos canadensis).* The habitats of all upland species are associated mainly with vegetation types. Habitat boundaries are fluid and can include different life zones. When plant inventories change, boundaries of faunal habitats tend to change also (Cully 1980: 61-84; Earls 1985: 73-79).

[5] The effort that has generated the most publicity is the reintroduction into the Gila Wilderness of the Mexican wolf in the late 1990s. The range of the program includes the San Mateo Mountains and adjacent areas (cf. USFWS 1996, Bergman et al. 2004).

Changing Landscapes and the Archaeological Record

Starting with the 19th-century reoccupation, there is an increasingly detailed record of natural and man-made changes in the Piro area. Identifying the agents is not always easy, particularly for the earlier part of this period, but for the years after c. 1860-70 the picture is relatively coherent. The development of mining and the arrival (in the early 1880s) of the AT&SF railroad triggered a substantial population increase in the areas around Socorro, Magdalena, and San Antonio. As population tended to cluster in the fertile Rio Grande lowlands, the spatial distribution of 19th-century settlement was somewhat similar to that of 16th- and 17th-century Piro settlement. At the same time, mines near Magdalena and San Antonio lured many people into largely unsettled (at least by Euro-Americans) upland areas. With most known Ancestral/Colonial Piro sites located near the floodplain margins, changes to the lowland environment are obviously important factors in archaeological preservation and visibility (Marshall and Walt 1984: 1; cf. Marshall 2005). Fig. 3.14 shows 14 lowland and three upland sites with different degrees of damage from flooding, construction, looting, etc. The 17 sites represent a sub-sample of at least 28 damaged sites in the 40-site sample (including Plaza Montoya) considered in this study. In outlining what and how environmental changes can impact individual sites, I focus mainly on the Rio Grande lowlands and such factors as stream flow and flooding, changes in the floodplain area, and modern development of local settlement. But as mining and especially ranching have left their marks on the upland landscape, it is also necessary to consider the potential for damage to archaeological sites outside the lowland core area.

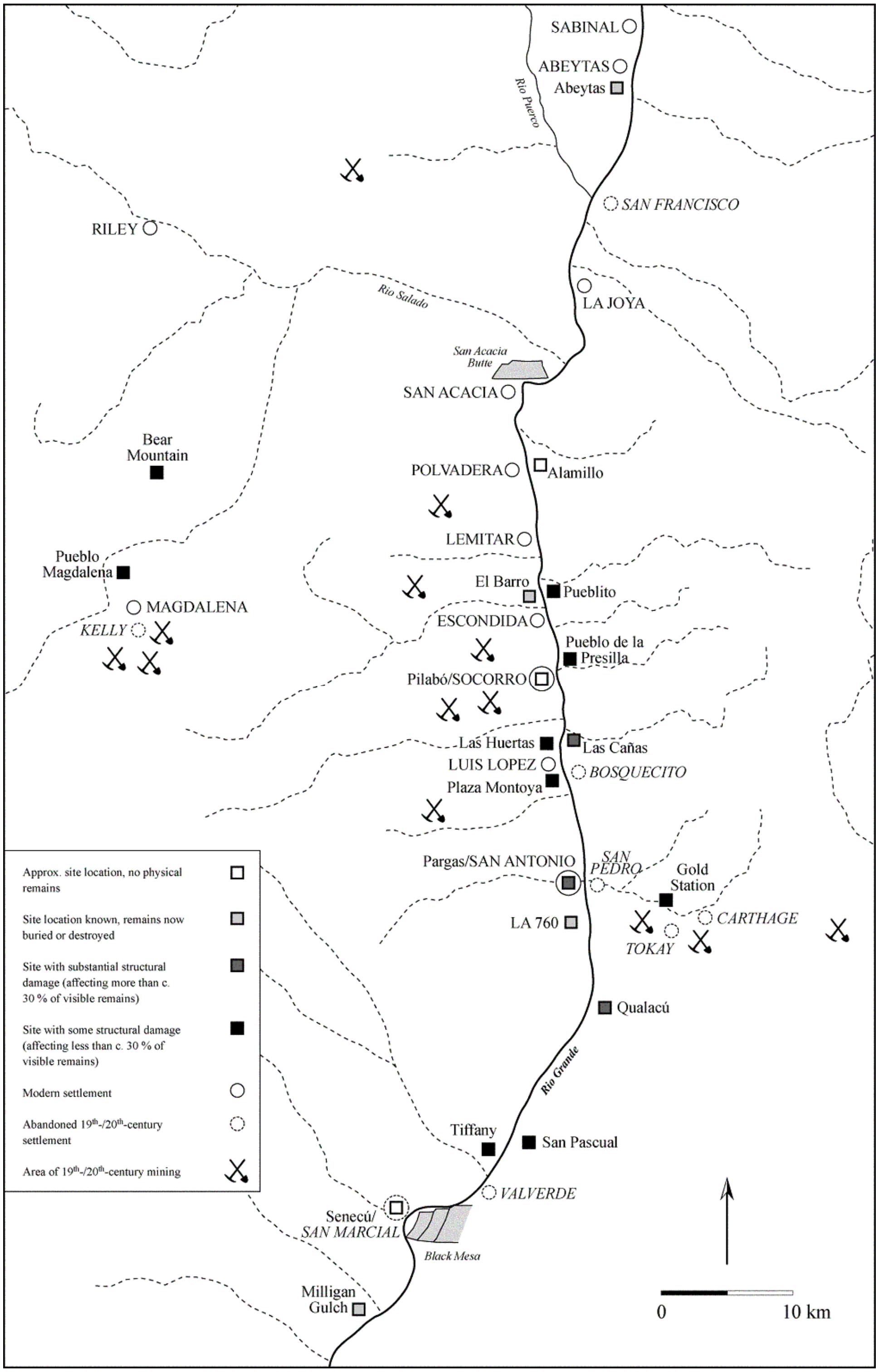

Fig. 3.14. Distribution of Ancestral/Colonial Piro sites with structural damage in relation to 19th-20th-century and modern settlement (based on Levine and Tainter 1982; Tainter and Levine 1987; Marshall and Walt 1984; Oakes 1986).

THE LOWLAND ENVIRONMENT

Pre- to Post-Regulation Changes in the Floodplain Area

The Rio Grande at Socorro today is often only a dry streambed during the summer and autumn months. Partly resulting from rising water consumption in upriver communities, the decline in stream flow makes it hard to imagine that until the 1940s the Rio Grande could be a very violent river. Records from the 18th through early 20th centuries refer to disastrous floods as far south as El Paso (Table 3.3). On more than one occasion the river washed away or buried under sediments entire villages. Notorious were the frequent channel shifts that could take the river across the floodplain and virtually overnight change a community's location from one bank to the other (Yeo 1910a, 1910b; Carter 1953; Marshall and Walt 1984: 261-286; Scurlock 1998: 30-39).

Various descriptions and maps pre-dating the beginning of modern stream-flow regulation in the 1910s and 20s stress the complexity of old and new river channels and their instability during periods of high-volume stream flow. In 1847, one traveler noted that north of Socorro the Rio Grande was "a rapid stream, about 120 or 200 feet wide, dividing off, so as to make many islands" (Ames 1943: 20). At Socorro a few years later, the river's width was described as varying between 200 and 600 yards, depending on the volume of flow, with a shift in the river channel occurring every year (Scurlock 1998: 186-188). Earlier documents mention *"vueltas"* or "turns" on the east-bank *camino real* near Acomilla, Socorro, Luis López, and Senecú. *Vueltas* were stretches where travel was difficult, particularly for carts, due to the rough nature of the riverside terrain (as in the *Quebradas* area) and the meandering river channel(s), which together dictated the road's course (Marshall and Walt 1984: 238-240; Marshall 2005).

Table 3.3. Recorded floods in the Piro area.

Year	Location	Volume/Impact
1600s-1700s	Scattered references to high water and floods in various locations in the Rio Grande Valley	
1828	Entire area	Channel shifts, widespread property damage
1829	Socorro	San Miguel church destroyed
1830	Entire area	N/a
1852 May-June	Socorro to Black Mesa	Flooding caused by spring thaw
1857 June/July	Entire area	South of Black Mesa river reportedly ½ mile wide, impossible to cross
1862 August	Entire area	Buildings and fields damaged
1865	Socorro area	Various communities north and south of Socorro destroyed or heavily damaged
1866	Black Mesa area	Village of La Mesa de San Marcial destroyed, various channel shifts
1872 May-June	Entire area	Widespread inundation of floodplain
1874 May-June	Entire area	Damage to buildings and fields, river could not be crossed
1880	Socorro to San Marcial	Flooding of Rio Puerco affects southern part of the area
1884 May-June/July	Entire area	Every village between Albuquerque and El Paso reportedly affected, heavy damage to buildings and fields north of Socorro, river shifts channel below San Acacia
1885	Entire area	Nearly as severe as 1884 flooding
1886 September	Entire area	Rio Puerco and Salado bridges washed out, railroad cut, villages of Bowling Green and San Marcial destroyed, widespread damage to buildings and fields
1888 April/May	Socorro	Parts of Socorro under water
c. 1889	Entire area	Damage to fields
1890	Abeytas to Socorro	Buildings and fields destroyed
1891 May	Entire area	Buildings and fields destroyed, bridges and road washed out
1895 July	La Joya to Socorro	Buildings and fields damaged, parts of Socorro under four feet of water
1896	San Marcial	USGS gauging station washed away
1897 May	Entire area	Peak flow at San Marcial 21,750 cfs

Table 3.3. (continued)

Year	Location	Volume/Impact
1897 October	San Marcial	Peak flow at San Marcial 15,500 cfs
1903 June	Abeytas to Socorro	Buildings and fields damaged
1904 Sept./Oct.	Entire area	Peak flow at San Marcial 33,000 cfs, fields and houses damaged throughout the area
1905 May	Entire area	Peak flow at San Marcial 29,000 cfs
1906 May-June	Entire area	Peak flow at San Marcial more than 10,000 cfs
1911 May-June	Entire area	Peak flow at San Marcial 15,270 cfs
1911 October	Entire area	Peak flow at San Marcial 11,780 cfs, river shifts channel at San Marcial, substantial property damage
1912 May-June	Entire area	Peak flow at San Marcial 15,145 cfs
1916 May	Entire area	Peak flow at San Marcial 25,145 cfs
1920 May-June	Entire area	Peak flow at San Marcial 22,500 cfs, parts of San Marcial damaged
1921 June	Entire area	Peak flow at San Marcial 19,360 cfs
1924 May	Entire area	Peak flow at San Marcial 12,400 cfs
1928 August	Socorro to San Marcial	Flooding of Puerco and Salado affects southern part of the area, several villages under water
1929 August	Entire area	Peak flow at San Marcial 47,000 cfs, all valley settlements damaged; San Acacia, San Antonio, Valverde, San Marcial destroyed, widespread destruction of buildings, crops, bridges, roads, and railroad
1937 Aug./Sept.	Entire area	Levees broken, fields and crops damaged
1941 Jan.-May	Abeytas to Socorro	Widespread damage to buildings and fields
1942 April-June	Entire area	Peak flow at Bernardo (near Abeytas) 21,000 cfs

(Based on Carter 1953; Marshall and Walt 1984: 262-287; Scurlock 1998:30-39).

Studies of channel geometry on the upper Rio Grande and along ephemeral streams in southern Arizona suggest that strong stream flow promotes lateral movement of channels and formation of meanders (Jones and Harper 1998; Pelletier and DeLong 2004). This confirms historical references to flood-related channel shifts. Between 1874, when floods began to be regularly recorded, and 1929 at least 26 major floods hit the area (Table 3.3). The figure may or may not be representative of earlier periods, but at least for this 55-year period it suggests a very unstable floodplain environment. Despite the danger, settlements that had spread onto the floodplain were often reoccupied after floods and channel shifts (Marshall and Walt 1984: 267-281). The example of San Marcial best illustrates the predicament of such settlements. Located opposite Black Mesa, San Marcial occupies a spot where the mesas on the east and high gravel benches on the west hem in river and floodplain (Figs. 3.14, 3.15). Established in the late 1860s, San Marcial became a railroad town in 1881 (cf. Stanley 1960). Though flooding damaged the town in 1886 and 1896, the situation got worse following the 1916 completion of Elephant Butte Dam near Hot Springs (now Truth or Consequences). Aggradation was already a problem, but with the filling of the reservoir backwater effects accelerated the process. By 1928, the streambed had risen four meters above its 1880 level or almost one meter above town and railroad facilities. Concerns about weak levees proved justified when a massive flood demolished the town in August 1929. Stream flow reached 47,000 cfs, the highest ever recorded at the local gauging station (Table 3.3). This flood marked the end of San Marcial. A few people stayed around until the 1940s, but subsequent floods and ongoing aggradation have since turned the place into the “Pompeii of New Mexico” (Fig. 3.15) (Marshall and Walt 1984: 282-284, cf. Stanley 1960).

Fig. 3.15. San Marcial today. Seen from lower right to center are the old Rio Grande streambed, railroad right-of-way, and the Rio Grande conveyance channel. The town was located above the railroad (USGS photograph, 1996).

Since the 1950s, the construction of major dams on the upper Rio Grande has put an end to flooding on the scale of the 1929 disaster (Scurlock 1998: 38). Still, locally a threat remains, as arroyos can quickly turn into raging torrents following a summer thunderstorm. The scale of some of the recorded inundations bodes ill for the structural integrity of any Ancestral/Colonial Piro sites located in the floodplain, though the extent to which the Piros may have occupied this area is unclear. Early Spanish accounts convey the image of densely populated floodplain margins without giving clear references to actual locations of pueblos. One account mentions extensive cornfields, "and also fields of beans, calabashes, and cotton" (Hammond and Rey 1966: 82).[6] At least some fields were probably tended from field houses. There is at present no archaeological evidence of Piro pueblos in the floodplain, but with two centuries of increasingly intensive and extensive floodplain farming this is not surprising. In the early 1930s, the archaeologist H. P. Mera recorded a large ceramic scatter (LA 760) in a field in the floodplain below San Antonio (Mera 1940: 8). No structural remains were visible, but sherd descriptions suggest a pre-contact and contact- to early colonial-period occupation (see Chapter 4). In the early 1980s, Marshall and Walt (1984: 234) noted only few sherds at LA 760. During a brief visit of the site location in 2000, I did not see any artifacts on the surface.

Strong candidates for a floodplain location are the historic pueblos of Senecú and Alamillo. Contemporary documents leave no doubt that Senecú was a west-bank pueblo close to Black Mesa. The exact location is unknown, however (Fig. 3.2). A secondary post-abandonment source places Senecú *"en una montaña de escollos pedregosa"* ("atop a gravelly bluff") (Vetancurt 1960-61, 3: 266), but there is no trace of a pueblo on the gravel benches opposite Black Mesa, let alone one that like Senecú had a mission attached to it (Marshall and Walt 1984: 253). In 1882, Adolph Bandelier inspected some wall foundations in an adobe borrow pit just north of San Marcial. Adjacent to the walls, he saw "embankments which show traces of a rectangular building, and the soil now covering it appears to have been formed by decay of adobe walls" (Lange and Riley 1966: 325). Pottery on the site was apparently of the red-slipped kind with runny (Bandelier calls it "glossy") glaze decoration most common on Colonial Piro sites (cf.

[6] Hernán Gallegos' Relation of the Chamuscado-Rodríguez Expedition, 1581.

Marshall 1987: 74-75). As no other pueblo is known to have been located so close to Black Mesa, Bandelier's walls and adobe mounds may well have been the remains of Senecú. The site is not mentioned in the first archaeological descriptions of the Black Mesa area, compiled in the 1910s and 20s (Yeo 1910a, 1910b, 1929). That part of it served as a borrow pit in Bandelier's time would bode ill for its survival, especially when one considers the continued growth of San Marcial in the 1890s and early 1900s. If any remains were still there in 1929, they shared San Marcial's fate (Marshall and Walt 1984: 252-253; Marshall 2005: 20-21). Even less is known about Alamillo, a pueblo and mission on the east side of the river below the San Acacia narrows (Fig. 3.14). Unlike Senecú, Alamillo figures little in colonial records. No site in the area resembles a mission pueblo, and there are no later historical pointers, however vague. Like several 19th-century villages in the area, Alamillo was probably destroyed by a combination of flooding, channel shifts, and riverbank erosion (Marshall and Walt 1984: 254-255; Marshall 2005: 23, 32).

Evidence of floodplain occupation comes from Valencia Pueblo (LA 953), an Ancestral Tiwa site located on the east bank of the Rio Grande some 60 km above Sevilleta (Fig. 3.1). Topography and stratigraphy/texture of excavated sediments indicate that the pueblo was built in an environment subject to periodic flooding (Wiseman 1988: 3-4; Vierra 1997a: 9, 1997b: 64, 98; Brown 1997c: 101-103). In the Piro area, flood damage is evident at Las Cañas Pueblo (LA 755) and Qualacú (LA 757), which both sit on low benches next to the floodplain. Riverbank erosion and, in the case of Las Cañas, arroyo-cutting have removed substantial portions of each pueblo. In particular at Las Cañas erosion continues to degrade remaining room-block mounds (Chapter 5).

From an archaeological standpoint, aggradation perhaps even more than erosion can affect archaeological sites near the floodplain margins. Scale of aggradation is driven largely by the amount of silt and clay coming from the Rio Puerco. Sediment loads near the Puerco's junction with the Rio Grande have in the past reached 600,000 ppm, one of the highest ratios worldwide (Nordin 1962; Gorbach et al. 1996). Much of this sediment ends up in the floodplain between the Black Mesa area and the upper reaches of Elephant Butte Reservoir (Tetra Tech 2000, 2004; Aby et al. 2004). Milligan Gulch Pueblo (LA 597), for instance, is no longer visible because alluvial deposits have engulfed the pueblo in a process partly documented by archaeologists (Fig. 3.16) (Wilson and Beckett 1971; Marshall and Walt 1984: 229). During a search for the pueblo in 2004, I did not locate any artifacts or structures in the approximate site area (cf. Marshall 2005: 21).

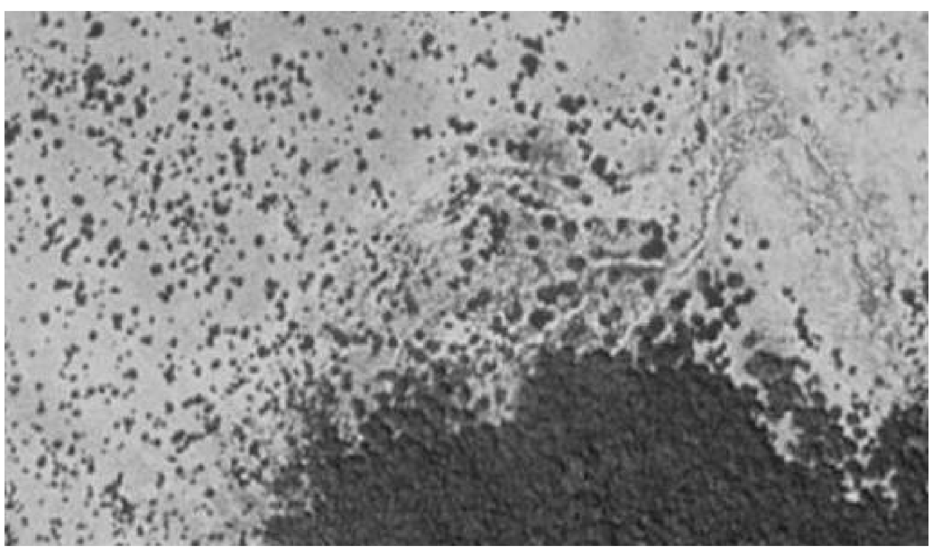

Fig. 3.16. The Milligan Gulch site area (above center) (USGS photograph, 1996).

The loss of San Marcial also demonstrates the scale of aggradation along this stretch of the river. Between 1894 and 1938, silting raised floodplain and river channel some five meters (16 ft) at San Marcial. Despite a weakening of annual stream flow due to regulation measures, another 2.5 m (8 ft) of sediment were added between 1938 and 1990 (Tetra Tech 2004, 1: 12, 4: 15). A short distance north of San Marcial, most of the 1862 Civil War battlefield of Valverde (LA 138496) is estimated to be buried under as much as 10 m (30 ft) of sediment (Robert H. Weber, personal communication, June 2001). Aggradation is likewise evident near the pueblos of San Pascual (LA 487) and Qualacú. The two pueblos were built on benches above the floodplain. In the early 1980s, San Pascual's westernmost room blocks still stood about three meters higher than the adjacent floodplain (Marshall and Walt 1984: 182). During a visit in the summer of 2000, I noted that in some places elevation was reduced to just one meter. More recently, Marshall (2005: 20-21) has observed that in periods of high stream volume overflow from the main river channel reaches the edges of both pueblos.

Modern Versus Ancient Settlement

The central and northern portions of the former Piro province today essentially represent the detached southern end of a zone of urban and suburban settlement dominated by the Bernalillo-Albuquerque-Belen metropolitan area. Population density of the Socorro area is roughly equal to that of Belen and the more rural communities south of Belen, but for more than 100 km to the south and east no comparable zone of settlement is found. To the west, the next community with at least 1,000 residents is 250 km away (Springerville, AZ, population 1,972 in 2000). The town of Socorro is the regional center of population and seat of Socorro County. Census data from 2000 give a population figure of 8,877 for Socorro, which amounts to roughly half the county's overall population of 18,078. Most of the residents in the other half live in villages that line the Rio Grande floodplain from La Joya in the north to San Antonio in the south (Figs. 3.1, 3.14). The only larger upland communities are Magdalena (913 residents in 2000), and, 40 km to the northwest, the Alamo Navajo Reservation (1,183 residents).[7]

To some extent, Socorro's prominent role in the modern settlement landscape recalls 17th-century conditions. In 1626, the first permanent Piro mission was established at the pueblo of Pilabó, which the Spaniards renamed Socorro. According to fray Alonso de Benavides, founder of the mission and in charge of the overall missionization effort, Socorro was then *"principal, y cabeça desta Prouincia de los Piros"* (Ayer 1916: 97). Subsequently, Pilabó/Socorro continued to be the main mission establishment and administrative center of the area. Its mission was probably the only one in the Piro area staffed without interruption until 1680 (see Chapter 6).

Abandoned after the Pueblo Revolt, Socorro was not re-established until the early 1800s. First Hispanic and later Anglo-American settlement concentrated on the Rio Grande lowlands. Until the 1880s, upland settlement was sporadic. Larger communities eventually developed in the western uplands in the wake of mineral strikes in the Magdalena Mountains and east of the Rio Grande around San Pedro and Carthage (Fig. 3.14) (Nieman 1972; Sanders 1976; Betancourt 1980; Ashcroft 1988; Gerow 1994). According to the Federal Census of 1910, 14,761 people were then residing in Socorro County. Later figures show a long-term, fluctuating, decrease, which was largely the

[7] Census data are available at: http://www.census.gov/main/www/cen2000.html

result of the decline of the mining industry. It was not until the 1970s that the population of Socorro County entered a phase of sustained growth. In 1990, there were 14,764 residents, just three more than in 1910 (Forstall 1995).[8] A number of ghost towns and villages bear testimony to the boom and bust cycle of the late 1800s and early 1900s. Some of the more prominent ghost towns are included in Fig. 3.14, but others have disappeared leaving few, if any, traces on the surface.

With both Ancestral/Colonial Piro and modern settlement clustering in the Rio Grande lowlands, damage to archaeological sites is all but assured. Except for buried Milligan Gulch Pueblo (LA 597), the lowland sites shown in Fig. 3.14 have been affected by overbuilding, road or channel construction, agriculture, quarrying, or looting. At Las Cañas Pueblo (LA 755) and Qualacú (LA 757), looting and construction have added to damage from flooding and arroyo-cutting. At Las Huertas (LA 282) and San Pascual (LA 487), bulldozers have left deep scars in room blocks. A gravel pit has destroyed El Barro Pueblo (LA 283). Abeytas Pueblo (LA 780) has been badly damage by railroad, canal, and highway construction, as well as farming. At Plaza Montoya, there is damage from road construction and horticulture (see Chapter 7). As for Pargas Pueblo (LA 31746) and Pilabó (LA 791), they have vanished under the streets and houses of modern San Antonio and Socorro, respectively (Marshall and Walt 1984: 135-249).

Considering its historical prominence, the obliteration of Pilabó is the most acute example of how human activities can directly impact archaeological remains in the Piro area. The site of the pueblo has never been conclusively identified (cf. Marshall and

[8] At the time of the 1910 census, Socorro County extended to the Arizona state line, but in 1921 the area west of Magdalena became Catron County. Although Catron is the largest New Mexican county, in 1990 it had only 2,563 residents, the third-lowest figure among the state's 33 counties (Forstall 1995).

Walt 1984: 248-249). Bandelier in 1882 noted that there "appears to have been a pueblo on the very site of Socorro itself". A local informant labeled the pueblo "very large", but Bandelier was uncertain of the informant's reliability (Lange and Riley 1966: 324). Learning later that "metates and pottery are occasionally exhumed", he became more certain that the locations of town and pueblo overlapped, but stressed that "no traces" of the latter remained, "the spot having been built over" (Bandelier 1890-92, 2: 241). In the 1930s, a search by H. P. Mera was only marginally more successful. Exploring "vacant lots, ditches, and other likely spots" (Mera 1940: 8), Mera found some glaze-decorated sherds of contact- and colonial-period affiliation. Though Mera says little about where he searched for the pueblo, an official LA number (791) was assigned to Pilabó following his investigation.

Most likely, Pilabó was located not far from where Socorro's 19th-century church of San Miguel stands (Figs. 3.17, 3.18). In the late 1930s, the art historian George Kubler mentioned the "possibility" that the church was "substantially the same as that noted by Benavides in 1630 at the pueblo of Pilabo" (Kubler 1940: 98). In 1973, restoration work in the church revealed old walls, burials, and pre-contact and colonial-period ceramics (Boudreau 1974; Marshall and Walt 1984: 249). This supports both Kubler's suggestion and local traditions of a structural link between the colonial and current churches, but it does not solve the question of the pueblo's location. The Franciscans in New Mexico generally placed their missions very close to pueblos (Kubler 1940; Ivey 1988), a practice presumably also followed at Pilabó/Socorro. After 200 years of surface modifications around San Miguel, however, the only chance to find the pueblo may be through remote-sensing of areas that have not yet been built over.

Fig. 3.17. The area around Socorro's San Miguel church (above and right of center) (USGS photograph, 1996).

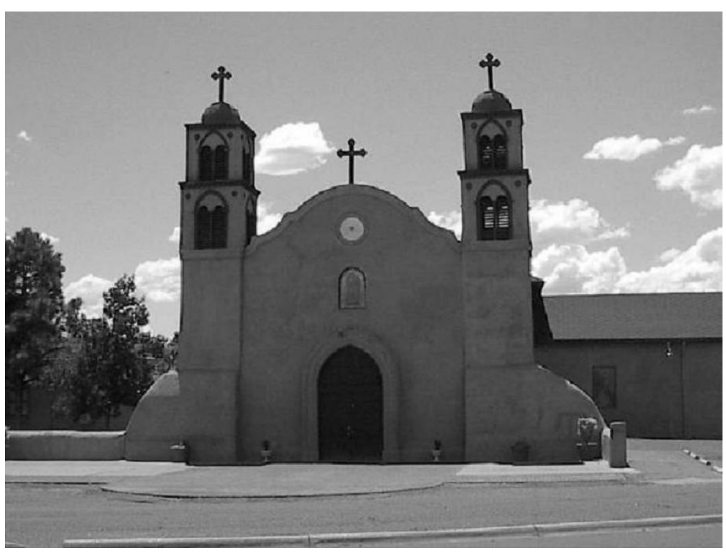

Fig. 3.18. Socorro, San Miguel church (M. Bletzer, 6/2003).

Pilabó in many ways appears to be a case of lost opportunities. Its urban location would have required a commitment to monitoring construction activities in downtown Socorro (cf. Murphy 1994; Galinié 2000; González Acuña 2004). Considering the local network of streets and underground utility lines, such an effort perhaps could have helped narrow down the approximate site area. Since the late 1960s, federal and state cultural preservation laws have improved recognition of archaeological remains,[9] but at that point most of the infrastructure of downtown Socorro was already in place (cf. Nieman 1972; Ashcroft 1988). The situation is reminiscent of that in the greater Albuquerque area, which was home to at least a dozen Tiwa pueblos in the 16th and 17th centuries. Some of these pueblos were studied between the 1930s and 70s, but others were destroyed with little or no archaeological recognition (Eckert and Cordell 2004; cf. Mera 1940; Marshall 1985; Schutt and Chapman 1992; Scurlock et al. 1995; Brown 1997; Brown and Vierra 1997).

In the Socorro area, Pilabó is not the only piece missing from the archaeological puzzle. During his excursions around Socorro, Adolph Bandelier visited a site at the "hot springs of Socorro". Though "almost obliterated", Bandelier produced a sketch map of what appears to have been a pueblo with three detached adobe room blocks (Fig. 3.19) (Bandelier 1890-92, 2: 243; Lange and Riley 1966: 319-320). I have found no references to such a site in published cultural resource overviews (e.g. Berman 1979; Cordell 1979; Stuart and Gauthier 1981; Levine and Tainter 1982) or in data files at the Museum of New Mexico. Nor have I come across local records that might add something to

[9] E.g., National Historic Preservation Act (NHPA) of 1966, New Mexico Cultural Properties Act of 1969, New Mexico Prehistoric and Historic Sites Preservation Act of 1989, and New Mexico Cultural Properties Protection Act of 1993 (cf. http://nmhistoricpreservation.org/OUTREACH/outreach_review.html).

Bandelier's brief description. In the late 1800s, the area around historic Socorro Hot Springs (or Ojo Caliente) at the base of Socorro Peak was part of the Socorro mining district. Together with site's advanced state of deterioration noted by Bandelier, this no doubt accounts for its disappearance from the archaeological record.

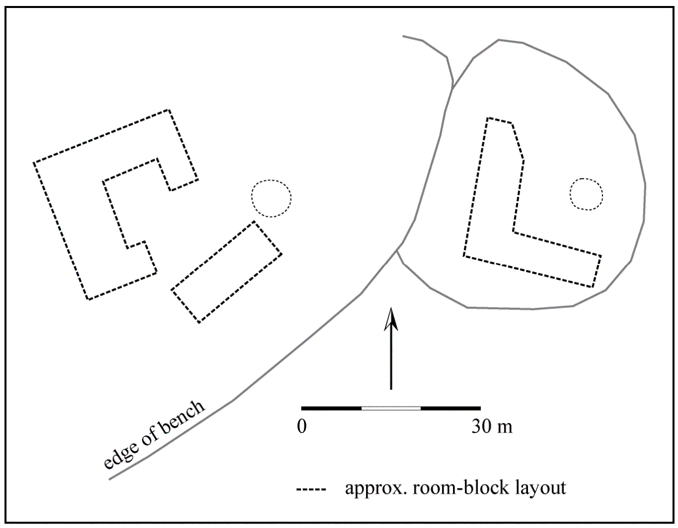

Fig. 3.19. Sketch map of Bandelier's Socorro Hot Springs site (adapted from Lange and Riley 1966: 319).

Structural attrition is common to all lowland Piro sites, regardless of size or setting. A key factor is the fragility of the original architecture, which was mostly adobe. Unlike stone structures, abandoned adobe structures quickly melt away, a process that often leaves little in the way of readily visible debris. A cross-cultural review of studies of mud-based architecture (e.g. McIntosh 1974, 1977; Garrison and Ruffner 1983; Rojas Bravo 1984; Agorsah 1985; Chazelles-Gazzal 1997; Ogundele 1998; Bedaux et al. 2003) shows that rates of deterioration can vary wildly even within similar types of structures. Factors influencing decay range from size of structures and building methods (brick vs. coursed, width of walls, etc.) to physical and chemical properties of soils and sediments (Schiffer 1996: 225-228).

A case in point is the site of Sevilleta (LA 774), the only surviving Piro mission pueblo. In Chapter 1, I briefly compared the remains of Sevilleta to those of the Tompiro pueblo of Abó (Fig. 1.3). Although Sevilleta is one of only a few nearly undamaged sites in the Piro area, not much is left above ground save for some low mounds of rock and adobe rubble (Fig. 3.20). At Las Huertas Pueblo (LA 282), adobe walls and floors in an archaeological profile cleared in 1981 are eroding away since the awning built to protect the profile has been destroyed (Fig. 3.21). Across the site, a substantial amount of rocks on the surface suggests part masonry construction, but still structures are much reduced. So, too, are the adobe room-block mounds at San Pascual, Las Cañas, and Qualacú (see Chapter 5). Compounding the situation at Qualacú is a massive cut through the eastern third of the pueblo. The cut was dug in the 1950s as part of a conveyance channel that was eventually relocated to the west side of the Rio Grande. About 90 m long, 30 m wide, and five meters deep (Fig. 3.22) (Marshall and Walt 1984: 181; Siegel 1987: 7), it is the most invasive single disturbance at a Piro site. Nor has lack of definition/visibility protected sites from destruction. At Plaza Montoya, for instance, it may have been failure to notice the pueblo's northern edge that caused a dirt road to be graded right through the north room block (Chapters 7 and 8).

Fig. 3.20. Sevilleta Pueblo, looking north across the center of the site (M. Bletzer, 7/2000).

Fig. 3.21. Bulldozer cut, Las Huertas Pueblo. Wooden frame over 1981 excavation profile (M. Bletzer, 8/2002).

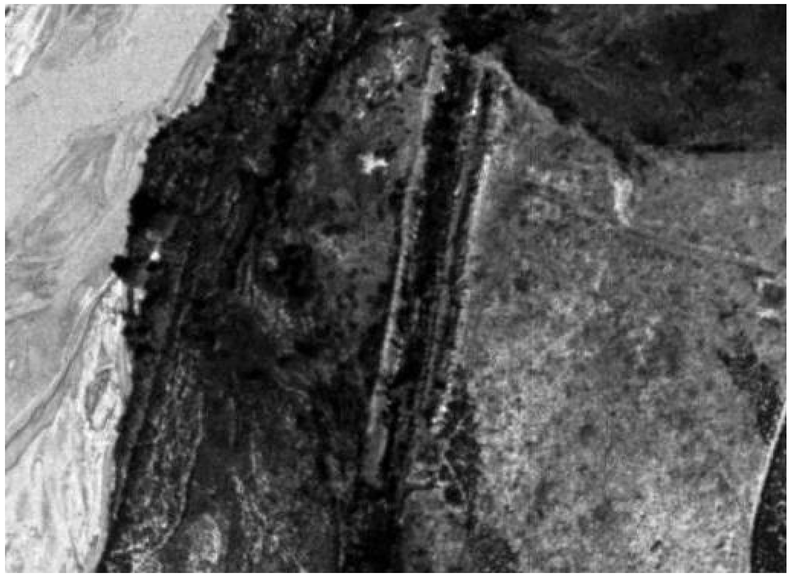

Fig. 3.22. The Qualacú site area (top center). The Rio Grande streambed is visible to the left, while the channel cut runs from top to bottom center (USGS photograph, 1996).

THE UPLAND ENVIRONMENT

The Impact of Ranching and Mining

Unlike in the Rio Grande lowlands, archaeological sites in the uplands have been impacted primarily by human activities. The two factors covering the most upland space are ranching and mining. Both have 17^{th}-century origins in the Piro area, yet scale is not easy to estimate, particularly for ranching. Livestock were part of the traveling inventory of most of the 16^{th}-century exploring parties, and Oñate's colonists brought thousands of cattle, sheep, horses, etc. to New Mexico. In 1601, more than 3,000 head of cattle and sheep were said to be in the colony. Although no totals exist for later years, some figures indicate that missions and the wealthiest among the settlers owned herds of more than a thousand head each (Scholes 1942: 25-28; Baxter 1987: 1-13). Complaints about ranch animals feeding on native crops, a habit officially banned by colonial law, seem to have been frequent in the Piro province and other areas of Puebloan settlement (see Chapter 6). If herds (some were also kept by individual pueblos, cf. *AGN*, *Tierras*, *tomo* 3268)[10] were sent to upland pastures in the Piro area, such movements are not recorded in the surviving records. The threat of Apache raids, however, must have limited the reach of upland transhumance, especially during the last two decades before the Pueblo Revolt.

Following New Mexico's re-submission to colonial rule in the mid-1690s, more than a century passed before Hispanic settlers returned to the Piro area. By the mid-1800s, the zone of settlement extended from Sabinal and Abeytas to below Black Mesa (Fig. 3.14) (Marshall and Walt 1984: 259-306). Like their 17th-century predecessors, the settlers engaged in farming and ranching. Cattle and sheep were sent to pasture in upland areas, even though raids by Apaches and Navajos prompted many ranchers to move their largest herds to the plains of eastern New Mexico. With the subjugation in the 1880s of the last Apache "hostiles", the western uplands attracted many ranching outfits (Sanders 1976; Baxter 1987; Mutchler 1992, 2002; Gerow 2003). By the turn of the 20th century, the mining town of Magdalena, since 1883 connected by rail to the outside world, had become a major shipping point for livestock. A stock driveway linked the railhead with ranches as far away as eastern Arizona. In 1919 alone, some 150,000 sheep and more than 21,000 head of cattle were driven to Magdalena (Betancourt 1980: 41-44; Mutchler 1992, 2002).

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[10] Antonio Gonzalez, *"demanda en nombre y con bos de los yndios de senecu"* (presented against Governor Bernardo López de Mendizábal), Santa Fe, Oct. 26, 1661.

Ranching continues today on a much-reduced scale, but decades of overstocking have left indelible marks on upland landscapes (Earls 1985: 69-71). Grazing reduces or destroys original vegetation cover, a pattern amply documented in studies of arid-region stock farming. In many grassland areas, established species are replaced by more xerophytic plants or not replaced at all (cf. Costin 1958; Lusigi 1981; Thébaud 1988; Melville 1992, 1994). Ensuing loss of water-retaining capacities, plus soil compaction from trampling, generate higher volumes of runoff, which in turn increases soil erosion and gullying (Scurlock 1998: 270-271). Lengthy dry periods can intensify the process to such an extent that there is debate as to whether the root causes of recent arroyo-cutting are primarily climatic or cultural (Betancourt 1980: 26-29; cf. Bryan 1928; Bailey 1935).

Changes in vegetation, soil stability, and erosion rates have long been studied in the Puerco and Salado drainages (Betancourt 1980; Scurlock 1998: 195). On the Puerco, archaeological sites suggest a relatively dense occupation between the 13th and 15th centuries, but subsequently the drainage seems to have been unoccupied (Wimberly and Eidenbach 1980; Eidenbach 1982; Gerow 1998). In the mid-1700s, Hispanic farmers and ranchers began to move in. Contemporary accounts describe the Puerco as a shallow river with *charcos* (pools) and extensive grasslands and cottonwood *bosques* along its banks. Navajo raids periodically drove out settlers until this cycle was broken in the late 1800s. As settlements grew more stable, other problems arose. In some places, soil loss and channel-cutting led to abandonment of farmland and villages as early as 1890 (Bryan 1928; cf. Dean et al. 1985: 540-544). Erosion and incising continued through the early 1900s, increasingly threatening survival of remaining settlements. In the 1920s and 30s, first measures to reduce livestock grazing (the Taylor Grazing Act of 1934) and check erosion (planting of tamarisk for bank-stabilization; construction of check dams along tributary arroyos) were implemented. Since the 1940s, a decline in annual sediment loads has been noted, but how this decline came about is not entirely clear. Despite the trend, arroyo-cutting and riverbank erosion are still very active (Lopez 1980; Betancourt 1980: 28-32; Scurlock 1998: 195-199, 288-291; Aby et al. 2004).

Archaeologically, channel-cutting and riverbank erosion along the Puerco offer a bleak example of site vulnerability. At Pottery Mound (LA 416) (Fig. 3.1), the active streambed has cut some 10 to 15 m into the surrounding landscape. The threat to the bluff-like west bank on which the site is located was part of the rationale to begin fieldwork in the 1950s. Efforts in the early 1980s to divert stream flow have apparently slowed erosion, but not before the river destroyed part of the site. Surviving structures remain on unstable ground (Wimberly and Eidenbach 1980: 112; Lister 2000: 110-111; Ballagh and Phillips 2006: 3-4). In the Piro area, the destructive potential of gullying and riverbank erosion is most striking at lowland Las Cañas Pueblo. Riverbank erosion at the mouth of Arroyo de las Cañas has taken out the northern periphery of the pueblo (see above and Chapter 5). Built mostly of stone and more removed from major arroyos, the larger upland sites have been spared similar damage. There is, however, much room for erosion to affect smaller sites. Among these sites are lithic and ceramic scatters along the Rio Salado and La Jencia Creek. Possible hunting camps or campsites on a lowland-upland trail, ceramics and foreign plant remains (peach pits) suggest colonial-period use (Robert H. Weber, personal communication, June 2001 and January 7, 2004). Given the creek-side locations and with no official site records, the sites will probably erode away without having been formally monitored.

On upland sites in general, the most common effect of ranching appears to be trampling. The role of human, animal, or automotive traffic in site formation has been subject of a number of experimental and ethnoarchaeological studies (Schiffer 1996: 126-129). In one short-term comparison of "trial" artifact scatters divided between a plot grazed by cattle and an adjacent ungrazed plot, artifacts on the grazed plot were on average moved (after only three weeks of grazing) six times farther (13.25 to 2.2 cm) than those on the ungrazed plot. The difference in maximum movement was even bigger (>100 to 7 cm) (Broadhead 1999). Though artifact scatters are most susceptible to this kind of disturbance, sites with large architectural compounds are not immune to trampling damage (Gosden and Lock 2000). At almost all Piro upland sites that I have seen, grazing animals or their droppings were present. As there are generally few artifacts on the surface, however, it is impossible to get even a vague idea of displacement and breakage rates due to trampling. Structural damage may also exist, but there are no structural data for upland Piro sites apart from a two-room test excavation at Bear Mountain Pueblo (LA 285) in 1960 (see Chapter 5). In view of the documented extent of upland ranching, trampling damage can be expected at most sites, but unless sites are investigated more closely physical evidence will be lacking.

This last point also applies to assessments of the archaeological impact of mining. A few vague references and traces of smelting/metalworking point to a 17th-century beginning of Spanish mining in the Socorro area. Though the scale of early mining is not known, it was no doubt modest (see Chapter 6). After 1880, however, mining grew into an extensive industry as the Socorro Peak area and the northern Magdalena Mountains became two of New Mexico's most productive mining districts. In 1881, some 3,000 mining claims were registered in Socorro. The same year the AT&SF railroad reached town. Within a few years, branch lines connected Magdalena and the coal-mining district around Tokay and Carthage to the main line at Socorro and San Antonio. Based mainly on the exploitation of silver and lead ores, the boom years of the 1880s faded as more and more deposits played out. Zinc carbonate (smithsonite) kept the Magdalena district afloat into the 1920s, but with the exception of Magdalena proper all mining communities were subsequently abandoned (Gardner 1910; Lasky 1932; Laughlin and Koschmann 1942; Christiansen 1974: 11-70; Ashcroft 1988; Scurlock 1998: 118-119, 129-134).

Visible relics of mining infrastructure today range from collapsed dwellings and pieces of hardware to tailings, slag heaps, and old railroad grades (Fig. 3.23). Although these cluster in the core mining areas indicated in Fig. 3.14, traces of prospecting can be found across much of Socorro County. Given the extent of landscape modifications in the former mining districts, it is unlikely that there remains any physical evidence of sites that may have existed prior to mining. As archaeological recording of Piro-area sites post-dates the mining period, no comparisons of site inventories are possible. Bandelier's Socorro Hot Springs site perhaps exemplifies the problem, but again smaller sites seem most affected. This should be especially true of sites related to native and Spanish use of mineral resources. For a Piro potter to decorate pottery with lead-based glazes required prospecting and some degree of mining just as much as did Spanish searches for silver deposits. Presumably, the lead-silver ores of the Socorro and Magdalena districts thus attracted both Piro and Spaniard. To date, however, only a handful of possible Spanish smelting sites have been identified in the Socorro area (Chapter 6).

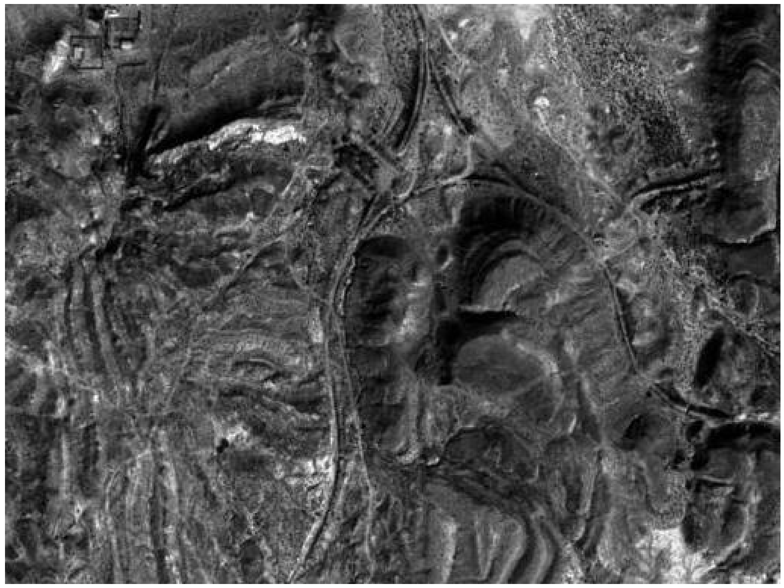

Fig. 3.23. Abandoned mines near Carthage. Old railroad loop spur and Y visible at center (USGS photograph, 1996).

Modern Versus Ancient Settlement

Magdalena and the village of Alamo on the Alamo Navajo Reservation are today the only settlement clusters in the uplands of the old Piro province. As the preceding paragraphs indicate, this is not a distribution representative of the maximum range of 19^{th}- and 20^{th}-century upland settlement. During the 1890s and early 1900s, the Kelly-Magdalena mining district and the San Pedro-Carthage area had more than 5,000 residents combined. Beyond these agglomerations, smaller communities and individual homesteads were scattered throughout the uplands. One of the more substantial of these communities, the village of Santa Rita (now Riley) on the Rio Salado north of Magdalena (Figs. 3.3, 3.14), was established in 1880/81. At the height of its occupation in the 1890s, it had between 150 and 200 residents. A lack of mining prospects and rapid widening of the Salado's main channel that destroyed most agricultural land soon sent the village into decline. Broken walls and fences indicate the extent of the old settlement and mark the sites of outlying homesteads (Betancourt 1980: 32, 43-58; Scurlock 1998: 199).

East of the Rio Grande, settlement has never really extended much beyond the lowland periphery (Marshall and Walt 1984: 259-306). Although today the east bank is thinly occupied, the remains of a number of small villages are evidence of a more extensive occupation in the 19th and early 20th centuries. The one exception to this pattern is the area east of San Antonio/San Pedro. The mining camps of Tokay, Farley, and Carthage ran up the course of San Pedro Arroyo (Figs. 3.3, 3.14). Further on, at the eastern edge of the Chupadera Basin, were the mines of the Hansonburg district (Kottlowski 1953). All these communities were abandoned in the first half of the 20th century. Other than a few isolated ranches there is no modern settlement in this area (Gerow 1994).

Recent or modern upland communities are not known to overlie archaeological sites. This probably reflects more a lack of archaeological recording than the situation on the ground. Especially in the core mining areas with their settlement clusters some degree of overlap seems likely. Without historic or modern site inventories, however, the assumption is wholly conjectural. Throughout the uplands, documented cases of direct human impact on archaeological sites are limited to infrastructure improvements (mainly highway construction) and looting. Two small sites near Carthage, for instance, were recorded prior to widening of State Highway 380 (Oakes 1986). One of the sites, Gold Station (LA 45885), is among the few Ancestral/Colonial Piro sites known in the eastern uplands (Figs. 3.3, 3.14). Road construction also affected some small sites on the Alamo

Navajo Reservation northwest of Magdalena (Dello-Russo 1999). As for looting, this is evident at a number of sites ranging from the Gold Station site to the two large upland pueblos, Pueblo Magdalena (LA 284) and Bear Mountain Pueblo (LA 285). As far as can be determined from the surface, looting has been less extensive than at lowland sites and has not involved the use of heavy machinery. All visible marks suggest “only” pick-and-shovel looting (Fig. 3.24) (cf. Berman 1979; Wimberly and Eidenbach 1980: 87-164; Oakes 1986; Tainter and Levine 1987). Even so, as most upland sites have few or no structural remains, the danger of destruction from looting is real and, if recent increases in upland recreation are any indication, growing.

Fig. 3.24. Looted room, Pueblo Magdalena (M. Bletzer, 8/2002).

Despite the rural character that much of the Piro area presents today, the problem of landscape change and archaeological preservation should not be underestimated. For the upper Rio Grande Valley, Riley (1995: 20) has noted that "there has been so much tinkering with the environment...that today it is difficult to reconstruct the older conditions, especially in the river valleys". For the Rio Abajo as a whole, Cordell (1989: 295) sums up the difficulties this presents to archaeologists who have to rely primarily on surface data. "[I]t is not always possible to duplicate surface collections made in the 1940s, because results of even well-executed surveys are distorted by years of uncontrolled collecting. In the same area, surficial structural remains are often poor indicators of the extent and configuration of subsurface features". Though numerically or spatially the modern occupation of the Piro area does not compare to upriver areas, there is sufficient evidence to show that collecting and "tinkering" with the local environment have impacted the record of Ancestral/Colonial Piro settlement, particularly in the Rio Grande lowlands. As I grapple with issues of site distribution and site structure, this evidence will emerge in more detail in the following chapters.

CHAPTER 4

ARCHAEOLOGY OF ANCESTRAL AND COLONIAL PIRO SETTLEMENT

A review of site files from the Museum of New Mexico's Archaeological Records Management Section (ARMS) shows more than 500 archaeological sites in the Piro area as it is defined here. The sites range from simple lithic or ceramic scatters to adobe and masonry pueblos containing several hundred rooms. Their temporal/cultural affiliations range from Paleoindian to 20th-century Euro-American (Berman 1979; Cordell 1979; Wimberly and Eidenbach 1980; Stuart and Gauthier 1981). More than half of the files are minimal tabulations of locational and temporal data, but there are brief descriptions of structures and assemblages visible on the surface for some 200 sites (e.g. Mera 1940; Wimberly and Eidenbach 1980; Eidenbach 1982; Gossett and Gossett 1985, 1990; Marshall and Walt 1984; Marshall 2005; Dello-Russo 1999, 2002). Among the latter are more than three dozen sites with at least one architectural component yielding Ancestral and/or Colonial Piro material: 17 pueblos with an estimated 100 or more rooms each, 10 pueblos with between 25 and 80 rooms, 11 small sites with less than 20 rooms, one likely Spanish *estancia*, plus, possibly, the site of another *estancia* (Fig. 4.1, Tables 4.1, 4.2).

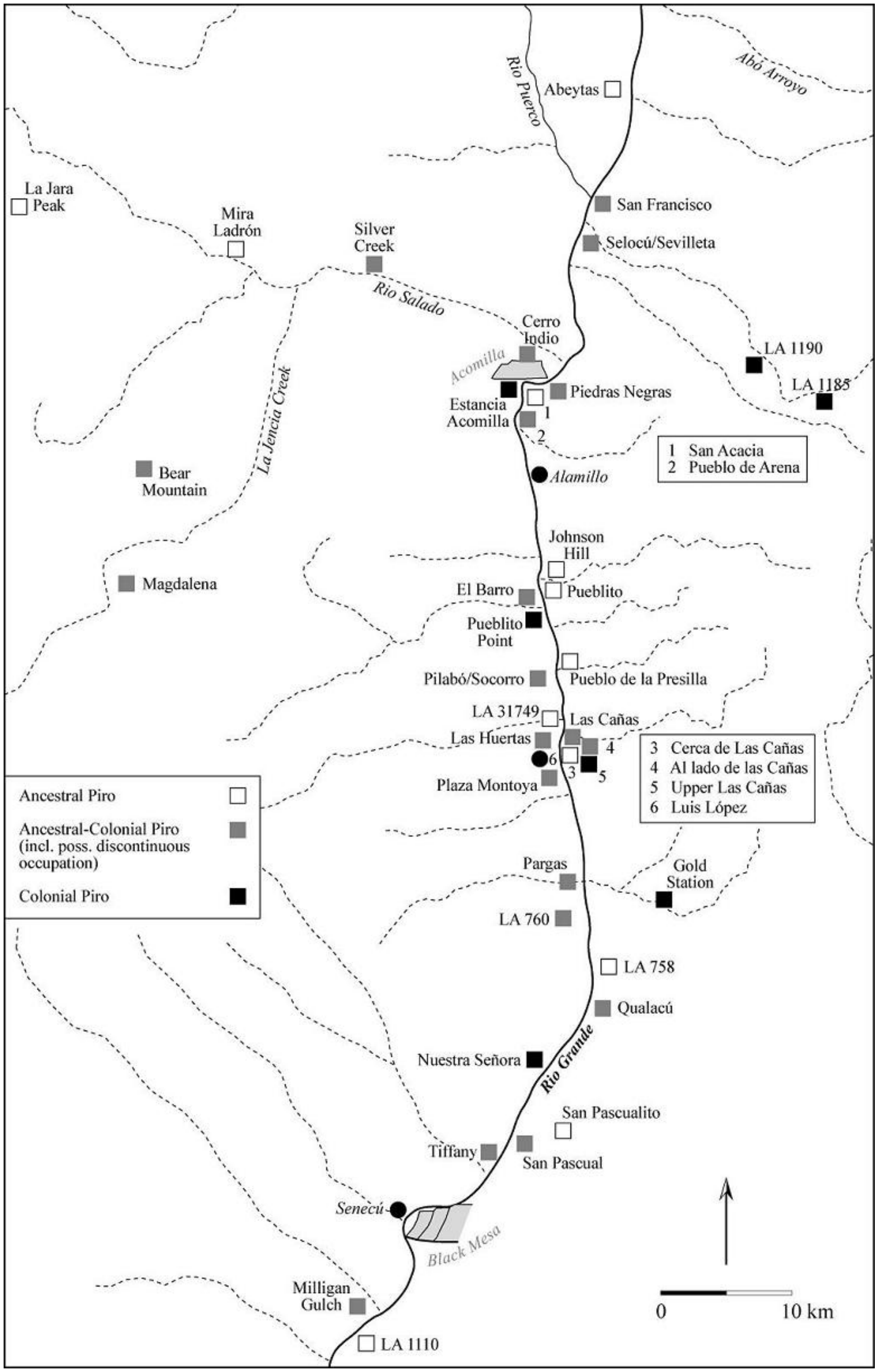

Fig. 4.1. Known Ancestral/Colonial Piro sites with structural remains (based on ARMS data; Wimberly and Eidenbach 1980; Marshall and Walt 1984; Oakes 1986; Earls 1987).

Table 4.1. Ancestral/Colonial Piro sites with more than 100 rooms.

Site	Room estimate (ground-floor/ total)	Occupation (range)	Archi-tecture	Comments
San Pascual (LA 487)	750/?	Ancestral-Colonial	Adobe	Largest archaeological site in the Piro area; *San Pascual* is historic name
Pilabó/ Socorro (LA 791)	? >300/?	Ancestral-Colonial	Adobe?	Site of Pilabó and first permanent Piro mission (est. 1626), buried below modern Socorro, exact location not known
Plaza Montoya (LA 31744)	250-300/ 350	Ancestral-Colonial	Adobe	West-bank pueblo south of Socorro, size estimate and occupation range based on 2001-5 excavations
Qualacú (LA 757)	250/350	Ancestral-Colonial	Adobe	Partly destroyed, stabilized in 1985/86, *Qualacú* historic Piro name
Milligan Gulch (LA 597)	200-300/?	Ancestral-Colonial (?)	Stone, adobe	Likely site of *San Felipe del Nuevo México*, structural remains no longer visible due to silt accumulation
Pueblo Magdalena (LA 284)	210/285	Ancestral-Colonial	Stone	One of two large masonry pueblos in the uplands west of Socorro (el. ~2000 m)
Las Cañas (LA 755)	200/?	Ancestral-Colonial	Adobe	Large east-bank pueblo near Socorro, partly destroyed
Las Huertas (LA 282)	180-260/?	Ancestral-Colonial	Stone, adobe	Located just north of Plaza Montoya Pueblo, site partly excavated in 1981.
Sevilleta (LA 774)	165/225	Ancestral-Colonial	Stone, adobe	Only surviving Piro mission pueblo; original name is *Selocú*
Bear Mountain (LA 285)	165/215	Ancestral-Colonial	Stone	One of two large masonry pueblos in the uplands west of Socorro (el. ~2000 m), two rooms tested in 1960

Table 4.1. (continued)

Site	Room estimate (ground-floor/ total)	Occupation (range)	Archi-tecture	Comments
Piedras Negras (LA 2004)	150/150	Ancestral/ Colonial	Stone	East-bank Pueblo III hilltop site with minor Colonial-period reoccupation
Cerro Indio (LA 287)	117/?	Ancestral/ Colonial	Stone, jacal	Ancestral west-bank hilltop site north of Socorro, minor Colonial-period occupation
Pueblo de la Presilla (LA 31720)	95/115	Ancestral	Stone, jacal	Early Ancestral east-bank site, heavily looted
Pueblito (LA 761)	? ~200/?	Ancestral	Adobe	Ancestral east-bank pueblo north of Socorro, partly disturbed
Unnamed (LA 758)	? ~100/?	Ancestral	Adobe, jacal?	Ancestral east-bank pueblo north of Qualacú, largely reduced
Pargas (LA 31746)	? >100/?	Ancestral-Colonial (?)	Adobe?	West-bank pueblo in the village of San Antonio, built over, est. occupation partly based on ceramic sample collected in 2003
Unnamed (LA 760)	? ~100/?	Ancestral-Colonial (?)	Adobe?	Site located in bottomlands south of San Antonio, today destroyed

(Based on ARMS data; Mera 1940; Davis and Winkler 1960; Marshall and Walt 1984; Marshall 1986, 1987; Earls 1987).

Table 4.2. Ancestral/Colonial Piro sites with less than 100 rooms.

Site	Room estimate (ground-floor/ total)	Occupation (range)	Archi-tecture	Comments
La Jara Peak (LA 786)	74	Ancestral	Stone	Located some 40 km west of the Rio Grande on the upper Rio Salado
San Acacia (LA 1999)	60	Ancestral	Stone, adobe	Ancestral east-bank pueblo in the San Acacia narrows
Tiffany (LA 244)	40	Ancestral/ Colonial (?)	Stone	West-bank site near Black Mesa, main occupation is colonial
Mira Ladrón (LA 20938)	~40	Ancestral	Stone, jacal	Located on the Rio Salado, c. 20 km west of the Rio Grande lowlands
San Pascualito (LA 756)	37	Ancestral	Stone	Ancestral east-bank hilltop site near San Pascual
Pueblo de Arena (LA 31717)	36	Ancestral/ Colonial	Stone, adobe	Pueblo III site south of San Acacia narrows, colonial-period reoccupation
Nuestra Señora (LA 19266)	35	Colonial	Stone, adobe	West-bank site south of San Antonio, only Piro-area site with near-circular layout
Upper Las Cañas (LA 31698)	25	Colonial	Stone, adobe	Colonial-period site located south and east of Las Cañas Pueblo
Estancia Acomilla (LA 286)	12-18	Colonial	Adobe	Possible Spanish *estancia* south of Cerro Indio Pueblo, Estancia Acomilla is historic name
Al Lado de las Cañas (LA 768)	9	Ancestral/ Colonial (?)	Stone	Ancestral/Colonial site east of Las Cañas Pueblo
Pueblito Point (LA 31751)	8	Colonial	Stone, adobe	Small west-bank site north of Socorro, Colonial-period occupation

Table 4.2. (continued)

Site	**Room estimate (ground-floor/ total)**	**Occupation (range)**	**Archi-tecture**	**Comments**
Pueblo San Francisco (LA 778)	8	Ancestral/ Colonial (?)	Stone	Post-contact east-bank site north of Sevilleta, mix of surface and pit structures
Arriba de Luis López (LA 31749)	3-5	Ancestral/ Colonial (?)	-	Pueblo I masonry structure with detached pit structure of early glaze affiliation
Gold Station (LA 45885)	3	Colonial	Stone, jacal	Four possible field houses in uplands east of San Antonio, partly excavated in 1986
Cerca de las Cañas (LA 31709)	<10	Ancestral	Stone, adobe	Small site west of Las Cañas Pueblo, partly destroyed
Silver Creek (LA 20954)	<10	Ancestral/ Colonial (?)	Stone	Small upland site located on the Rio Salado, 15 km west of the Rio Grande
El Barro (LA 283)	? ~50	Ancestral/ Colonial (?)	Stone, adobe	West-bank site located north of Socorro, destroyed
Abeytas Pueblo (LA 780)	? ~25	Ancestral	Adobe	Northernmost Ancestral Piro site, now largely destroyed
Johnson Hill (LA 31690)	? ~20	Ancestral	Stone	Pueblo I-III east-bank site, Ancestral Piro reoccupation
Unnamed (LA 1110)	? ~10	Ancestral	Stone, adobe?	Southernmost Ancestral Piro site known
Unnamed (LA 1185)	? <10	Colonial	Stone	Possible field-house site in uplands east of Sevilleta
Unnamed (LA 1190)	? <10	Colonial	Stone, adobe	Possible field-house site in uplands east of Sevilleta
Luis López (LA 31748)	?	Colonial (?)	?	Possible site of 17th-century *estancia* of Luis López

(Based on ARMS data; Wimberly and Eidenbach 1980; Marshall and Walt 1984; and Oakes 1986).

A comprehensive description of the archaeological record and the criteria defining the structure and distribution of Ancestral and Colonial Piro sites is the subject of this and the following chapter. Many of the sites portrayed here were initially recorded in the 1920s and 30s, and it was not until the mid-1960s that a first, very limited, archaeological test was carried out at one of them. In the early to mid-1980s, a brief burst of archaeological activity saw excavations at four sites, three of them large pueblos in the Rio Grande Valley, and one a small cluster of field houses in the piedmont area east of the river. Alas, none of these projects were part of a long-term research commitment, nor have the results led to any follow-up work. There thus exists a strange dichotomy between the significance of the existing excavation data and the episodic nature of their recovery. Both despite and because of this dichotomy, it is imperative that the available data are examined in detail before assumptions for the analysis of the Plaza Montoya material are formulated. It is, however, equally imperative to identify and address the shortcomings inherent in the various data classes, and to outline the potential impact on analysis and interpretation.

The organization of this chapter reflects these concerns. A summary overview of previous archaeological approaches to the Piro area is followed by an in-depth look at the main characteristics and caveats of the archaeological record as it is known today. In this effort, the focus will be on spatial coverage and chronology. Some of the problems in defining archaeological space have been outlined in the preceding chapter; here the discussion is expanded to include basic archaeological observations on regional distribution of sites and local site structure. As for chronology, this is a complex issue involving a variety of ceramic and non-ceramic variables. Each has its own limitations when it comes to relative and/or absolute precision. To what extent these limitations may affect perceptions of temporal affiliation is a question of great interest not only for the purpose of this study, but also in a wider methodological context.

Archaeological Research in the Piro Area

The beginnings of historical and archaeological research in the Piro area go back to much-traveled Adolph Bandelier, who visited the area in June 1882 (Marshall and Walt 1984: 12-13; cf. Goad 1939). Though short of time, he managed to delineate the general north-south extent of Piro territory from La Joya/Sevilleta to the San Marcial/Black Mesa area, and to visit ruins on both sides of the Rio Grande (see Chapter 3). With extensive knowledge of colonial sources, he identified the site of Sevilleta Pueblo (Bandelier 1890-92, 2: 238-239), and examined several sites, now destroyed, in the Socorro area and near Black Mesa (Bandelier 1890-92, 2: 239-251; Lange and Riley 1966: 318-325; cf. Marshall and Walt 1984: 12-13, 253).

In November 1883, Bandelier followed up on his Piro wanderings with a trip to the El Paso area where he visited the settlements of Senecú and Ysleta del Sur, home to the descendants of the 1680/81 Piro-Tiwa exodus. Interested in collecting accounts of pre-Pueblo Revolt origin, Bandelier's notes of the visit are modest in volume and contain little specific information (Bandelier 1890-92, 2: 272-274; Lange and Riley 1966: 163-166). "The dispersion of the Piros", he noted, "the long period of complete abandonment of their country...and the absence of documentary material concerning the missions, have created a blank which could be partly filled only in [the archives of] Spain, unless the folk-lore of the Piros at Senecú come to our rescue" (Bandelier 1890-92, 2: 273-274).

Given the time-limits and nature of his efforts, it is hardly surprising that a number of Bandelier's assumptions have proved inaccurate over the years. For example, documents discovered since Bandelier's time have rendered his placement of Senecú at modern San Antonio untenable, as well as the claimed existence of a separate pueblo called Trenaquel. The same is true of his assertion that Senecú was the first Piro mission (Bandelier 1890-92, 2: 130), likewise his definition of Piro territory beyond the Rio Grande Valley proper, as described in the previous chapter. The pueblos in the western uplands he knew only from hearsay and deemed their locations "too indefinite to warrant reproduction" (Bandelier 1890-92, 2: 346). In contrast to this stands his sweeping claims of Piros affinities for the pueblos in the Salinas area and of sites in the Sierra Blanca and Tularosa Basin (Bandelier 1890-92, 2: 291-292), a view incompatible with the archaeological and historical data available today.

It is, of course, not altogether fair to fault Bandelier on the basis of data collected long after his time. In some observations, such as his hesitant identification of Socorro as the site of Pilabó Pueblo, he was more cautious. All told, his observations present an important snapshot of the regional archaeological record as it was prior to the 20th-century landscape changes in the Piro area. His was an important contribution, especially when one considers that it took some 30 years before another archaeologically interested mind appeared on the scene. In the 1910s, Herbert W. Yeo began investigating sites in the vicinity of Black Mesa (Yeo 1910a, 1910b, 1914, 1929). In hindsight, it is perhaps ironic that it was Yeo's position as topographical engineer for the Elephant Butte Dam project, the main cause of floodplain aggradation around Black Mesa, that offered him the chance to pursue his archaeological inquiries (Marshall and Walt 1984: 12-13).

Yeo periodically returned to the Piro area over the course of nearly 30 years, documenting sites and surface assemblages (Yeo 1929, 1939). Unlike Bandelier, he did not look specifically for sites with a possible historic affiliation, but visited and recorded several Ancestral/Colonial Piro sites near Black Mesa. In this, his efforts partly heralded and paralleled those of H. P. Mera. Mera's work in the area in the 1930s resulted in a first region-wide inventory of archaeological sites (Marshall and Walt 1984: 13). With the help of a revised sequence of diagnostic glaze-decorated ceramics (Mera 1933), he attempted "to gain a general idea of the movements and shifts" of Puebloan populations in and around the Rio Grande Valley between c. 1300 and 1700 (Mera 1940: 1). Seeking to identify changes in site occupation through identification of changes in the distribution of surface ceramics, Mera (1940: 6) on topographical grounds distinguished three sub-areas in what he called the Piro "division": Rio Grande Valley, western uplands, and Chupadera Basin. Overall, he recorded 58 glazeware sites, ranging from pueblos with several hundred rooms to small structures with 10 and fewer rooms. Of these, 21 were in the Rio Grande Valley, three in the uplands north of Magdalena, and 34 in the Chupadera Basin (Mera 1940: 6-13).

While Mera's survey complemented similar work further north in the Rio Grande Valley and adjacent areas, there were no other projects in the Piro area. A glance at the amount of research done in the neighboring Salinas and Rio Grande Tiwa areas illustrates the novelty of Mera's Piro work. In 1913/14, excavations were first carried out in the Salinas area at the mission pueblo of Quarai (LA 95) (Ivey 1988: 315-319). From the 1920s to the mid-1940s, archaeologists worked at Las Humanas (Gran Quivira, LA 120) (e.g. Hewett 1926, 1927), Quarai (e.g. Senter 1934; Ely 1935; Hurt 1990), and Abó (LA

97) (Toulouse 1938, 1940, 1949; Dutton 1981, 1985). Much of their interest focused on the missions at these sites (Ivey 1988). In 1941, excavations were initiated at Pueblo Pardo south of Las Humanas, but this project was cut short by World War II (Toulouse and Stephenson 1960: 1). At Las Humanas, work resumed in 1951 when San Isidro, the older of the two mission churches at the pueblo, a large part of one room block (Mound 10 or House A), and a kiva were cleared (Vivian 1951, 1964; cf. Lister 2000: 134-136).

Meanwhile in the Tiwa area, a survey of potential historic pueblos in the early 1930s (Vivian 1932) was followed by major archaeological projects at two pueblos west of the Rio Grande near Bernalillo. The pueblos were thought to be associated with the Coronado expedition of 1540-42 (Lister 2000: 32). The first, Santiago Pueblo (LA 326), had been identified (incorrectly so, as it later turned out) by Bandelier as Puaray, a site of some prominence in contact-period and early colonial documents (Lange and Riley 1966: 87; cf. Snow 1975, 1976b; Riley 1981). The second pueblo, Kuaua (LA 187), had seen minor excavation in the early 1900s, but otherwise remained untouched. The highlight of the Kuaua excavations was the discovery of large kiva murals (Vivian 1935; Dutton 1963; Lister 2000). In 1935, Kuaua officially became Coronado State Monument (Lister 2000: 57-59).

Much of this early research in the Salinas and Tiwa areas has never been reported (Hayes et al. 1981: v; Lycett 1995: 295-298; Lister 2000: 50-51, 134). Even so, records and collections do exist (cf. Ivey 1988; Vierra 1989: 4-14), which is more than can be said for Mera's Piro "division". With the last of Mera's visits, the Piro area returned to archaeological oblivion. As Marshall and Walt (1984: 14) observed, "[t]he mud-and-cobble hovels and the massive but reduced mounds of the Rio Abajo did not present much of an attraction" to archaeologists. In the years after Mera, archaeological work amounted to a few spot checks of potential Pueblo III sites in the upland zone around Magdalena (Danson 1957). In 1952/53, very limited excavation tests were done at Lemitar Shelter (LA 18139) north of Socorro, a rock shelter with deposits reaching back to Paleoindian and Archaic times (Dello-Russo 2002, 2004). Several years later, Gallinas Springs Pueblo (LA 1178), a late Pueblo III site with an apparent Mesa Verdean affinity in its ceramic assemblage (cf. Lekson et al. 2002: 76-80) also saw limited testing. The site is located c. 25 km west of the Ancestral/Colonial Piro Bear Mountain Pueblo (LA 285) (Fig. 4.1). In the summer of 1960, the crew from Gallinas Springs spent some time at Bear Mountain excavating two rooms and six short trenches in plaza and offsite locations (Davis and Winkler 1960). Though with a total of around 200 rooms (Marshall and Walt 1984: 215) the analytical limitations of this test are obvious, it produced the first stratigraphic sample from an Ancestral/Colonial site in the Piro area (see Chapter 5) – a "mere" 80 years after Bandelier's original foray into Piro archaeology and history!

For two decades, the Bear Mountain test represented the sum total of excavated Ancestral/Colonial space in the Piro area. Not until the 1980s did archaeologists return to the region for more, and more extensive, testing. In 1981, the University of New Mexico Field School spent seven weeks at Las Huertas (LA 282), one of the larger pueblos on the west side of the Rio Grande (Fig. 4.1) (Earls 1985: 13-18). Four rooms and a four-room profile in a bulldozer cut were excavated in the west room block (see Fig. 3.21), as were several plaza and offsite tests (Earls 1987: 32). Size estimates vary between 180 and 260 ground-floor rooms (Table 4.1). The lower figure is based on surface data (Marshall and Walt 1984: 209; Earls 1987: 26), the latter extrapolated from the excavated room sample

(Earls 1987: 26). Diagnostic ceramics and the first chronometric dates for a Piro pueblo indicate an occupation spanning the entire Ancestral and part of the Colonial Piro phase. Other discoveries included eight burials, including several cremations (see Chapter 5). Up to that point, Pueblo IV/V cremations had been known only from the Zuni and Salinas areas (Las Humanas, Pueblo Pardo, Quarai), and from the middle Rio Puerco (Pottery Mound) (Hayes et al. 1981: 173-176; Earls 1987: 80; Ballagh and Phillips 2006: 95). The excavations also produced a substantial collection of faunal and botanical data. These would form the basis for the first Ph.D. dissertation on Piro material, Amy C. Earls' (1985) *The Organization of Piro Pueblo Subsistence, AD 1300 to 1680.*

The Las Huertas project stood near the midpoint of a brief period of relatively intense archaeological activity in the Piro area (Lekson et al. 2004: 56). Starting in the early 1970s, several informal surveys in the southern Piro area were aimed at identifying colonial-period affiliations of archaeological sites (Marshall and Walt 1984: 14). In the late 1970s and early 80s, regional surveys were conducted in the Rio Salado and Rio Puerco drainages (Wimberly and Eidenbach 1980; Eidenbach 1982). In 1973, excavation of a Pueblo II/III pit house near Socorro (Weber 1973) marked the first such investigation of a Puebloan site in the Rio Grande lowlands. Also in 1973, archaeologists returned to Lemitar Shelter (Anzalone 1973). In the late 1970s and early 80s, several small upland sites of mostly pre-Puebloan affiliation were excavated on the Sevilleta National Wildlife Refuge (e.g. Winter 1980; Hogan and Winter 1981), while just south of the Piro area, at Paraje (LA 1124), excavations targeted a 19th-century Hispanic village whose origins may go back to the 17th-century *paraje* (campsite) *de Fra Cristóbal* (Boyd 1984, 1986). Finally, the period also saw the compilation of several cultural resource overviews

(Berman 1979; Cordell 1979; Stuart and Gauthier 1981; Levine and Tainter 1982). These form a useful source of reference for what was then known about the archaeological record of the Piro area.

The high point of regional survey work in the Piro area came with Marshall and Walt's Rio Abajo Survey of 1980/81 (Marshall and Walt 1984). This remains the most comprehensive study especially of lowland Piro sites. Expanding on Mera's work, and following preparatory research by Marshall (1976), Marshall and Walt recorded or re-recorded more than 130 sites in the Rio Grande Valley and portions of the surrounding uplands. Some of these sites had not been visited since the days of Yeo and Mera; others, including Plaza Montoya Pueblo, were noted for the first time. As far as the inventory of known Ancestral/Colonial Piro sites was concerned, by the end of the survey it had increased to 39 from the 24 recorded by Mera for the Piro area minus the Chupadera Basin (Marshall and Walt 1984: 14).

Unlike after Mera's investigations 50 years earlier, no lengthy gap in research followed the Rio Abajo Survey. As mentioned in the previous chapter, sometime in the 1950s a large conveyance channel had been dug right through the eastern half of Qualacú Pueblo (LA 757) (Siegel 1987: 7). This had caused extensive damage, and triggered erosion of now exposed structural remains (Marshall 1987: 15). As a preliminary to stabilizing the channel cut, Marshall (1987) during the winter of 1985/86 directed salvage excavations in which a 34-m long profile in the channel cut was cleared. The profile provided stratigraphic data for ceramic chronology, construction sequence, and occupation history (see Chapter 5) (Marshall 1987: 27). In March 1986, Marshall (1986) also carried out salvage excavations at Pargas Pueblo (31746). Unlike Qualacú, Pargas had not been officially recorded prior to the Rio Abajo Survey (Marshall and Walt 1984: 196-197). In Chapter 3, I briefly described the pueblo's location in the village of San Antonio and the impact of modern residential development on its structural remains. Despite extensive disturbances, the Pargas excavation bears out the necessity to use every opportunity to explore and record what is left of such sites (Chapter 5).

In retrospect, the mid-1970s to mid-1980s mark the heyday of archaeological research in the Piro area. In 1983, a "Rio Abajo Conference" attracted a large attendance. It was, according to Marshall and Walt (1984: 14), "a testimonial" to a surge in interest in the Piro area – a surge which also extended to the field of cultural resource management (CRM) projects (e.g. Frizell 1980; Hunter-Anderson 1984; Fowler 1985; Higgins 1985; Noyes 1985, 1986; Stiger 1986; Seaman 1987). Since then, though, the surge has receded. After Qualacú and Pargas, no Piro pueblo saw so much as a shovel test. In the fall of 1986, archaeologists excavated part of the Gold Station site (LA 45885), a group of Ancestral/Colonial Piro field houses east of San Antonio (Fig. 4.1, Table 4.2) (Oakes 1986). Like more recent archaeological work in the Piro area (e.g. Alexander 1991; Gerow 1994; Brown 1996; Perlman and Phillips 1997; Dello-Russo 1999; 2002, 2004; Oakes and Zamora 2001; Marshall 2005), the Gold Station project was carried out in a CRM context, but with only one exception, remote sensing at Tiffany Pueblo (LA 244) (Rohe 2004), no other project targeted Ancestral/Colonial Piro sites.

The Archaeological Record: Characteristics and Caveats

Archaeological knowledge of the Piro area is clearly limited. With a total of five sites tested, the subject of Ancestral/Colonial Piro settlement has literally only just been touched. Obviously, there remains much room for basic data-collecting research. At the same time, it is imperative to appraise already existing data, particularly in problem-oriented research. To date, Earls (1985) in her study on subsistence change is the only one to have done so in the Piro area, but this was before the Qualacú, Pargas, and Gold Station data became available. As Mark Lycett (1995: 278) notes, data evaluation "requires some understanding of how...data were collected and what attributes of places were consistently recorded". It also requires some understanding of what data and attributes can or cannot tell a researcher interested in a specific research question. With this in mind, the following presents a critical appraisal of data and attributes of Piro settlement. The appraisal is not fixed solely on the Piro record, but also incorporates information from sites in other areas, especially the nearby Tiwa and Salinas provinces.

SPATIAL COVERAGE

Site Distribution

To define archaeological space in the Piro area represents a challenge that cannot be underestimated. On the regional level, the challenge is two-fold: to recognize and record archaeological sites outside the core area of the Rio Grande Valley and, closely related, to approximate the upland limits of Piro settlement. Lack of fieldwork and –around modern communities and industrial/agricultural areas – changes in the physical setting combine to form a rather sketchy archaeological data base. It is useful, therefore, to take a closer look at some of the survey work in the area, and at what the results of this work may suggest about the possible spatial and temporal distribution of sites in areas that are still unexplored.

Most of the information considered here comes from the lower Rio Puerco-Rio Salado and Rio Abajo survey projects of the late 1970s and early 80s (Wimberly and Eidenbach 1980; Marshall and Walt 1984). The two projects represent the bulk of survey data available for the Piro area, with coverage extending across most of the Rio Grande lowlands and part of the uplands northwest of Socorro. Although upland coverage is limited to portions of the Rio Grande's main western tributaries in the Piro province, the resulting data give at least some idea of the archaeological record of an area for which little information exists and which hardly figures in the historical record (Fig. 4.2).

As indicated in Chapter 3, there are few historical references to Piro settlement outside the Rio Grande Valley. To conclude from this that no such settlements existed would be misleading, though. Aside from the pueblos they saw along the Rio Grande, some of the Spanish explorers who came through the Piro area in the 1580s mention pueblos located "off the beaten track" (Hammond and Rey 1966: 219). At the other end of the chronological spectrum is the 1692 Vargas reference to what was doubtless Pueblo Magdalena (LA 284) (cf. Marshall and Walt 1984: 256). The Spaniards can hardly have missed – for the better part of a century, no less – Pueblo Magdalena, nearby Bear Mountain Pueblo, or the pueblos in the Chupadera Basin, even if none of these sites are mentioned in the surviving documentation. Barring new archival discoveries, however, exploration of upland Piro settlement is entirely an archaeological matter.

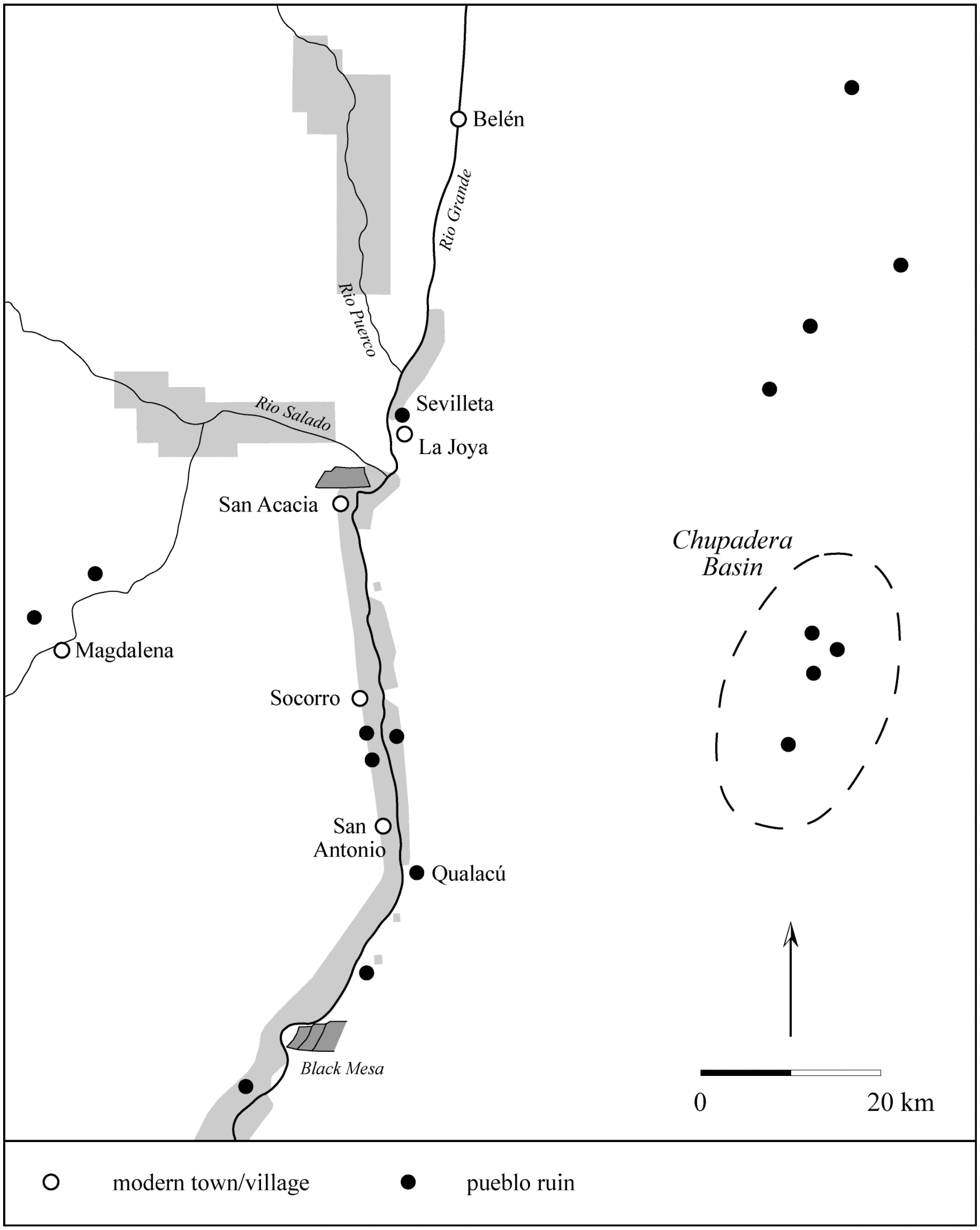

Fig. 4.2. Approximate coverage (shaded areas) of the lower Rio Puerco-Rio Salado and Rio Abajo surveys (adapted from Wimberly and Eidenbach 1980: 2; and Marshall and Walt 1984, Fig. 1.1).

As far as this undertaking is reflected in the distribution of Ancestral/Colonial Piro sites shown in Fig. 4.1, several basic observations can be made. There are 40 sites with one form or another of residential architecture. Of these, 17 fall within the category "large" as defined here, and 23 in the category "small" (Tables 4.1, 4.2). Broken down by location, 32 sites – 15 large, 17 small – are located within a kilometer or two of the Rio Grande floodplain. This leaves a total of only eight upland sites. Among these are Pueblo Magdalena and Bear Mountain, plus with nearly 80 rooms the largest of the small sites listed here, La Jara Peak Pueblo (LA 786). There also are three of the smallest sites: LA 1185, LA 1190, and the Gold Station field-house site (LA 45885). All three are located east of the Rio Grande. The ratio of large versus small upland sites is 1:3, compared to the near-parity between large and small lowland sites. The figures and ratios naturally reflect the way in which I chose to rank the 40 sites (see above). There are more refined ways of rank-ordering these sites, but this is not the issue here. What matters in this overview is the general idea of how site size relates to site location, and how both relate to survey coverage.

According to Marshall and Walt (1984: 6-12), the Rio Abajo Survey covered about 80% of the margins of the Rio Grande floodplain along a 115-km stretch between Abeytas in the north and the Fra Cristóbal Mountains in the south (Figs. 4.1, 4.2). Survey work focused on landforms "that appeared suitable for settlement", and there was "an explicit bias toward the architectural sites of Pueblo and early Hispanic affinity" (Marshall and Walt 1984: 12). Some 90 sites of varying temporal/cultural affiliation were discovered and recorded, including a dozen Ancestral and Colonial Piro sites. In terms of size and structural complexity, the most prominent "new" sites were Plaza

Montoya (LA 31744), Pueblo de la Presilla (LA 31720), and, presumably, Pargas (LA 31746), all with around 100 or more ground-floor rooms (Fig. 4.1, Table 4.1). There were six smaller sites with architecture, the largest of which, Pueblo de Arena (LA 31717), had about 35 rooms, while none of the others had more than 25 (Fig. 4.1, Table 4.2). A few sites turned out to be ceramic and lithic scatters without any visible structures, but of considerable size (Marshall and Walt 1984: 135-234). Their role is unknown. The largest of these scatters (LA 31681) measured 185 x 90 m (Marshall and Walt 1984: 144-145).

In contrast to the Rio Abajo Survey, the slightly earlier Rio Puerco-Rio Salado project covered c. 10% of two target areas marked out along the lower drainages of the two streams (Fig. 4.2) (Wimberly and Eidenbach 1980: 87),. Survey units were 40-acre (c. 400 m^2) sections, selected as a stratified random sample (*n* of sample units=197) from all units (*n*=1,953) within the target areas. During the survey, 57 archaeological sites were discovered (Wimberly and Eidenbach 1980: 17-19, 87-88). Of these sites, three had ceramics of Ancestral and Colonial Piro affiliation, but only two – Mira Ladrón (LA 20938) and Silver Creek (LA 20954) – had structural remains. With around 40 rooms, Mira Ladrón was by far the largest of all 57 sites recorded during the survey. Silver Creek probably has no more than five rooms, which is more in line with other sites for which architectural data exist (Wimberly and Eidenbach 1980: 92-161).

What data there are on upland sites (e.g. Hogan and Winter 1981; Oakes 1986; Oakes and Zamora 2001; Dello-Russo 1999), support the site-size pattern observed in the Rio Puerco-Rio Salado survey. Pueblo Magdalena, Bear Mountain, La Jara Peak, and perhaps even Mira Ladrón are exceptions in terms of size and structural complexity.

Future discoveries of Ancestral/Colonial sites most likely will be along the lines of the Silver Creek site, or else may be sites without visible surface structures. One example of the latter is a cluster of five sites (LA 87807-87811) near Pueblo Magdalena. As recorded in the ARMS files, the sites either are or include artifact scatters. According to the listing, four may in part date to the Ancestral and/or Colonial Piro periods. Though nothing more can be said about these sites, they also hint at the kind of discoveries lying ahead in the lowlands. Unless the remains of Senecú or Alamillo emerge somewhere, or someone stumbles upon Bandelier's "big ruin in the Cañada de la Parida", it seems unlikely that any more large sites will be found along the river.

In the wake of the Las Huertas project, Earls (1987: 83) noted that upland surveys were needed to complement Marshall and Walt's Rio Abajo Survey. Little has happened since. The surveys along the Rio Puerco-Rio Salado and the more recent discoveries of small sites near Pueblo Magdalena and other parts of the western uplands (Dello-Russo 1999) stress the potential of such work. Based on the 57 sites they recorded, Wimberly and Eidenbach (1980: 204) predict a total of 204 sites in their two sample areas. For the entire Rio Puerco-Rio Salado watershed, they give a "conservative" total estimate of 30,000 sites. At the time of their survey, about 3,000 sites had been reported "in some manner". Estimated combined coverage of all surveys was 3% for the entire watershed, 2% for the lower Rio Puerco, and 1% for the lower Rio Salado (Wimberly and Eidenbach 1980: 238; Gossett 1980: 215-218). With a lack of comparable follow-up surveys in the two drainages, these ratios cannot have changed much. In a negative way, the same is true of the eastern uplands, where the next comprehensive survey will be the first. Clearly, Earls' observation is as current today (2009) as it was in the 1980s.

Site Structure

On the level of the individual site the challenge of defining archaeological space is equally clear-cut. What is most striking in the overall record of Ancestral/Colonial Piro settlement is the lack of spatially and temporally representative structural data. Prior to the Plaza Montoya project, no Piro pueblo had ever been studied to an extent that would have allowed construction of a complete site sequence. Earl's (1985, 1987) work at Las Huertas, and Marshall's (1986, 1987) at Pargas and Qualacú represented the extent of structural information from excavations for the entire register of large Piro pueblos. Beyond these sites, any assessment of site structure and chronology had to – and still largely must – be based on observations of above-ground structural remains and distribution of diagnostic surface ceramics. With most large sites defined only by partly disturbed and/or eroded mounds of adobe rubble, surface assessments of site and room-block layouts remain problematic.

Lack of structural data is a serious obstacle to any study of settlement and population trends. Larger pueblos in particular were probably established, occupied, and abandoned over decades, if not centuries. As I pointed out in Chapter 2, archaeologists, historians, and ethnographers for some time now have been documenting the cumulative nature of pueblo growth. Also, awareness of variability in these processes has more recently been increasing. Partial occupation, relocation, temporary abandonment, seasonal shifts in population, settlement reoccupation – these are just some of the phenomena emerging from analyses of historical records, ethnographic accounts, and native oral traditions.

For the archaeologist there is obviously a need to arrange research in a way that helps identify patterns relating to these phenomena. In the end, everything comes down to how and how much space can be investigated. The excavations at Las Huertas, Qualacú, and Pargas illustrate this perfectly. All three projects were guided chiefly by assessments of past and future disturbances at each site. At Las Huertas, it was a bulldozer cut through one of the pueblo's room blocks (Earls 1987: 26). At Qualacú, it was a collapsing channel bank which threatened further damage to the pueblo (Siegel 1987: 7; Marshall 1987: 19). At Pargas, it was trenching for a telecommunications line (Marshall 1986: 1-3). The bulk of each site remained untouched. At Las Huertas, in-room excavations covered approximately 30 m^2 of an estimated 1,124 m^2 of space in the west room block. The extramural tests covered an additional 15 to 20 m^2 (Earls 1987: 26-27, 32). In relative terms, all tests covered "less than 1 percent of the estimated area of the roomblocks and trash scatter at the site" (Earls 1985: 245). At Qualacú, work concentrated on the channel profile in the southeastern part of the pueblo. Artifact samples were collected from the surface in other parts of the site, but no further sub-surface testing was done. Given the state of the site and the nature of the project, estimating a ratio of excavated space versus site size is not feasible. If anything, it is not a representative sample of overall site structure (Marshall 1987: 30). In the case of Pargas, this ambiguity is even more apparent. No part of the pueblo is visible on the surface. Only about 25 m^2 were excavated. The effort revealed an east-west running room block which in the excavated area stood five rooms deep (Marshall 1986: 3-6). This is the only structural information for the site (see Chapter 5).

When viewed against some of the non-Piro Pueblo IV/V sites considered in this study, the shortcomings of the Piro data are glaring. The multi-year project at early Pueblo IV Grasshopper Pueblo in Arizona included excavation of 103 rooms or 23% of the total of 447 rooms in the main pueblo and outliers, and sufficient clearing of 179 more rooms (40%) to permit study of wall alignments and room dimensions (Reid and Shimada 1982; Riggs 2001: 25, 28-29). For contemporary Arroyo Hondo Pueblo (LA 12) near Santa Fe, structural data exist for 150 of 1,200-rooms. At least one room was excavated in 20 of 24 room blocks. Excavation tests were also placed in five of 13 plazas and all identified kivas (Creamer 1993: 1-10; Creamer and Thibodeau 1993). At Pueblo del Encierro (LA 70), some 20 km west of Arroyo Hondo, all 230 ground-floor rooms were excavated, the only site of this size in the Rio Grande Valley to be so studied (Snow 1976a). At Las Humanas (LA 120), excavations of San Isidro, Mound 10 (Vivian 1964), and Mound 7 (Hayes 1981; Hayes et al. 1981) covered a good part of the post-contact settlement. In the 1960s, Mound 7, the largest of 21 house mounds, was excavated completely, providing a 224-room sample of pre- to post-contact settlement (Hayes et al 1981: 13-61). Data also exist for 37 rooms of Mound 10, the San Isidro church, and several nearby kivas (Vivian 1964: iii; Hayes et al. 1981: v).

These are just a few examples to point up the data lag characterizing the record of Ancestral/Colonial Piro settlement. Perhaps more so than in any other area of Puebloan settlement, the study of residential sites in the Piro province is dependent on comparisons with non-Piro sites. This dependence is not restricted to the definition of archaeological space. Due to the limited extent of excavation tests at Ancestral/Colonial Piro sites, temporally relevant material from such sites is likewise limited, and the data that do exist are not too specific. Site chronologies are based primarily on seriation and cross-dating of native ceramics, and, to a lesser extent, on the presence in archaeological assemblages of objects of Spanish-European and Spanish-Colonial (i.e. Mexican, Central and South American, or Far Eastern) origin. Unlike the neighboring Tiwa and Salinas pueblos, the Piro pueblos have yet to yield a single tree-ring date. Absolute dates are limited to a series of 12 ^{14}C and three archaeomagnetic dates from Las Huertas, Qualacú, Pargas, and the Gold Station site. This series is considered below. Not included here are 18 recent ^{14}C-dates from Plaza Montoya. These will be evaluated in Chapter 9.

CHRONOLOGY

Temporal control is a crucial factor in the study of population and settlement trends (cf. Schiffer 1996: 320-321). Given the lack of tree-ring dates, it is particularly important to draw on as much information as possible to measure time and temporal variation in Ancestral/Colonial Piro assemblages. Over the next few pages, I introduce the basic types of chronological data for the Ancestral/Colonial Piro province. The description is divided into two sections. The first examines distributions of diagnostic artifacts, and the second chronometric data. Together, these data offer a first glimpse of the kind of information available for establishing the Plaza Montoya sequence.

Artifact-Based Chronology

A key factor in Marshall and Walt's (1984: 138, 141-142) description of the Ancestral and Colonial Piro phases is the presence of glaze-decorated ceramics at a number of Piro-area sites. These ceramics represent a regional expression of a wider innovative trend that is part of the archaeological definition of the Pueblo IV and V periods. The use of lead-based glazes for decorating service vessels apparently spread from sites in east-central Arizona via the Zuni area to the Rio Grande during the early 1300s (Hayes et al. 1981: 90; Cordell 1984: 340). In many Rio Grande pueblos glazewares quickly replaced, or at least became more frequent than, established carbon- or mineral-painted whitewares (Snow 1982; Powell 2002). Stylistic or petrographic variation in glazewares from proveniences that are dated by tree-ring or chronometric analysis, and/or are part of known historic contexts (e.g. missions and mission pueblos), have allowed construction of a developmental sequence which covers some 400 years of production (Habicht-Mauche 1993; Morales 1997; Franklin 1997, 2006/7, 2007; Boggess and Hill 2007/8). Since the 1930s, this sequence has formed the chronological basis of archaeological research in Pueblo IV/V contexts in the Rio Grande Valley and adjacent areas (Lycett 1995: 283-284). Basic spatial/temporal associations and tendencies within the Rio Grande glazeware sequence are outlined below, with a focus on how glazewares facilitate chronological evaluation of Ancestral and Colonial Piro assemblages.

Ceramics other than glazewares can also be useful temporal markers (Lycett 1995: 290; cf. O'Brien and Lyman 1999: 73, 185-188). After reviewing data from Las Huertas, Qualacú, and Pargas, the Rio Abajo Survey, and from the better-documented Salinas area, I chose to look more closely at two such markers. The first, Tabirá Black-on-white, is a whiteware produced in the 17th-century Jumano pueblos (Hayes et al. 1981: 73). The second is a complex of plain red-, orange-, cream-, or unslipped wares with morphological traits of late glaze forms. The name Salinas Red originally applies to red-slipped plainwares produced in the Salinas area (Hayes et al. 1981: 101). Both markers can help identify Colonial Piro assemblages due to their massed occurrence in the Salinas mission pueblos. There, historical provenience and tree-ring-dated contexts provide a much narrower absolute timeframe than exists for any Ancestral/Colonial Piro site.

As colonial-/mission-period assemblages go, obvious giveaways are Spanish and Spanish-colonial objects (cf. Fournier and Lourdes Fournier 1989; Zeitlin and Thomas 1997). Records of the 16th-century exploring parties, the 1598 colonizing expedition, and later reinforcement and supply caravans, provide some insight into colonial material inventories and give an idea of the range of artifacts and livestock/cultigens appearing in the 17th-century Pueblo world (Trigg 2005: 85, 173-176). In picking markers such as ceramics, metal hardware, or architectural features, I have tried to bring together a cross-section of objects from reasonably secure archaeological contexts. Most of these come from sites outside the Piro area. An important source of information is again the Salinas pueblos, but data from other colonial-period sites are also included here.

Ceramics

Rio Grande Glazewares

The roots of the Rio Grande glazeware sequence go back to Nels Nelson's excavations in the Galisteo Basin in the 1910s, and, especially, Alfred Kidder's (1916, 1917, 1926, 1958) work at Pecos Pueblo, which resulted in an initial sequence comprising six phases (I-VI) (Kidder 1927; Kidder and Shepard 1936). In the 1930s, H. P. Mera (1933, 1935, 1940) worked out a similar sequence for the Rio Grande pueblos, also with six phases or "time horizons" (A-F). In defining phases and ceramic types within phases, Nelson, Kidder, Mera, and others focused on variations in such traits as rim forms, surface treatment, and decoration. Bowl rims in particular were shown to be subject to a relatively clear progression of formal changes (Kidder 1917: 329-337). As Mera (1940: 2) noted, "bowl rim developments...may serve to broadly distinguish time horizons" (Fig. 4.3). Early approaches toward sequencing were not always in accord, yet as Lycett (1995: 285) has pointed out, the similarity of results "suggests a strong underlying empirical pattern to formal variation in these ceramics". Lack of dating methods other than seriation of samples from stratigraphic proveniences hampered initial studies. What unified research at Pecos, in the Galisteo Basin, and similar sites was the "direct historical approach" (cf. Cordell 1984, 1997; Snead 2005). Ceramics were anchored by historical types, i.e. types defined in historically documented contexts such as mission or mission pueblos (O'Brien and Lyman 1999: 220-221; Fowler 2005: 22-24).

With the development first of dendrochronology and later radiometric dating methods, absolute dates could be assigned to assemblage proveniences, irrespective of historically defined ceramic markers. As data on glazewares have increased, it has become clear that there is more variability within and between glazeware groups than the sequence as such may suggest (Hayes et al. 1981: 90-101; Franklin 1997, 2006/7, 2007, 2008). That a ceramic sequence based on empirical generalizations should suffer from a lack of fine-tuning is, of course, not much of a surprise (Lycett 1995: 283-284). Even sequences of more readily sortable ceramics such as Roman Terra Sigillata wares with their individual maker-marks do not always yield clear spatial-temporal associations (cf. Laser 1998; Brulet et al. 1999; Eschbaumer 2001). Still, the fact that the Rio Grande glaze sequence (with modifications) continues to be widely used demonstrates its general utility (Lycett 1995: 289-290; Franklin 1997: 134-135; Eckert and Cordell 2004: 35).

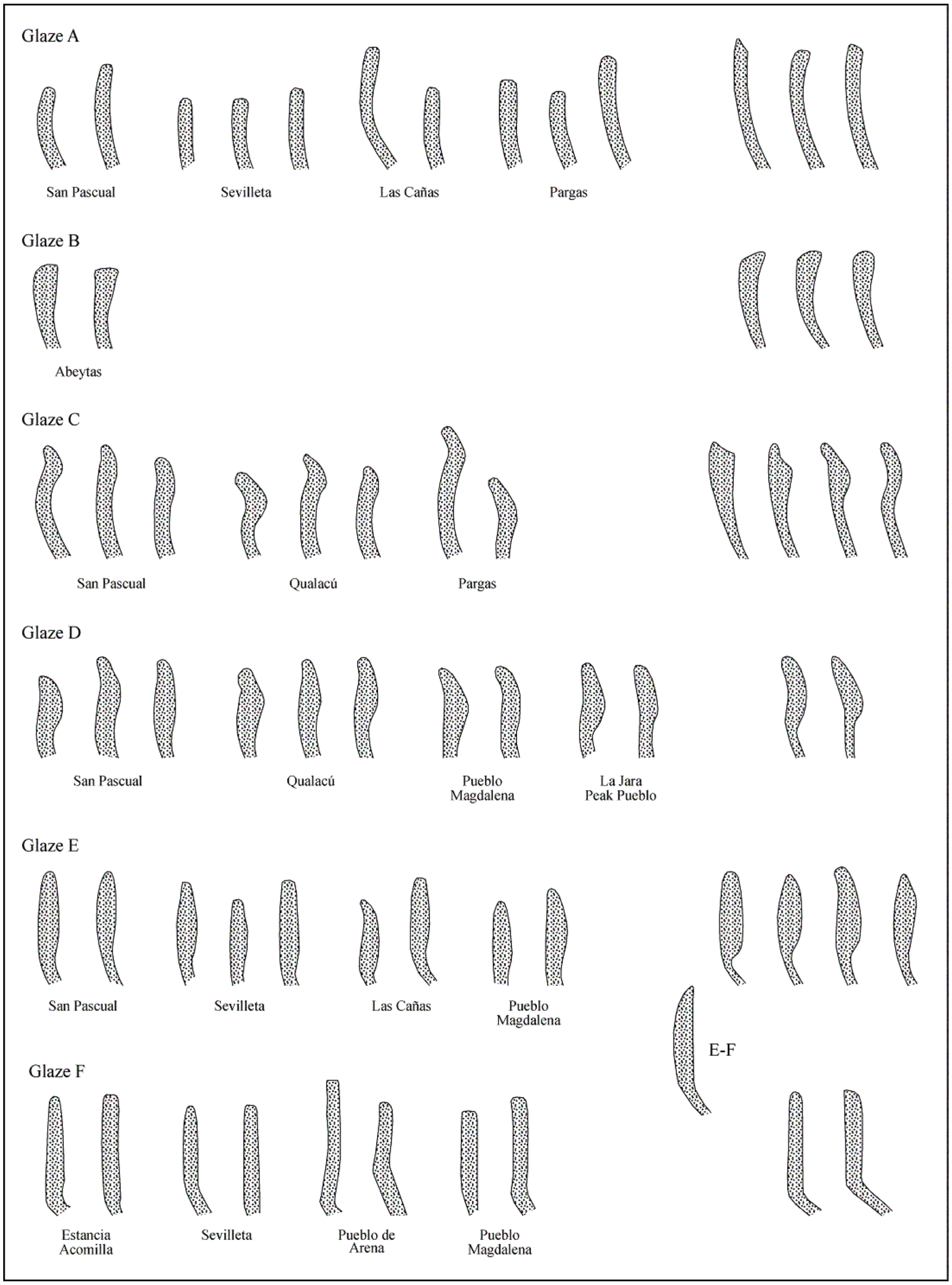

Fig. 4.3. Rio Grande glazewares: phase-typical bowl rims (no scale) from outside the Piro area (unlabeled specimens on the right, after Warren 1980, Fig. 59) and from Piro-area sites (based on illustrations in Marshall and Walt 1984; Marshall 1986, 1987).

Like all artifact-based chronologies, the Rio Grande sequence reflects the kind(s) of data on which it is based. As long as field research continues, the sequence remains a work in progress. Piro-area glazewares are prime examples of this. In the early 1930s, Mera defined and named a Glaze E type, Trenaquel Glaze Polychrome, from sherds found at Trenaquel (LA 244), now Tiffany Pueblo. A few years later, Anna Shepard (1942: 250-251) on the basis of petrographic analysis of sherds from sites around Socorro and in the Chupadera Basin identified, but did not formally propose as types, a Socorro and a Jornada "late variant" (Marshall and Walt 1984: 141; Warren 1986: 90). In the 1960s, Ken Honea (1966) as part of a general review of Rio Grande glazeware definitions described and named a Glaze E type, Escondido Polychrome, and two Glaze F types, Polvadera and Lemitar, with varieties Glaze-on-red and Polychrome for the former, and Glaze-on-yellow and Polychrome for the latter type (Honea 1966: v-6 - v-7, vii-5 - vii-7). Some traits overlap between old and new types (cf. Warren 1981b: 70), but by and large Escondido resembles Trenaquel, while Polvadera and Lemitar match the Jornada and Socorro late variants, respectively (Marshall and Walt 1984: 141; Warren 1986: 90-91).

The archaeological community provisionally accepted Escondido and Polvadera, but not the Lemitar type. Enough traits remained uncertain to postpone recognition of the latter "pending additional information" (Warren 1986: 91). On the other hand, Marshall and Walt (1984: 141) found that attributes of glazewares examined during the Rio Abajo Survey support Honea's classification. In his Qualacú and Pargas reports, Marshall (1986, 1987) retained the types proposed by Honea. The old designations also persist, however, a reflection of the ambiguities in the type descriptions (cf. Hayes et al. 1981: 98; Franklin 1997: 142, 144). At the Gold Station site (LA 45885), for instance, different researchers used new (Escondido, Lemitar) and old (Trenaquel) names (Baldwin et al. 1986; Warren 1986). Though not always acknowledged as such, subjectivity is a problem common to style-based analyses (cf. Spaulding 1953; Fish 1978; Dunnell 1986). The Gold Station data hint at the extent of the problem in the Piro area, and underscore the need for more ceramic data from excavated contexts (Oakes 1986: 94-98).

Although the Rio Grande glaze sequence has proved fairly consistent over time, absolute dates have been subject to debate and revision (Fig. 4.4). Few archaeologists today probably avow strict sequential ordering of phases, but a lack of data from secure contexts and a taxonomic rigidity may convey an impression of formal separation which in reality does not exist (cf. Lycett 1995: 285-289). This, in turn, can suggest a degree of temporal and/or spatial separation between types which may also not exist (cf. Shennan 1988: 190-208; Lyman and O'Brien 1999: 23-58). A case in point in the Piro area is the temporal position of Glaze A forms. Prior to the Las Huertas excavations, Glaze A was largely believed to have gone out of fashion by c. 1450, but Earls' work suggested that it had a longer run. The claim that A forms ran through the entire glazeware sequence (Earls 1985: 29-30, 1987: 71-72) appears precipitate, however, given the small excavated sample on which this assumption rests. In a synthesis of ceramic data primarily from Qualacú, Marshall (1987: 78-81) gives approximate glaze-form ratios for five "ceramic group-complexes" spanning the period from c. A.D. 1300/50 to 1680. The "Rio Abajo Ceramic Group-Complex Sequence" is a rough quantitative sketch of run times of, and possible overlap between, different ceramic forms. The ratios back up the notion of a longer-running Glaze A group, but also suggest that after c. 1500 Glaze A forms began to disappear from the regional ceramic spectrum (Chapter 7).

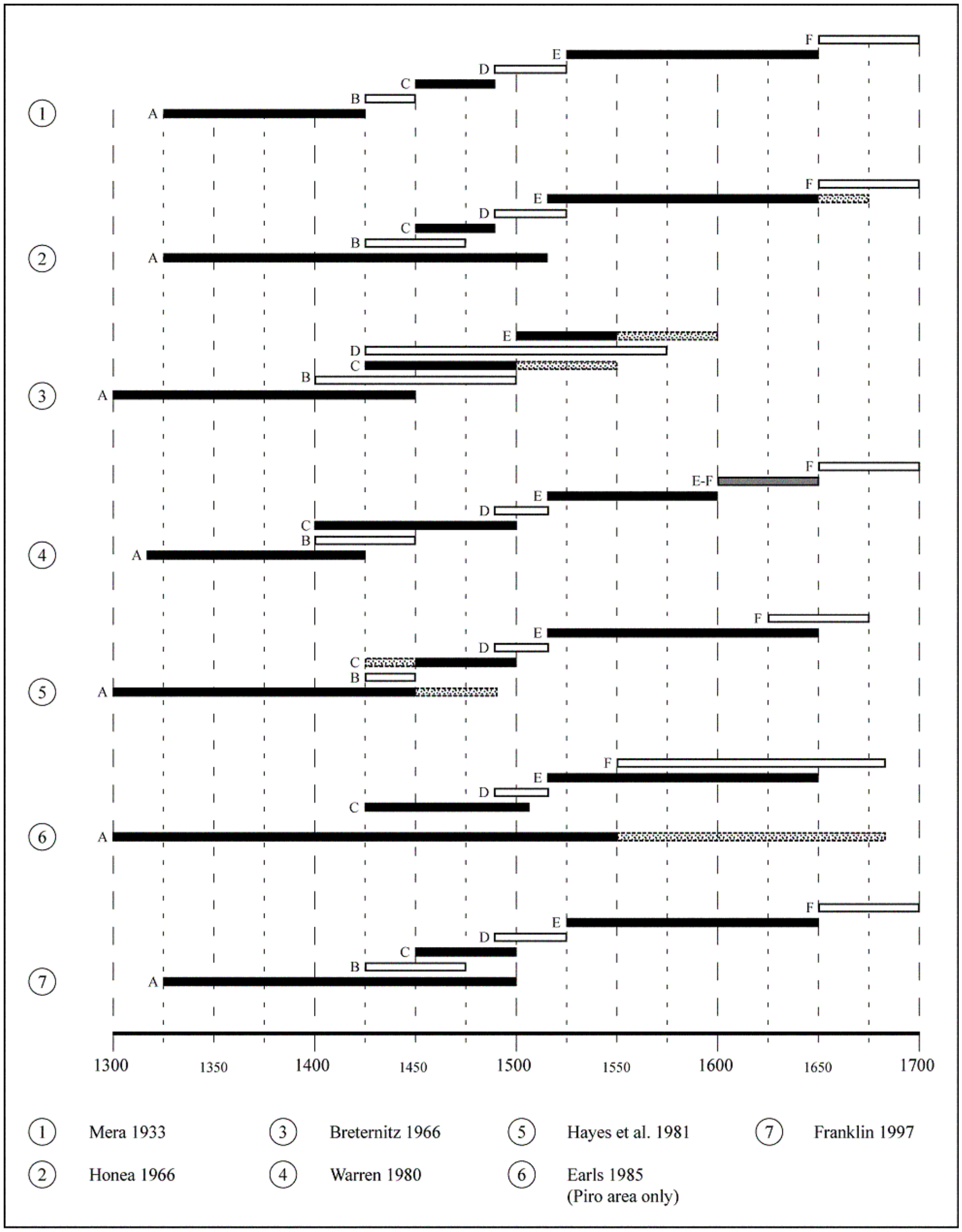

Fig. 4.4. Rio Grande glazeware sequence, estimated dates (cf. Lycett 1995, Fig. 7.2; Franklin 2006/7, 2007, 2008).[1]

[1] Glaze B seems to be largely restricted to the Galisteo Basin and adjacent areas on the upper Rio Grande. In the Piro and Salinas pueblos, Glaze B forms are rare (Hayes et al. 1981: 95-96; Marshall and Walt 1984: 135, 138; Marshall 1987: 72-73; Baldwin 1991: 4-6; Franklin 1997: 140-141, 2006/7, 2007, 2008).

Of particular interest in contact- and colonial-/mission-period Piro assemblages is the association of Glaze E and F forms (Table 4.3). Stylistically, both E and F bowl rims tend to be taller than earlier rims, sharply angled from vessel base, and not everted at the lip. The main difference between "pure" E and F rims is that the former are often thickened on the inside (sometimes on the outside, too), whereas the latter are straight and narrow, with no wall thickening but with a sharper angle marking the rim base (Fig. 4.3). In decoration, E and F vessels frequently exhibit a lack of line control. Unlike on earlier types, glaze paints are often runny, obscuring motifs and design patterns (Hayes et al. 1981: 97-102; Franklin 1997: 142-144). Although there are transitional "types" with both E and F traits, there seems to be a tendency towards little or no decoration in the Glaze F group. A number of Glaze F rims that I have seen on Piro sites were undecorated or even unslipped. As all were single sherds, decorated parts of a vessel could have been missing. In the better-known Glaze F material from the Salinas area, many locally produced (at Abó and Quarai) bowls have only one or two interior glaze lines. The local Salinas Redwares represent perhaps part of this trend, for among the most common vessel forms are bowls that look like plain Glaze F bowls (Hayes et al. 1981: 101-102). Temporally, Salinas Red belongs to the colonial period. Spatially, the known distribution is only slightly less limited than area of production (see below). It is at present impossible to say whether Piro-area ceramics may have undergone similar changes, but the Salinas data at least suggest the possibility that ceramic trends might be more variable than has so far been recognized.

Table 4.3. Relative occurrence of Glaze E and F forms in Piro surface assemblages.

Site	Glaze E	Glaze F
Sevilleta (LA 774)	A	A s.r.
Cerro Indio (LA 287)	T	T
Estancia Acomilla (LA 286)	A	A
Piedras Negras (LA 2004)	T	T
Pueblo de Arena (LA 31717)	A	A
Pueblito Point (LA 31751)	A	A
Pilabó (LA 791)	A	A
Las Huertas (LA 282)	T	T s.r.
Plaza Montoya (LA 31744)	A	T
Qualacú (LA 757)	T	T s.r.
San Pascual (LA 487)	T	T
Tiffany (LA 244)	A	A
Pueblo Magdalena (LA 284)	A	A
Bear Mountain (LA 285)	A	A
Gold Station (LA 45885)	A	A

A Abundance T Trace s.r. spatially restricted

(Based on Marshall and Walt 1984, App. 2, Table 1; with additional information from Marshall 1987; Mera 1940; Oakes 1986; and personal observations at 11 sites between 2000 and 2005).

As for the chronological correlation between E and F forms, this is still less clear than one would like. Relative to the Piro area, the best-dated proveniences with Glaze E and F sherds are in the Salinas pueblos, especially at the Jumano pueblo of Las Humanas/Gran Quivira (Hayes 1981; Hayes et al. 1981). The Mound 7 excavations produced 1,021 Glaze E sherds and eight restorable bowls, which made this the third-most frequent glaze form in the excavated glazeware sample. Petrographic analysis shows that more than half of the Glaze E material from Mound 7 was produced at Abó, with lesser percentages coming from Quarai and areas further north (Hayes et al. 1981: 97-98; Warren 1981a: 180-182, 1981b: 70-72; cf. Capone 1995). Stratigraphy, structural data, and tree-ring dates suggest that Glaze E forms appeared at Las Humanas a few years before 1545. Although there is no specific run-time estimate, E forms were nearly absent in the fill of seven kivas which seem to have been razed in the late 1650s in a Franciscan campaign against native religious practices (Hayes et al. 1981: 26-29, 54-74, 97-98; cf. Scholes 1942; Sánchez 1987: 89-96). For the earlier San Isidro/Mound 10 excavations, data on glazewares are more limited. Glaze sherds were overwhelmingly F forms. The excavated sample reportedly included “traces” of Glaze A and D, but E forms are not mentioned (Vivian 1964: 110-114).

The Mound 7 Glaze F sample totaled 1,108 sherds and 39 complete or near complete vessels. Stylistic and petrographic analyses show that more Glaze F vessels came from Quarai than Abó, a reverse of the Glaze E pattern. Though the beginning date of Glaze F at Las Humanas is grounded less securely in tree-ring-dated stratigraphic and structural data than is the Glaze E material, it no doubt falls between c. 1625/30 and 1650 (Fig. 4.4) (Hayes et al. 1981: 98-101; Warren 1981a: 180-182, 1981b: 70-72). In the overall San Isidro/Mound 10 sample, Glaze F made up 18% of all ceramics. There are no absolute dates from this excavation. In the sample from the San Isidro church – which was built in the early 1630s (Ivey 1988: 157-176) – the ratio of Glaze F (27%) was equal to that of Tabirá Black-on-white (see below) and second only to culinary wares (41%) (Vivian 1964: 110). Glaze F continued in use until the abandonment of the pueblo in the early 1670s (Hayes et al. 1981: 98-101).

Ceramic, stratigraphic/structural, and chronological data are less certain for other Salinas-area sites. At Abó, for instance, Glaze E and F bowl rims were found in refuse areas of the mission of San Gregorio (Toulouse 1949: 17-18), established in the 1620s (cf. Ivey 1988: 55-110). How long Glaze E forms were used in the mission period is not clear, however. The end date most often assigned to Glaze E in the Rio Grande sequence is 1650 (Fig. 4.4). Based on survey work in the Abó Pass area and limited testing at the pueblos of Abó and Tenabó, Stuart Baldwin (1983, 1991, n.d. a; Baldwin et al. 1986: 62) considered E and F forms "essentially contemporaneous with each other". A Glaze F start date of c. 1550 which Baldwin claims for his study area has also been applied to the late glaze sites in the Chupadera Basin, but with the caveat that the basin's chronology is known only in "very general" terms (Kyte 1988: 161-169; 1989a, 1989b).

Earls (1985: 30-31) in her subsistence study uses a widely accepted run time for Glaze E of c. 1515 to 1650 (Fig. 4.4). For Glaze F, she adopts a start date of 1550 as proposed by Baldwin (1982) in a correlation of Ancestral/Colonial Piro sites with historic pueblo names. Such historical-archaeological correlations are of dubious value, given the twin problems of site preservation and documentation. As Baldwin's undertaking shows, directions and distances as given in the documents may in a few cases fit in with the archaeological landscape, but the misidentification of just one site (in this case Nuestra Señora Pueblo, LA 19266, as Senecú) will defeat the whole effort. Baldwin (1982: 52) arrives at the 1550 start date for Piro-area Glaze F forms by identifying two sites with Glaze F surface ceramics – Tiffany Pueblo (LA 244) and San Pascual (LA 487) – with pueblos described as ruined by some of the Spanish explorers of the 1580s. Again, gaps and inconsistencies in the available sources makes such correlations vague at best. More importantly, San Pascual is one of only three sites whose surface assemblages include all glaze groups (Marshall and Walt 1984: 342-343). This hardly indicates a lengthy period of abandonment. Baldwin (1982: 52) acknowledges that Glaze F could have been introduced during a later reoccupation of the pueblo, but considers this an "assumption" because of a lack of documentary evidence of site reoccupation.

The only Piro pueblo whose historical identity is beyond doubt is the old mission pueblo of Sevilleta (LA 774). At Sevilleta, most Glaze F sherds on the surface cluster around the remains of the San Luis Obispo mission, which was established in the late 1620s. A spatial separation of Glaze F and earlier glazes points to a discontinuous occupation. There are references to two occupation breaks, one pre-dating the mission and a brief one in the late 1650s (Chapter 6). The former seems to have been substantial, since fray Alonso de Benavides, the mission's founder, noted that the pueblo had been burned and abandoned (Ayer 1916: 17, 96; cf. Marshall and Walt 1984: 245-248). Though not conclusive either, the information from Sevilleta is more suggestive of the Glaze F date from Las Humanas than of Baldwin's correlation-based estimate.

Additional evidence for a 17th-century date for Glaze F comes from Marshall's (1987) excavations at Qualacú. On the surface, Glaze F forms are restricted to the northwestern part of the pueblo. None were found in the channel-cut excavations, but all other forms were (Marshall 1987: 51). Of five ^{14}C dates considered reliable, the two latest medial dates fall within the early to mid-1500s (Chapter 5). By themselves the ^{14}C dates do not discount a possible 1550 start date, but the spatial separation between Glaze F and the other glaze forms reminds one of the Sevilleta assemblage. In view of all this, I consider Glaze F to be essentially a mission-period form, with a start date in the early 1600s. The date, however, is a "working" estimate and needs further testing. This was one of the objectives to be addressed with a new suite of ^{14}C dates from Plaza Montoya.

Tabirá Black-on-White

Stylistically and spatially much more restricted than glazeware forms is the non-glaze Tabirá Black-on-white pottery. Its origins lie east of the Piro area, in the Jumano pueblos of Pueblo Blanco (LA 51, the 17th-century Tabirá Pueblo), Las Humanas (LA 120), and Pueblo Pardo (LA 83). Hayes et al. (1981: 72-90) in their discussion of the Mound 7 ceramic assemblage at Las Humanas provide the most exhaustive description of the Tabirá "type" and its three "variations", Plain, true Black-on-white, and Polychrome. That Tabirá might perhaps be better classified as a type rather than a ware was not immediately apparent when it was first identified at the Abó mission in the late 1930s (Toulouse 1949). Up to that point, only the briefest of references to this pottery existed. In late 1882, Adolph Bandelier during an excursion to the Salinas area was shown what appear to have been Tabirá Polychrome specimens. As he noted, these were "absolutely different from all that I have seen in New Mexico, gray, with black and red designs" (Lange and Riley 1966: 387). H. P. Mera observed similar sherds on late glaze sites in the Chupadera Basin, but called them late forms of Chupadero Black-on-white (Mera 1935: 31), a whiteware whose date-range (c. 1175-1550) spans the better part of the Pueblo III and IV periods (Hayes et al. 1981: 71-73; Wiseman 1985; cf. Clark 2006).

At Abó, two restorable Tabirá vessels and an unspecified number of sherds were found in the mission. Described under the header "Chupadero Wares", the sherds represented between .7 and 10.9% of all ceramics in the seven proveniences excavated in and around the mission (Toulouse 1949: 18-19, 21; cf. Hayes et al. 1981: 73). Additional Tabirá sherds were found during minor testing in Room Block I of the pueblo, located southwest of the mission, and in an offsite midden area (Dutton 1981: 182-188). At nearby Tenabó (LA 200), testing in what may have been a Spanish chapel produced a Tabirá Plain "soup" plate (Baldwin n.d. b: 2). Among the Jumano pueblos, excavation of 14 rooms, a kiva, and several short test-trenches at Pueblo Pardo, a 500-room pueblo located south of Las Humanas, yielded two Tabirá vessels, plus a total of 409 sherds (279 Black-on-white, 105 Plain, and 25 "miscellaneous"). In a sample of 894 identified decorated sherds, the Tabirá ratio came to 45.7% (Toulouse and Stephenson 1960: 27). At Pueblo Blanco/Tabirá, a surface collection of 228 sherds reportedly contained 86% Tabirá sherds (Hayes et al. 1981: 73), though another report mentions a sample of 231 sherds of mostly Glaze E and F types (Warren 1981b: 73). Analysis of data from a minor excavation in the late 1950s shows 65 Tabirá specimens in a 325-sherd sample. In this sample, Tabirá was the most common type (Wilson et al. 1983: 123).

At Las Humanas, the San Isidro/Mound 10 excavations produced one complete and several fragmentary vessels, plus a sample of sherds reported as a ratio of 38% of the overall ceramic sample (Vivian 1964: 110; Hayes et al. 1981: 73). The Mound 7 excavations yielded a total of 5,046 Tabirá sherds (5.1% of the overall ceramic sample), 736 of the Plain variety, 4,182 Black-on-white, and 128 Polychrome (Hayes et al. 1981: 74). Also recovered were 126 complete or nearly complete vessels. The Las Humanas form spectrum is by far the most extensive known for this type. At least 12 categories are present, ranging from jars and canteens (the most numerous forms) to various kinds of bowls, pots, pitchers, and jugs, to Spanish forms such as soup plates and candlesticks (see below) (Vivian 1964: 108-109; Hayes et al. 1981: 76-82).

Stratigraphic associations of glazeware and Tabirá sherds at Las Humanas suggest a span of c. 1545-1672 for the type (Hayes et al. 1981: 73-75; Wilson et al. 1983: 122). Significantly, there was no *in situ* association of Tabirá material with glazewares other than E and, especially, F types (Hayes et al. 1981: 49, 74), a pattern apparently also applying to the San Isidro/Mound 10 sample (Vivian 1964: 110). There is, however, some variation within the Las Humanas sample. Spanish-influenced forms occur in the Plain and Polychrome varieties, but not in true Black-on-white (Vivian 1964: 108-109; Hayes et al. 1981: 77). The same is true of the Pardo sample (Toulouse and Stephenson 1960: 21). Based on the Las Humanas data, Hayes et al. (1981: 75) propose a beginning date of 1545 for “early” Tabirá Black-on-white, 1600 for “classic” Black-on-white, 1625 for Plain, and 1650 for Polychrome. Except for early Black-on-white, all varieties seem to have been in use until the abandonment of the Salinas area.

Ceramic samples collected by Mera in the 1930s and later studies of sites outside the Jumano area show the distribution of Tabirá to be mostly restricted to the Tompiro (Abó, Tenabó) and Salinas Tiwa (Quarai, Tajique, Chililí) pueblos, and to the late glaze sites in the Chupadera Basin (Baldwin n.d. b; Hayes et al. 1981: 73; Kyte 1989a: 134-135). There is no evidence that Tabirá was traded to the Rio Grande Tiwas. Samples from five sites located south of Isleta contained no Tabirá (Hayes et al. 1981: 74). Excavations at Valencia Pueblo (LA 953) confirmed this pattern. Late (D-F) forms made up only 1.3% (*n*=36) of identified glazewares (*n*=2766) (Franklin 1997: 130). Given the implications of this ratio, the lack of Tabirá in the Valencia sample is not surprising. Earlier Chupadero Black-on-white, however, is also represented with only eight sherds, and its geographical origin is similar to that of Tabirá (Hayes et al. 1981: 68).

If the trans-regional diagnostic value of Tabirá seems thus limited, it does at least extend to the Piro area (Table 4.4). In Mera's Piro samples, Tabirá was definitely present at Sevilleta and two other sites, and possibly present at three more (Hayes et al. 1981: 74). During their Rio Abajo Survey, Marshall and Walt (1984, App. 1, Table 7) found Tabirá sherds at four sites, all of which also have Glaze E and F types in their surface assemblages: Sevilleta (LA 774), Estancia Acomilla (LA 286), Tiffany (LA 244), and Upper Las Cañas (LA 31698). At Sevilleta, the Tabirá material was of the Polychrome variety (Marshall and Walt 1984: 207). Two Polychrome and one Black-on-white sherds were found at Las Huertas (Earls 1987: 73). At the Gold Station site, one sherd of Tabirá Plain was identified on stylistic grounds. Compositional analysis suggests that several unidentified plain sherds with temper typical of Tabirá material may also fall within the Tabirá spectrum (Baldwin et al. 1986: 57, 60-62; Warren 1986: 89, 92-93).

Table 4.4. Presence-absence tabulation of late non-glaze ceramics in Piro surface assemblages.

Site	Tabirá	Salinas Red/ plainwares	Spanish vessel forms	Mayólica/ porcelain
Sevilleta (LA 774)	B-on-w, plain, polychrome	Salinas Red	Soup plates or platters (gl-on-white and plain)	White and blue-on-white mayólica
Estancia Acomilla (LA 286)	B-on-w and polychrome	Salinas Red?	Soup plates or platters (gl-on-red)	White and blue-on-white mayólica
Las Cañas (LA 755)	B-on-w?	Salinas Red?		
Upper Las Cañas (LA 31698)	B-on-w or Plain?			
Las Huertas (LA 282)	B-on-w and polychrome	-Salinas Red -Unspecified historic plain		
Qualacú (LA 757)	B-on-w or Plain?		Soup plates or platters (gl polychrome)	
San Pascual (LA 487)			Soup plate or platter (gl-on-tan)	Unspecified mayólica
Tiffany (LA 244)	B-on-w			
Pueblo Magdalena (LA 284)	B-on-w?			
Bear Mountain (LA 285)		Unspecified redwares		
Gold Station (LA 45885)	Plain	Salinas Red		

(Based on Davis and Winkler 1960; Marshall and Walt 1984; Marshall 1986, 1987; Oakes 1986; Earls 1987; and personal observations made between 2000 and 2005).

Limited as archaeological work has been in the Piro area, meaningful frequency comparisons remain unfeasible. Observations I made at several Piro-area sites suggest a wider range for Tabirá, yet neither in quantity nor in quality is there enough material to go beyond a simple presence-absence tabulation (Table 4.4). At two sites, Pueblo Magdalena (LA 284) and Las Cañas (LA 755), I noted possible single Tabirá Black-on-white sherds. At Qualacú (LA 757), three small white-ware sherds may have been Tabirá Black-on-white or Plain, but were too fragmented to be clearly identifiable. The location of these sherds in the northwestern site area would fit in well with the aforementioned concentration of late glaze types in the same part of the pueblo.

Plainwares

Compared to Tabirá Black-on-white, plainwares form a much more ambiguous ceramic complex. There are few type descriptions, and production and distribution patterns are little known. Only temporal position is relatively well established through the occurrence of redwares at the Salinas mission pueblos and their association with historic ceramics like Glaze F and the Tabirá varieties. Subsumed under the name Salinas Red, these ceramics are, as the name implies, primarily red-slipped, though with a range running from beige to bright red, and often on the same vessel (Hayes et al. 1981: 102). As visual identifications go, it is sometimes difficult to distinguish between Salinas Red and "accidentally overfired pieces of Tabirá" (Hayes et al 1981: 102). In addition, Salinas Red bowls generally have Glaze E- and F-type rim forms. As a result, reasonably secure distinctions between late glaze types and Salinas Red often can only be made if larger vessel fragments are available (Hayes et al. 101-102).

The name Salinas Red was first applied to plain redwares found at Abó (Hayes et al. 1981: 101). In the seven excavated mission proveniences, Salinas Red material made up between 21.4 and 62.7% of the ceramic sample. Only culinary wares were more numerous (Toulouse 1949: 14, 21). The limited Mound I test contained several redware sherds (Dutton 1981: 184, 186), as did tests in Mounds B (Dutton 1985: 101-102) and J (Baldwin n.d. a: 7-8). At the nearby Tiwa pueblo of Quarai, 42% of the sherds found in the Nuestra Señora de la Concepción mission were Salinas Red, while a sample from one of the pueblo's room blocks contained 19% Salinas Red (Hayes et al. 1981: 101). In the Jumano pueblos, Salinas Redwares occur much less frequently. At Las Humanas, the only Salinas Red material recovered during the San Isidro/Mound 10 excavations came from the mound proper. The sample amounted to 4.8% of the Mound 10 ceramic total, and 1.6% of ceramics (including culinary wares) of all proveniences (Vivian 1964: 109-110). At Mound 7, 422 Salinas Red sherds were identified, though the excavators caution that not all sherds could "be separated from undecorated sections of one of the glazes unless a fairly large piece was in hand" (Hayes et al. 1981: 101).

As for formal patterns, most redware bowl rims resemble Glaze F rims. This suggests significant temporal overlap with the latest glaze types, and further supports the late affiliation suggested by stratigraphic position. Petrographic analysis of Salinas Redwares from Las Humanas has also revealed close matches with tempering material used in Glaze F material (Warren 1981b: 70). As with Tabirá Black-on-white, however, chronologically even more suggestive are forms that show Spanish influences (see below). At Abó, soup plates, cups, and candlesticks were present in the mission assemblage (Toulouse 1949: 14-16). Salinas Red soup plates were part of the Mound I assemblage together with Glaze F and Tabirá specimens (Dutton 1981: 186), while the Mound J test contained soup-plate fragments in association with iron and copper fragments, a glass bead, and a mayólica sherd (Baldwin n.d. a: 7-8). At Las Humanas, the distribution of Salinas Red forms varied by provenience. In the Mound 10 sample, the only forms present were jars and bowls sherds, a limited spectrum compared to the Abó material (Vivian 1964: 109-110). In the Mound 7 sample, redwares turned out as variable as the Abó redwares or the local Tabirá sample, including the Spanish-influenced forms. But unlike the Tabirá material, which was dominated by jars/canteens, Salinas Red forms were mostly small bowls and soup plates. Jars were rare, and cups, pitchers, or candlesticks even rarer (Hayes et al. 1981: 101).

In the Piro area, Salinas Red specimens are known especially from Sevilleta (LA 774). Marshall and Walt's (1984, App. 1, Table 7) tabulation of surface ceramics does not include sherds identified as Salinas Red, but in their brief site description they state that the Sevilleta assemblage "includes a great quantity of the plain, red-slipped vessels which are commonly called Salinas redware" (Marshall and Walt 1984: 205-207). Their sample of illustrated rim forms includes 34 Salinas Red sherds, 21 from bowls, 13 from jars (Table 4.4) (Marshall and Walt 1984: 206). Other than Sevilleta, Piro sites with Salinas Red material are Las Huertas Pueblo, the Gold Station site and, possibly, Las Cañas Pueblo and Estancia Acomilla (Oakes 1986: 95-98; Earls 1987: 73).

At Bear Mountain Pueblo, testing and surface collecting produced a number of unspecified redware sherds (Davis and Winkler 1960). Except slip color, no attributes of these sherds are known (see Chapter 5). At Las Huertas, six Salinas Red sherds were identified, yet the vast majority (87%) of non-culinary sherds are labeled "Historic Plain"

(Earls 1987: 72-73). Some of these plainware sherds could represent undecorated variants or fragments of Glaze F, Tabirá, or Salinas Red specimens. There, too, is a possibility that the Bear Mountain and Las Huertas sherds represent a local colonial-period plainware complex. At Valencia Pueblo (LA 953) in the Tiwa area, for instance, Isleta Red-on-tan, a partially red-slipped plainware made at Isleta and dated vaguely to the 18th- and 19th-centuries, was found in quantity (*n*=250, 5.2% of all identified rim sherds). Isleta Red-on-tan slip colors (which range from medium dark red to orange and magenta) and form spectrum (which includes Spanish soup plates) are somewhat reminiscent of Salinas Red. Such attribute overlap and reported associations with Glaze F sherds could indicate a start date of c. 1650 for Isleta Red-on-tan (Franklin 1997: 146-156). At colonial sites further north, redwares have been found with mayólica and late glaze and non-glaze ceramics, including Spanish forms (Warren 1979). While overall post-contact ceramics still offer a fair share of research challenges, the bulk of red- and other plainwares are clearly products of the 17th and 18th centuries, similar, it seems, to the "colonowares" which appear in the circum-Caribbean during the same period (Penman 2002; cf. Deagan 1987: 103-105; Crane 1993; Singleton and Bograd 2000; Davidson 2004). For the Piro area, this raises the question of whether the Bear Mountain and Las Huertas plainware assemblages might not be local examples of early red-/ plainware production in the Piro area. Such a development would have been truncated by the dissolution of the last Piro settlements in the years after the Pueblo Revolt.

At least some of the Las Huertas sherds could also come from the post-1800 Hispanic reoccupation of the Socorro area. While 19th-century structures are not apparent at the site, the name "Las Huertas" suggests that the adjacent Rio Grande floodplain was then used for farming. Whether this could have involved use of the site area is not known, but even with this scenario the overall sample proportion of the plainware material seems high. Unfortunately, the Las Huertas sherds are not described in detail and there is no clear record of provenience in the site report (cf. Earls 1987). As there are no other data on possible 17th-century Piro plainwares, and only a few brief descriptions of plainwares found on 19th-century sites, the issue cannot be resolved (see Chapter 5).

Foreign Ceramics

Spanish/Spanish-colonial ceramics like mayólica and porcelain, and vessel forms, are the most obvious indicators of colonial-period affiliation of ceramic assemblages. Spanish forms are best represented at mission sites, and range from plates and platters to cups, chalices, and candlesticks (Fig. 4.5) (Kidder and Shepard 1936: 287-290; Lambert 1981: 224-228; Hayes et al. 1981: 80-82, 101-102; Penman 2002). Some forms (pitchers, cups) were part of the Pueblo II/III ceramic spectrum on the Colorado Plateau, but uncommon in pre-contact pottery of the Rio Grande area (cf. Breternitz et al. 1974; Lister and Lister 1978; Wilson and Blinman 1995; Hays-Gilpin and van Hartesveldt 1998). A good example of the colonial form expansion is Tabirá Black-on-white. Spanish forms occur most often in the late (post-1625 and post-1650) varieties Tabirá Plain and (less frequently) Polychrome. In the early (post-1545) Black-on-white variety, the forms are absent, while in classic (post-1600) Black-on-white they seem to be relatively rare (Hayes et al. 1981: 73-83; cf. Wiseman 1985).

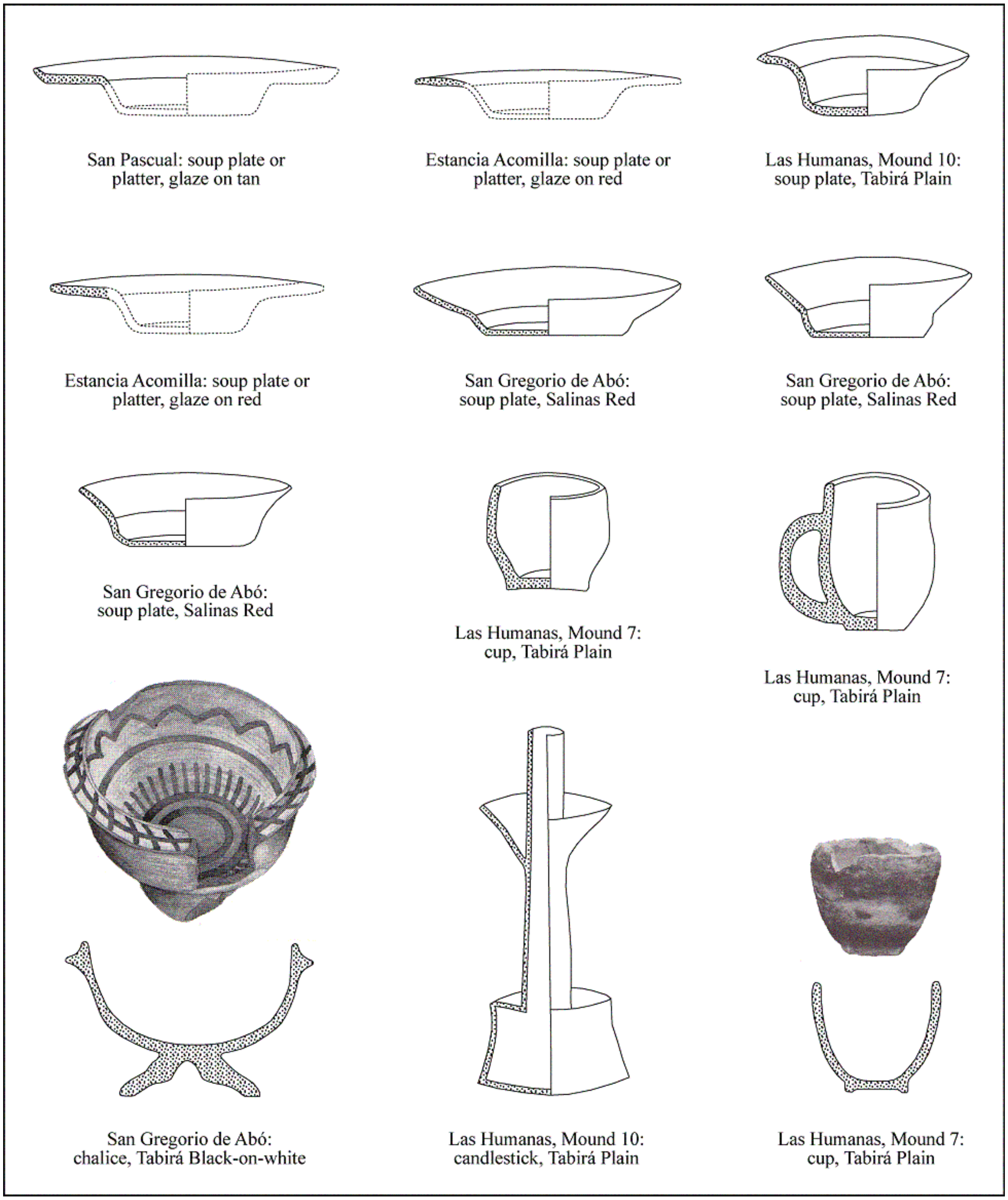

Fig. 4.5. Spanish vessel forms from the Piro and Salinas areas (no scale, redrawn from Marshall and Walt 1984, Figs. 9.47, 9.71, Toulouse 1949, Figs 12, 23; Vivian 1964, Fig. 38; Hayes et al. 1981, Figs. 107, 108).

Spanish forms reported from Piro-area sites are fragments of glazeware soup plates or platters from Sevilleta, Estancia Acomilla, Qualacú, and San Pascual (Fig. 4.5, Table 4.4). Without a broader record of Ancestral/Colonial Piro ceramics it is difficult to examine both timing and process in the native adoption of new vessel forms. Nor are there any documentary references to the role of form and style in native pottery production. As fragments of Puebloan-made Spanish vessels have been found on mission and *estancia* sites throughout New Mexico, it was most likely demand from missionaries and settlers that pushed integration of the new forms (Lambert 1981; Snow 1984).

Lack of evidence for a Hispanic pottery-producing tradition in 17th-century New Mexico also suggests that native adoption of foreign ceramic forms was mainly a result of external demand (Wiseman 1988; Carrillo 1997: 46-49; Trigg 2005: 130-133). It is possible that functional or symbolic aspects generated some interest in the new forms among the Pueblos (Penman 2002). Data with which to evaluate rate of acceptance by comparing assemblages from pueblos exposed differently to Spanish influence (i.e. mission vs. non-mission pueblos) are few, however. The recorded distribution of Spanish vessel forms on Puebloan sites concentrates on mission pueblos, and one can probably assume that native potters started making Spanish-style vessels only after some sort of regular contact with the newcomers had been established. For most Pueblos, such contacts would have come with the presence in their villages of missionaries, or, outside, of settlers and civil officials. In need of a stable pottery supply, both missionaries and settlers presumably actively encouraged production of vessels types that would reflect their own ceramic traditions (cf. Lambert 1981: 224).

Historical and archaeological data suggest that many, if not most, of the new shapes and traits that Puebloan potters incorporated into their repertoires were from vessels that the Spaniards brought with them (Pierce 2003: 263-266). Though the documents are not much help in determining the kind of pottery that made it to New Mexico during the 17th century (cf. Carrillo 1997: 49), there are a few references to tin-enameled Spanish-Mexican earthenware (mayólica) and Asian porcelain. The material evidence is more informative, especially on the spatial distribution of mayólica (cf. Lister and Lister 1976). Of Near/Middle Eastern origins (Caiger-Smith 1973; Watson 1985; Hill 2006), mayólica[2] became part of Iberian pottery tradition during the Muslim period in southern Spain (Goggin 1968; Lister and Lister 1987, 2001; Pleguezuelo 2003a). In New Spain, it was first produced around Mexico City. By the late 1500s, as historical, stylistic, and compositional analyses show, mayólica was also being made at Puebla de los Angeles. In the 17th century, Puebla became a hub of production (Lister and Lister 1976: 114-116, 2001: 79-87; Fournier and Charlton 1999; Monroy-Guzmán and Fournier 2003; Gámez Martínez 2003). Archaeologically, definitions and dating of mayólica wares are based largely on research at 16th-/17th-century sites in Florida, Mexico, and the Caribbean (e.g. Goggin 1968; Deagan 1972; 1985; 1987; Milanich and Fairbanks 1980).

Early colonial mayólica found in New Mexico ranges in coloration from plain white or off-white and cream to blue-on-white, blue-on-cream, and polychrome (Lister and Lister 1976). Stylistic attributes are varied and include rim bands, floral or animal designs, ring bases, and pendant elements. Some early allusions to Spanish pottery are in the inventories of the Oñate expedition (Hammond and Rey 1953, 1), but tablewares are

[2] For etymological reasons, I use the spelling “mayólica” rather than “majólica” (cf. Gavin 2003: 1-2).

not mentioned. Even so, the initial Spanish settlement at San Gabriel on the junction of Rio Chama and Rio Grande has yielded mayólica sherds. These have been identified mostly as Fig Springs Polychrome, a *loza fina* (fine ware) produced around Mexico City from c. 1540 to 1650 (Fig. 4.6) (Goggin 1968: 151-154; Deagan 1972, 1987: 74; Lister and Lister 1976: 120-124, 132).

The chief characteristic of 17th-century New Mexican mayólica samples is small sample size (Levine 1995: 66; Penman 2002). Fine wares in particular were objects that few settlers would be able to acquire. That a good number of mayólica sherds come from the provincial capital Santa Fe seems to reflect the better socioeconomic standing of at least some of the people residing in the only "quasi-urban" Spanish settlement in New Mexico (Snow 1993, 2005; Trigg 2005: 118-119, 200-204). Outside Santa Fe, finds of mayólica are limited (Plowden 1958; Lister and Lister 1976; Penman 2002; Snow 2005). Nearer the Piro area, the Mound 7 excavations at Las Humanas produced 20 fragments, scattered, apparently, across the mound's 11 late-phase room blocks (Hayes et al. 1981: 103, 159). No mayólica is reported for the San Isidro/Mound 10 excavations (Vivian 1964). At Pueblo Blanco/Tabirá, five sherds were picked up from surface and midden areas in the late 1950s (Wilson et al. 1983: 137-139). At Abó, clearing of the mission revealed both vessels and sherds (Toulouse 1949: 21). Though there are no references to mayólica from the tests in Mounds B and I (Dutton 1981, 1985), a room in Mound J yielded one unspecified fragment (Baldwin n.d. a: 8). Finally, work in both the mission and pueblo of Quarai in the 1930s produced three dozen sherds of probable 16th-/17th-century manufacture (Hurt 1990: 120-124; Penman 2002: 147-151; cf. Senter 1934; Ely 1935; Reed 1939; Ivey 1988: 320-328).

Fig. 4.6. Sample vessels of mayólica series represented in 17th-century Salinas-area assemblages: 1 – Fig Springs Polychrome, 2 – San Luis Blue-on-white, 3 – Puebla Blue-on-white, 4 – Puebla Polychrome, 5 – Abó Polychrome (vessels are, in order, Figs. 10.1, 10.8, 10.7, 10.2, 10.3 in Gámez Martínez 2003).[3]

[3] Vessels 1 and 2 are in the Museum of Indian Arts and Culture, Santa Fe, New Mexico; 3 is in the Museo Franz Mayer, Mexico City; 4 in the Metropolitan Museum of Art, New York City; and 5 in the Museo José Luis Bello y González, Mexico City.

The historically recorded abandonment of the Salinas pueblos again makes these data valuable for potential comparison with Piro assemblages. Identified Salinas-area sherds are from series that begin in the 16th or run into the 18th century (Fig. 4.6). Fig Springs Polychrome was found at Quarai, as was San Luis Blue-on-white (and a related series, Tallahassee Blue-on-white), another 16th-/17th-century *loza fina* from Mexico City (Hurt 1990: 121-124). The Abó and Las Humanas samples also included San Luis Blue-on-white. Present at all four pueblos were sherds of Puebla Blue-on-white. Produced from c. 1650/75 to 1800 at, it seems, both Mexico City and Puebla, the Puebla Blue-on-white series subsumes a variety of formal patterns in *loza fina* and *entrefina* (Goggin 1968: 190-195; Lister and Lister 1976, 1982; Deagan 1987: 83-85; Gámez Martínez 2003; Monroy-Guzmán and Fournier 2003). Among the five Pueblo Blanco sherds was also a fragment from a Puebla Polychrome vessel (Wilson et al. 1983: 137-139). Puebla Polychrome is a 17th-/early 18th-century series, but neither beginning nor end of its production run are well established (Goggin 1968: 180; Lister and Lister 1976: 132). A fifth series, Abó Polychrome, was found at Abó and Quarai. With production again perhaps split between Mexico City and Puebla, Abó Polychrome chronologically seems to match Puebla Polychrome. Beginning and end dates are also unclear, however. In general, long run times and imprecise bracket dates reduce the diagnostic value of all these wares. It is also likely that in frontier contexts use lives of individual types were quite different than in the core areas of New Spain (Plowden 1958; Snow 1965; Goggin 1968; Lister and Lister 1976, 2001; Penman 2002). But despite these caveats, the historical circumstances of its circulation in New Mexico sufficiently outline the value of mayólica as a material marker of colonial-period affiliation.

For the Piro area proper, reported finds of mayólica scarcely amount to a handful of sherds. Given the lack of fieldwork and the loss of three of the four known mission sites, this is perhaps to be expected. Plain white, San Luis Blue-on-white/cream, and unspecified sherds have been seen at Sevilleta, Estancia Acomilla, and San Pascual (Table 4.4) (Marshall and Walt 1984: 142, App. 1, Table 7). A tentative identification is that of an unrecorded Columbia Plain sherd found on a possible 17th-century smelting site near Socorro (Robert H. Weber, personal communication, January 7, 2004). Columbia Plain is a common import ware on 16th- and 17th-century sites in the Spanish Americas. It was produced in Sevilla from c. 1490s to 1650. Archaeologists recognize an early, pre-1550, and a late, post-1550, style (Goggin 1968 120-122; Deagan 1987: 56-58). While the description of the Socorro fragment does not allow for more precise identification, the local historical context suggests a late-style specimen.

Besides mayólica, porcelain is also a potential ceramic marker of post-contact Piro assemblages. With the Spanish conquest of the Philippines and the establishment in the late 1560s of regular Manila-Acapulco shipping, Chinese porcelain came to New Spain in large quantities. A hot commodity in Europe, most porcelain was transshipped, but some remained for domestic use and trade (Deegan 1987: 96-97; Pleguezuelo 2003b: 109-110; cf. Mudge 1986; Kuwayama 1997, 2001; Jörg 1997; Barraca de Ramos 2000). The bulk of porcelain found in 16th- and 17th-century shipwrecks and in the ports and trade centers of Mexico and the Caribbean originated in Ming- and (after c. 1650) Qing-period eastern China. Main series are Ming Blue-and-white, Polychrome, and Qing (Ch'ing) Blue-and-white (McElney 1979; Carswell 1985; Mudge 1986; Deagan 1987; Kuwayama 1997, 2001). Vessels in these series were high-end items among Spanish

American ceramics and considered well worth the exchange for silver from New Spain and Peru. Another mark of the standing of porcelain was the imitation of color and design elements on 17th-century Puebla Blue-on-white mayólica wares (Brew 1949b: 94-95; Snow 1993: 71-73; Gavin 2003: 5-9).

As with mayólica, specimens of 16th-/17th-century porcelain cluster at San Gabriel and, especially, Santa Fe (Snow 1993: 71-73). Beyond these places, there are only traces at mission and *estancia* sites (Trigg 2005: 107). At the Hopi mission of San Bernardo de Awatovi (in operation from 1629 to 1680), for instance, three porcelain fragments were unearthed in five seasons of excavations. Two sherds were identified as Qing Blue-and-white wares, produced probably after 1662 at King-te-chen (Jingdezhen) (Brew 1949b: 94-95), then the main center of porcelain manufacture in Kiangsi (Jiangxi) province (Joseph 1979: 27). Porcelain fragments have been found at all Salinas mission pueblos (Hayes et al. 1981: 103; Hurt 1990: 124-126). For Pueblo Blanco/Tabirá, five sherds of "inexpensive blue-on-white Chinese export porcelain" are on record (Wilson et al. 1983: 139-140, Fig. 18). These sherds may be Ming-period *kraak* porcelain, an export ware of lesser quality which too seems to have been produced at King-te-chen (McElney 1979: 34-36; Deegan 1987: 98-99; Snow 1993: 73). At the mission of San Gregorio de Abó, a number of King-te-chen sherds, plus two jar fragments of a kind made in Shantung (Shandong) province, were recovered (Toulouse 1949: 21). Coming from one vessel and one provenience, midden fill re-deposited in a kiva, the Abó sherds appear to pre-date those at Awatovi. Historical and archaeological context suggest that arrival, use, and discard of the vessel, as well as re-depositioning of the sherds, occurred during Abó's early mission period, i.e. between c. 1622 and 1650 (Ivey 1988: 309-310).

There is no record of early colonial porcelain at sites in the Piro area. At a number of post-1800 Hispanic settlements, porcelain sherds can be observed on the surface, but all are of wares produced in the 19th and early 20th centuries (Marshall and Walt 1984: 289-306, App. 1, Tables 7 and 16). This is also true of specimens seen on vacant/abandoned lots in Socorro, San Antonio, or Lemitar. No sherds have so far been reported from the 17th-century mission and pueblo of Sevilleta (LA 774), but the site has not yet been subjected to systematic survey, let alone test excavations (see Chapter 5).

A brief look at a third marker ceramic from sites outside the Piro area concludes this section. Used for liquids, olive jars were part of a transport technology whose roots lay in ancient Mediterranean commerce (Goggin 1960: 3-5). Ubiquitous aboard ships and in ports and towns along trade routes, the jars are found frequently in archaeological investigations of ship wrecks and trading entrepôts (Goggin 1960: 6; Deagan 1987: 31-32; e.g. Martin 1979; Ewen 1991; Avery 1997; Smith 1999). Archaeologists identify three basic styles. Early jars (globular, walls less than 10 mm thick, often white-slipped on the outside and with greenish lead glaze on the inside, flared necks, handles) (Fig. 4.7) were common between 1500 and 1575. Middle-style jars (ovoid with rounded base, walls 10 to 12 mm thick, glazed on one/both sides, glaze colors green to "gunmetal" blue, "doughnut ring" neck, no handles) date from c. 1560 to 1800. Variability in size/shape translates into definition of at least four sub-series within this style. Late-style jars (various shapes with elongated/pointed base, walls 7 to 10 mm thick, wide ring neck, no handles) are 19th-century objects and thus fall outside the period of interest here (Goggin 1960: 11-21; Deagan 1987: 31-35; Marken 1994; Avery 1997).

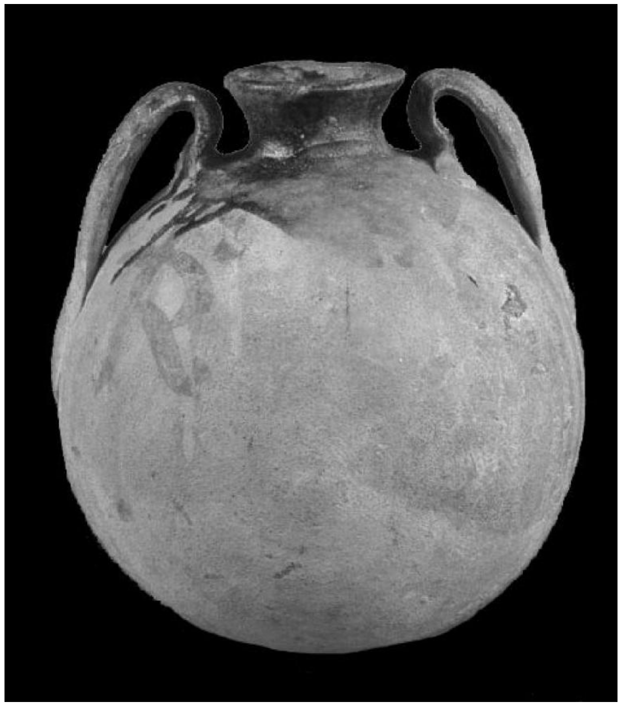

Fig. 4.7. Early-style olive jar, partly white slipped, with green glaze on the inside and over lip, neck, and upper handles (jar is in the Historical Archaeology Collection, Florida Museum of Natural History, Gainesville).[4]

A likely reference to olive jars relating to New Mexico's colonization is in the final inspection of the Oñate expedition, carried out in the winter of 1597/98. One line in Oñate's personal inventory lists 15 "jugs" with oil, each sealed and with a capacity of half an *arroba* (c. eight liters or 8.5 quarts) (Hammond and Rey 1953, 1: 219).[5] As a basic transport container, olive jars probably entered New Mexico in some quantity. At present, however, they do not seem to occur in appreciably larger quantities in pre-Pueblo

[4] Photo by Dana Leibsohn and Barbara Mundy, 2005, *Vistas: Spanish American Visual Culture, 1520-1820* (http://www.smith.edu/vistas).

[5] Salazar inspection of the Oñate expedition, river of San Gerónimo, December 23, 1597. Transport jars are also listed in the inventories of the reinforcements that went to New Mexico in early 1600 (e.g. Hammond and Rey 1953, 1: 525-526, 539).

Revolt assemblages than mayólica or porcelain. Like the latter, olive jar sherds have been found at San Gabriel, Santa Fe, and various *estancia* and mission sites (Trigg 2005: 80). While excavations in the Salinas area have yielded a few olive jar fragments (e.g. Toulouse 1949: 21; Hayes et al. 1981: 103), there is as yet no record of such vessels in early colonial contexts in the Piro area. The only possible olive jar fragments that I have seen were on 19th-century sites east and south of Socorro.

To some extent, the low occurrence of imported ceramics on sites like the Salinas mission pueblos may be attributed to the limited scale of research at these sites and lack of coherent documentation of early excavations. At the same time, colonial documents give no reason to believe that such ceramics ever made it to New Mexico in more than token numbers. That Santa Fe was the main destination and its residents the principal users of imported ceramics has already been mentioned, but even Santa Fe's residents relied heavily on Puebloan potters (Snow 1984; Wiseman 1988, 1992; Penman 2002) and local inventories of mayólica and porcelain were no doubt low when compared to towns closer to the population and trading centers of New Spain. A comparison of ceramic assemblages from six 17th-century *estancia* sites in the Santa Fe area reveals some striking trends in the distribution of Puebloan versus foreign ceramics. At none of the sites did Puebloan wares constitute less than 96% of the recorded ceramic sample. The highest proportion of mayólica sherds was 3.4%. For the six sites combined, only one specimen of porcelain is listed (Trigg 2005: 140-142, Table 6.2).

Observations at sites in old Spanish La Florida (Florida, plus coastal Georgia and South Carolina) back up the quantitative picture emerging from these data. Ceramic samples from several 16th- and 17th-century La Florida missions generally have ratios of native ceramics to Spanish/Spanish-colonial ceramics on the order of nine to one or higher (Deagan 1972; Loucks 1979, 1993; Thomas 1987, 1988, 1993; Hann 1990, 1996; McEwan 1991, 1992, 1993; Weisman 1992; Bushnell 1994). At the Fig Springs site in northern Florida, for example, a sample of 5,451 provenienced sherds contained 5,237 or 96.1% from native wares. Fig Springs is the type site for the Fig Springs Polychrome mayólica series (cf. Goggin 1968) and likely location of the 17th-century mission of San Martín de Timucua (Weisman 1992: 36). The remaining 214 sherds included 157 middle-style olive jar and 57 mayólica sherds (10 series/types were identified). Although surveyed/excavated areas revealed no clear differences in the distribution of Spanish ceramics, native types clustered in structures identified as native Timucuan. In a sample of unprovenienced sherds curated at the Florida Museum of Natural History, native sherds made up 79.6% (*n*=3,373), olive jars 14% (*n*=594), and mayólica 6.4% (*n*=272) of a total of 4,239 sherds. Neither this nor the survey/excavation sample contained fragments of porcelain (Weisman 1992: 117-140, 171-172).

Non-Ceramic Artifacts

While largely silent on the complex of imported ceramics and ceramic forms, contact- and colonial-period documents offer some details on the variety of non-ceramic objects that appeared in New Mexico during the 17th century. Archaeological finds confirm the wide assortment of these objects (Trigg 2005). Ranging from the smallest items of personal use to tools and weapons to mission architecture, the diversity of New Mexico's early colonial material record fits in well with historically and archaeologically recorded material samples from other areas of Spanish America (cf. Kubler 1940; Deagan 1987;

Deagan and Cruxent 2002; South et al. 1988; Gasparini 1997). Amid this inventory of chronologically relevant objects, I focus here on three of the better-documented categories: metal, plant and animal domesticates, and architectural features.

Perhaps the most obvious markers of post-contact sites in New Mexico are iron, brass, and copper objects (Vierra 1989: 142-143, 1992: 172; Levine 1995: 65-66; cf. Simmons and Turley 1980). In parts of Mesoamerica, "soft" metals (copper and various copper-based alloys, silver, gold) had been worked before contact, but not iron (Pendergast 1962; Hosler 1988, 1995). In the Pueblo area, the only metal exploited at some scale before contact was lead, popular after c. 1300 as glaze-decoration of ceramics (Weber 1999: 201-202; Ramenofsky and Vaughan 2003; Habicht-Mauche et al. 2000, 2002). As for "Spanish" metals, accounts of the expeditions of the 1580s show that the utility of iron was immediately evident to the Piros. Since the expeditions were generally willing to trade or give as gifts machetes, axes, and "various trinkets" (Hammond and Rey 1966: 142, 1953, 1: 220-221),[6] the Piros may have obtained metal objects early on. Occasionally, they seem to have accelerated the transfer. In February 1583, a member of the Espejo-Beltrán party noted that the natives "covet iron very much and whenever they can steal some they do not postpone it till the next day" (Hammond and Rey 1966: 173).[7] As trade items go, metal objects had a continent-wide appeal. Through traditional networks, even remote groups could acquire iron or brass implements long before they set eyes on the first European (Simmons and Turley 1980: 36-40; Richter 2001: 41-47).

[6] Hernán Gallegos, Relation of the Chamuscado-Rodríguez expedition, 1581/82; Salazar inspection of the Oñate expedition, river of San Gerónimo, December 22, 1597.
[7] Diego Pérez de Luján, Account of the Espejo expedition, 1582/83.

The oft-referenced inventories of the Oñate colonization contain detailed listings of metal items introduced to New Mexico. Listed are far in excess of 100,000 nails of all sizes, thousands of weapons, pieces of armor, tools, horseshoes, and many other kinds of objects (Hammond and Rey 1953, 1: 215-289, 522-557; Simmons and Turley 1980: 23-29). Notwithstanding these figures, neither this material, nor equipment brought by later supply caravans, represented much of a hardware market (Simmons and Turley 1980: 31; Wilson et al. 1983: 132-133; Levine 1995: 65; Trigg 2005: 166-177). All through the colonial period, 18th and early 19th centuries included, iron and iron objects were seldom widely available. With long periods between re-supply and no local iron production, lags in supply could cause severe shortages. As a result, few iron objects seem to have been discarded without being (re)cycled through a variety of uses. Clusters of stone tools and reduction debris at some *estancia* sites also suggest that lack of iron set off a kind of technological retrogression in parts of the Spanish camp (Chapman et al. 1977; Rudecoff and Carrillo 1987; Moore 1992). To what extent 17th-century settlers fell back on lithic technology can only be guessed at, however. The known sources say little about material inventories of contemporary *estancia* households. At least as weapons are concerned, muster records from the years of the Pueblo Revolt show that the settlers maintained a basic stock of guns, swords, and other steel/iron weapons throughout the early colonial period (Simmons and Turley 1980: 25-26; cf. Hackett and Shelby 1942; Kessell 1989; Kessell et al. 1992, 1995).

Similar to mayólica or porcelain, metal artifacts are absolute temporal markers in that they denote a general post-contact context. More so than ceramics, however, they are often difficult to place within specific time frames. This is due to the variety in the overall artifact base and lack of discernible change in artifact traits, and to problems in assessing artifact use life. Three examples, from the rare to the relatively common, help illustrate these issues. Accounts of the early Spanish conquests in the Caribbean and on the American mainland mention both firearms and crossbows, but in the late 1500s references to the latter cease (Salas 1950: 203). Crossbows are recorded for Coronado's expedition of 1540-42, but not for the next expeditions that reached New Mexico, the Rodríguez-Chamuscado and Espejo-Beltrán parties of the early 1580s (Vierra 1989: 141; Hordes 1992: 163). Finds of crossbow bolt-heads in the Zuni and Tiwa areas, at Pecos Pueblo, and on the southern Plains thus have a very narrow temporal connotation (Ellis 1957; Gagné 2003: 240-242; Brecheisen 2003: 263). In this context, a copper tip said to have been lodged in a human sternum at Santiago Pueblo (LA 326) (Tichy 1939: 145-146) may be evidence for the use of crossbows in Coronado's attacks on several Rio Grande Tiwa pueblos in the winter of 1540/41 (Vierra 1989: 12; Gagné 2003).

References to forays into Piro territory by members of Coronado's army are very vague. Lack of a clear record suggests that any forays, if they occurred, were minor in scale (Chapter 6). Possible physical evidence is an iron crossbow bolt-head found south of Socorro. With a solid pyramidal tip and a tang twice as long as the tip (Fig. 4.8), it resembles 15th-/16th-century European armor-piercing *cuadrillos*, but compared to other bolt-heads from New Mexico and adjacent areas it is unusual. In a sample of 41 bolt-heads analyzed recently, 13 were of sheet and 28 of solid copper. All were socketed. Some were similar enough to suggest a single maker (Gagné 2003: 245-252), but how representative the heads are of Coronado's arsenal of bolts is unknown. Given its morphology and the fact that it was found on the *camino real*, the Piro-area bolt-head could reflect (limited) use of crossbows by one of the expeditions of the late 1500s. Interestingly, bolt-heads and what may have been crossbow fragments have been reported from Comanche Springs (LA 14904), a small site near Belén dated to the 17th century (Hibben et al. 1985; cf. Vierra 1989, Table 27; Penman 2002: 176-178).

Also part of the Comanche Springs assemblage is a military item for which the temporal context is more diffuse: chain-mail. Spaniards in central Mexico early on began using native cotton-quilted vests that offered sufficient protection against native weapons and were readily available (Salas 1950: 250-257). A long war with Chichimec groups in the basin-and-range country of northern Mexico brought a further decline in the use of mail after 1550. Sources of the time describe how Chichimec arrows would go through all but the tightest woven *cotas de malla* (mail shirts), and suggest that multi-layered leather armor was generally more reliable than chain-mail (Powell 1952: 47-49).

Fig. 4.8. Iron *cuadrillo*-type crossbow bolt-head from the *camino real* south of Socorro (penny for scale) (M. Bletzer, 6/2001, from the collection of Robert H. Weber).

The muster roll of the Coronado expedition shows that most of the Spanish rank-and-file, like the expedition's many allies from central and western Mexico, used cotton-quilted armor (Salas 1950: 255; Flint 2003: 74-76, Fig. 4.4). References to mail can be found in the records of all 16th-century expeditions, however. Oñate's colonists brought a large stock of leather armor for themselves and their horses, but many men also declared chain-mail *cotas* and *jacos* (short vests) (Hammond and Rey 1953, 1: 150-168, 226-286, 522-557). Throughout the 17th century, *cotas*, *jacos*, and perhaps *quijotes* (cuisses) *de malla* apparently remained in use, even as leather armor became prevalent (cf. Salas 1950: 246-248; Johnson 1992).

Chain-mail has been collected from a number of sites in New Mexico and the southern Plains (Wedel 1975; Simmons and Turley 1980: 26; Vierra 1989, Table 27). At Pueblo Blanco/Tabirá in the Salinas area, a badly corroded clump of interlinked iron-wire rings probably came off a mail shirt or vest (Wilson et al. 1983: 129-131). In worse shape was a possible fragment found at pre-contact Pottery Mound Pueblo (LA 416) on the Rio Puerco (Ellis 1955). Aside from Comanche Springs, Pottery Mound and Pueblo Blanco are so far the sites closest to the Piro area to yield chain-mail. No mail fragments were uncovered in the excavations preceding the Plaza Montoya project, nor am I aware of any surface finds at Ancestral/Colonial Piro sites. On the other hand, mail has been found near Socorro at the same site that produced evidence of metalworking and the Columbia Plain sherd mentioned earlier (Robert H. Weber, personal communication, January 7, 2004). In addition, more than a dozen iron links have been picked up along the *camino real* south of Socorro. Originally, these links appear to have been riveted, but as found none were still connected (Fig. 4.9).

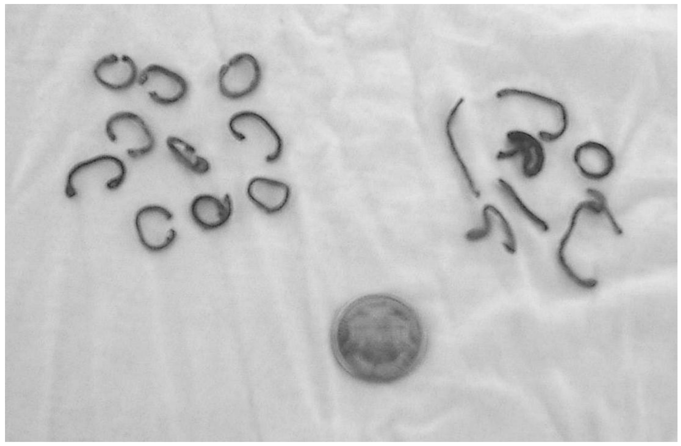

Fig. 4.9. Chain-mail links from the *camino real* south of Socorro (penny for scale) (M. Bletzer, 6/2001, from the collection of Robert H. Weber).

There is no evidence that regular troops or local militias used any protective gear other than leather armor after 1700 (Salas 1950: 246-247; Brinckerhoff and Chamberlain 1972; Hotz 1991). A few contemporary sources indicate that by this time chain-mail was a prized possession among some leaders of Plains Indian groups such as the Comanches, but distribution appears to have been restricted to a few heirloom pieces (Wilson et al. 1983: 131). While there may be exceptions, most chain-mail fragments found in New Mexico thus probably entered the archaeological record during the roughly 80 years between Oñate's colonizing expedition and the Pueblo Revolt of 1680.

In contrast to mail or crossbow bolt-heads, the most generic type of colonial hardware, nails, is only broadly useful for assessing temporal context of archaeological assemblages. Nails also denote post-contact affiliation, but their interpretive value is limited due to a manufacturing process that underwent few changes throughout the colonial period (cf. Lyon 1988). In the Spanish colonies, nails were hand-forged, not cut or stamped, until well into the 19th century. Nails found on the same site can differ widely in appearance, with head shapes ranging from round to oval to oblong, with flat to convex surfaces, and mostly square to rectangular shanks that may or may not be centered (Simmons and Turley 1980: 150). To some extent, this morphological variety no doubt reflects functional characteristics. Contemporary supply lists and hardware inventories often describe nails only by length and weight, but there are occasional references to usage, such as nails for shoeing horses or for carpentry, or decorative nails for mission doors (Simmons and Turley 1980: 62-66, 150; Ivey 1988: 39-40; e.g. Scholes 1930, 1: 103-104; Hammond and Rey 1953, 1: 226-286).

Archaeological inventories of nails from New Mexican and other southwestern sites (Vierra 1989: 131-141, Tables 27, 28), as well as from southeastern sites (e.g. South et al. 1988; Lyon 1988; Weisman 1992: 110-117; McEwan 1992), reveal something of the variety of nails and spikes used in the frontier provinces of New Mexico and La Florida. In New Mexico, nails are the most common non-native artifacts found at contact-/colonial-period sites. In length, they range from c. two centimeters to spikes 10 cm long and more. Corrosion and fragmentation often make it difficult to document basic attributes like diameter and shape of head, or length and width of shank (Simmons and Turley 1980: 150; Vierra 1989: 131-134, 138-141).

Despite their widespread occurrence, nails are seldom found in large numbers (Wilson et al. 1983: 131-133). At Las Humanas, excavation of the more than 200 rooms of Mound 7 produced all of 56 metal objects. Just three of these could be definitely identified as nails, and only the largest, a spike 13.3 cm long, was complete (Hayes et al. 1981: 166). Seven metal objects but no nails came from the excavation of the church of

San Isidro and the 37 Mound 10 rooms (Vivian 1964: 136). With the exception of the Abó mission, work at the other Salinas missions and mission pueblos also produced few nails (cf. Toulouse 1949; Toulouse and Stevenson 1960; Wilson et al. 1983; Dutton 1981, 1985; Hurt 1990). In the Piro area, nails have been found at Plaza Montoya (see Chapters 8 and 9), but other than that I know only of a few nails from the Piro section of the *camino real.* Most notable among the latter is a huge (length and max. width of shank 22.8 and 2.1 cm) square-shanked, hand-forged, spike (Fig. 4.10). Judging by its size, this may have been a hanger intended for heavy objects, such as a large door or gate.

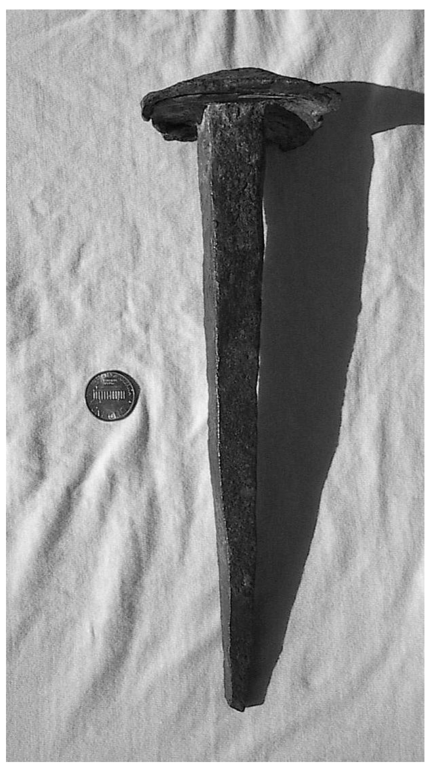

Fig. 4.10. Iron spike from the *camino real* south of Socorro (penny for scale) (M. Bletzer, 6/2001, from the collection of Robert H. Weber).

Prior to work at Plaza Montoya, only three metal objects, two (perhaps intrusive) iron fragments and a copper bead from Las Huertas (Earls 1987: 58, 60), had been found in sub-surface contexts in the Piro area. Neither testing at Bear Mountain, Pargas, or the Gold Station site, nor the channel stabilization at Qualacú produced any metal (Davis and Winkler 1960; Oakes 1986; Marshall 1986, 1987). Also absent from nearly all excavated proveniences were remains of non-native plants and animals. As elsewhere in Spanish America, missionaries and settlers in New Mexico kept horses and livestock and planted Old World cereals, above all wheat (Wozniak 1995: 29-30; Trigg 2005: 76, 128-129; cf. Lopinot 1986; Ford 1987). In New Spain in the years after 1550, farms and ranches had spread north with the silver-mining frontier. In some areas, the combination of mining and agriculture fostered the rise of ranching estates with herds comprising tens of thousands head of cattle and sheep (Mecham 1927: 208-221; Morrisey 1951, 1957; Chevalier 1952; Powell 1952; Brand 1961; Matezanz 1965; Rouse 1977: 50-56; Melville 1994: 31-59). It was in this frontier region that Juan de Oñate acquired the bulk of the livestock and seed grains for his colonizing venture (Hammond and Rey 1953, 1: 215-289, 522-557). From the base stock brought to New Mexico during the early years of colonization sprang the herds and fields of the missions and settlers. The line eventually expanded to the Pueblos, the Piros included. Documents from the mid-1600s suggest that individually or as a group at least some residents of Piro mission pueblos were then owning cattle and horses independently of mission stocks (e.g. *AGN*, *Provincias Internas*, *tomo* 35; *Tierras*, *tomo* 3268).[8]

[8] Fray Pedro Zambrano to Viceroy marqués de Cadereyta, Santa Fe, November 6, 1636; presentation of Antonio González, *"en nombre y con bos de los yndios de senecu"*, against Bernardo López de Mendizábal, Santa Fe, Oct. 26, 1661.

Oñate's colonists were not the first to come to New Mexico with large numbers of animals. In 1540, the roughly 2,000-strong Coronado expedition had more than 1,000 horses and mules, and a walking larder of 5,000 head of livestock (Hammond and Rey 1940: 7-8; Flint 2003: 50-51). How many especially of the latter made it to Pueblo territory is unknown. Sheep are mentioned during the final months of the expedition's stay among the Pueblos, but no figures are given (Bolton 1949: 338, 340; Kessell 1979: 25; Baxter 1987: 2-3). On smaller scales, later expeditions were similarly composed. A good example is the 1581/82 Rodríguez-Chamuscado party. Three missionaries, nine soldiers, and 19 native servants hit the trail with 90 horses and some 600 head of livestock (Obregón 1997: 228; cf. Hammond and Rey 1966: 8) in what must have looked more like a cattle drive than an expedition into unknown territory.

Archaeological evidence of foreign domesticates comes from a number of New Mexican sites (e.g. Toll 1989: 201-205, Table 45, 1992; Brown and Brown 1997: 395-405; McBride 1997: 466-467; Trigg 2005: 99-106). As is the case with ceramics and metal, this evidence is not plentiful (Toll 1992). Also, despite recent studies of faunal remains from the Zuni (Tarcan 2005) and Hopi (Chapin-Pyritz 2000) areas, detailed analyses are scarce (cf. Levine 1995: 67; Trigg 2005: 80). Possibly the earliest faunal specimens in New Mexico come from a site (LA 54147) near Bernalillo. Thought to be a camp of the Coronado expedition, work at the site yielded 265 bone fragments. Of the 27 fragments that could be identified to genus or species, three were from sheep *(Ovis aries)* (Binford 1989: 184-185, Table 42). Botanical analysis revealed no foreign cultigens, but a high proportion of maize kernels and pollen in all samples is unusual when compared to the more varied plant assemblages of colonial-period sites (Toll 1989; Clary 1989). In the Salinas area, samples from Abó mission proved most diverse, comprising, among others, water melon *(Citrullus vulgaris)*, peach *(Prunus persica)*, European grape *(Vitis vinifera)*, and chili pepper (*Capsicum annuum*, of Mesoamerican origin) (Toulouse 1949: 25; Jones 1949: 29-31; Toll 1992: 53-54). As for introduced animals, Salinas-area assemblages include cattle *(Bos taurus)*, horse/mule (*Equus* sp.), sheep, goat (*Capra* sp.) and, limited, domestic pig *(Sus scrofa)* (Toulouse 1949: 25; Toulouse and Stephenson 1960: 39; Vivian 1964: 136-139; Hayes et al. 1981, Tables 28, 33; McKusick 1981).

There are as yet no pollen or macro-botanical samples of foreign cultigens from excavated Ancestral/Colonial Piro assemblages (Toll 1986a, 1986b, 1987a, 1987b; Fish 1987; Clary 1987). Since the appearance of foreign cultigens most likely post-dates the contact period, a lack of physical evidence only adds to the problem of identifying colonial-period contexts with scant excavation data. What this evidence may look like is suggested by peach pits found at two late glaze camp sites along La Jencia Creek (Robert H. Weber, personal communication, January 7, 2004). Faunal remains were excavated at Las Huertas and Pargas Pueblo. At Las Huertas, the near-complete skeleton of a neo-natal pig came from the fill of one room (Earls 1987: 57-58; Bertram 1987). Sheep and cattle were present in room and midden assemblages at Pargas (James 1986: 58-60), but at neither site were the remains in secure stratigraphic context. While the pig lay just below a looter's pit (Earls 1987: 58), the sheep and cattle bones were discovered near the surface in two disturbed areas. The latter specimens in particular were probably intrusive (see Chapter 5) (James 1986: 58-60; Marshall 1986: 71).

The last category in this sample review of non-Puebloan temporal markers are architectural features. Most conspicuous are the churches and *conventos* (friaries) of the former missions (Figs. 4.11, 4.12, see also Fig. 1.3). Although the remains of the settlers' *estancias* are far less visible, archaeological data from a small sample of *estancia* sites reveal a few basic patterns such as L-shaped or square layouts of large and linear layouts of small sites, the presence of corrals and, at some sites, of detached buildings. Walls of larger buildings often were adobe set on cobblestone masonry. Architectural features of Hispanic origin include wide doorways with low thresholds, corner fireplaces (Fig. 4.12, 4.13), and the occasional use of mold-formed adobe bricks (Levine 1995 62-64; Trigg 2005: 72-75; cf. D. Snow 1973, 1992b; C. Snow 1979; Ivey 1988, 2005).

Corner fireplaces or low-threshold doorways are sometimes found in Puebloan structures. The features are best documented in pueblos where there is evidence that the Franciscans built initial *conventos* into existing room blocks. Contemporary sources suggest this was common practice for new missions. The Mound 7 excavations at Las Humanas produced archaeological proof of one such early *convento.* In the mound's westernmost rooms, walls had been reinforced, doors widened and lowered, windows cut into walls, and fireplaces put in room corners – modifications not seen on this scale in other parts of the mound (Figs. 4.11, 4.12). The result, a structurally distinct room cluster, was just across from the site of the first mission church of San Isidro, whose construction could easily be supervised from the improvised *convento.* After its founding in the late 1620s, the Las Humanas mission was not permanently used until 1660, when construction began on a larger *convento* and church (San Buenaventura). This project was never finished (Figs. 4.12, 4.13) (Hayes et al. 1981: 31-36; Ivey 1988: 157-200).

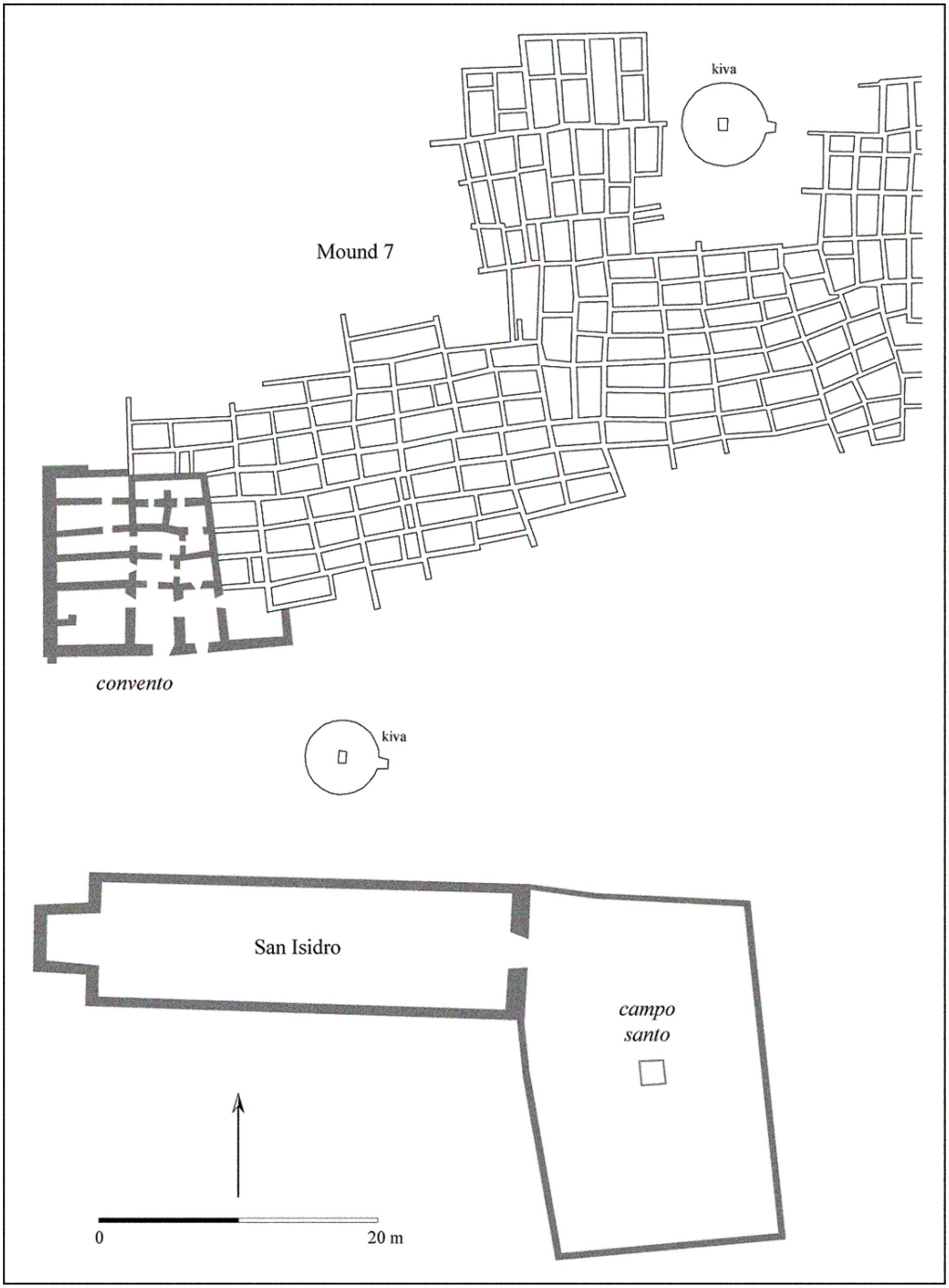

Fig. 4.11. Las Humanas, Mound 7 (walls outlined) with early mission *convento* and church of San Isidro (solid gray lines) (adapted from Ivey 1988, Fig. 19).

Fig. 4.12. Las Humanas, Mound 7, southwest corner of the early mission *convento.* In the background (i.e. to the west) is the church of the San Buenaventura mission, built in the 1660s (but not completed) (M. Bletzer, 7/2003).

Fig. 4.13. Las Humanas, mission of San Buenaventura, Room 3, corner fireplace (Vivian 1964, Fig. 27).

A few references to an early "room-block *convento*" are in fray Alonso de Benavides' account of the founding of the Piro mission at Pilabó/Socorro (Chapter 6). As the site of Pilabó is lost, any idea of architectural expressions of the missionizing process can come only from sites like Las Humanas. At the site of Sevilleta (LA 774), there is sufficient evidence on the surface to identify it as the historic mission pueblo of that name, but the site has never been tested archaeologically. Excavations at Bear Mountain Pueblo, Las Huertas, Qualacú, and Pargas did not cover enough space or target possible colonial components to represent adequate structural samples. No evidence of Hispanic architectural influence was uncovered at any of these sites.

Chronometric Dating

Absolute chronological data for Ancestral/Colonial Piro sites are limited to some two dozen ^{14}C and archaeomagnetic (AM) dates. As mentioned, wood samples suitable for dendro-dating have yet to be found in the Piro area. There are 15 chronometric dates from five sites with structural remains and artifact assemblages indicating possible contact- and colonial-period contexts. The sites are the pueblos of Las Huertas (LA 282), Qualacú (LA 757), and Pargas (LA 31746), the eastern upland Fite Ranch pit-house site (LA 45884), and the nearby Gold Station field-house site (LA 45885) (Fig. 4.14, Table 4.5). In this sample, only one date from the Gold Station site falls clearly in the colonial (i.e. the post-1600) period, though at least the lower ranges of five other dates also reach into the 1600s. For all dates, wide standard deviations leave little room for precise chronological placement (Marshall 1987: 57).

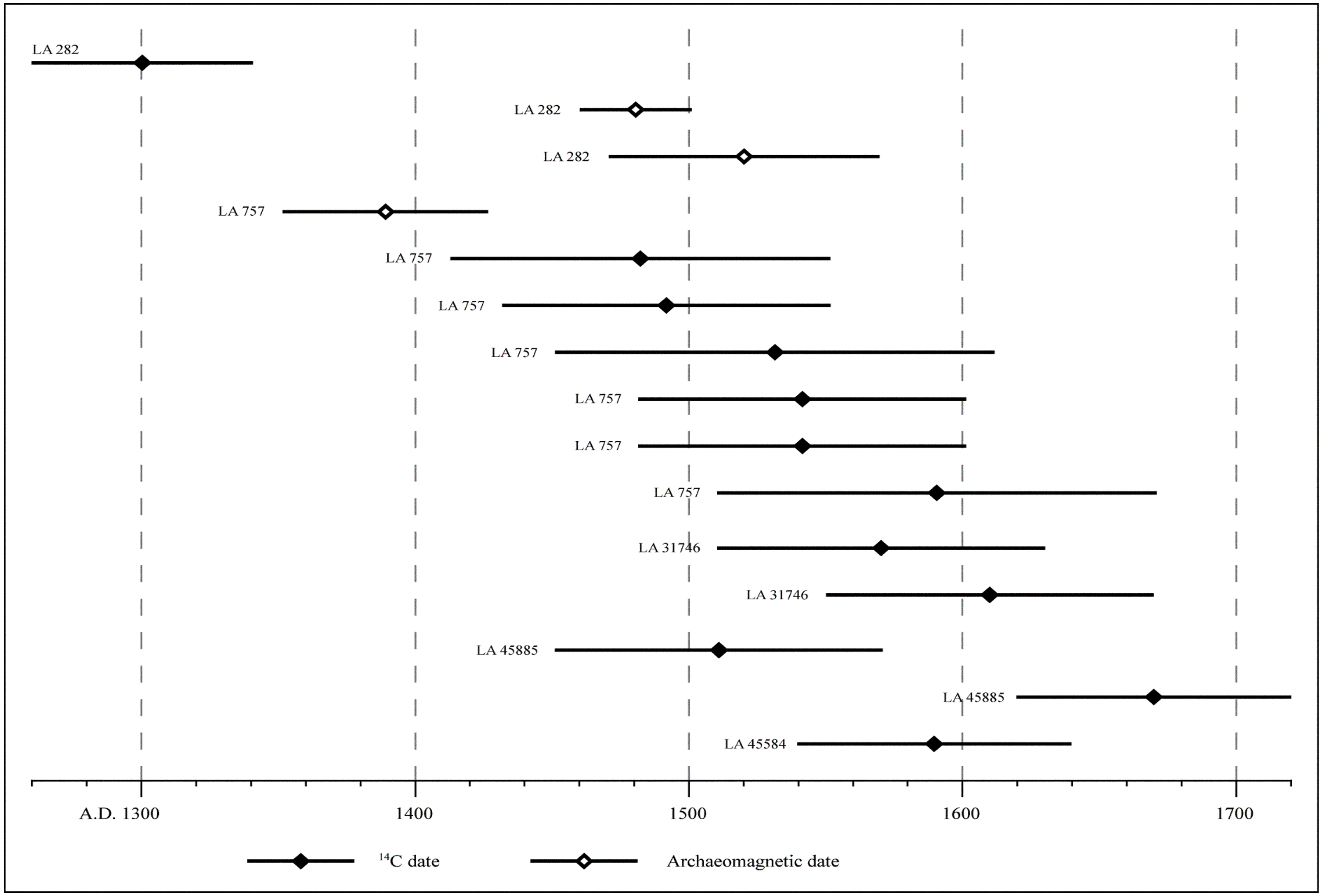

Fig. 4.14. Chronometric dates from Ancestral/Colonial Piro sites (based on Earls 1985, 1987; Marshall 1986, 1987; Windes 1986; Oakes 1986). (Dates are uncorrected. For Qualacú and Pargas, ranges are at the one-sigma level. Ranges for the other dates are not specified. Recalibration using the Oxford Radiocarbon Accelerator Unit's OxCal system IntCal04 Northern Hemisphere Atmospheric Curve (https://c14.arch.ox.ac.uk/oxcal/OxCal.html) could provide more detailed probability distributions within individual date ranges).

Table 4.5. Chronometric dates and associated glazewares from Ancestral/Colonial Piro sites.

Site/Context	Date[9]	Associated glazewares
Las Huertas (LA 282), ^{14}C-date, Room 2, Feat. 9	A.D. 1300±40	A(-D)
Las Huertas (LA 282), AM-date, Room 3, north wall	A.D. 1480±22	?
Las Huertas (LA 282), AM-date, Room 3, south wall	A.D. 1520±50	?
Qualacú (LA 757), ^{14}C-date, Feat. 3, Pit 8	A.D. 1480±70	A
Qualacú (LA 757), ^{14}C-date, Room 6, L. 1	A.D. 1490±60	?
Qualacú (LA 757), ^{14}C-date, Room 13	A.D. 1530±80	D-E
Qualacú (LA 757), ^{14}C-date, Room 2, L. 3	A.D. 1540±60	A, C
Qualacú (LA 757), ^{14}C-date, Room 13	A.D. 1540±60	D-E
Qualacú (LA 757), ^{14}C-date, Room 16, lower floor	A.D. 1590±80 (considered erroneous)	A
Qualacú (LA 757), AM-date, Room 16, lower floor	A.D. 1387.5±37.5	A
Pargas Pueblo (LA 31746), ^{14}C-date, Room 1, upper floor, Feat. 1	A.D. 1570±60	A
Pargas Pueblo (LA 31746), ^{14}C-date, Room 1, lower floor, Feat. 9	A.D. 1610±60	A
Pargas Pueblo (LA 31746), AM-date, Room 1, upper floor, Feat. 1	>1400? (off curve)	A
Fite Ranch (LA 45884), ^{14}C-date, isolated hearth outside PI/PII pit-house village	A.D. 1590±50	-
Gold Station (LA 45885), ^{14}C-date, hearth outside field house	A.D. 1510±60	-
Gold Station (LA 45885), ^{14}C-date, hearth outside field house	A.D. 1670±50	E-F

(Based on data from Earls 1985, 1987; Marshall 1986, 1987; Windes 1986; Oakes 1986).

[9] See n. under Fig. 4.14.

Compounding the problem is the small size of the sample and the constraints this places on statistical evaluation of the dates. In the sub-sample of three AM dates, two come from one room at LA 282. The similarity of the dates is consistent with the dated context, burned room walls that indicate a single large fire in the room (cf. Earls 1987: 59). The single AM date from Qualacú Room 16 fits in well with stratigraphic and ceramic data, but a ^{14}C date of the same context does not and is considered erroneous (Table 4.5). A fourth date (from Pargas) I included here is only an estimate (Table 4.5). The sample plotted off the Virtual Geomagnetic Pole (VGP) curve, which at the time of analysis ended at c. A.D. 1425 (Marshall 1987: 57-60; Windes 1987: 60-63, Thomas C. Windes, personal communication, August 2002).

Overall, the time frame provided by these chronometric dates leaves much to be desired. A larger sample from secure stratigraphic contexts is needed to establish better temporal control of diagnostic ceramics. Although the dates broadly confirm the validity of the Rio Grande glazeware sequence for the Piro area, the ceramic associations reported from Piro sites point to peculiarities in the regional glaze spectrum, such as the apparent longer run time of Glaze A pottery. It is one example of the chronological ambiguities in the database that will crop up repeatedly over the remainder of this study.

CHAPTER 5

THE MATERIAL RECORD OF ANCESTRAL AND COLONIAL PIRO SETTLEMENT

With the basic material attributes of Ancestral/Colonial space and time in mind, this chapter offers a more detailed overview of 14 of the 40 sites listed in Fig. 4.1 and Tables 4.1 and 4.2. As the figure and tables show, I make a simple distinction between large (c. 100 and more ground-floor rooms) and small (considerably less than 100 ground-floor rooms) sites. Although derived from estimates of site size, I should stress that this is an approximate grouping that does not reflect a statistical cut-off point between "large" and "small" sites. For sites known only through surface observations, descriptions are based mainly on Marshall and Walt's (1984) Rio Abajo Survey, data from ARMS, and observations I made during site visits between 1999 and 2005. For the five sites with excavation data the main sources of information are the respective excavation reports. The descriptions are arranged in north-south order, with lowland preceding upland sites.

Several factors influenced my choice of sites introduced here. The pueblos of Bear Mountain (LA 285), Las Huertas (LA 282), Qualacú (LA 757), and Pargas (LA 31746) are the only pueblos with excavation data, while the Gold Station site (LA 45885) is the only excavated small site of Ancestral/Colonial Piro affiliation. Unique in various ways are Sevilleta (LA 774), Estancia Acomilla (LA 286), and San Pascual (LA 487). Sevilleta is the only extant Piro mission pueblo and the result of one of the very few *reducción* resettlement efforts known from early colonial New Mexico. Estancia Acomilla is the only site of likely Spanish origin, and San Pascual the largest site in the entire area. Milligan Gulch (LA 597) and Cerro Indio (LA 287) are mainly pre-contact sites, while Las Cañas (LA 755) and Magdalena (LA 284) represent the entire pre- to post-contact transition. Tiffany Pueblo (LA 244) is a smaller site with primarily colonial-period material. For sake of comparison, I include a summary of Plaza Montoya Pueblo as it was when first recorded during the Rio Abajo Survey. More details of its pre-excavation record are in Chapter 7. Together, the above sites supply most of the regional background and comparative information for the analysis of the Plaza Montoya data.

Sevilleta (LA 774)

Sevilleta is the northernmost large pueblo that can be assigned to the Piro area on the strength of historical evidence (Fig. 4.1). The site occupies the edge of a steep gravel bench on the east side of the Rio Grande, 30 m above the modern floodplain (see the aerial photograph in Chapter 1, Fig. 1.3). A short distance south of the pueblo is the modern community of La Joya. Recorded as Site LA 774 in the 1930s (cf. Mera 1940: 8), Marshall and Walt revisited the pueblo during the Rio Abajo Survey. Recognizing nine room blocks, three possible kivas, and three midden areas (Fig. 5.1), they estimated that the pueblo had some 165 ground-floor and 60 upper-story rooms (Table 4.1) (Marshall and Walt 1984: 203-205).

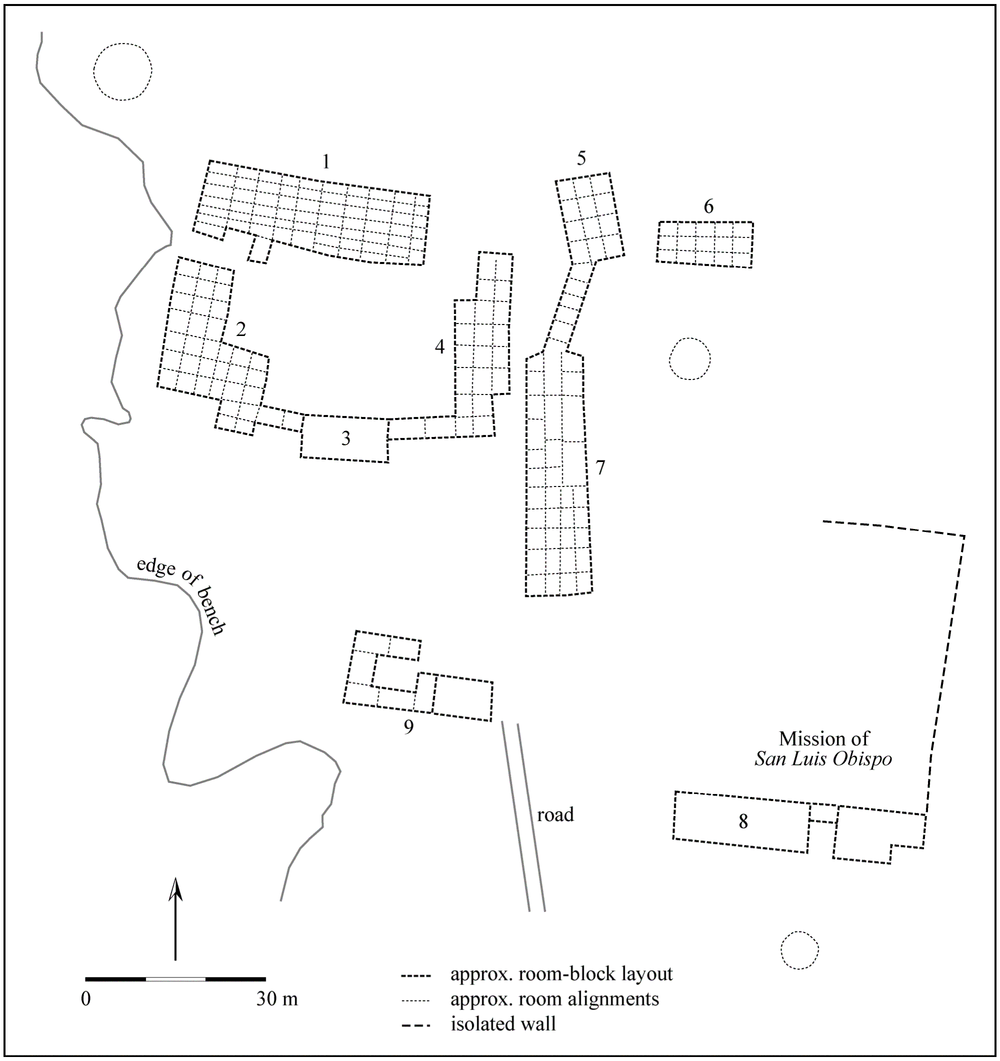

Fig. 5.1. Sketch map of Sevilleta Pueblo (adapted from Marshall and Walt 1984, Fig. 9.73).

What makes Sevilleta stand out among known Piro sites is a cluster of structural remains (labeled Room Block 8) south and southeast of the main pueblo (Fig. 5.1) (Marshall and Walt 1984: 205; Marshall 2005: 35). Wall alignments, wall size, and surface distribution of ceramics (Glaze F, Salinas Red, Tabirá Polychrome, Spanish vessel forms, mayólica) within the cluster clearly differ from the rest of the pueblo. A comparison with mission-period pueblos in the Salinas area (Las Humanas, Quarai, Abó) leaves no doubt that this cluster represents the remains of a Spanish mission complex with church, *convento* (missionary quarters), and *campo santo* (churchyard). Documents relating to the Piro missions led Bandelier (1890-92, 2: 238) to identify the "Piros [sic] pueblo...near La Joya" as the "old village of Sevilleta, a pueblo well known in history" through its mission of San Luis Obispo de Sevilleta (cf. Marshall and Walt 1984: 205).

Sevilleta's original name was recorded as Selocú (Chapter 6) (Hodge et al. 1945: 64). Few Piro sites can be similarly linked to a historical name, let alone a historical record, with any degree of certainty. Fewer still appear as undisturbed as Sevilleta. The low mounds of adobe and masonry rubble are much reduced (see Fig. 3.20), but feature none of the extensive mechanical or natural disturbances seen at other Piro sites. Nor are there many signs of looting. According to Marshall and Walt (1984: 215), the pueblo's layout is about 95% intact. Given the topography, there is a possibility that structures close to the edge of the bench may have been affected by slope erosion, but no evidence of this is visible on the ground.

A number of documentary references to Selocú/Sevilleta exist, but like the overall regional record they are patchy. As a group, they span the contact and colonial/mission periods from 1581 to 1681, and contain some intriguing information on how Spanish activities could impact a large Piro community (Bletzer 2005). Though I describe the sources at some length in Chapter 6, it should be pointed out here that there are several references to abandonment and reoccupation of Sevilleta during the documented period. A lengthy gap in occupation in the late 1500s and early 1600s also seems to be reflected in the surface distribution of glazeware ceramics. Mera in the 1930s reportedly found “all groups from A to F” at Sevilleta (Mera 1940:8), but in a study (in 2002) of Mera’s sample sherds, I could identify only A and E/F-related forms. With 70 years of handling, a small sample size (*n*=29), and the risk of misidentification, it is difficult to make much of these sherds. Interestingly enough, during the Rio Abajo Survey Marshall and Walt observed a similar distribution of glazewares and collected a sample in which Glaze A occurred less frequently than E and F sherds. They also noted that A sherds were largely restricted to Room Blocks 1, 2, and 7. Room Block 8, by contrast, stood out for variety (including non-glazes like Tabirá Black-on-white and Salinas Red, see Chapter 4) as well as quantity of late ceramic material (Marshall and Walt 1984: 205-206, 342-343).

Beyond its historical significance as the sole surviving Piro mission and mission pueblo, Sevilleta’s contact- and colonial-period material record very likely represents the best possible benchmark against which the sequence of Ancestral and Colonial Piro settlement might be calibrated. This requires some idea of what lies beneath the surface, however. For all its potential to define and refine the regional archaeological record, Sevilleta has yet to be systematically surveyed and mapped. There have been no test excavations, however limited. Other than the brief surveys of Mera and Marshall and Walt, no work has been done at the site. Unless this changes, statements regarding size, length of occupation, and occupation-abandonment cycles will remain conjectural (cf. Marshall 2005: 35).

Cerro Indio Pueblo (LA 287)

Cerro Indio Pueblo is located on the west side of the Rio Grande at the southern end of the San Acacia narrows, about 10 km downstream from Sevilleta (Fig. 4.1). Situated atop San Acacia Butte, 60 m above the river, the pueblo occupies what Mera (1940: 7) called "a highly defensive location" (Fig. 5.2). San Acacia Butte and the Black Mesa basalt flow south of San Antonio are the two most prominent natural landmarks in the Rio Grande lowlands. There can be no doubt that the butte is the Acomilla or "little Acoma" mentioned in various 17th-century documents. A reference from 1681 to "the height of the pueblo of Acomilla" indicates that the allusion in name to the famous mesa-top pueblo of Acoma derived from the pueblo's unique locale, not the butte as such (cf. Marshall and Walt 1984: 256; Marshall 2005: 51, 69).

Despite the lack of specific descriptions, the Spaniards were doubtless familiar with the site. The mission pueblo of Alamillo was only a short distance to the south, the *camino real* passed by to the east, across the river, and a possible Spanish *estancia* was located just a short walk away at the foot of the butte (see below and Chapter 6) (Marshall and Walt 1984: 255; Marshall 2005: 69). There is, however, no archaeological evidence that the pueblo was still occupied when the first Spaniards clambered up to the top of the butte. Mera (1940: 7) found "a well-developed [Glaze] A site, with nothing later", as did Wimberly and Eidenbach (1980: 162), who visited Cerro Indio during their survey of the lower Salado. Still, over the years a few late glaze sherds have been recovered (Marshall and Walt 1984: 150, 323). To Marshall and Walt (1984: 141), these sherds probably represent a minor, "opportunistic" (defense-related?) reoccupation during the later colonial period.

Fig. 5.2. San Acacia Butte with Cerro Indio Pueblo (top center). Estancia Acomilla (LA 286) is located at the butte's southwestern base (lower left) (USGS photograph, 1996).

Cerro Indio, like Sevilleta, remains essentially unexplored. Its layout can be traced with little difficulty on the surface (Fig. 5.2), however, owing to construction that was part full masonry, part masonry-based jacal. The main room blocks are arranged around a single plaza with a large kiva in the northwest corner. One small room block is located south of the plaza (Fig. 5.3). Distribution and appearance of rooms and room blocks suggest more or less gradual growth until the pueblo, in its final form, had more than 110 single-story rooms (Table 4.1.). Second-story rooms seem to have been few. Its isolated location has spared the pueblo major structural damage, yet some disturbance and looting is evident (Marshall and Walt 1984: 147-150). In 1855, San Acacia Butte was chosen as the central control point for the New Mexico Meridian and sporadic survey-related activities since then have resulted in some movement of rocks. Surface-collecting is known to have been extensive, and it is estimated that about 20 rooms and the kiva area have been partially disturbed by looters (Marshall and Walt 1984: 50).

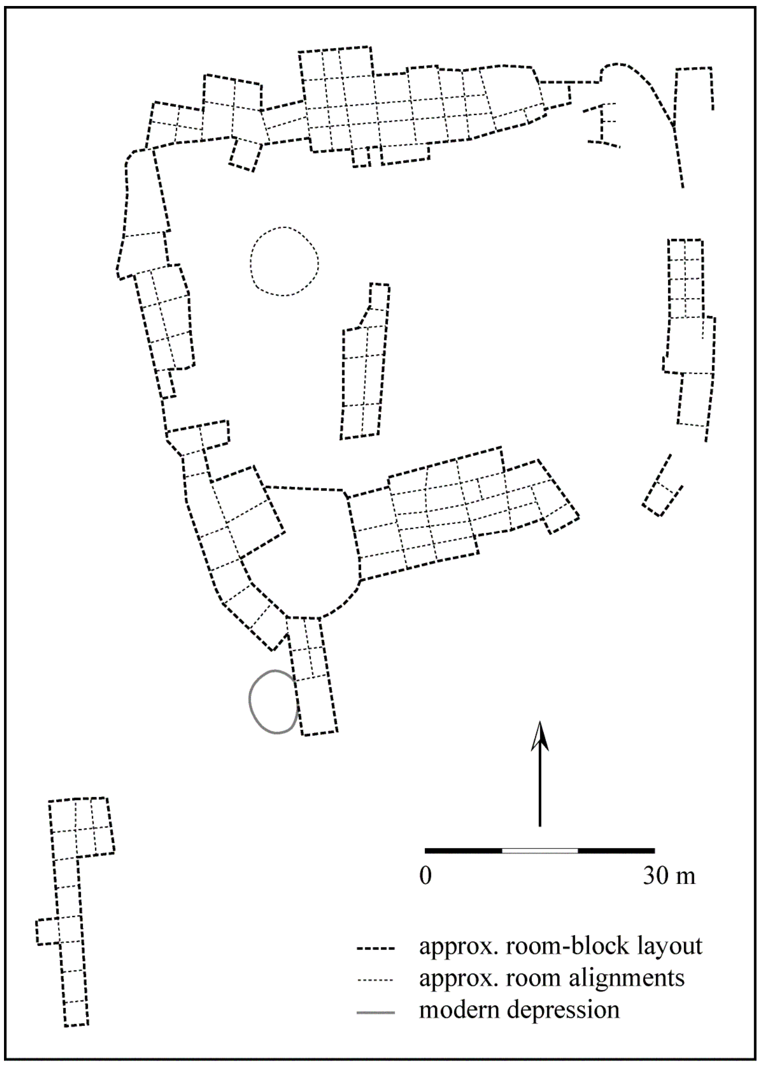

Fig. 5.3. Sketch map of Cerro Indio Pueblo (adapted from Marshall and Walt 1984, Fig. 9.11).

Estancia Acomilla (LA 286)

A stone's throw southwest of Cerro Indio Pueblo, at the foot of San Acacia Butte, lies one of the smallest Ancestral/Colonial Piro sites in the Rio Grande lowlands (Table 4.2, Fig. 5.2). Estancia Acomilla has two L-shaped room blocks with about six and 12 rooms, respectively, which were arranged around a plaza, as well as two detached, unidentified structures. The larger room block apparently incorporated a small interior courtyard (Fig. 5.4) (Marshall and Walt 1984: 199). Room construction was most likely masonry-based adobe. Marshall and Walt (1984: 199) estimate that masonry may have reached to half wall height. All this represents a unique structural pattern for Piro-area sites and suggests, as Marshall and Walt (1984: 199) note, "Spanish influence". Excavations of 17th-century *estancias* outside the Piro area have shown L-shaped houses, plaza layout, outbuildings, and masonry-adobe architecture to be characteristic of rural Spanish settlement (Trigg 2005: 72-75; cf. Snow 1973; 1992b).

Surface ceramics place Estancia Acomilla in the contact-period/early colonial to late colonial spectrum (Fig. 4.1). In a sample taken during the Rio Abajo Survey, identified decorated sherds (*n*=64) were mainly Glaze E (*n*=16), F (*n*=20), and various "mid-to late period" rims (*n*=9). Four glaze sherds were of Spanish forms (see Fig. 4.5). Non-glazes included Tabirá Black-on-white (*n*=2), Jemez Black-on-white (*n*=3), and Tewa Whitewares (*n*=5). Also found were two mayólica fragments (Marshall and Walt 1984: 327). Visits to the site in 2000 and 2002 confirmed the diversity of the sample. All in all, the ceramics back the assumption that this may have been a Spanish site. In the Piro area, only Room Block 8 (the mission complex) at Sevilleta has similarly diverse late glaze and non-glaze ceramics (Marshall and Walt 1984: 344). Like Sevilleta, too, Estancia Acomilla is without archaeological parallels in the Piro area, except, perhaps, for the site of Luis López (LA 31748) south of Socorro (Fig. 4.1, Table 4.2). Even rarer is its possible association with a historic *estancia* and a named Spanish settler (Chapter 6). All this makes the site a promising source of data for any potential study of Spanish settlement in the Piro area (cf. Marshall 2005: 20, 51).

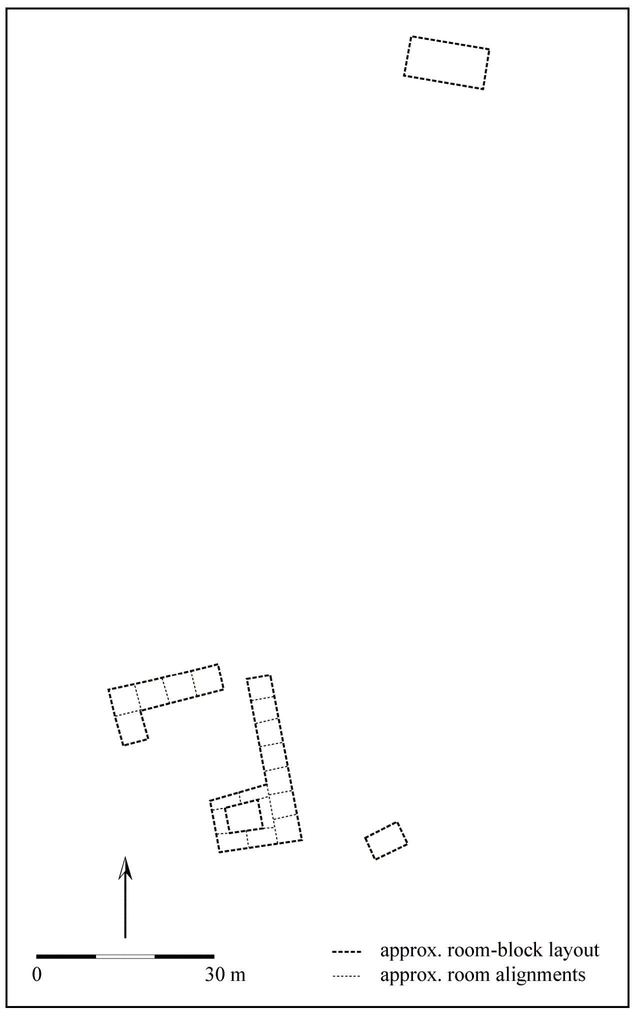

Fig. 5.4. Sketch map of Estancia Acomilla (adapted from Marshall and Walt 1984, Figs. 9.69 and 9.70; and personal observations between 2000 and 2003).

Las Cañas Pueblo (LA 755)

Las Cañas Pueblo is located just below the point where the Arroyo de las Cañas joins the Rio Grande (Figs. 4.1, 5.5). As mentioned in Chapter 3, erosion by both river and arroyo has taken a heavy toll on the site. What structures may have marked the pueblo's western and northern limits no longer exist (Fig. 5.6). A visit in the summer of 2000 showed gullies and swales cutting into the southern part of the site, a process already observed by Marshall and Walt (1984: 172-173). As structural outlines go, there is not much to see, and little more can be said other than that the pueblo had at least four room blocks, all built of adobe, with few stones in walls and wall footings.

Fig. 5.5. The Las Cañas site area (above center) (USGS photograph, 1996).

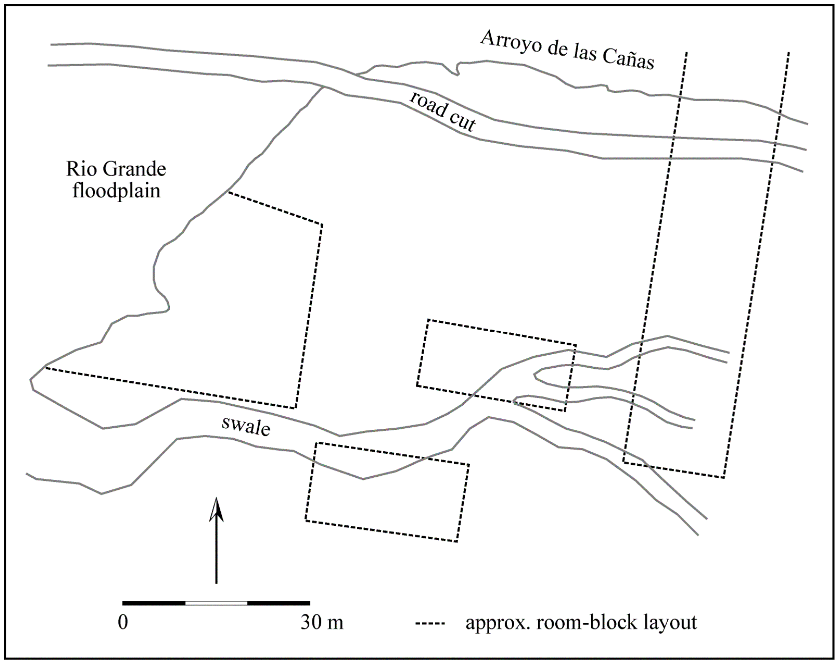

Fig. 5.6. Sketch map of Las Cañas Pueblo (adapted from Marshall and Walt 1984, Fig. 9.34; and personal observations in 2000).

Marshall and Walt (1984: 172) noted the sandy consistency of the local soil and identified this as a possible factor in the pueblo's disintegration. The low mounds of this sandy adobe debris convey only a very general impression of room-block layouts. To some degree, the site's desolate state of preservation can probably also be attributed to 19th- and 20th-century settlement of the lower Las Cañas Arroyo. This and more recent bulldozer cuts and looters' pits made Las Cañas one of the most badly disturbed sites recorded during the Rio Abajo Survey (Marshall and Walt 1984: 173). Not surprisingly, the most useful sketch map of Las Cañas is H. P. Mera's from the 1930s. Marshall and Walt (1984: 172) updated the map following the Rio Abajo Survey and I have done likewise following my 2000 visit (Fig. 5.6).

As for ceramics, Mera (1940: 7) collected Pueblo III Elmendorf Black-on-white sherds, as well as Glaze A through E sherds. Marshall and Walt's sample of decorated sherds (n=136) covered the same spectrum, but was dominated by Glaze A sherds (n=90) (Marshall and Walt 1984: 324). Later glaze types were few (C, n=4; D, n=5; E, n=5), even if one counts a batch (n=29) of unspecified glazes that may have contained a few more late sherds. Despite the misgivings that accompany a surface sample from such a heavily disturbed site, it should be noted that the sherds were spatially clustered. The late sherds came primarily from the south and west room-blocks, a pattern which may reflect pre- to post-contact population decline and contraction of occupied space within the pueblo (Marshall and Walt 1984: 173, 344). It was in the south room block that I noted a possible Tabirá Black-on-white sherd (see Chapter 4). More data are needed, preferably from sub-surface contexts, before any further statements on the site can be made.

Las Huertas Pueblo (LA 282)

Across the river from Las Cañas, on the first gravel bench west of the floodplain, is the site of Las Huertas Pueblo. This is the first pueblo south of modern Socorro and the pueblo located closest to Plaza Montoya (Figs. 4.1, 5.7, Table 4.1). In the previous chapter I noted that the 1981 University of New Mexico project at Las Huertas was the first systematic study of an Ancestral/Colonial Piro site. As summarized by Earls (1987: 31), the project had three objectives: to examine the "nature and extent of the site inhabitants' interactions with other Rio Grande Valley inhabitants", to examine "their relationship with the Spanish colonists", and to compare "the quality of information obtained from vandalized and undisturbed deposits".

Fig. 5.7. The Las Huertas site area (upper right) (USGS photograph, 1996).

SITE STRUCTURE

Las Huertas is a plaza-type pueblo with three room blocks surrounding a central plaza on the west, north, and east sides (Fig. 5.8). To recall, the 1981 excavations focused on a bulldozer cut through the center of the west room block (see Fig. 3.21). There, a four-room profile and four adjacent rooms were cleared. Additional tests were placed south of the plaza, in the plaza just east of the bulldozer disturbance, and in possible midden areas south, west, and northwest of the west room block. Excavated space amounted to about 45 to 50 m^2, or c. 1% of an estimated site size (including plaza area) of 4,500 m^2 (Earls 1985: 245, 1987: 26-27).

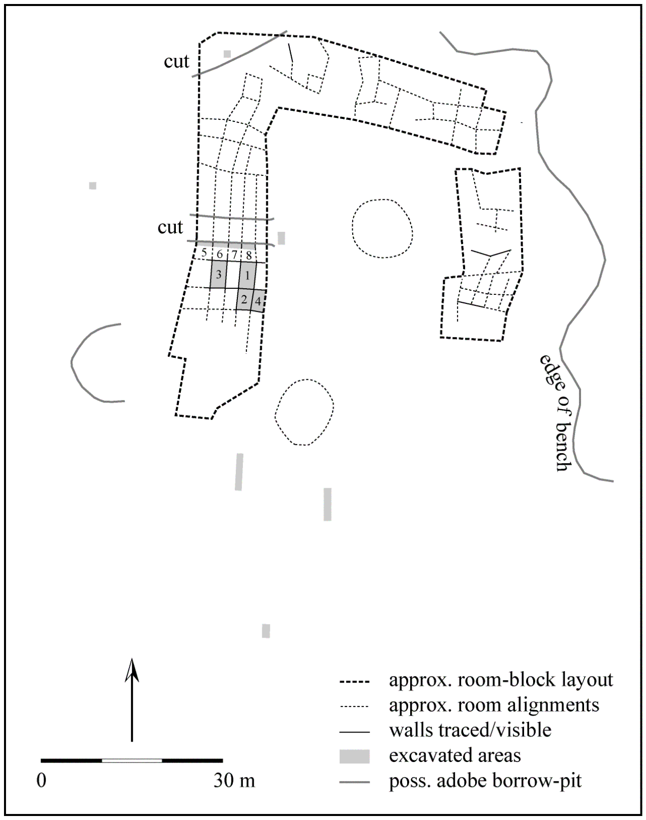

Fig. 5.8. Sketch map of Las Huertas Pueblo (adapted from Earls 1987, Figs. 3, 5, 6; and personal observations between 2000 and 2005).

Las Huertas Pueblo was constructed mainly of puddled adobe. Unlike at Las Cañas, however, basaltic rocks and cobbles are common across the site. Excavation plans and profiles show a fair amount of rocks in foundations and lower wall sections (Earls 1987: 33-41). Apparently, Las Huertas' residents preferred an adobe-rock mix for the walls of their pueblo (Marshall and Walt 1984: 211). It is perhaps partly because of this construction technique that more of Las Huertas remains on the surface than is the case at Las Cañas. In the west room block, mound height ranges from 75 to 150 cm, while in the north and east room blocks it is between 75 and 125, and 50 and 100 cm, respectively. Based on a lack of physical evidence of upper-story rooms in the west room-block excavation tests, and through comparing mound heights, Earls (1987: 26) concludes that all three room blocks were single-story construction. Yet considering the limited size and tight clustering of the excavation tests, the possibility that sections of each room block had second-story rooms cannot be completely ruled out.

In the area of construction and occupation sequences the limitations of the excavated sample are most obvious. Identifying patterns of room-block expansion and overall site growth was not one of the project's stated goals (see above). As a result, there is no information on wall bondings and abutments. Of little help are the data from the four rooms excavated south of the bulldozer cut. Except for one abutted room corner, Earls (1987: 29) notes that "[a]ll corners are round and interlocking". Published floor plans and photographs, however, show neither the abutment, nor details of the other room corners. In view of the data from Qualacú (below) and Plaza Montoya (Chapters 8 and 9), it is difficult to imagine just one corner abutment, and even more so if the rooms are offset as they are in this room sample. Only extensive wall-tracing could bring some clarity into this and other questions of room-block and site structure.

Excavations in the West Room Block

Initial examination of the bulldozer cut showed that the west room block stood (in part at least) five rooms deep (Fig. 5.8). Of the rooms destroyed by the bulldozer, all but the easternmost (i.e. plaza-fronting) were profiled on the south side of the cut (Earls 1987: 26, 49). As work progressed several depositional and structural patterns emerged. Room fill, though much disturbed, was mostly melted adobe across all rooms. There was no evidence of roof-top work areas or upper-story rooms in the form of artifacts and/or collapsed features like hearths or mealing and storage bins. Remaining room walls stood between 100 and 125 cm high (Fig. 5.9). Room features included an apparent set of four mealing bins in the westernmost room (Room 5), a possible clay-lined hearth and shallow ash pit in the center room (Room 7), and a cobble-filled pit in the eastern room (Room 8). None of the rooms seems to have had more than one prepared floor, though it is possible that floors in Rooms 5 and 8 were resurfaced. Sub-floor features were encountered only in Rooms 5 and 8. It is not clear whether the pit underlying Room 5 was a cultural or natural feature (i.e. a rodent burrow). The sub-floor ash lenses in Room 8, however, indicate use areas pre-dating room construction (Earls 1987: 49-52, 60-61).

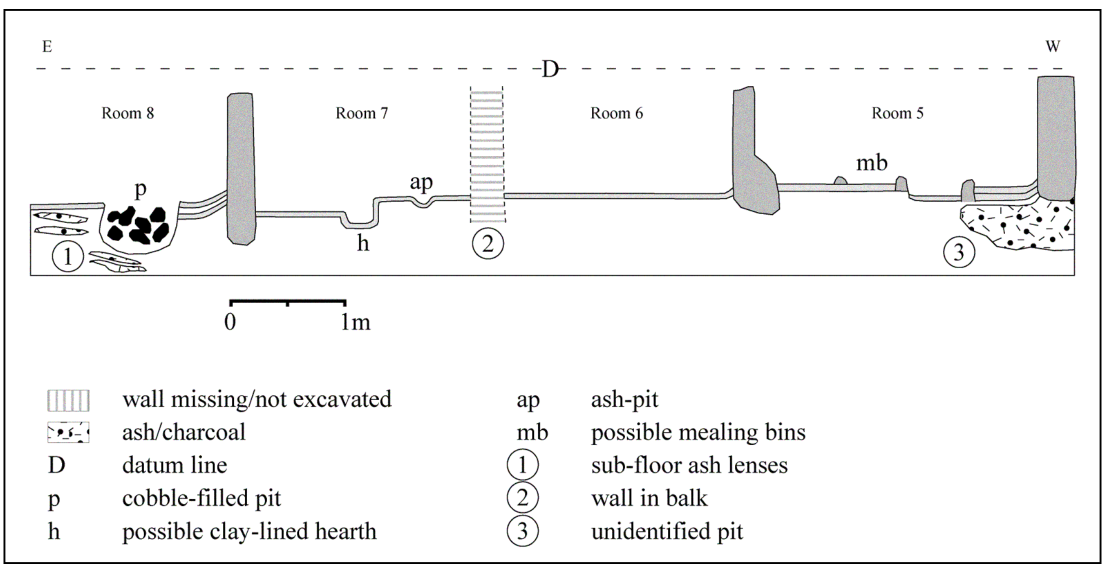

Fig. 5.9. Las Huertas, west room block, structural profile of south face of bulldozer cut (adapted from Earls 1987: 49-52, 60-62, and Figs. 7a-d, 11).

Among the rooms excavated south of the bulldozer cut, Rooms 1 and 3 adjoin the profiled Rooms 8 and 6, respectively. Room 2 is immediately south of Room 1 and west of Room 4. The latter is a plaza-fronting room (Fig. 5.8). As in the rooms in the cut, fill material in Rooms 1-4 was mostly adobe. In Room 1, a large amount of collapsed roofing material was buried in the fill, but only patches of such material were found in Rooms 2 and 3, and none in Room 4 (Earls 1987: 60-61). Few features were associated with room floors: two unidentified pits in Room 3, a shallow ash-pit in Room 2, and a hearth with small ash-pit in Room 4. No features were found in Room 1 (Fig. 5.10).

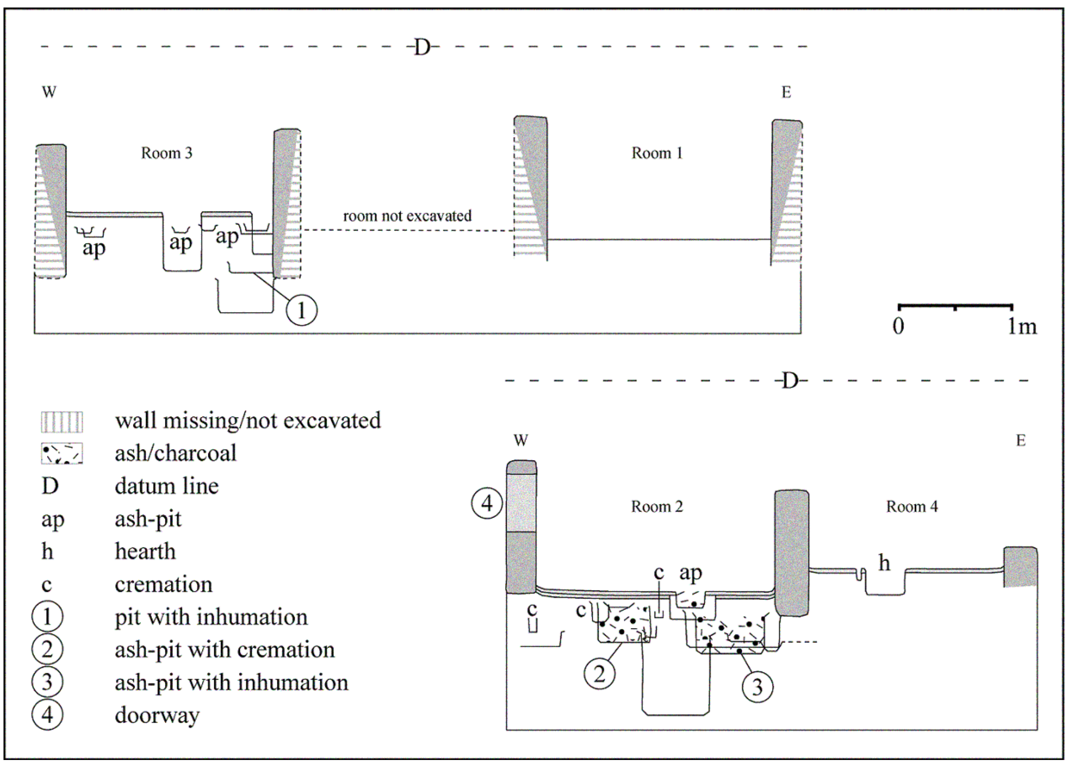

Fig. 5.10. Las Huertas, west room block, structural profile of Rooms 1-4 (adapted from Earls 1987: 54-62, and Figs. 9-11).

Floors in Rooms 2, 3, and 4 were apparently laid down with adobe plaster, while Room 1 had a compacted, unplastered floor. With the exception of Room 2, where two adobe floors were uncovered, there was no evidence of more than one floor in any of the rooms. Lack of separation between the floors in Room 2 suggests resurfacing, albeit with some further remodeling, for different features are associated with each floor (Fig. 5.10). Sub-floor excavations were carried out only in Rooms 2 and 3. Both rooms revealed a variety of pits at different levels below the floors. Four pits in Room 2 held cremation and two others inhumation burials. One inhumation was also found under Room 3 (Earls 1987: 43, 57-59; London 1987). Similar to Room 8, the vertical distribution of sub-floor features points to different use surfaces pre-dating room construction (Fig. 5.10). If the association is correct, it is possible that these surfaces underlie a larger section of the room block.

Plaza and Offsite Tests

The plaza area was tested in two locations just east of the west room block. One test was placed in the debris from the bulldozer cut, the other outside Room 4 (Fig. 5.8). The first test produced a number of possible postholes, indicating, perhaps, a *ramada*-style addition to plaza-fronting rooms. Given the disturbed context, the identification remains tentative, however. No such features were found in the other test. This one was located so close to Room 4 that it partly overlapped the in-room excavation. Postholes may have extended farther out in the plaza, beyond the excavated area. Neither test revealed other features, nor evidence of a prepared plaza surface (Earls 1987: 64).

Offsite tests were placed in areas north, west, and south of the west room block (Fig. 5.8). Other than refuse accumulations, no features associated with the pueblo's occupation were found in these tests. The accumulations were mostly between 20 and 60 cm deep, and contained ceramics, lithics, faunal and botanical remains, and a few ash lenses. Disparities in the distribution of early versus late glazeware types and plain versus textured utility sherds suggest different periods of refuse disposal. A small mound of cobbles at the southern edge of the plaza was tested for architectural features, but no such features, nor any use surfaces, were uncovered (Earls 1987: 62-64).

CHRONOLOGY

Ceramics

The study of ceramics from Las Huertas goes back to Mera's explorations of the Piro area. Based on glaze- and whiteware sherds collected during several site visits, Mera (1940: 7) identified "two distinct occupations: an early Group [Glaze] A with a small percentage of black-on-white and a later one during E and F times". Subsequent observers noted traces of Glaze C and D, but recorded frequencies supported Mera's assumption, with the added detail that the major occupation had been the later one (Marshall and Walt 1984: 211). A different picture emerges from the analysis of two surface collections made before and during the 1981 excavations. Earls (1987: 46) states that Glaze A was "the only painted type" to appear "in any appreciable quantity" in the two collections. In describing the distribution, however, she points out that the discrepancy "may be more apparent than real" (Earls 1987: 48-49), for all collections were either grab samples or covered only parts of the site.

Though even less representative spatially, the excavated sherd sample offers a limited ceramic sequence for the west room block. In the sample, glaze sherds in Rooms 2 and 4 are of particular interest. The excavation report gives no absolute figures per provenience, only early versus late glaze percentage ratios. In the Room 2 fill, Glaze A through F sherds were recovered, but the sub-floor levels yielded only Glaze A, C, and D sherds. A Glaze D sherd found below the south wall indicates an approximate *terminus post* of 1490 to 1515/25 for room construction (see Fig. 4.4) (cf. Earls 1987: 58). The early/late glaze ratio for the fill was 63:38, while for the sub-floor levels it was 71:29. Even more pronounced was the difference between textured/plain utility ratios: 1:99 for the fill and 36:64 for the sub-floor levels (Earls 1987: 50, 55-58). No sub-floor ratios are available for Room 4, but as in Room 2 the fill contained sherds of all glaze groups except B. Early/late glaze ratio was 63:37 and the textured/plain utility ratio 1:99 – virtually identical to the ratios from the Room 2 fill (Earls 1987: 50, 60).

In comparing the ceramic assemblages in Rooms 1 through 4, Earls (1985: 29-31, 1987: 54-55, 70-72) observed some mixing of early and late glazeware forms. In Room 1, for instance, Glaze C, E, and F sherds were recorded below Glaze A specimens. This was the kind of distribution that first hinted at significant temporal overlap between those forms, though how significant is difficult to assess (Chapter 4). According to Earls (1985: 29-30, 1987: 54, 71-72), Glaze A-style vessels were in use at least until the emergence of Glaze E forms. In her revision of the glaze sequence for the Piro area, she assigns a terminal date of c. 1550 to the Glaze A group (Earls 1985: 31). Marshall (1987: 78-81) in his "Rio Abajo Ceramic Group-Complex Sequence" sees a similar overlap. With a more extensive stratigraphy to work with, he describes changes in ceramic distribution by giving approximate ratios for the ceramic groups represented in the Qualacú channel cut (Chapter 7). But even with these observations, the longevity of early ceramic forms is hardly a well-established record. More excavated samples are needed if temporal relationships between early and late glazeware groups are to be traced more accurately, including samples from sites which like Plaza Montoya have few or no Glaze A sherds in their surface assemblages.

A few decorated ceramics other than glazewares have been documented for Las Huertas. No Pueblo III whitewares were excavated, but both Mera's sample and the pre-excavation sample included such specimens (Earls 1987: 48, 73). Late ceramics like Tabirá Black-on-white and Polychrome, and native and Hispanic forms of Salinas Red, were recovered from surface and sub-surface contexts, the latter mostly in Room 2 (Earls 1987: 60, 70-73). Amid some 1,200 identified sherds (excluding 3,900 utility and more than 1,500 unidentified sherds), three Tabirá and six Salinas Red sherds may seem unimpressive, as may 17 Glaze E and 5 Glaze F sherds, but when compared to a total of 33 identified Glaze A, 23 Glaze C, and nine Elmendorf Black-on-white sherds the impression is perhaps deceptive (Earls 1987: 73). These figures and resulting overall early/late sherd ratio of 2:1 somewhat qualify the perceived predominance of Glaze A forms in the site surface sample. A great unknown in all this is the 1,069 sherds Earls labeled "Historic Plain". Despite the fact that these sherds make up 87% of all identified sherds, information on provenience or distribution is lacking. Petrographic analysis of a small sherd sample indicates some variability in temper types (Earls 1987: 72), but no other attributes of these sherds are described.

Chronometric Dates

Absolute chronological data from room-block proveniences at Las Huertas are restricted to two ^{14}C and three archaeomagnetic dates (Earls 1985: 32, 1987: 52). In Chapter 4, I discussed these dates from a regional chronological perspective; of interest here are the links between archaeological provenience and chronological information. The two ^{14}C dates come from samples taken in Room 2. The first sample, from one of the sub-floor cremation burials (labeled ② in Fig. 5.10), yielded a date of A.D. 1300±40, while the second, from a sub-floor charcoal concentration, was dated to A.D. 1780±50 (Table 4.5, Fig. 4.14) (Earls 1987: 61). The stratigraphic location of the cremation just below the lower room floor suggests association with a late pre-room use surface. About 200 years separate the cremation date and the estimated date for the construction of the room as indicated by the Glaze D sherd underneath the south wall. Whether this implies a hiatus in the use of the area or a problem with the sample cannot be established with the Room 2 evidence alone (see below). Unfortunately, the other sub-floor date is clearly in error as it post-dates the historically recorded abandonment of the Piro area (Earls 1987: 61, 71).

Of the three archaeomagnetic dates, one derives from a sample of the hearth in Room 7. Analysis of this sample proved problematic in that it produced widely dispersed values (see Chapter 4). According to Earls (1985: 32), these values were "consistent with [a] date of about AD 1500". The two other dates, from samples taken in a burned area along the north and east walls of Room 3, yielded values of A.D. 1480±22 for the north-wall and 1520±50 for the east-wall sample (Earls 1985: 32, 1987: 52, 59). Together, they suggest a date in the early 1500s. This largely agrees with the ceramics found in the room fill, but as sample proveniences are not described the link between burning event and room construction remains unclear. On the whole, the Las Huertas chronometric dates are not very clear-cut (Windes 1987: 62-63), being limited in both number and temporal resolution: one archaeomagnetic date has little analytical value, and one ^{14}C date has none at all. The remaining three dates in effect bracket part of the pre-room and room-construction sequence, but otherwise add little to the ceramic chronology.

SUMMARY

As establishment of site sequence and analysis of occupation patterns were not primary objectives of the Las Huertas project, the excavation results represent only a snapshot of the pueblo's occupation history. But despite the shortcomings of the data at hand, a few patterns can be identified. Based on a 25:75 ratio of textured/plain utility sherds, Earls (1987: 62) places the Room 3 sub-floor levels in the 1300s through c. 1500. The two archaeomagnetic dates from Room 3 suggest room construction shortly thereafter (Earls 1985: 285-286). With a textured/plain ratio of 36:64, utility sherds in the Room 2 sub-floor levels point to a similar date, as does the sub-wall Glaze D sherd mentioned above. Viewed against the Room 3 material, the gap between the stratigraphic and ceramic data on one side and the ^{14}C date from the sub-floor cremation on the other is probably not the result of some pause in activities prior to construction of Room 2, but rather reflects a problem with the dated sample (dating error, old wood, etc.).

Given the widespread archaeological pattern of pueblo expansion into plaza areas, Room 3 may well have been built before Room 2 (Earls 1985: 286). Such a sequence probably includes Room 1, which is in the same tier as, and was connected by a doorway to, Room 2. As for Room 4, its location in the plaza front and the presence of the Salinas

Red forms leave little doubt that this was the latest of the excavated rooms (Earls 1985: 286-287). Also worth mentioning despite the disturbed context is the material from the bulldozer cut in the plaza. Here, only D, E, and F glaze sherds were found (Earls 1987: 64). Whether these sherds represent a different ceramic distribution and, perhaps, later construction north of the cut cannot be known without additional testing, however.

On length of occupation and timing of abandonment few specific data exist. Late glaze and non-glaze sherds indicate occupation into the 17th century. Potential markers of colonial affiliation include two iron fragments and the skeleton of a piglet in Room 2, a copper bead in Room 3, and in Room 4 bones with possible cut marks made by a metal edge (Bertram 1987). While all items were found in lower fill levels, in the case of the animal bones at least depositional context may be a post-abandonment disturbance (Earls 1985: 286-287, 318-319, 1987: 58, 60, 70). Earls (1985 314-316, 1987: 67) for her part does not believe that Las Huertas was occupied into the mission period. The lack of a room-floor sequence seems to support this view. At Arroyo Hondo Pueblo, for instance, 41 of the 50 excavated rooms in the Component II room sample had only one floor. Tree-ring dates suggest a Component II occupation of 40 to 50 years (c. 1370/80-after 1410) (Creamer 1993: 45, 147-148). This and similar occupation patterns for parts of Grasshopper Pueblo (cf. Riggs 2001: 35-113) provide a rough idea of the use life of single-floor rooms. Of course, the small and spatially limited Las Huertas room sample leaves open the possibility that some segments of the pueblo may be structurally more complex than the part of the west room block where the excavated rooms are located.

On the nature of room and site abandonment there are also few data. There is no site-wide record of spatial clustering of diagnostic ceramics that might indicate variable rates of abandonment, but there are references to in-room refuse disposal. Earls (1985: 312-313, 1987: 50) notes that the mealing bins in Room 5 were filled with refuse, as were Rooms 1 through 4. No quantitative or qualitative data for anything resembling de facto refuse are given, however. Ground stone is mentioned indiscriminately (e.g. Earls 1985: 314), and there are no references to whole or restorable vessels, nor to any other objects that might be classed as room or site furniture (see Chapter 2). Still, if the recorded artifacts are any indication, the rooms appear to have been swept clean of most useable items. Indirect evidence of curation or scavenging of materials is the absence of large roof beams in all excavated rooms. Earls (1987: 61) assumes that beams were reused elsewhere or used for fuel. All told, the observed patterns seem most consistent with a gradual, and perhaps planned, mode of site abandonment.

Plaza Montoya Pueblo (LA 31744)

The following summary describes Plaza Montoya Pueblo as it appeared prior to initial walkovers (in 1999/2000) for the Plaza Montoya project. The information I use here is essentially a recap of Marshall and Walt's (1984: 194-196, 346) description of the site. Chapter 7 contains a record of my own pre-excavation reconnaissance. Briefly, Plaza Montoya is located a short distance south of Las Huertas on a low gravel bench west of the Rio Grande floodplain (Figs. 4.1, 5.11). The site is reduced and was, prior to excavating, densely covered by a variety of xerophytic shrubs. It was not recorded until the Rio Abajo Survey.

Fig. 5.11. The Plaza Montoya site area (lower center) (USGS photograph, 1996).

Marshall and Walt's (1984: 194) original sketch map shows a slightly trapezoidal layout with four room blocks enclosing a central plaza (Fig. 5.12). Based on this layout, Marshall and Walt give an estimate of c. 200 rooms for the pueblo. Higher areas in the west and east room-block mounds suggested upper-story construction. Only one possible ground-floor entrance to the plaza area was identified. Located north of the east room-block mound, this was a narrow swale which had apparently formed in a gap between the east and north room blocks. No depressions indicating kivas could be seen in the plaza, nor was there any evidence of midden areas across the entire site. As for disturbances, the most serious was a graded dirt road that had been pushed through the western half of the north room block (Chapters 7 and 8).

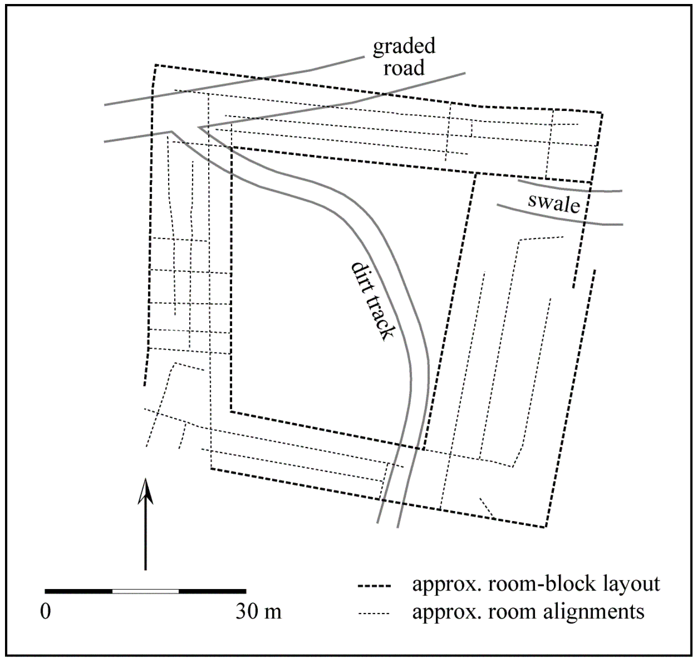

Fig. 5.12. Sketch map of Plaza Montoya Pueblo (adapted from Marshall and Walt 1984, Fig. 9.62).

A sample of 52 decorated sherds collected by Marshall and Walt (1984: 326) included 14 sherds of Glaze E and two of Glaze F affiliation. No non-glaze specimens like Tabirá Black-on-white or Salinas Red were found in the sample, nor any sherds of non-Puebloan origin. With one identified Glaze A sherd and no Pueblo III whitewares, there was a striking lack of early ceramics. For the bulk of the sample, no type or type-complex identifications were recorded. In contrast to the Sevilleta or Las Cañas samples, Marshall and Walt mention no spatial clustering of types. Possible super-positioning of rooms they noted only in the southwestern part of the pueblo. Based on all this, Marshall and Walt (1984: 194, 346) suggest a major contact- and colonial-period occupation with a minor pre-contact beginning.

Pargas Pueblo (LA 31746)

Pargas Pueblo is the nearest Ancestral/Colonial Piro pueblo south of Plaza Montoya (Fig. 4.1). It sits on a low gravel bench in the village of San Antonio, just west of the Rio Grande floodplain (Marshall and Walt 1984: 196). Nothing of the pueblo remains on the ground; houses, trailers, and a small telecommunications facility now occupy the site area (see Chapter 3). Just to the north is State Highway 380, and to the east San Antonio's *acequia madre* and the old Santa Fe railroad right-of-way (Figs. 5.13, 5.14). Use of the site and loss of above-ground remains must go back some time, for neither Bandelier, nor Yeo, nor Mera mention an archaeological site at this location (cf. Marshall 1986: 7-8).

Fig. 5.13. The Pargas site area (right of center) (USGS photograph, 1996).

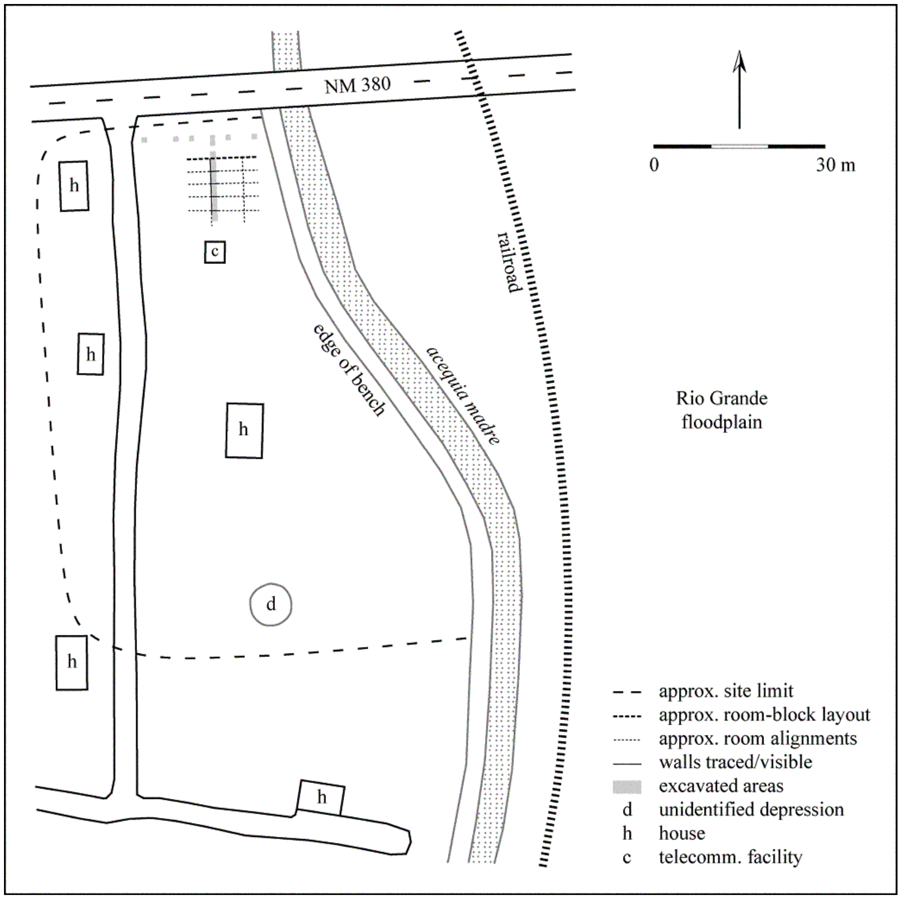

Fig. 5.14. Sketch map of Pargas Pueblo (adapted from Marshall 1986, Figs. 4 and 5; and based on personal observations between 2000 and 2005).

SITE STRUCTURE

Pargas, like Plaza Montoya, was not officially recorded until the Rio Abajo Survey of the early 1980s. In 1986, planned construction at the site prompted a small archaeological clearance project (Marshall 1986). Two south-north and east-west axes totaling 39 1x1 m units were laid out south of Highway 380 (Marshall 1986: 1-6). Excavation of 22 units unearthed an adobe room block between four and five rooms wide and a nearby refuse midden. The sketch map in Fig. 5.14 shows the limited scale of these excavations.

Clearly, the discovery of the rooms must be deemed fortuitous, and not just because of the project's restricted objectives. Of all known Piro pueblos, Pargas is the only one without surface remains conveying at least a general picture of site size and layout. As a result, the sole indicator of site size is the surface distribution of ceramics and other cultural materials, which suggests that the site measures c. 100 m north-south by 60 m east-west (Fig. 5.14) (Marshall and Walt 1984: 197; Marshall 1986: 8). In July 2004, I had the opportunity to inspect a utility trench in a private backyard c. 40 m south of the estimated site area. The trench profile, between 100 and 125 cm deep, revealed no cultural deposits, nor did a quick check of the trench back-dirt produce any artifacts or organic remains. Across the site area, a circular depression near the estimated southern edge of the site is the only visible feature that may be related to the pueblo (Fig. 5.14).

As at Las Huertas, the limitations of the Pargas project are particularly obvious in the structural data available. Though it may seem trivial given that only a handful of rooms in one narrow stretch of one room block were tested, there is no information on the room corners exposed in the test-units (Fig. 5.15). One or two corners are shown to have been destroyed by modern disturbances, but whether the other corners were still identifiable as wall bondings or abutments is nowhere stated. As work did not include wall-scraping outside the two test-trenches, the stratigraphies of the north-south trench units offer the only information on construction and occupation sequence in the room-block area.

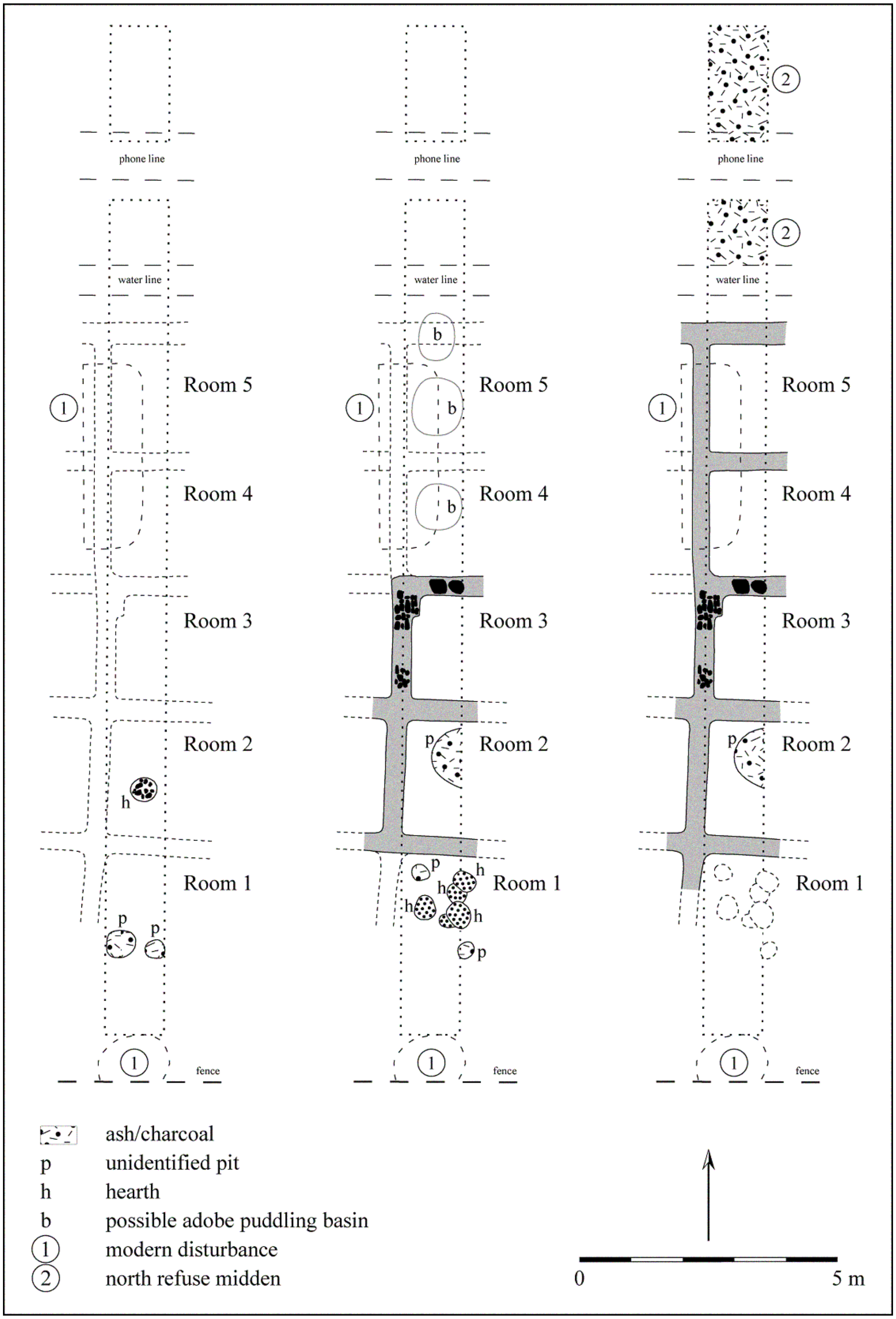

Fig. 5.15. Pargas Pueblo, room-block test-trench, estimated room-block expansion (left early, right late) (based on Marshall 1986, Figs. 4-6, 10, 13-14).

Room-Block Excavations

Despite the lack of visible structural remains, Marshall and Walt (1984: 197) in their visit to Pargas during the Rio Abajo Survey noted that buried foundations appeared largely intact. To some extent, Marshall's excavations bore out this observation, for both the room block and the midden area were reasonably well-defined in the test-units. In areas not occupied or bisected by modern buildings, roads, and utility lines, wall foundations and (at least) lower-level floors and features thus may still be worthwhile targets of archaeological investigation. On the other hand, the excavations also indicated that most remaining structures and deposits are probably very shallow, and that late use surfaces may be missing. Depth of room fill, for example, only ranged from six centimeters above floor in Room 1 to 18 cm in Room 5. As for walls, the north wall of Room 1 went no deeper than 15 cm below the modern ground surface, and none of the other walls went deeper than c. 40 cm (Marshall 1986: 16, 24-26).

In all rooms, fill deposits were compact. Fill material included clay-loam and sand accumulations, as well as adobe debris. Especially in Room 5, the excavators encountered an "abundance of unburned adobe clumps", undoubtedly the last remnants of the collapsed superstructure (Marshall 1986: 25). Apparently few artifacts or organic remains were found in the fill (Marshall 1986: 14, 25; Elyea 1986: 54). Also, due to the hardness of the fill material, floors were not easily identified. Only one prepared surface was recorded, a three-centimeter-thick adobe floor in Room 5 (Marshall 1986: 25). Room 1 seems to have had two unplastered floors or use surfaces, though whether they were actually associated with the occupation of the room is uncertain. As a south wall was not located (Fig. 5.15), Room 1 may not have been a room at all, but an outside activity area in an alcove formed by two plaza-fronting rooms (Marshall 1986: 14-16). It is also possible that leveling of the present ground surface obliterated walls and perhaps upper floors in the area south of Room 1. Marshall (1986: 16) describes “an upward trend of floor surfaces” from north to south, with a difference in elevation of c. 10 cm between the Room 1 and 5 floors. Given the overall lack of depositional depth, such a difference could well account for any missing walls.

The difficulties in defining floors leave little room for distinguishing between floor and sub-floor features. The majority of features exposed in the room-block trench were located in Room 1 (Fig. 5.15). Marshall (1986: 16-19) lists six pits/hearths and six possible postholes as floor features, and two more pits as sub-floor features. The features were tightly clustered, with super-positioning and overlapping indicating varying periods of usage. In Room 2, two features were found at different depths, but there was no clear evidence of a floor. Room 3 was the only room without floor or sub-floor features. As in Room 2, no floor could be identified. A couple of large cobbles at the base of the north wall and several smaller rocks embedded in the west wall were unique to Room 3 (Fig. 5.15). Set on a sterile surface, the cobbles were the only ones found in a wall in the entire room-block trench (Marshall 1986: 20-23). In Rooms 4 and 5, testing revealed three near-circular sub-floor pits up to 35 cm deep (Fig. 5.15). There were neither signs of oxidization nor cultural material in the pit fill suggesting use as hearths or perhaps storage pits. As Marshall (1986: 25) asserts, these features may have been adobe-mixing basins used in construction and repair of earlier parts of the room block. No definite floor surface was found in Room 4, but Room 5 had the single adobe floor mentioned above (Marshall 1986: 23-25).

Excavations in the Midden Area

The main feature discovered in the test-units north of the room-block area was the refuse midden located just outside Room 5 (Fig. 5.15). The midden deposits were between 25 and 50 cm deep. As in the excavated rooms, however, modern modifications to the site surface may have removed the upper levels of deposited material. In some of the test-units, only five centimeters separated the deposits from the surface (Marshall 1986: 27-28). Examination of the highway shoulder showed the deposits to run up right to the edge of the road cut. This and a lack of cultural material north of the road indicates that the midden originally extended into but not beyond the highway right-of-way. Along the projected east-west axis, excavation tests exposed midden deposits over a stretch of 14 m (Marshall 1986: 4, 25-26). The deposits consisted mainly of charcoal-stained sand, accumulations of ash, and fragments of burned adobe, with ceramics, lithics, and animal bones mixed in between (Marshall 1986: 44-45; Elyea 1986: 55; James 1986: 61-62).

Beyond helping establish extent and composition of the midden deposits, the excavations in the midden area also turned up evidence of activities other than simple refuse disposal. In three test-units, at least five features were uncovered. One appears to have been an outdoor hearth and one an adobe borrow pit, while three were unidentified basin pits. The possible hearth consisted of several sandstone slabs and a thin lens of ash and charcoal, and the borrow pit was an unprepared, c. 30-cm-deep depression. In diameter, the pit surpassed the limits of the unit. In a fourth test, the midden fill was found to contain unburned adobe rubble and a number of rocks. This, suggests Marshall (1986: 28), may have been "constructional debris from a dismantled adobe room". Similar to the floor and sub-floor features in the room-block tests, differences in stratigraphic position of the midden features point to temporal differences in usage. Overall, however, feature and midden usage appear to have been contemporaneous, for none of the tests revealed any features in the sterile soil beneath the midden deposits (Marshall 1986: 27-29).

CHRONOLOGY

Ceramics

Based on the distribution of surface ceramics, Marshall and Walt (1984: 197) outlined the probable site area and placed its main occupation in Glaze A-C or Ancestral Piro times. Of a total of 11 Rio Grande glazeware sherds listed for the site, seven were Glaze A, three Glaze C, and one was an unspecified "[m]id- to late-period rim". A few Carnue Plain sherds most likely date from the 19th-century reoccupation of the area (Marshall and Walt 1984: 327, 346). During the excavations, a sample of 713 sherds was collected. Of these, 191 were glazeware sherds, including 22 bowl rims. Of the 22 rims, 18 were Glaze A, two Glaze C, one Glaze D, and one Glaze E types. Despite the small size, the sample hints at a predominantly pre-contact occupation of the pueblo (Marshall 1986: 34, 46-49). A chance to examine another sample came in 2003 when I received 28 bowl rims from a resident of the site area (Bletzer 2004). The sample included 22 Glaze A, three Glaze C/D, two possible Glaze D/E, and one Glaze E sherds (Figs. 5.16a-c). Unlike the survey and excavation samples, these rim sherds have no provenience record.

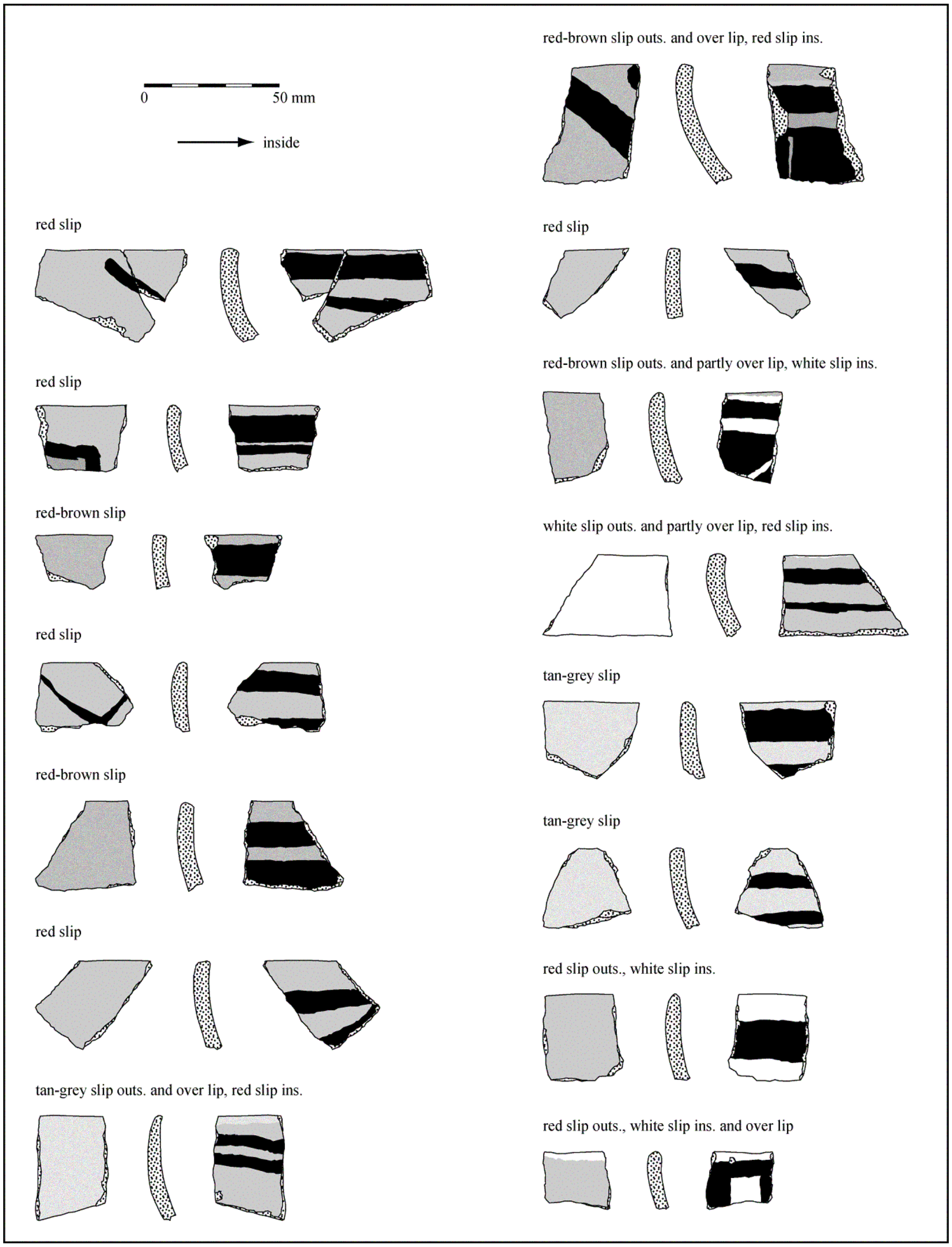

Fig. 5.16a. Early glazeware rims from Pargas Pueblo.

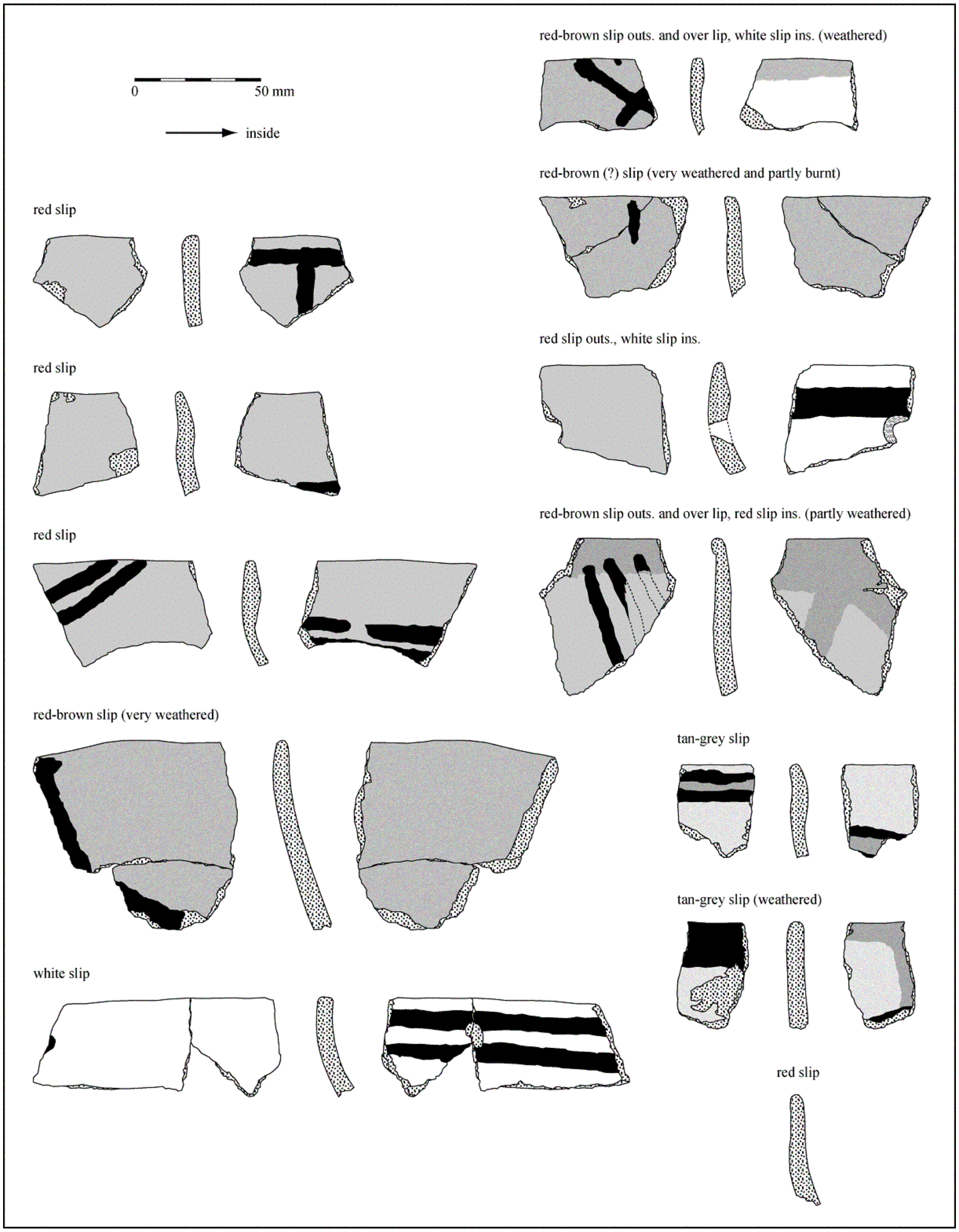

Fig. 5.16b. Early and late glazeware rims from Pargas Pueblo.

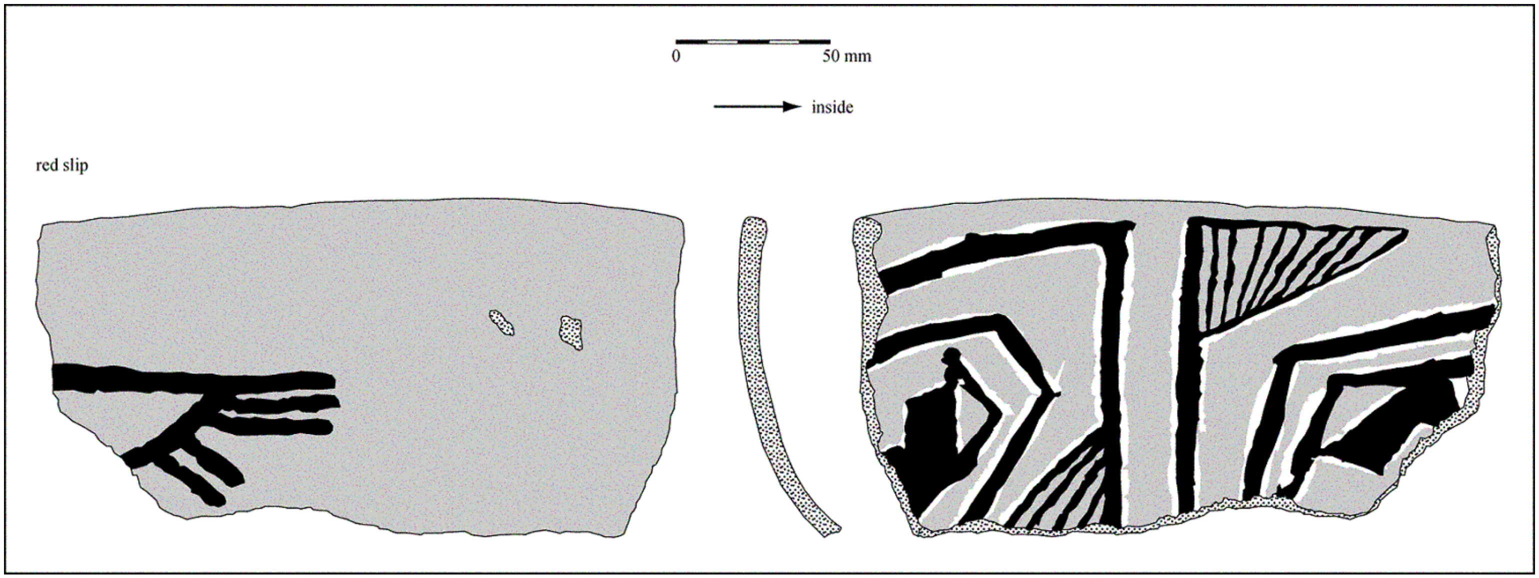

Fig. 5.16c. Early glazeware bowl rim from Pargas Pueblo (all drawings M. Bletzer, 3/2003).

The majority of glazeware rims (13 Glaze A, one C, and one D) in the Pargas excavation sample came from the north midden. The room-block tests produced six sherds: two Glaze A sherds in Room 1, one Glaze E sherd in Room 2, one A in Room 3, and one each of A and C in Room 5. As for non-glaze decorated specimens, only three were found: a possible Tewa Whiteware fragment in the midden area, and two Elmendorf Black-on-white sherds in Rooms 1 and 3, respectively (Marshall 1986: 35-50). Tying in well with the lack of early whitewares is a low frequency of textured utility wares. According to Marshall (1986: 30), only 5.8% of all sherds in the Pargas utility sample were of the textured variety. Additional undecorated material included 14 Carnue Plain sherds found in disturbed midden contexts. Together with glass, ironstone, and metal artifacts collected from the same contexts, these sherds again seem to reflect post-Piro settlement of the site area (Marshall 1986: 52-53).

Chronometric Dates

As part of the Pargas project, two ^{14}C and one archaeomagnetic samples were submitted for analysis (Table 4.5, Fig. 4.14). The ^{14}C samples were taken from two hearths in Room 1. Dated to A.D. 1570±60 and 1610±60, the closeness of the mean dates and the overlapping standard deviations apparently parallel the shallow stratigraphy of the Room 1 floors. Unfortunately, though, the dates turned out in reverse order. The earlier one applies to a hearth associated with the upper of the two Room 1 floors, while the later one dates a lower-floor hearth. The archaeomagnetic sample was taken from the same upper-floor hearth that produced the earlier of the two ^{14}C dates. Analysis of the sample did not yield a viable date, however, for the sample's paleopole plot could not be charted on the

Southwest VGP curve (see Chapter 4) (Marshall 1986: 31-33; cf. Windes 1987: 62). Aside from broadly placing the Room 1 floor proveniences in a late 16th-century context, the Pargas chronometric dates are thus of little analytical value.

SUMMARY

Pargas Pueblo was very probably one of the larger Ancestral/Colonial Piro settlements. The surface distribution of cultural material is more or less comparable to sites like Las Cañas, Las Huertas, or Plaza Montoya. The same is true of the cross-section of rooms excavated during the project. As Marshall (1986: 9) points out, the "width of the roomblock...is consistent with only the largest Piro pueblos". Within the estimated site area, the room block no doubt stood at or near the northern periphery (Fig. 5.14). Given the preponderance of the plaza-type pattern among the larger Piro pueblos (Marshall and Walt 1984: 137), it seems reasonable to assume that it was also the basic layout at Pargas (Marshall 1986: 9). How many rooms the pueblo may have had at the height of occupation is impossible to say. Comparisons of site area with other Piro sites suggest a minimum figure of 100 rooms for the pueblo (Table 4.1).

Due to the nature of both site and project, chronology is problematic even for the few rooms tested. The dominance of Glaze A rim sherds (80% of the combined bowl-rim samples) clearly demonstrates the pueblo's Ancestral Piro affiliation. At the same time, the small number of late glaze sherds (D and E), absence of Pueblo III whitewares, low occurrence of textured utility wares, and the two ^{14}C dates point to minor occupation into contact- and perhaps early colonial times. Except for one bone of a domestic sheep *(Ovis aries)* found in the midden and two possible cow *(Bos taurus)* bones from Room 5

(James 1986: 58-63), the excavations yielded no objects of foreign origin (Marshall 1986: 70-72). But with more recent refuse common in the tested areas, the bones are no proof of a colonial-period occupation (Marshall 1986, App. B).

With the data available, assessments of construction and occupation sequence can only be limited. Fig. 5.15 shows a rough three-phase sequence of room-block expansion that I based on number, type, and position of floors and features. Of the five rooms, Rooms 2 and 3 seem to be the earliest. The lower of two features in Room 2 was perhaps part of a pre-room surface that included the Room 1 area. Structural association of the Room 1 floors is unclear, but the many features are more suggestive of a plaza than room context. Here the potential postholes are especially interesting, for they may have held the posts of a *ramada*-structure. That the tests revealed no floor clearly connected to the room itself may be a result of modern leveling of the site surface. Given all this, I have placed the Room 1 features in the pre-room phases of the sequence (Fig. 5.15).

On the other side of Rooms 2 and 3, the picture is a little clearer. That Rooms 4 and 5 sit atop three possible adobe-mixing basins shows that usage of these features must pre-date construction of the two rooms (Marshall 1986: 25). It is tempting to associate the basins with building/maintenance of Rooms 2 and 3, but this is an assumption that cannot be proved. Nor is it clear whether Rooms 4 and 5 were added in one step. The lack of refuse deposits in the Room 4 and 5 sub-floor levels suggests that refuse disposal north of the room block did not begin in earnest until the later rooms were added. There also are no offset walls or other signs of structural super-positioning. The adobe rubble and rocks in parts of the midden may indicate remodeling, but this, too, is guesswork.

Little can be said about the end of Pargas' occupation. The ^{14}C dates from Room 1 may pre-date part of the room-block expansion and can only be considered a broad *terminus post* for room-block abandonment. With more early than late glaze sherds, no other late material, and few textured utility specimens, the sample is similar to Marshall's (1987: 77-81) Qualacú-based Ceramic Group X, dated to c. 1450-1500. The few late glaze sherds probably stand for the last stages of an occupation which – if the shallow floor sequence in the rooms is any indication – must have been brief. The adobe rubble atop the single floor in Room 5 also suggests as much. For his part, Marshall (1986: 30) sees in the room block a late occupation that could have lasted into the early 1600s, with the pueblo being completely abandoned prior to or early in the mission period (Marshall 1986: 30, 70). Although a reduced final occupation may reflect a gradual process of abandonment, at this point the spatial limitations and a lack of clearly defined late-floor assemblages render any such scenario conjectural.

Qualacú (LA 757)

Qualacú Pueblo is located close to the east bank of the Rio Grande, about 10 km south of San Antonio (Fig. 4.1). In the past, the site has suffered from active floodplain erosion. Proximity to the river was doubtless the main reason for the excavation of the conveyance channel that runs through the eastern part of the site (Figs. 3.22, 5.17). Several documents from the early days of Spanish colonization (e.g. *CDII* 1865-84, 16: 250; Hammond and Rey 1953, 1: 317-318) and from the time of the Pueblo Revolt mention Qualacú, but no references from the intervening years exist (Chapter 6) (e.g. Hackett and Shelby 1942, 2: 364; Marshall and Walt 1984: 249-251).

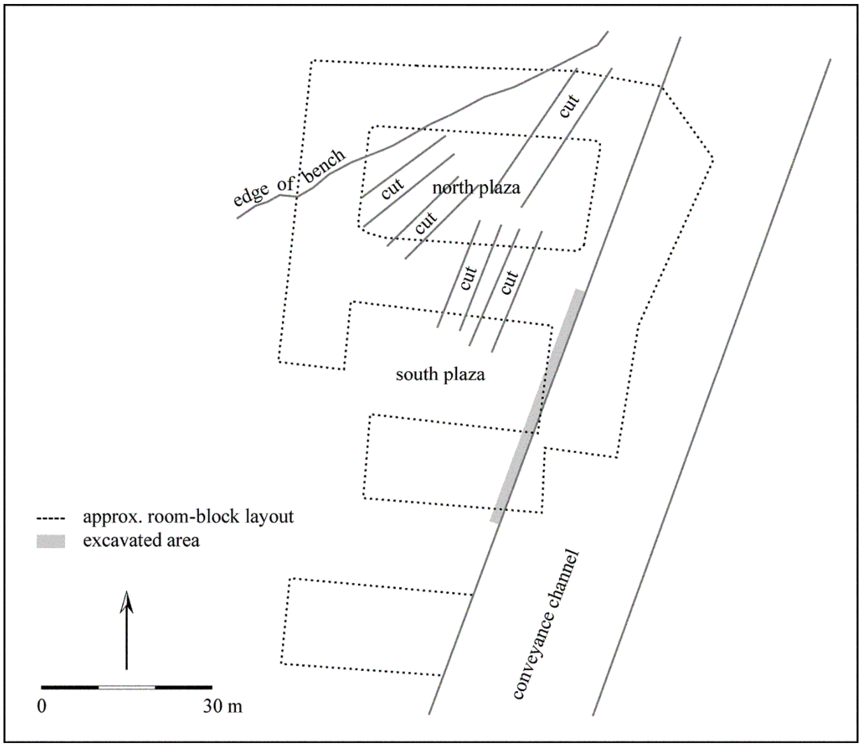

Fig. 5.17. Sketch map of Qualacú Pueblo (adapted from Marshall 1987, Figs. 4 and 5).

The available archaeological and historical data led Marshall (1976) to identify LA 757 with the Qualacú of the documents. Although the link between site and name cannot be considered definitive, it is one of only a few reasonably certain identifications of Ancestral/Colonial Piro pueblos. Yeo and Mera recorded the site in the 1930s, when it was still largely untouched. The channel and other disturbances were documented in the 1970s, and again during the Rio Abajo Survey (Marshall and Walt 1984: 179-182), at which point erosion revealed extensive structural remains and the need for stabilization of the channel faces (see Chapter 3). By that time, about half of the pueblo had been destroyed (Siegel 1987: 7; Marshall 1987: 15, 19).

SITE STRUCTURE

Qualacú's layout follows a general plaza-type pattern. The room-block mounds cover an area of 120 m north-south by 75 m east-west (Marshall 1987: 27). There seem to have been at least seven adobe room blocks (Fig. 5.17), but various disturbances and severe reduction of the mounds make it difficult to single out individual structures. A large number of rooms was removed by the river, and there are five bulldozer cuts in the north-plaza area. All told, Qualacú had perhaps 250 ground-floor and 100 upper-story rooms (Marshall 1987: 27). As part of the Bosque del Apache National Wildlife Refuge, the site now seems relatively safe from additional man-made damage. During a visit to the site in the summer of 2000, I noted no disturbances other than those recorded previously.

The Channel-Cut Excavations I: Room Proveniences

The salvage excavations conducted by Marshall in 1985/86 focused on the west face of the channel cut. No structural remains were visible along the channel's eastern side. Walls and cultural deposits exposed along a stretch about 34 m long were cleared to a horizontal depth of 50 to 100 cm from the channel face. At the end of the excavations stood a vertical, two-meter-deep, profile which comprised "a series of superimposed roomblock constructions and extensive deposits of midden fill" (Marshall 1987: 19). In all, 16 rooms and bin features were recorded on three different occupation levels.

The excavated section of the channel cut ran through what may be called a "south-plaza complex" (Marshall 1987: 28). Structures and features in the profile belong to a south room block, south plaza, and north room block. Near the horizontal mid-point of the profile, the southwest corner of one room (Room 5) was all that remained of a room block that once marked the east side of the plaza. This block was destroyed in the channel construction (Marshall 1987: 19, 48). Also destroyed were most of the latest structures in the profile. Material relating to these structures occurred only in the upper 20 to 30 cm of deposits (Marshall 1987: 31, 44). In undisturbed areas, Marshall (1987: 44) estimates that such late remains are still between 50 and 75 cm deep. Rooms 12, 13, and 14, and Bins 15 and 17 in the south block were the only late structures encountered in the excavations. Room 13 was almost as wide as Rooms 14 and 16 combined, a size difference which may reflect functional variation, with Room 13 representing "some type of communal chamber" (Marshall 1987: 44). The rooms were probably oriented east-west and had just one floor.

The late rooms and bins were built partly over derelict adobe walls and partly on top of midden deposits in the plaza area. Of the walls which formed Rooms 3, 6, 8, and 18, and Bins 1 and 7, only the lower 25 to 50 cm remained,. Rooms and bins were part of an earlier building phase in the south room block (Fig. 5.18). The north room-block section in the profile revealed no structures from this phase (Marshall 1987: 28-30). Room 18 was not excavated, but in Rooms 3 and 8 two adobe floors were found directly overlying lower floors. In Room 8, this resurfacing effort also included replastering of walls. Room 6 had three floors separated by refuse layers 10 and eight cm thick (upper to middle to lower floor). Construction of the upper floor coincided with a renovation of room walls. As the upper floors of Rooms 3 and 8 were basically level with the middle floor in Room 6, the upper floor in Room 6 was probably contemporaneous with the late-phase Rooms 12, 13, and 14 (Marshall 1987: 32-34, 40).

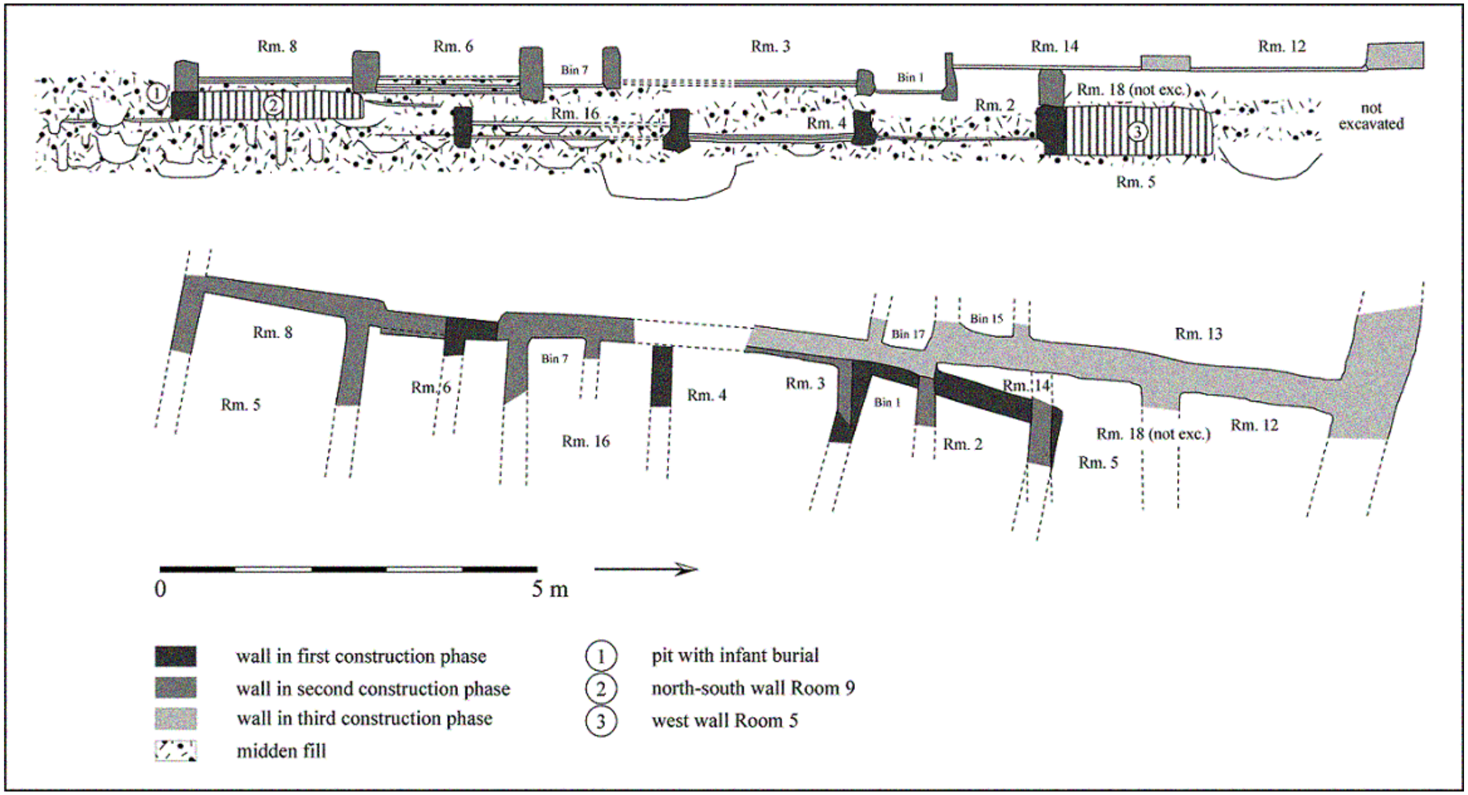

Fig. 5.18. Qualacú Pueblo, south room block, structural profile and plan of excavations (adapted from Marshall 1987: 31-47, and Figs. 5.1-5.8).

Other than the refuse layers in Room 6, no midden deposits were found in the rooms of this building phase. Artifact density was generally low. At least for Room 3, Marshall (1987: 33) suggests that it may have been “cleaned out upon abandonment”. In Room 8, charred roof-fall and a few fire-reddened adobe chunks indicated that this room had burned, but as walls and floor were not oxidized the fire was probably not intense. No other traces of structural fire were seen in the profile section (Marshall 1987: 40). The midden deposits beneath Room 8 and its contemporaries and above the earlier structures were between 20 and 30 cm deep. The latter represent the first construction phase in the channel-cut profile. In the south room block, Rooms 16, 4, 2 were built during this phase, as was (though perhaps somewhat later), Room 9 (not excavated). Room 5 dates to the same phase. This was most likely the southernmost room of an east room block obliterated by the channel cut (see above). With neighboring Room 2, Room 5 formed the southeast plaza corner. Other early-phase rooms were Rooms 10 and 11 in the north room block. The distribution suggests that at some point during this phase the south-plaza complex included at least three room blocks (Marshall 1987: 28-35, 40-48).

With the exception of the two north-block rooms, all early-phase rooms were filled with midden deposits. Remaining adobe walls stood between 20 and 50 cm high. Room 4 with two adobe floors separated by a thin (3-5 cm) layer of sand, and Room 16 with two adobe floors separated by a 20-cm-thick refuse layer were the only early-phase rooms with more than one floor (Marshall 1987: 28, 33-34, 44). Due to its depth, the Room 16 stratigraphy best illustrates initial construction of the south room block. The lower floor of Room 16 was placed on top of a deep midden formation, which contained several pit features of varying size. Covering the upper floor was a 10 cm-thick refuse layer, which in turn had been buried by adobe material from the room's superstructure. After the adobe came more midden sediments, an outside use surface, and, finally, the lowest floor of Room 6 (Fig. 5.18) (Marshall 1987: 35, 44-45).

Another interesting aspect of Room 16 is an outside activity area adjoining the room on the south side. According to Marshall (1987: 44), this area was identified by a "well-defined occupation surface" with midden deposits below and above it. The profile view of the area shows an array of pit features. Vertical distribution of features suggests at least four different periods of feature usage, but no lower use surfaces are described. Among the features were five circular pits measuring c. 15 to 20 cm across and 25 to 50 cm in depth. A sixth pit was 10 cm wide and 15 cm deep (Marshall 1987: 35, 43). With similar shapes, and with five of them aligned roughly on two levels, the pits may have been postholes for successive *ramada* structures attached to Room 16. The two topmost pits were probably associated with Marshall's "well-defined" surface and the lower floor in Room 16. The base of unexcavated Room 9, by contrast, was located above the area and lined up with the upper floor in Room 16 (Fig. 5.18) (Marshall 1987: 40).

The Channel-Cut Excavations II: Midden Proveniences

As the description of the room proveniences indicates, midden deposits made up a good part of the channel-cut stratigraphy. Refuse was encountered within, below, and on top of rooms and plaza surfaces (Fig. 5.18). The lowest midden layer in the profile (depth c. 30-40 cm) had been buried by the early-phase structures in the north and south room blocks. Marshall (1987: 28, 30) calls this layer the "Prelude Midden". Pit features at different elevations suggest intensive use of the midden area. Some large pits at or near the bottom of the midden were perhaps adobe-mixing basins. Many smaller pits showed signs of oxidization characteristic of hearths or roasting pits. Others may have been used as caches. None of the pits exposed in the profile were lined with adobe or heavily oxidized. Given their large number and the succession of possible use surfaces, most of these pits were probably used for only brief periods (Marshall 1987: 48-53).

Later midden deposits hint at changes in the structure of the south-plaza complex. Marshall (1987: 48) estimates that between 1.5 and two meters of refuse were dumped in the plaza during the occupation of the complex. In the early building phase, 17 m of plaza space separated the south and north room blocks. In the subsequent phases, construction was limited to the south room block, while refuse was now deposited in a plaza that included the north-block area. Accumulation over the old north-block rooms eventually reached one meter in depth (Marshall 1987: 41, 48). Refuse disposal also continued outside the south room block. Various features and surfaces again reflect different uses, including burial. In contrast to these deposits, the late-phase rooms and top levels of the profile contained almost no refuse. Abandonment of the complex may thus have overlapped with a temporary abandonment of most, if not all, of the pueblo (Marshall 1987: 28-31).

CHRONOLOGY

In the previous chapter, I reviewed some of the ceramic and chronometric information from Qualacú in the context of regional chronology. Here, the focus is not so much on regional issues, but on dating the construction/occupation sequence of a large Piro pueblo. Aside from offering rare glimpses of an extended segment of pueblo structure, the salvage excavations in the channel cut generated a substantial (and thus equally rare) amount of chronological data from many stratigraphic proveniences. It is this quantity and quality of data that make the Qualacú project the most important investigation of Ancestral/Colonial Piro settlement structure prior to the Plaza Montoya excavations.

Ceramics

Surface samples of ceramics collected by Mera (1940: 7) and Marshall and Walt (1984: 325, 343) represented the whole spectrum of decorated wares from Pueblo III whitewares to Glaze F and historic types. In 213 sherds taken during the Rio Abajo Survey, Marshall and Walt (1984: 325) found 101 Glaze A sherds, 13 Glaze C, 11 Glaze D, and 18 Glaze E sherds, plus one Glaze F specimen, one "late-period rim", and 10 "mid- to late-period rims". Whitewares amounted to 28 Elmendorf Black-on-white sherds. There were no Tabirá or other late non-glaze types. Two glazeware soup-plate pieces seem to have been the only forms of colonial affiliation (Marshall and Walt 1984: 181, 325). Though at the time of the Rio Abajo Survey spatial clustering of forms was only broadly described, one sample area in the northwestern part of the site produced more (*n*=24) late glaze sherds (i.e. D-F and generic mid- to late-period types) than four southern and eastern sample areas combined (*n*=17) (Marshall and Walt 1984: 325, 344). In a surface sample of 253 glaze rims collected during the Qualacú project, Glaze E and F specimens also came mainly from the northwestern part of the site (Marshall 1987: 19-20, 73, 80). In 2000, I noted six Glaze F and three possible Tabirá Black-on-white sherds in the same general area (see Chapter 4). At that point, few sherds remained on the surface.

The channel-cut excavations produced a sample of 234 glazeware rims (Marshall 1987: 72, App.). Except for Glaze F, all major glaze forms were present, plus forms Marshall recognized as transitional (e.g. C/D, D/E). Glaze A sherds dominate all but the uppermost proveniences, but, as Marshall sums up in his Rio Abajo ceramic sequence (see Chapter 4), decrease in frequency from lower to upper levels. In room proveniences, the numbers run from 61 Glaze A (including one A/B form) bowl rims in the Prelude Midden (total sample *n*=63 rims) to 13 in early-phase rooms (sample *n*=14), to 15 in middle-phase rooms (sample *n*=21), to two in late phase rooms (sample *n*=6). In midden proveniences, the lowest two levels yielded 55 Glaze A rims (total glaze-rim sample *n*=56), the middle two levels 46 (including one A/B form, sample *n*=52), and the upper two levels 12 (also including one A/B form, sample *n*=18) (Marshall 1987: 70-71).

The distribution of late glazes (D-F) shows a reverse trend. Rims in the room sample included two D specimens from the Prelude Midden and one from early-phase rooms; one C/D, three D, one D/E, and one E from middle-phase rooms; and three D and two E from late-phase rooms. In the midden sample, the lowest two levels had no late glazes, but six rims (four D, two D/E) were found in the middle and four (two D, two E/F) in the upper two levels (Marshall 1987: 70-71). Temper-type analysis revealed several chronologically relevant trends in the glazewares from Qualacú. Sand was used more often (26-47%) in early (A-C) than late (D-F) forms (8-17%). White-rock temper occurred only in traces (<1%) in Glazes A through D, but with some frequency (17-24%) in E and F forms. Overall, sherds tempered with various types of basalt dominated all but the lowest proveniences (Marshall 1987: 74-77, App.).

The only decorated sherds in the channel-cut sample other than glazewares were of Elmendorf Black-on-white affinity. There are no absolute figures, but the ratio of whitewares is reported as declining from 19 to 1% from lowest to uppermost levels. An increase in the frequency of glazeware more or less paralleled this decline. The ratios of plain and textured utility sherds from the midden sample revealed a bottom-to-top increase from 40 to 66% in plain and a decrease from 23 to 1% in textured specimens (Marshall 1987: 68, 77-78). Late non-glaze types or colonial forms (soup plates, cups, etc.) were not found during the excavations (Marshall 1987: 124).

Chronometric Dates

The Qualacú project produced a suite of seven ^{14}C and one archaeomagnetic dates (Table 4.5, Fig. 4.14) (Marshall 1987: 30, 57-60; Windes 1987: 60-63). Stratigraphically, the earliest sample provenience was a hearth on the lower of the two floors in Room 16. A ^{14}C date of charcoal came out at A.D. 1590±80, while archaeomagnetic samples of the oxidized adobe lining yielded a date (at mid-range) of A.D. 1387.5±37.5 (Windes 1987: 60). Stratigraphy and ceramics (Glaze A, Elmendorf Black-on-white) were in line with the archaeomagnetic date. Since the provenience was undisturbed, the 200-year discrepancy of the ^{14}C date was attributed to analytical error (Marshall 1987: 44, 58). Another early provenience by stratigraphic position, a plaza hearth in midden deposits bordering the north room block, was dated to A.D. 1480±70. As the hearth was level with the floors in the adjacent early-phase Rooms 10 and 11, the date may well fall within the upper sample range (Marshall 1987: 50-51, 58-59). Charcoal from early-phase Room 2 provided a ^{14}C date of 1540±60. Provenience was just above (0-10cm) floor level. The sample thus post-dates room abandonment, but probably not by as much as the medial date suggests. If anything, ceramics and depth of overlying deposits again point to a date in the upper sample range (Marshall 1987: 58).

Two charcoal samples from middle-phase proveniences were also ^{14}C-dated. One sample came from a small pit below the south wall of Room 6, the other from the roof-fall atop the upper floor in the same room. In selecting the two samples, Marshall's intention was evidently to obtain bracket dates for the middle-phase occupation. A date of 1490±60 for the upper sample provenience appears plausible, but a date of 1820±80 for the lower provenience clearly is not. Since the lower provenience had proved undisturbed, the discrepancy was again attributed to analytical error (Marshall 1987: 34, 57-58). More straightforward are two ^{14}C dates for the late-phase Rooms 13, 14, and 14. The two samples were taken from a burned area on the floor of Room 13 and from fill material just above (0-10 cm) floor level in the same room. Dates were 1530±80 for the lower and 1540±60 for the upper provenience. The two dates reflect the stratigraphic proximity of the two proveniences, and fit in well with the Glaze D and E sherds found in the late-phase levels (Marshall 1987: 31, 44, 57-58).

SUMMARY

Based on the structural and chronological data from the channel cut, Marshall (1987: 27-31) identifies three construction/occupation phases in the south-plaza complex. The extent of the earliest cultural deposits in the Prelude Midden suggests that the pueblo already had a sizeable population prior to construction of the first south-plaza rooms. This population probably resided in a nearby, as yet unidentified, part of the pueblo.

Judging by its ceramics, the Prelude Midden accumulated between c. 1350 and 1400 (Marshall 1987: 30). Above the midden, the early-phase rooms represent Phase I in Marshall's site sequence. In the south room block, the Room 16 floor-midden-floor succession divides Phase I into three sub-phases: I-A, the main occupation of the lower floor; I-B, room abandonment and refuse disposal; and I-C, occupation of the upper floor. It was during Phase I-A that rooms were built all around the eastern part of the south-plaza complex. As a whole, the Phase I occupation seems to have lasted from c. 1400 to 1450 (Marshall 1987: 28, 30).

Following abandonment, the Phase I rooms in the south room block were filled with refuse. This, too, was most likely deposited by residents who lived close enough to make such a disposal convenient. By the time middle-phase or Phase II construction began, the old room blocks had melted into low mounds. The degree of deterioration and depth of the "Phase I-II Interlude Midden" (Marshall 1987: 30) suggest a substantial occupation break in the mid-1400s. Both Phase I and II rooms contained mostly Glaze A sherds (93 and 71% of excavated glazewares, respectively), however, which in turn suggests the break did not last too long. At Las Humanas Mound 7, for instance, a structural break marked a middle- to late-phase transition in the early 1500s. Only the lower courses of middle-phase masonry walls were still standing when the first late-phase rooms were built. Tree-ring dates and differences in ceramic distribution indicate that 15 to 25 years separated the two occupation phases (Hayes et al. 1981: 25-28). Considering this, and if one allows for a faster deterioration of adobe walls, a plausible estimate for the Phase I-II interlude at Qualacú is perhaps around 10 years.

Phase II construction was limited to the area of the old south room block. In the excavated section, the Phase II room block stood four rooms deep, compared to the three rooms of the Phase I room block (Fig. 5.18). Marshall (1987: 30) dates the Phase II occupation to the mid- to late 1400s. Similar to the Phase I room block, only one room showed evidence of multiple occupations. The three floors in Room 6 represent Phases II-A, II-B, and II-C in Marshall's sequence. The Phase II-A/B floors and refuse probably reflect a pause in room use, but the upper floor (II-C) was part of a major renovation effort. Though the evidence is not conclusive, renovation and floor location point to a Phase III affiliation for the late Room 6 occupation (Marshall 1987: 28-31, 34).

Except for Room 6, no refuse had been deposited in the excavated Phase II rooms after abandonment. This contrasts with the Phase I/II occupation break and accumulation of the Interlude Midden. The absence of a Phase II/III midden indicates a shift in the use of occupied space away from the south-plaza complex, if not a temporary abandonment of the entire pueblo. This hiatus can roughly be dated to the late 1400s, for the two near-identical ^{14}C dates from Room 13 point to the early to mid-1500s for the Phase III occupation. Like the Phase I/II Interlude, the Phase II/III hiatus was long enough for all abandoned structures to deteriorate to near floor-level. Subsequent Phase III rooms were built over the Phase II plaza front and adjacent plaza space (Fig. 5.18) (Marshall 1987: 30-31, 42-44). The old north room-block area, which during Phase II had become part of the plaza, remained open. The excavations revealed no midden deposits in Phase III rooms, nor evidence of later rooms. Based on ceramics, Marshall (1987: 31, 44) dates the end of the Phase III occupation to the contact period. Although it was the end of the south-plaza complex as a whole, parts of the north-plaza area remained or were again occupied in colonial times. Late glaze and, possibly, non-glaze ceramics on the surface mark this as Phase IV in Marshall's site sequence. The last of Qualacú's occupation phases, it perhaps ended some time between 1650 and 1670 (Marshall 1987: 30-31).

In depth and density of structural remains and cultural deposits the Qualacú sequence differs greatly from what is known about other Ancestral/Colonial Piro sites. The sequence represents c. 200 years of occupation, abandonment, and reoccupation of the southeastern part of the pueblo. The channel-cut profile for the first time enabled archaeologists to study suites of rooms at a large Piro pueblo, including their material inventories. Thus Marshall (1987: 31, 44, 67; cf. Elyea 1986) observes a relative lack in all proveniences of what might be called de-facto refuse (i.e. complete or restorable pottery vessels, useable grinding stones, etc.). Differences in midden deposits perhaps reflect differences in overall site occupation during periods of abandonment of the south-plaza complex, but beyond this there is little to suggest variability in abandonment processes. At the end of each phase, the rooms in the profile section seem to have been abandoned in planned fashion, at more or less the same time.

To what extent this may be true of the rest of the pueblo is uncertain. It is also uncertain whether other patterns emerging from the profile section "of the southeast pueblo reflect those throughout the entire pueblo" (Marshall 1987: 30). The caveat is obvious if one compares the c. 40 m^2 of excavated space with a rough estimate of 2,500 m^2 for the area covered by the remaining room-block mounds. Yet at the same time the Qualacú data clearly stand out from those of Las Huertas or Pargas Pueblo. The discrepancy makes comparisons between these sites difficult, but also reminds one of the potential structural and occupational complexity of the larger Piro pueblos.

San Pascual (LA 487)

San Pascual is located a few kilometers south of Qualacú (Figs. 4.1, 5.19). Nine large mounds and at least four plazas cover an area c. 200 m east-west by 150 m north-south (Fig. 5.20). Natural disintegration of the adobe room blocks, erosion, and bulldozing translate into a lack of structural definition which only permits a rough size estimate of 750 ground-floor rooms (Marshall and Walt 1984: 182-183). Variations in mound height are slight, making it impossible to assess the extent of upper-story construction. Even so, size clearly separates San Pascual from all other Piro pueblos. It is more than twice as large as Las Huertas or Qualacú, but about the same size as Abó Pueblo (cf. Trott and Nordby 1981; Baldwin n.d. b) or the Zuni pueblo of Hawikuh (cf. Kintigh 1985: 61).

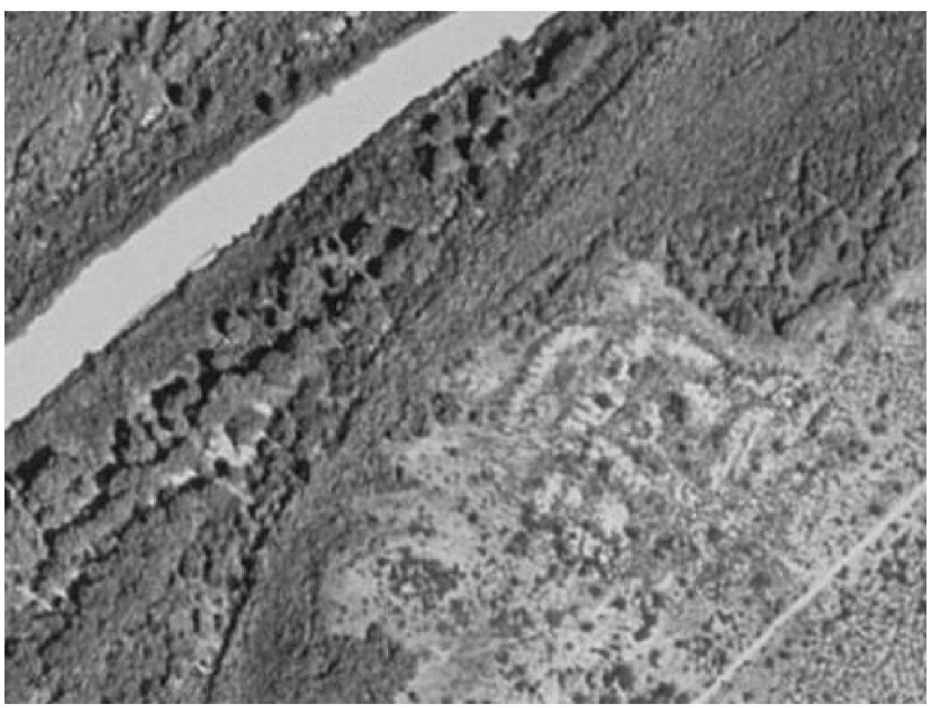

Fig. 5.19. The San Pascual site area (right of center) (USGS photograph, 1996).

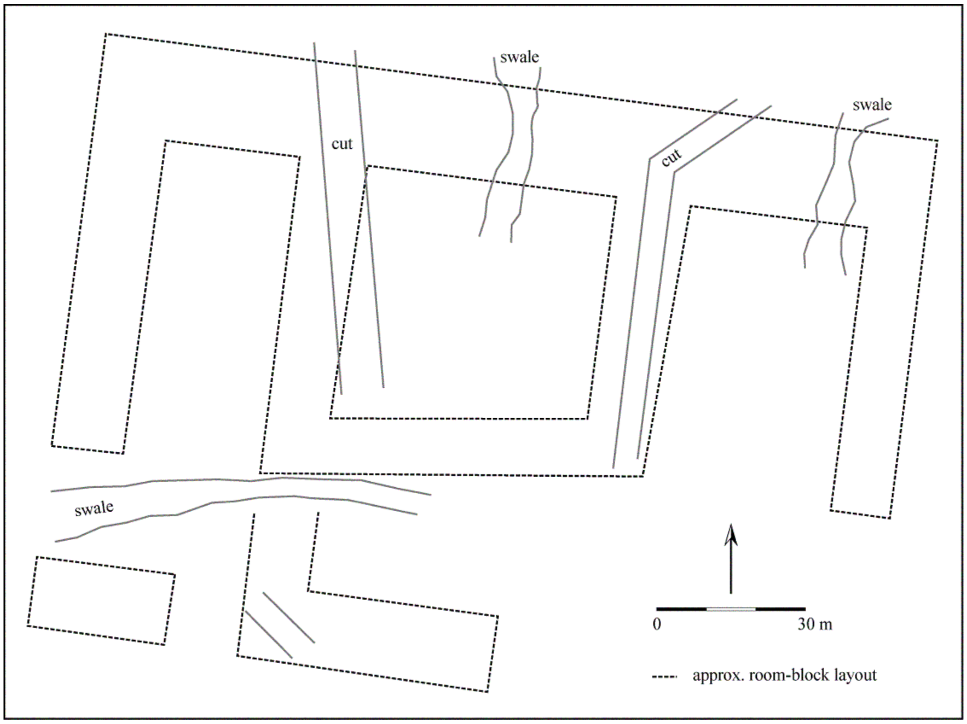

Fig. 5.20. Sketch map of San Pascual Pueblo (adapted from Marshall and Walt 1984, Fig. 9.45; and personal observations in 2001).

H. P. Mera (1940: 7) in the 1930s found all glazeware groups represented in the San Pascual ceramic assemblage. A surface sample of 74 glaze sherds taken from three room blocks during the Rio Abajo Survey included 51 sherds of Glaze A-D affiliation, 16 sherds labeled "mid- to late" and "late" glazewares, a glazeware soup plate or platter (see Fig. 4.5), and two mayólica fragments (Marshall and Walt 1984: 325, 344). This suggests that occupation peaked during pre-contact times and continued at a reduced level into the post-contact years, but with no research beyond a few walkovers the pueblo's occupation sequence remains essentially unknown. The spatial distribution of ceramics as noted by Marshall and Walt (1984: 183) does not indicate which part(s) of

San Pascual might have been occupied in the 17th century. A visit to the pueblo in 2000 added no further insight, only the realization that despite its size and apparent occupation span surface ceramics are scarce at the site.

Although San Pascual is a colonial-period name, it first appears in documents from the time of the Pueblo Revolt (Marshall and Walt 1984: 251; Marshall 2005: 36). Some of the Spanish explorers of the early 1580s noted that a pueblo they called Piña exceeded in size all others in the area (see Chapter 6). Neither structure nor location are described in a way that would allow one to equate Piña with San Pascual, however. It is thus unclear where San Pascual fits into the post-contact landscape. The name may hint at a religious establishment, and there are a couple of 18th-century references to a church at San Pascual. Given the size of LA 487, a *visita* or temporary mission could well have been founded there during the mission period (see Chapter 6). At the Tompiro pueblo of Tenabó (LA 200), for instance, test excavations uncovered what may have been the remains of an undocumented *visita* chapel (Baldwin n.d. a). This strengthened the link between the site and the 17th-century name (cf. Ivey 1988: 17-19). No chapel is visible at San Pascual, but considering what little is left of the Sevilleta mission traces of a chapel may exist below the surface (Marshall and Walt 1984: 251). By Piro-area standards the identification of LA 487 with the historic San Pascual seems fairly reliable; discovery of a church or chapel would make it definite. As is true of site structure and chronology, only a concerted effort of remote sensing and test excavations can help clarify the issue of historical identity (Marshall 2005: 36).

Tiffany Pueblo (LA 244)

South of and across the river from San Pascual is the site of Tiffany Pueblo (Fig. 4.1). One of the smaller Ancestral/Colonial Piro pueblos, Tiffany is located on a bench 10 m above the Rio Grande floodplain (Fig. 5.21). Though partly disturbed, the site layout is clearly visible. Three masonry room blocks surround a plaza on the north, west, and south sides. A circular depression measuring 10 m in diameter is in the center of the plaza. Except for a smaller structure near the edge of the bench, the plaza is open toward the east (Fig. 5.22). The pueblo seems to have had about 40 rooms (Marshall and Walt 1984: 207-208). A recent magnetometer survey (Rohe 2004) revealed no sub-surface wall foundations, nor any alignments differing vastly from those depicted in Fig. 5.22.

Fig. 5.21. The Tiffany site area (above and right of center) (USGS photograph, 1996).

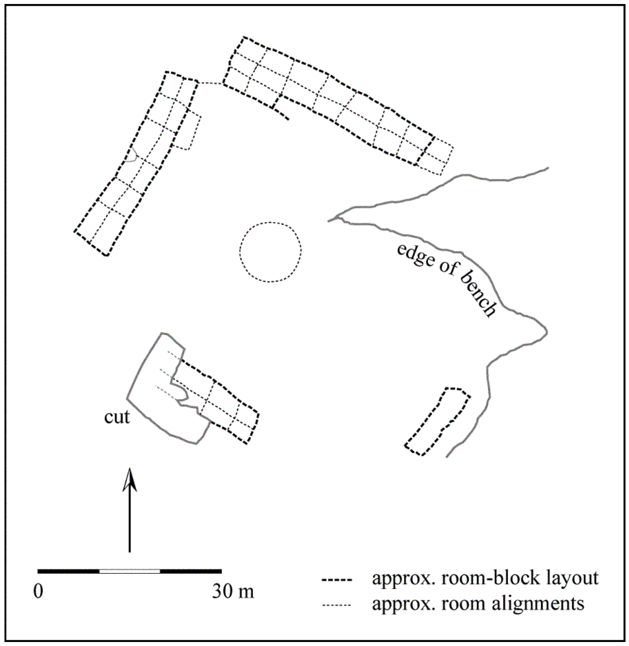

Fig. 5.22. Sketch map of Tiffany Pueblo (adapted from Marshall and Walt 1984, Fig. 9.79).

Tiffany Pueblo was first visited by Yeo and Mera in the 1930s. Mera (1940: 7) reported a spatial separation of early and late glaze sherds which he interpreted as marking two distinct occupations. He identified the site with the Trenaquel or Tzenaquel Pueblo mentioned in the early colonial documentation, and it became the type site for his Glaze E Trenaquel Glaze Polychrome type (see Chapter 4). A review of 17th-century locational references, however, shows that Trenaquel and the lost pueblo of Senecú were one and the same, and that neither in location nor in size Tiffany matches what is known about Trenaquel/Senecú (see Chapter 3) (cf. Baldwin 1982). A sample of 59 decorated sherds collected by Marshall and Walt (1984: 328) during the Rio Abajo Survey corroborated Mera's ceramic analysis. Although few of the Rio Grande glazeware sherds

(n=55) in the sample were identifiable by glaze group (two Glaze A, two E, and four F), the distribution of the named forms still reflects the pattern Mera had noted. The two early sherds both came from the small eastern structure. The late sherds were found in the main room-block areas. The same also produced two Tabirá Black-on-white sherds, but save for a fragment from a ring-based vessel picked up by Mera no other late non-glaze types have so far been recorded at Tiffany. As for early whitewares, these are entirely absent (Marshall and Walt 1984: 328, 341). At present, there is nothing to add to Mera's and Marshall and Walt's observations. In some ways (e.g. size, possible large kiva), Tiffany seems similar to smaller Colonial Piro sites with no obvious Ancestral affiliation, but in others (e.g. layout, Glaze A component) it resembles many of the larger Ancestral/Colonial pueblos (cf. Marshall and Walt 1984: 139-140).

Milligan Gulch Pueblo (LA 597)

The southernmost of the large Piro pueblos, Milligan Gulch Pueblo is located some 10 km south of Black Mesa on the west side of the Rio Grande (Fig. 4.1). Its name derives from the ephemeral stream that joins the Rio Grande just north of the pueblo. Yeo and Mera visited the site in the 1920s and 30s. They described several mounds of adobe and masonry rubble grouped around two plazas (Fig. 5.23) (Yeo 1932; Mera 1940: 7). As I described in Chapter 3, at the time of the Rio Abajo Survey the main mounds were still partly visible. Since then, however, alluvial deposits have totally buried the site (see Fig. 3.16). I had planned to visit Milligan Gulch in early 2004, but failed to locate any structures or cultural material in the general site area (cf. Marshall 2005: 21).

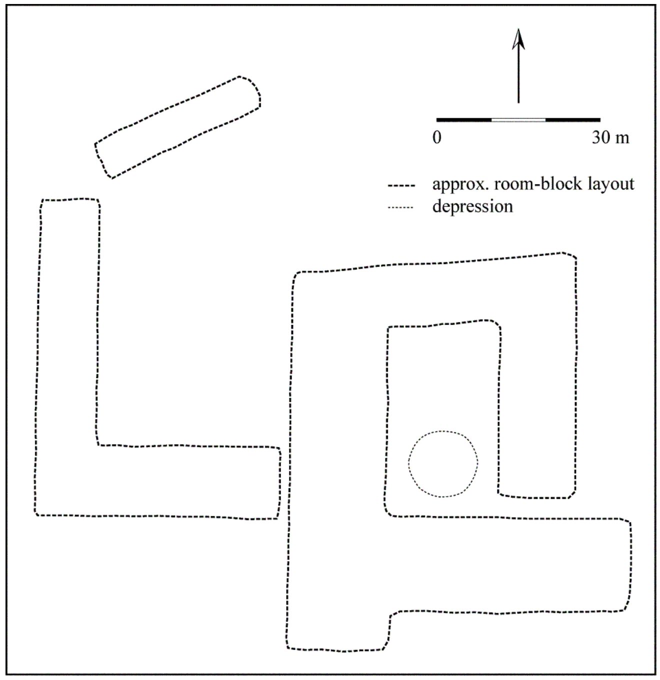

Fig. 5.23. Sketch map of Milligan Gulch Pueblo (adapted from Marshall and Walt 1984, Fig. 9.101).

As recorded by Mera, the pueblo covered an area of about 100 m east-west by 90 m north-south. There seem to have been between 200 and 300 ground-floor rooms, plus an unknown number of upper-story rooms (Table 4.1) (Marshall and Walt 1984: 229-230). Surface samples of diagnostic ceramics indicate an early occupation in the eastern masonry part of the pueblo, and a later occupation in the adobe portion to the north and west. A few Glaze E and F sherds in the assemblage probably reflect a minor occupation or reoccupation in the contact and perhaps early colonial period, but how extensive or enduring this may have been cannot be estimated. Given its location and size, Milligan Gulch is generally believed to be the pueblo called *San Felipe del Nuevo México* by the Spanish explorers who came through the area in the 1580s (Marshall and Walt 1984: 248;

Marshall 2005: 21). The pueblo was described as being abandoned and falling apart, though with walls apparently still standing to a height of two stories. No other references to San Felipe exist, however. In later years, the only pueblo mentioned in this area was Tzenaquel/Senecú. To Spanish travelers in the colonial period, Senecú was always the "first" (i.e. southernmost) pueblo of New Mexico (Chapters 3 and 6).

Bear Mountain (LA 285)

Bear Mountain Pueblo is located at the mouth of a narrow canyon on the eastern edge of the Bear Mountains, about 10 km north of Magdalena (Fig. 4.1). Elevation is nearly 2,000 m, or more than 500 m higher than Las Huertas or Qualacú. A small arroyo runs out of the canyon toward La Jencia Creek and the Rio Salado (Figs. 5.24, 5.25). Mera in the early 1930s recorded the site as Lower Goat Springs Pueblo (after an old spring a short distance up the arroyo) (cf. Marshall and Walt 1984: 215). The name is still used today by local residents (Robert Weber, pers. com., 7/2002). In July and August 1960, students from UCLA carried out minor excavations at Bear Mountain Pueblo and at the Pueblo III ruins of Gallinas Springs (LA 1178) (Davis and Winkler 1960).[1] The excavation tests provided a small sample of stratigraphic data, the first-ever from an Ancestral/Colonial Piro site (see Chapter 4). There are, however, no clear illustrations of excavated areas, nor is there much detail in the depositional and structural descriptions.

[1] The report on these excavations refers to the two sites under survey labels used by Danson (1957) in the 1940s (see Chapter 4): D 118 for Gallinas Springs, and D 125 for Bear Mountain. LA numbers are handwritten on the report (LA 8931 for Bear Mountain and LA 8932 for Gallinas Springs), but are incorrect. Mera recorded Bear Mountain as LA 285, and the number for Gallinas Springs is LA 1178.

Fig. 5.24. The Bear Mountain site area (right of center) (USGS photograph, 1996).

SITE STRUCTURE

In contrast to almost all lowland Piro sites, the extent of above-ground remains at Bear Mountain Pueblo is sufficiently clear to give a quick impression of general site layout. That most of the pueblo was built in masonry obviously has much to do with the preservation of structural mass, as does the fact that no modern settlement is near the site. There are three room blocks flanking the north, west, and south sides of a single large plaza (Fig. 5.25) (Danson 1957: 78; Davis and Winkler 1960: 3-4; Marshall and Walt 1984: 215-217). According to Davis and Winkler (1960: 2), the three room blocks held a total of 200 single-story rooms, with no upper-story construction.

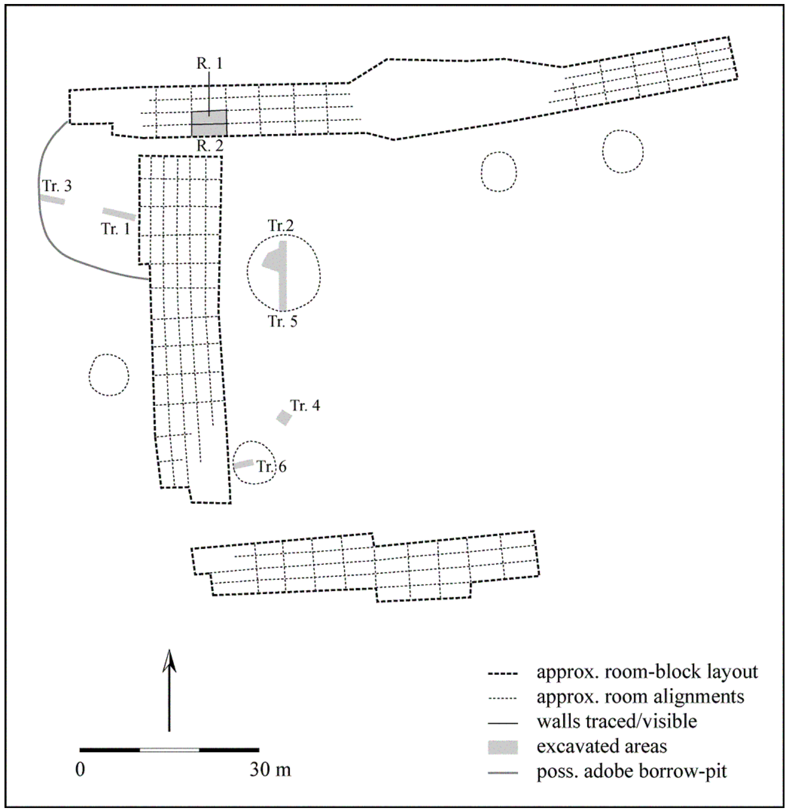

Fig. 5.25. Sketch map of Bear Mountain Pueblo (adapted from Davis and Winkler 1960, Map 1; and personal observations between 2000 and 2005).

As structural descriptions go, the most comprehensive is Marshall and Walt's (1984: 215-217). Based largely on surface observations during the Rio Abajo Survey, it gives a more specific size estimate of 165 ground-floor rooms and, based on differences in mound height between and within room blocks, suggests that inner tiers in the west and north room blocks may have had a total of up to 50 second-story rooms (Fig. 5.26) (Marshall and Walt 1984: 215, 217). Plaza dimensions are approximately 100 m east-west by 75 m north-south, which makes this the most spacious plaza in any of the known Piro pueblos (Figs. 5.24, 5.25). Several depressions are visible in the plaza and outside the west room block, as are a number of artifact scatters beyond the main pueblo (Davis and Winkler 1960: 5). Excavated were two rooms in the north room block and six test-trenches in depressions east and west of the west room block (Fig. 5. 25, 5.27).

Fig. 5.26. Bear Mountain Pueblo, west room block, looking south (M. Bletzer, 8/2002).

Excavations in the North Room Block

The two excavated rooms were located near the western tip of the north room block. The rooms were contiguous, with Room 1 located in the room-block's second tier and Room 2 fronting the gap with the west room block. In Room 1, the uppermost cultural level consisted mostly of cobbles and adobe chunks from the old superstructure. The second level was a mix of adobe and roofing material. Some of the adobe showed impressions of twigs and reeds from the upper parts of the roof. The third level seems to have been a prepared adobe floor. A posthole in the northeast corner with pieces of wood still *in situ* is the only floor feature described, though there also is a reference to a post in the room's northwest corner (Davis and Winkler 1960: 5, A-9).[2] Whether there were one or two posts cannot be determined from the descriptions. An area around the northeast posthole seems to have been excavated below floor level, but there is no information on the scale of this sub-floor test (Davis and Winkler 1960: A-1 - A-3).

Fig. 5.27. Bear Mountain Pueblo, north room block. One of the two rooms excavated in 1960. View is to the west (M. Bletzer, 8/2002).

[2] As the report on the excavations contains two identically numbered sections, I use the letter A (for appendix) in addition to page numbers when referring to the second section. In the report, the section (a kind of keyword list of excavated features and artifacts) is not listed as an appendix.

Work in Room 2 was apparently also limited to the upper fill and one floor level. The top two cultural levels were labeled “top rubble” and “middle rubble” (Davis and Winkler 1960: A-2 - A-3). An adobe floor similar to the one in Room 1 formed the third level. Fragments of floor and wall plaster hinted at the rooms interior finish. Associated with this floor was a hearth, which Davis and Winkler (1960: A-4) describe as being located “in center of south wall”. There is, however, no plan drawing of either floor or feature. Near the hearth, the excavators encountered an unidentified pit. A sub-floor pit was found in the room’s northwest corner, but no details as to size, fill, and possible function are given. Clearing of the floor surface seems to have completed the excavation of Room 2 (Davis and Winkler 1960: A-3 - A-4).

Plaza and Offsite Tests

Of the six test-trenches excavated during the project, Trenches 1 and 3 were placed in a large depression just outside the northern half of the west room block, Trenches 2 and 5 in the largest of the plaza depressions, and Trench 6 in a smaller plaza depression off the southern tip of the west room block. Trench 4, by contrast, seems to have been a random test located a few meters northeast of Trench 6 (Fig. 5.25). Again, there are few details on results. Trenches 1 and 3 produced ceramics, lithics, and organics (bone, charcoal, burned corn) to a depth of c. 70 cm (Davis and Winkler 1960: A-8). With no recorded features or use surfaces the depression may originally have been an adobe borrow pit that was later used for refuse disposal (cf. Marshall and Walt 1984: 217). Work in Trenches 2 and 5 turned up ceramics and pieces of adobe plaster, and there is a reference to a wall at the lowest excavation level of Trench 2 (Davis and Winkler 1960: A-7). Neither depth nor structure are known, but the existence of the wall, plus the plaster fragments in the fill, strongly suggest that the depression is a buried kiva (cf. Marshall and Walt 1984: 217). The Trench 6 excavation in the southern depression revealed no evidence of formal preparation, just a number of sherds and lithics, as well as some charcoal. A few sherds also came from the nearby Trench 4 test (Davis and Winkler 1960: A-8).

CHRONOLOGY

As there are no absolute dates for any of the tested proveniences, all evaluations of the Bear Mountain sequence must rely entirely on ceramic data. Mera (1940: 7) noted only Glaze D, E, and F sherds on the surface, and Marshall and Walt (1984: 217, 341) report a similar glazeware sample. At first glance, this may suggest a late Ancestral/Colonial Piro occupation, but if one considers the sample of excavated ceramics the picture becomes more diffuse. Among many unspecified sherds, the Trench 1 sample included a Glaze D and two Pinnawa Polychrome rims from what seems to have been the lowest excavated level, and six plain whiteware, one Glaze C, four D, and one E sherds from upper levels (Davis and Winkler 1960: A-6 - A-9). Pinnawa Polychrome is an early 15th-century type from the Zuni area (cf. Reed 1955; Woodbury and Woodbury 1966). For the lowest level of Trench 2, Davis and Winkler (1960: A-7) record a carbon-painted "Mesa Verde Black-on-white type" sherd. Davis later (1964: 353-354) labeled similar sherds from the Magdalena uplands "Mesa Verde Black-on-white, Magdalena variety". Common on late Pueblo III sites west of the Piro area, the pottery dates to about the late 13th and early 14th centuries (Knight and Gomolak 1987; Lekson 1996; Lekson et al. 2002). A second carbon-painted sherd was picked up from the surface (Davis and Winkler 1960: A-7).

Other identified sherds were two Glaze D rims from Trench 3, and a Bidahochi Polychrome sherd from the lower of two levels in Trench 6 (Davis and Winkler 1960: A-6, A-8). The latter specimen is a 14th-century type originating in the Hopi area (cf. Sires 1984; Crown and Sires 1984; Lyons 2001, 2003).

For the vast majority of decorated sherds from the excavations, references are only to slip color and decoration. Out of a total of 228 Rio Grande glaze sherds, the one C, seven D and one E rims from Trenches 1 and 3 are the only ones identified by glaze group. Of all sherds (*n*=1,247), the Pinnawa and Bidahochi Polychrome specimens in Trenches 1 and 6 are the only ones clearly identified by type. Especially ambiguous are descriptions of possible late non-glaze ceramics. Davis and Winkler (1960: A-1 – A-6) list a number of redware sherds ranging from “rub off red” to “polished” to “utility redware”. There is no mention of forms that might indicate whether any of these sherds were similar to Salinas Red specimens. Although most of the sherds seem to have come from the surface, in several visits to the site between 2000 and 2005 I noted few sherds on the ground, none of them redwares.

SUMMARY

Even with its obvious limitations, the Bear Mountain excavation record exposes some of the weaknesses inherent in surface-based chronological assumptions. If diagnostic ceramics found across the pueblo seem to reflect a late occupation, the presence of earlier ceramics in sub-surface contexts provides a sense of time depth otherwise absent. While the record is far too vague to permit establishment of a site sequence, it at least suggests that use of the site area goes back further into Ancestral Piro times than originally assumed. To some extent, perhaps, early white- and tradewares may have been an upland equivalent of the early glazewares found in lowland Piro sites, but again this is an assumption which requires a more developed database to be tested.

Overall, the pueblo's position within the regional landscape of Piro settlement is unclear. Whatever the beginnings, there can be no doubt that the height of its occupation was during the contact and/or early colonial periods. A conjectural explanation for this trend may be that some Piros were then moving out of the Rio Grande Valley to escape the incipient colonial regime (cf. Marshall and Walt 1984: 141, 215; Kulisheck 2003). If so, the pueblo may have been a dubious refuge, for it is neither inconspicuous nor in a defensive location. Besides, some documents indicate that Spanish activities extended well into the uplands during the mission and later colonial period, and perhaps even earlier (see Chapter 6). On the decline of Bear Mountain, no information exists. If the Glaze F sherds reflect a late colonial occupation, it is not recorded in the known documents. As chances are slim that references to the pueblo or other upland sites may yet emerge from future documentary discoveries, archaeological research offers the only means for investigating this aspect of Piro settlement.

Pueblo Magdalena (LA 284)

Pueblo Magdalena is the largest Ancestral/Colonial Piro site in the uplands west of the Rio Grande. The town of Magdalena is just two kilometers to the south, while Bear Mountain is approximately 10 km to the northeast (Fig. 4.1). Pueblo Magdalena occupies a low ridge just east of an arroyo that forms part of the upper La Jencia Creek drainage (Fig. 5.28). The site is well preserved, despite its proximity to Magdalena, a thriving mining community in the late 19th and early 20th centuries. There are relatively few signs of looting (but see Fig. 3.24), and none of the telltale marks of heavy machinery often seen at lowland Piro sites. Marshall and Walt (1984: 215) estimate that at least 95% of the pueblo remain intact (Chapter 3). Like Bear Mountain, architecture is primarily masonry. Four room blocks surround a central plaza; a fifth is slightly offset to the north and east. For the pueblo as a whole, Marshall and Walt (1984: 213) give a size estimate of 209 ground-floor and between 50 and 75 upper-story rooms (Table 4.1). Two depressions in the western half of the plaza indicate possible kiva locations (Figs. 5.29, 5.30) (Marshall and Walt 1984: 213-215).

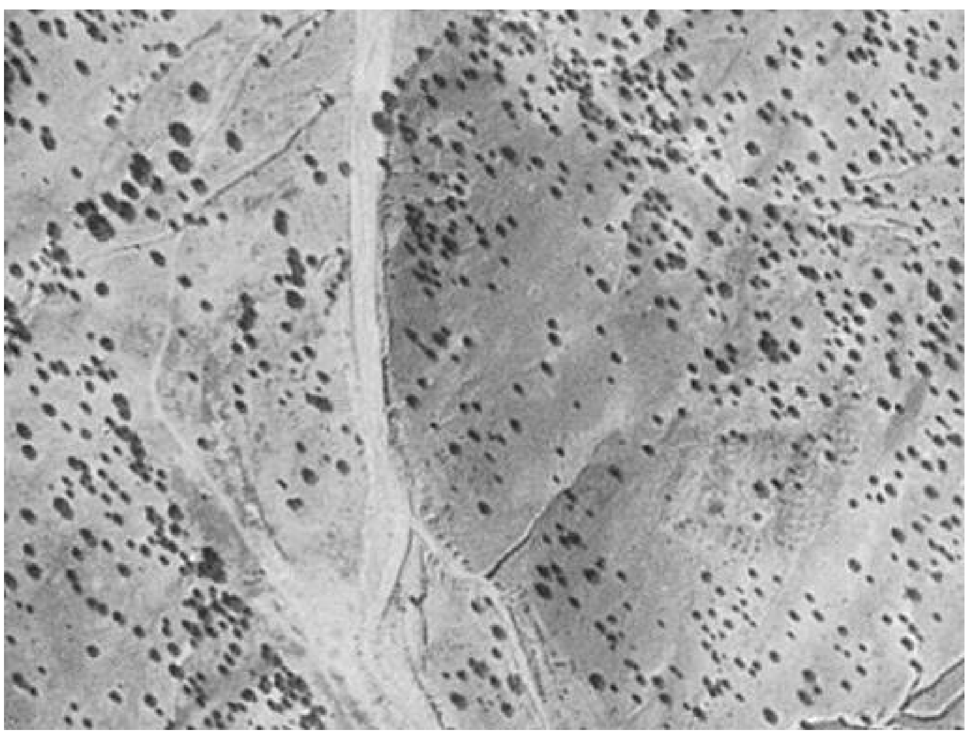

Fig. 5.28. The Pueblo Magdalena site area (lower right) (USGS photograph, 1996).

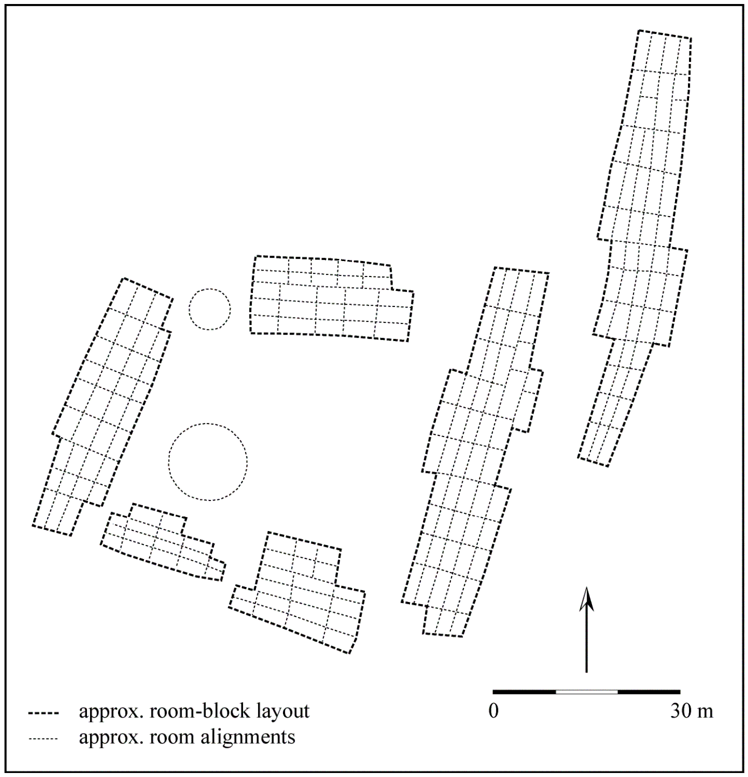

Fig. 5.29. Sketch map of Pueblo Magdalena (adapted from Marshall and Walt 1984, Fig. 9.86; and personal observations between 2000 and 2005).

Fig. 5.30. Pueblo Magdalena, central plaza, looking northwest (M. Bletzer, 7/2003).

Surface samples of ceramics from Pueblo Magdalena produced a spectrum of decorated sherds similar to those found at Bear Mountain. Mera (1940: 7) was the first to note that the only Rio Grande glazewares on the surface were late (D-F) forms. A sample of bowl rims collected by Marshall and Walt (1984: 214-215) from five midden areas confirms Mera's observations (see Fig. 4.3). Of 35 illustrated rims, 27 are E or E-related forms (D/E, E/F), while the rest are D, F, or unidentifiable fragments. As at Bear Mountain, surface density of sherds is low at Pueblo Magdalena. On several visits, I noted only a few decorated sherds, all of which represented the described form spectrum. Marshall and Walt (1984: 215) also picked up some glaze tradewares from the Zuni area, plus two Pueblo III Casa Colorado Black-on-white sherds, but there are no references to anything like the redwares found in the Bear Mountain excavations. Sherd distribution across Marshall and Walt's sample areas was fairly uniform (Marshall and Walt 1984: 215), an observation which applies to the site as a whole. In 2004, I noted a possible Tabirá Black-on-white fragment in the northwestern plaza corner (see Chapter 4), yet no other non-glaze sherds (except for utility wares) were then visible on the ground. Though the known ceramic distribution suggests Pueblo Magdalena was a "single-component" site (Marshall and Walt 1984: 215), the Bear Mountain data leave open the possibility that parts of the pueblo may be older than they appear on the surface.

As with other Piro sites known only through sporadic walkovers, there is no specific information on site structure and chronology at Pueblo Magdalena. If one considers the similarities in location and surface ceramics with Bear Mountain Pueblo, it is only a short step toward the working assumption that observations at the latter site might apply to Pueblo Magdalena, too. There is, however, a near-contemporary reference to Pueblo Magdalena in the journal of Diego de Vargas' 1692 campaign of reconquest (Kessell and Hendricks 1992: 590; cf. Espinosa 1940: 243-244; Marshall and Walt 1984: 256). While brief and without specific locational data, the description of the pueblo's surroundings leaves no doubt that this was Pueblo Magdalena (cf. Fewkes 1902; Marshall and Walt 1984: 256). Vargas calls it "very old", and mentions "some walls and parts of two kivas *[estufas]* made of stone" still standing (Kessell and Hendricks 1992: 590).[3] No name is given, nor is there any sign that Vargas' soldiers knew of the place. Though the interpretive value of the Vargas reference is limited, it conveys an image of a site abandoned some time before the lowland Piro exodus of 1680/81. Notwithstanding this impression, timing and process of abandonment at Pueblo Magdalena remain as unclear as at Bear Mountain (cf. Marshall and Walt 1984: 256).

Gold Station (LA 45885)

The Gold Station site is located in the eastern hills above the Rio Grande, about 10 km east of the village of San Antonio (Fig. 4.1). Comprising four possible field houses and a number of isolated outdoor features,[4] this small complex occupies the southwest corner of a ridge overlooking the San Pedro Wash to the south. State Highway 380 parallels the base of the ridge on which the site is located (Fig. 5.31). A Pueblo III pit-house site, the Fite Ranch site (LA 45884), is located little more than three kilometers to the east. Its main occupation pre-dates that of the Gold Station site by some 400 to 600 years (Oakes 1986: 2-4, 14, 43).

[3] Diego de Vargas, campaign journal, entry for December 7, 1692.
[4] The descriptions in the site report (Oakes 1986) mention three field houses, but the site map shows four, including a possible double structure (see Fig. 5.32 below). In the summer of 2005, I found that three structures away from the road were still partly visible. This suggests that there were indeed four houses.

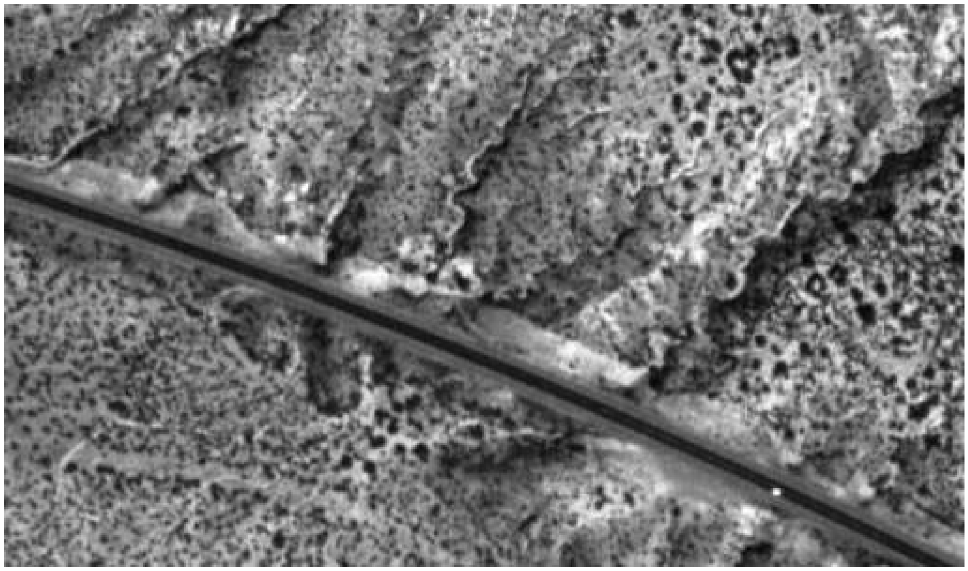

Fig. 5.31. The Gold Station site area (lower right). The site is located above the car (the bright dot) visible on the road (USGS photograph, 1996).

SITE STRUCTURE

Gold Station is one of just a handful of possible field-house sites identified so far in the Piro area (Fig. 4.1, Table 4.2). It is the only site for which a substantial excavation record exists. The site area as marked by the surface distribution of artifacts covers more than 2,700 m^2 (Oakes 1986: 43). Site elevation is 1,460 m, elevation above the nearby San Pedro Wash c. 25 m. Three of the four visible structures occupy small hillocks (Fig. 5.32). Archaeologists from the Museum of New Mexico recorded and first tested the site in 1983. In the spring of 1986, the planned widening of the highway prompted a salvage project during which a large part of the southern site area was excavated (Oakes 1986: 1-2; cf. Oakes 1984).

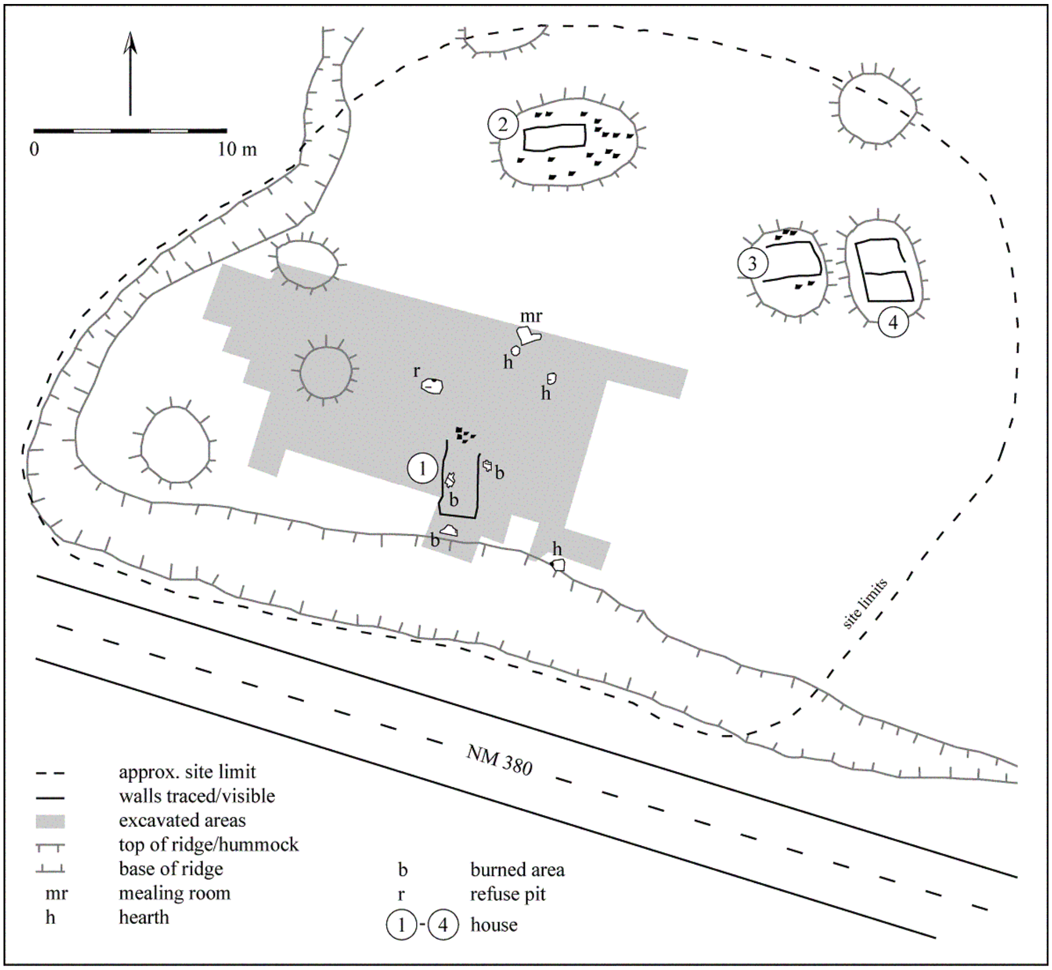

Fig. 5.32. Sketch map of the Gold Station site (adapted from Oakes 1986, Fig. 15).

The Field-House Excavation

The excavations included the southernmost of the four house mounds at the site. Construction of the house's lower walls was masonry. While three courses of limestone cobbles were found still standing, the excavators estimated from the amount of rubble that the stonework had originally been five courses high. There is no reference in the excavation report to adobe debris mixed in with the masonry rubble. This suggests that a less residual jacal superstructure once stood atop the foundation walls (Oakes 1986: 43-47). Aligned roughly north-south, the house measured 3.25x1.85 m on the inside (Fig. 5.32). The excavations revealed that looters had extensively disturbed the interior, which made it difficult to define features within the house. The floor apparently consisted of compacted sand and there were traces of a possible cross-wall, but no entrance could be identified. One amorphous ash/charcoal stain was found on the inside near the middle of the west wall, and two others just outside the east and south walls. None of these stains resembled a formal hearth or roasting pit, however. The only clearly provenienced artifacts from the house area were fragments of an unfired utility vessel (Oakes 1986: 43, 47-48). Summary descriptions show that other ceramics as well as stone tools and cores were also found in and around the house (Oakes 1986: 51, 53), but no absolute figures per artifact type are given for individual proveniences.

Excavated Outdoor Features

An essential preliminary to excavations outside the house structure was the removal of topsoil (Oakes 1986: 12). Five features were uncovered in the effort: a refuse pit, three hearths or roasting pits, and a mealing room. The refuse pit, a depression with a volume of .7 m^3, was located north of the house. It contained charcoal-stained sand and an undisclosed number of sherds. Also located north of the house were an oval-shaped and a round hearth. Depths were 23 and 30 cm, respectively. Both hearths were filled with charcoal and burned corn. The third hearth was found in the southeastern corner of the excavated area. Although its remaining depth was only five centimeters, it contained fire-cracked limestone, three flakes, and one sherd (Oakes 1986: 44, 48-50).

The mealing room was discovered near the northern edge of the excavated area. Dug into the old land surface, the room after abandonment had filled with sand to such an extent that it was completely invisible on the ground. Dimensions as excavated were 1.3x1.1 m, with a depth of 50 cm. The room had two floors of compacted sand which were separated by an 11 cm-thick layer of unspecified material. There are no references to artifacts associated with the upper floor, but a large basin/trough metate and a piece of burned matting or thatching of common reed *(Phragmites communis)* were found on the lower floor (Oakes 1986: 48-50, 54-55). Oxidization of floor and room walls suggest that a structural fire terminated the first use phase of the room. Mealing rooms are common in small Pueblo II and III sites across much of the northern Southwest, but so far the Gold Station room is the only one known with an Ancestral/Colonial Piro affiliation. Perhaps further archaeological work will eventually produce some comparative data on this and other structural components of field-house sites in the Piro area.

CHRONOLOGY

Ceramics

The Gold Station excavations produced a ceramic sample of 747 sherds (Oakes 1986: 50). Decorated wares accounted for c. 100 sherds in the sample. In Chapter 4, I referred to some problems associated with disparities in the sherd identifications of different researchers (Oakes 1986: 94-98; cf. Baldwin et al. 1986; Warren 1986), but despite such disparities the general picture seems clear enough. Rio Grande glazes were present only in late (E, E/F, and F) forms. Two glaze-totals (apparently including surface sherds) are given: 100 (Baldwin et al. 1986: 60) and 145 (Warren 1986: 90). While 58% of sherds in the first total reportedly came from the Piro area, 69% of sherds in the second total are listed as “local middle Rio Grande production”. Secondary sources of glaze ceramics were Abó, Quarai, and, perhaps, the Galisteo Basin. Also present in the Gold Station sample were traces of Salinas Red and Tabirá Black-on-white (Plain variety), and some plain polished sherds “of indeterminate classification” (Warren 1986: 92). As mentioned in Chapter 4, some of the latter sherds were tempered with the biotite felsite also found in Tabirá vessels from Las Humanas/Gran Quivira (Baldwin et al. 1986: 60-69; Warren 1986: 90-93). Together with a lack of early glaze- or whitewares, the sample sherds clearly place the site in the Colonial Piro period (Warren 1986: 93).

Chronometric Dates

Analysis of charcoal samples from the two hearths north of the excavated house yielded ^{14}C dates of 1510±60 and 1670±50, respectively (Table 4.5, Fig. 4.14). Oakes (1986: 55) notes that the first date “seems too early for the transitional Glaze E/F ceramics found on the site”, but the discrepancy may in part be due to the sample’s small carbon count. A third sample from an unnamed provenience was dated to the modern period (Oakes 1986: 55). Also of interest here is a date of 1590±50 obtained from a charcoal sample taken from an isolated outdoor hearth at the Fite Ranch site (LA 45884) (Oakes 1986: 41). There are nine ^{14}C dates for this site. The dates form five clusters at about A.D. 820, 960, 1040, 1240, and 1590 (approximate mid-points of the date ranges) (Baldwin et al. 1986: 79). No ceramics were associated with the hearth, which means that the feature probably represents a temporary encampment (Oakes 1986: 29-41).

SUMMARY

The Gold Station site is a rare source of information on Piro land-use outside the Rio Grande lowlands. In the spectrum of Ancestral/Colonial Piro settlement, the site holds the end opposite pueblos like San Pascual or Qualacú. Its structure points toward short-term, probably seasonal, occupation over an extended period (Oakes 1986: 93, 111). Given the decorated ceramics and ^{14}C dates, site use seems to have reached way into Colonial times. The range of material recovered during the excavation shows that the site's residents not only processed foodstuffs, but also made pottery and tools on or very near the site. The bulk of the non-local pottery in the site sample most likely came from the nearby Piro pueblos (Warren 1986: 93). Pargas Pueblo and Qualacú are barely 10 km away to the west and southwest, while the straight-line distance to the Las Cañas-Las Huertas-Plaza Montoya cluster of pueblos is only about 15 km (Fig. 4.1).

This concludes the overview of Ancestral/Colonial Piro sites. Clearly, much work needs to be done if the regional archaeological database is to approach a level comparable, for instance, to that of the neighboring Salinas province. Yet even so, the data available now already suggest a complexity of local and regional settlement not normally considered in archaeological references to the Piro area.

CHAPTER 6

"FIRST PROVINCE IN THIS KINGDOM": THE PIRO AREA IN THE HISTORICAL RECORD

The historical record of the Piro area resembles the archaeological record in that it contains large gaps, temporal as well as topical, in the available documentation. Specific information on the Piros is scarce and strongly biased toward mission pueblos, and although it seems obvious one must always keep in mind that the documents present Spanish viewpoints only. But despite these caveats, the documents are indispensable for any study of contact- and/or colonial-period contexts. From comments on domestic Piro life to information on tribute and labor, they offer at least glimpses of processes that are often difficult, if not impossible, to assess by means of archaeological inquiry alone.

What follows here, then, is both an outline of the historical record of the Piro area, as well as a review of major documentary sources, their potential for problem-oriented analysis, and their shortcomings in the pursuit of such analysis. Earls (1985) in her study of Piro subsistence made extensive use of the published record, and to some extent the present study will run along similar lines. Beyond this, however, unpublished sources (i.e. sources accessible only in manuscript form, as transcripts, or on microfilm) allow for a more inclusive historical narrative than has thus far been attempted. References in various historical works (e.g. Scholes 1937, 1942, 1975; Scholes and Bloom 1944, 1945; Bloom and Mitchell 1938; Chávez 1950, 1992; Forbes 1960; Sánchez 1987) served as starting points in searches for documents containing references to the Piro area. Given that Spanish records are often vague when it comes to subject peoples – an observation all the more true for peripheral areas like New Mexico (Beers 1979; Barnes et al. 1981; Gerhard 1993c) – expectations of finding explicit references to the Piros were modest. Archival work has corroborated this outlook by producing mostly material on the Spanish presence in the Piro area, especially for the period after c. 1650/60.

To what extent more precise information on the Piros or other Puebloan groups may emerge from new archival research is uncertain. Particularly useful would be the census-style data of baptismal or burial records (cf. Chamberlain 2006: 44-50), but the types of documents containing such data (e.g. *padrones*, *matrículas*, or *estados*) are relatively rare in 16th- and 17th-century archival collections throughout the Americas (cf. Gerhard 1993a, 1993b, 1993c). None are known from pre-Pueblo Revolt New Mexico (Gerhard 1993c: 323-324; Trigg 2005: 83). The rationale behind this assessment is the subject of the next few paragraphs. In these, I describe what documents have survived, and their strengths and weaknesses for the archaeological-historical "topical syntheses" (cf. Cordell 1989: 323) that illustrate, in Chapter 7, the analytical context of this study.

If there is one prevailing characteristic of the documents that I have seen, it is that most of the pertinent information comes in bits and pieces from lengthy administrative dossiers. Given this, classification of documents is not necessarily a good indicator of the kind of information one may find. Isolated references can be easily missed if texts are not studied closely. This is especially true when a source includes different types of documents, as, for example, the records of the 1675/76 *pesquisa secreta* into the conduct of Governor Juan de Miranda (*AGN*, *Civil*, *tomo* 511). Buried within proclamations, depositions, and complaints are references to a half dozen Spanish *alcaldes mayores* (chief magistrates) of the Piro province, and to the mission pueblos of Socorro, Senecú, Sevilleta, and Alamillo. Depending on scope/readability of the source(s) in question, the search for such references can be very time-consuming (cf. Jackson 1998: 132).

As I noted in Chapter 1, a summary account of the history of the Piro province has yet to be written. Some work has already been done in this direction, not only by historians (e.g. Scholes 1937, 1942; Sánchez 1987), but also by archaeologists. A synthesis and brief overview of published references to pre-Revolt settlements in the Piro area can be found in Marshall and Walt (1984: 245-257). Earls (1985) uses some of the same references. That many published documents have been examined "to the *n*-th degree" (Snow 1992a: 185) reflects both the value of these documents and their limited supply, but also an under-utilization of the unpublished record. Both despite and because of the known limitations of the pre-Revolt documentation, such a discrepancy is problematic. Even if the record may be just useful enough to provide background information to a specific research problem, it seems only reasonable to draw this information from as broad a documentary base as possible.

The Documentary Record: Characteristics and Caveats

According to the historian John Kessell (1979: viii), all that is known of New Mexico's early colonial history is the result of many years of exploring and sifting of manuscripts by a number of researchers who "charted pertinent islands in the oceans of material" that are the archives of Mexico and Spain. In a vast colonial bureaucracy, legal and administrative papers from all parts of Spain's overseas holdings were drawn up, copied and re-copied, appended to or inserted in other documents, and ultimately stashed away in various repositories for future reference (Hauschild-Thiessen and Bachmann 1972; Borah 1985a; Palermo 1992). The technicality of this may seem trivial, but as far as New Mexico's record is concerned, the process has proved crucial, for no pre-Revolt sources survive locally. The historiographic framework for studying 17th-century New Mexico thus rests entirely on the analysis of documentary duplicates and triplicates unearthed in Mexico and Spain. Archival work continues to refine this framework, as recent research on the Coronado expedition of 1540-42 (e.g. Flint 2002, 2003, 2005; Flint and Flint 2005) and the Vargas re-colonization of the 1690s has shown (Kessell 1989; Kessell et al. 1992, 1995, 1998, 2000, 2002).

Overall, New Mexico's pre-Revolt record is perhaps best described as a mixed bag of sources written by different actors for different purposes, a diversity which is broadly reflected in the archival classification of these sources (Gerhard 1993c: 323-324; Lycett 1995: 491-507; cf. Simmons 1967; Beers 1979). In the two main repositories, the *Archivo General de Indias (AGI)* in Sevilla and the *Archivo General de la Nación (AGN)* in Mexico City, the material relevant to New Mexico is scattered over several regionally and/or topically structured *secciones* or *ramos*, and within these over more or less logically arranged and numbered ledgers called *legajos* or *tomos.* An idea of the scale of this "ocean of material" comes from the fact that at *AGI* alone there are some 43,000 *legajos* comprising eighty- to eighty-six million manuscript pages from every corner of Spain's overseas dominions (Romero Tallafigo 1980; Rütimann and Lynn 1992; Morales et. al. 1995; González García 1999).

Of particular interest to early colonial New Mexico are documents from *AGI* and *AGN* in the *ramos/secciones Audiencia* de *México*, *Audiencia de Guadalajara*, *Tierras*, *Historia*, *Civil*, *Patronato*, and *Inquisición.* A number of records from these and other *secciones* have been published, and some translated (e.g. *CDII* 1865-84 [mainly Vols. 15 and 16]; Winship 1896; Bolton 1908; Hackett 1923-37; Hammond and Rey 1953, 1966). Many more, including documents from other sources (e.g. the *Biblioteca Nacional de México [BNM]* in Mexico City, the *Biblioteca del Museo Nacional de Antropología e Historia [BMN]*, also in Mexico City, and the *Biblioteca Nacional* in Madrid *[BNE]*), remain unpublished and available only on microfilm, microfiche, as photostat copies, or else as the original manuscript (cf. Gerhard 1993c: 323).[1]

A quick glance at documentary proveniences as referenced in various works on early colonial New Mexico suggests that documents from the *ramo Inquisición* at *AGN* are most significant, thanks to the extent of the surviving files (e.g. Scholes 1937, 1942; Forbes 1960; Garner 1974; Kessell 1979). For the Piro area, the earliest references to Spanish colonizing activities come from Inquisition records dating to the mid- to late 1620s. Drawn up for inquiries into alleged religious misbehavior by civil officials and colonists, these documents are the first to mention the Piro missions at Pilabó (Socorro) and Senecú. Later records hint at the beginnings of Spanish settlement and the nature of the Spanish presence among the Piros (Table 6.1). Especially extensive are the well-known Inquisition files of the governors Bernardo López de Mendizábal (1659-61) and Diego de Peñalosa (1661-64). These and other files contain hundreds of manuscript pages that deal primarily with conflicts within the Spanish camp (Scholes 1935a, 1935b,

[1] Most of the material used here is from photostat and microfilm copies, as well as transcripts, of original documents kept at the Center for Southwest Research, University of New Mexico, Albuquerque.

1937, 1942), but they also hold a fair amount of references to native affairs (Fig. 6.1). Though information on the Piros may be more fragmentary than for other Pueblo groups, there are references to labor and tribute obligations, missionary activities, civil administration, and the impact all this had on everyday Piro life.

On the whole, the information embedded in the Inquisition files seems fairly representative of the kind of information found in other contemporary records (cf. Garner 1974: 42-46). More representative, however, is a lack of quantifiable data, common to all documents of the period (Lycett 1995: 498-507; Kulisheck 2005: 63-66; Trigg 2005: 83-84). The deficiency is most glaring in the area of demography (cf. Earls 1985: 124-153). There are some population figures from the Spanish explorations of the early 1580s, plus a few estimates from the late 1620s, but no mission or parish or other registers which might permit mathematical modeling of local and regional population trends. What has been lost can be seen in 16th- and 17th-century records from central and southern Mexico (e.g. Borah and Cook 1960; Hunt 1974; cf. Gerhard 1993a, 1993b), or in later records from New Mexico and other frontier provinces (e.g. Kessell 1979, 1980; Brugge 1985; Jackson 1985, 1994; Levine and LaBauve 1997). Although these records may not always be complete, they contain enough data to make statistical analysis feasible (cf. Jackson 1985, 1994, 1998).

Table 6.1. Summary overview of documents relating to the Piro area.

Date	Source	Context
1539-42	*Relación de la jornada de Cibola* of Pedro de Castañeda: Castañeda 1596 [c. 1560]; Hammond and Rey 1940; Flint and Flint 2005, Tello 1891, 2	Brief exploration during Coronado Expedition of Tutahaco, a term perhaps referring to the later Piro province
1581-84	Rodríguez-Chamuscado and Espejo-Beltrán expeditions: *AGI*, *Audiencia de México*, *legajos* 20, 1064, *Patronato*, *legajo* 22; *CDII* 1865-84, 15; Hammond and Rey 1966; Obregón 1997	Earliest accounts of Piro area, list of pueblos, first population estimates, brief descriptions of material culture, subsistence, and social life
1598-1609	Documents of the Oñate colonization: *AGI*, *Patronato*, *legajo* 22; Villagrá 1992; Hammond and Rey 1953	Qualacú, Teypana, and Nueva Sevilla (Sevilleta) mentioned, Juan Claros first missionary to the Piros (Atzigues), list of 44 pueblos with transcriptions of native names
1626-28	Fray Alonso de Benavides, Inquisition: *AGN*, *Inquisición*, *tomos* 356, 363; Scholes Manuscripts (MSS) 360, Box 3b, various folders; also, fray Gerónimo Zárate Salmerón, *Relaciones* (1628): Milich 1966	First mention of Piro missions (Pilabó/Socorro, Senecú), references to missionization of Piros, earliest recorded use of the term “Piro”, description of mineral deposits near Socorro
1627-31	Inquisition files re Gerónimo Márquez and family: *AGN*, *Inquisición*, *tomos* 318, 372	Márquez *estancia* at Acomilla, first reference to colonists in the Piro area
c. 1628-30	MSS 360, Box 2B, Folder 31; Agustín de Vetancurt, *Teatro Mexicano*, 1960-61 (1698), Vols. 3, 4	Unidentified document from c. 1630 and late 17th-century source with information on Piro mission establishments
1630-34	Benavides’ *Memorial* (1630) and *Revised Memorial* (1634): Ayer 1916; Hodge et al. 1945	Descriptions of Piro province, number of Piro pueblos in late 1620s, founding of Socorro and Sevilleta missions, mines of Socorro
1640-60s	Various references in: *AGI*, *Audiencia de México*, *legajo* 306, *Patronato*, *legajo* 244; Hackett 1923-37, 3; Scholes 1929, 1944	First recorded instance of epidemic disease (smallpox?) in New Mexico, brief references to Piro missions (among others in mission census from early 1640s)

Table 6.1. (continued)

Date	Source	Context
1650-60s	Documents relating to the office of *protector de indios: AGN*, *Tierras*, *tomos* 3268, 3283; Hackett 1923-37, 3	Forced labor, Piro involvement in Apache slave trade to Sonora, requisitioning of horses, alleged sale of Sevilleta Pueblo, etc.
1660s	Inquisition files on governors López and Peñalosa: *AGN*, *Inquisición*, *tomos* 507, 586, 594, 616; MSS 360, Box 1, Folder 75; Hackett 1923-37, 3	More of the above, references to Senecú *encomienda*; settlers, Piro involvement in Manso mission at El Paso, Apache raids, drought, etc.
1660s	*AGN*, *Provincias Internas*, *tomo* 35; *BNE*, ms. 19258; MSS 360, Box 3b, Folders 57, 58; Hackett 1923-37; Hackett and Shelby 1942	Revival of native religion, Apache raids and Piro rebellion (death of *alcalde mayor* of Senecú), Spanish reprisals, reference to San Pascual, persistent drought, etc.
1665-68	Inquisition files re Luis López, *alcalde mayor* of Senecú in the 1660s: *AGN*, *Inquisición*, *tomo* 608	Names settlers in the southern Piro area (*"jurisdiccion de Senecú"*), references to local administrative structure
c. 1665-80	Various references in: *AGI*, *Audiencia de Guadalajara*, *legajo* 138; *AGN*, *Civil*, *tomo* 511; MSS 360, Box 2B, Folder 34, Box 3b, Folder 57, Hackett 1923-37, 3	Administrative structure, *alcaldes mayores*, Apache campaigns and possible Piro revolts, famine and disease, refugees from Salinas area, abandonment and resettlement of Senecú, etc.
c. 1680-1700	Records of Pueblo Revolt and post-Revolt campaigns: *AGI*, *Audiencia de Guadalajara*, *legajo* 138; *AGN*, *Provincias Internas*, *tomos* 34, 37; Hackett 1923-37; Hackett and Shelby 1942; Kessell 1989; Kessell et al. 1992, 1995, 1998, 2000, 2002; ; *Spanish Archives of New Mexico* (SANM), Reel 1	Abandonment of Piro pueblos, dispersal of Piros, squatters in and destruction of deserted pueblos, description of Pueblo Magdalena, reference to estancia of Juan García Holgado, plans to resettle Piro area, attempted resettlement of Sevilleta, etc.
1700s	Various references in: SANM, Rl. 1; Twitchell 1914; Hackett 1923-37, 3; cf. Marshall and Walt 1984	References to new Piro settlements near El Paso, Travelers' references to ruined pueblos of Senecú, San Pascual, Socorro, Alamillo, and Sevilleta, and to the Luis López and Felipe Romero estancias

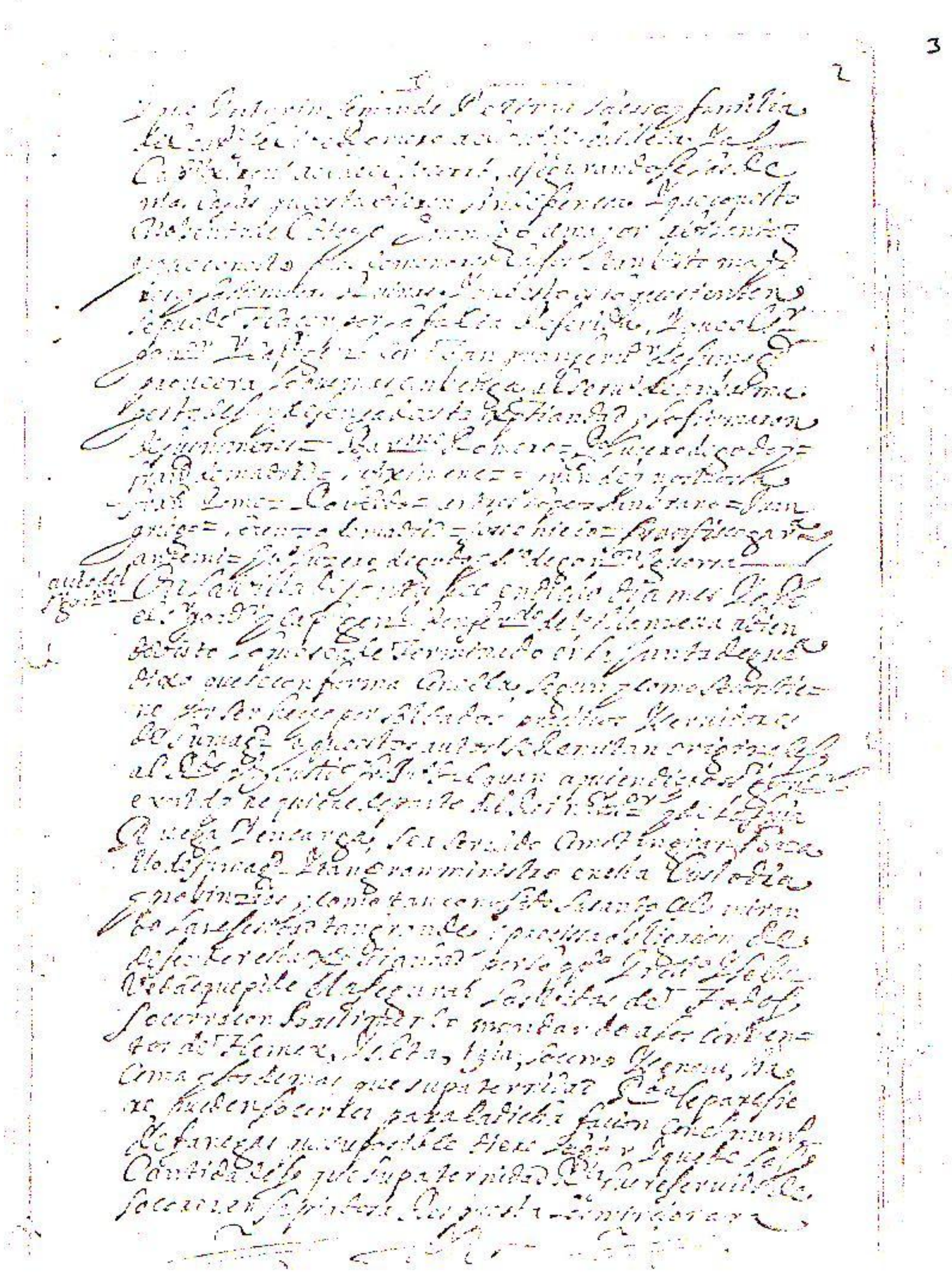

Fig. 6.1. Sample page from *BNM*, *legajo* 1, *no.* 29. The subject of this set of documents is mission support for a planned Apache campaign in 1668. Shown is Folio 2r, which mentions (sixth line from bottom) the Piro missions of *"Socorro Y senecu"* (see n. 20 below) (microfilm copy at Center for Southwest Research, University of New Mexico).

The lack of demographic data is not confined to the Piros alone. For the entire 17th century there is not one Spanish population figure for the Piro area, nor is there any clear indication of when the first colonists arrived, nor how their settlements expanded over time. There are one or two figures for Spanish *estancias* along the river, but these are either given for the Rio Abajo as a whole or else for only a portion of the Piro area (MSS 360, Box 1, Folder 75; Tainter and Levine 1987: 84, 88; Marshall and Walt 1984: 256-257; Bletzer 2005: 31-34, 52). A historical evaluation of Spanish population and settlement thus hinges on individual documentary snapshots. Again the focus is on Inquisition records from the initial mission period (c. 1626-40) and from the years after 1650. Documents name about two dozen Spanish residents of the Piro province, some with approximate place of residence. A few settlers also appear as local *alcaldes* or *justicias mayores* (Bletzer 2005: 34-35). Other documents give some idea of household size. Combined, they form the basis for some rough estimates of Spanish population levels in the Piro area. That the method is difficult and inexact and depends on a close combing of surviving texts is obvious, but in the absence of more specific records it is the only viable approach toward a general population estimate.

Another class of important documents now missing are land grants *(mercedes de tierra)* (Engstrand 1978) and, especially, *encomienda* titles (Snow 1983; Anderson 1985; cf. Kessell 2002: 395-396, n. 22; Kulisheck 2005: 109-110; Trigg 2005: 83). With the exception of a productive mining claim, few sources of income were as attractive to a Spanish colonist as a grant of *encomienda.* Rooted in Spain's *reconquista* past, *encomiendas* were a convenient tool for the Crown to reward soldiers for their services while at the same time establishing some measure of political and economic control over newly conquered territories. At the core of the system stood the *encomendero.* He received tribute from one or more communities in return for military service and the obligation of providing religious instruction to his tributaries. Lacking real controls, *encomenderos* often went beyond what their grants permitted. In the Americas, the prospect of obtaining an *encomienda* quickly became a key incentive of colonization when the system was transposed there (Chamberlain 1939; Simpson 1966; Lockhart 1969; Zavala 1973).

Land- and tribute-related records from central and southern Mexico underline the scope of the system in New Spain (e.g. Scholes and Adams 1955; Miranda 1965; Taylor 1975; Himmerich y Valencia 1991). They provide some insight, directly or indirectly, into native communities subjected to the system (Cook and Simpson 1948; Borah and Cook 1960; Cook and Borah 1960). While no such records survive for New Mexico, it is known that Juan de Oñate granted the first *encomiendas* during his tenure as governor (1598-1608) (Snow 1983; Anderson 1985). The 1608 instructions to Oñate's successor contain the explicit authorization to "allot Indians in encomienda, as many as he may think suitable, to persons who have served and who are living in those provinces, without interfering with those granted by don Juan de Oñate, since these must be preserved" (Hammond and Rey 1953, 2: 1088; Bloom 1929).[2]

The peculiar composition of the documentary sources for the Piro area is reflected in the overview that encompasses the remainder of this chapter. In consolidating the published and unpublished fragments of Piro history into some sort of coherent narrative, I use the chronological order outlined in Chapter 1. Within this order, I follow a basic

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[2] Viceroy Luis de Velasco to Governor Pedro de Peralta, Mexico City, March 30, 1609.

topical structure. As far as the documents allow, periods are described in terms of Spanish activities, their impact on the Piros, and Piro responses thereto. Though I generally try to distinguish between activities of missionaries, civil officials, and settlers, it is not always possible to do so because of the nature of the available information.

First Encounters: The Contact Period, 1540-98

The first direct Spanish intrusion of the Pueblo world, the massive Coronado expedition of 1540-42, brought more than 1,500 heavily armed people to what the Spaniards and their native allies called the "new land" (Riley 1995: 155-207; Kessell 2002: 31-46; Flint 2003, 2005; cf. Bolton 1949; Hammond and Rey 1940). The expedition's primary documentation includes various travel accounts and official letters, as well as a host of legal documents drawn up in the years following the return to Mexico (Hammond and Rey 1940; Flint 2002; Flint and Flint 2003, 2005). As the expedition's main thrust went from Zuni to the Tiwa area and on to Pecos, there is nowhere a clear reference to the Piros. Vague remarks of reconnaissance parties visiting a region called Tutahaco may refer to the Piro area (Table 6.1), as may a few equally vague geographical pointers (cf. MSS 360, Box 1, Folder 75; Bandelier 1890-92, 2: 234, 1929: 327-328; Mera 1940: 14, 16; Riley 1995: 166, 170; Barrett 1997: 3-4). Overall, though, they do not establish a reliable link between 16th-century name and 17th-century province (Bletzer 2005: 3-4).

The earliest definitive references in context, if not name, to the Piro area come from the records of the Rodríguez-Chamuscado expedition of 1581/82 (Earls 1985: 88, 106), especially from the *Relación* of the soldier Hernán Gallegos (*AGI*, *Patronato*, *legajo* 22; Hammond and Rey 1966: 67-114) and a second-hand account in Baltasar de

Obregón's 1584 *Historia de los descubrimientos de Nueva España* (Obregón 1997: 227-256). The historical background of the expedition is quickly summarized (cf. Forbes 1960: 48-54; Riley 1995: 225-233). Inspired by persistent rumors of a "clothed people living in good order" *("gente vestida que viven en policia")* (Naylor and Polzer 1986, 1: 50, 59) in the northern interior,[3] fray Agustín Rodríguez and Captain Francisco Sánchez Chamuscado with two Franciscans friars, eight soldiers, and more than a dozen native servants set out from the small outpost of Santa Bárbara in the upper Conchos Basin in early June 1581 (Mecham 1926; Hammond and Rey 1927, 1966: 7-8).

A journey of six weeks brought the group to the southern edge of Piro territory and a ruined pueblo they christened *"San Felipe del Nuevo México"*. Hernán Gallegos (Hammond and Rey 1966: 81) describes the pueblo as being "walled in; and the houses had mud walls and were built of adobes, three stories high, so it appeared, though they had crumbled from the rains and seemed to have been abandoned for a long time". Considering the distribution of Ancestral/Colonial Piro sites in the Black Mesa area, it is likely that San Felipe is the site of Milligan Gulch Pueblo (LA 597), located just below Black Mesa (e.g. Bandelier 1890-92, 2: 252; Mera 1940: 7; Hammond and Rey 1966: 81, n. 1; Marshall and Walt 1984: 248; Marshall 2005: 21). As mentioned in Chapters 4 and 5, this makes Milligan Gulch Pueblo one of only a handful of Piro sites that can be linked to the regional historical record with any degree of certainty (Fig. 6.2).

[3] Juan Bautista de Orozco to Philip II, Mexico City, November 25, 1576.

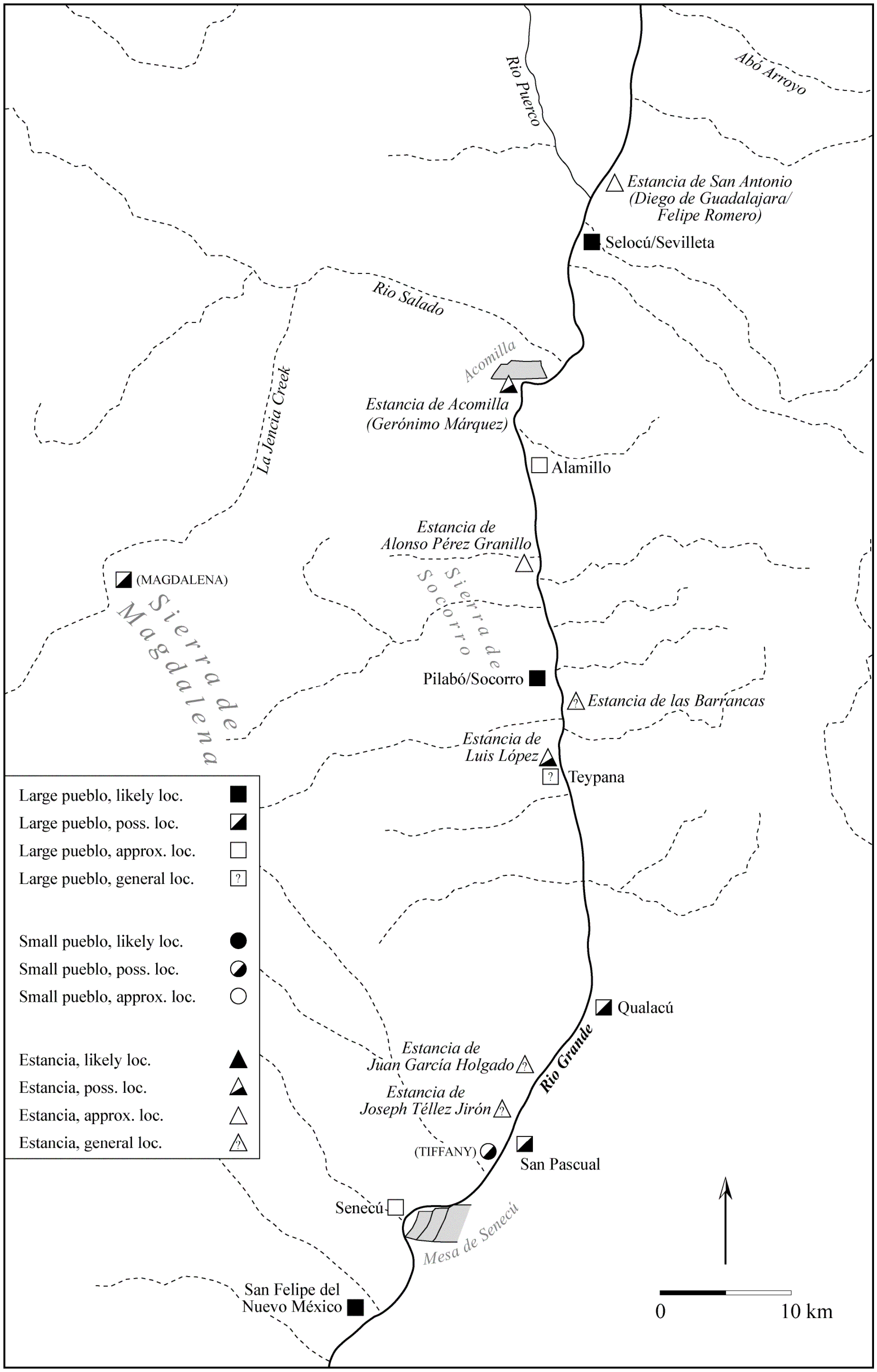

Fig. 6.2. Piro-area settlements mentioned in the documentary record, 1581-1692.

Gallegos and his companions spent four or five days among the Piros during their upriver journey, and perhaps as many on the outbound trip a few months later. From the structure and tone of Gallegos' writing it is clear that his Piro account relates mostly to the party's initial experiences among the Piros. It replicates the brevity of the encounter in that all identifiable references to the Piro area scarcely fill two folios. The references are a blend of basic observations and descriptions of minutiae, mixed with value judgments and comments that reflect the particular experiences and expectations of the author and his companions. In all, the *Relación*, like most such accounts, is neither an in-depth nor impassive summation of observed facts.

The limitations of the *Relación* are most evident in information on Piro population and settlement (Wilcox 1992: 103). As Gallegos (Hammond and Rey 1966: 82) claims, "more than twelve thousand people" surrounded the explorers – a figure no doubt more of symbolic value than of factual merit. Unfortunately, of all primary sources for the expedition, only Gallegos mentions figures, which makes it difficult to approximate the magnitude of his exaggeration. There is just one other figure in the second-hand account in Obregón's *Historia.* This account is based on interviews with expedition members. In part it reads like a copy of Gallegos, but it also offers details not included in the *Relación.* Its description of Piro crowds only mentions "upwards of 2,000 Indians" *("había...de dos mil indios arriba")* (Obregón 1997: 239). Given the near-homonymy and paleographic similarity of the terms *"doce mil"* and *"dos mil"*, there is a possibility that the latter figure is more accurate. A lower estimate is certainly more plausible vis-à-vis later population figures (see below and Chapter 7).

While among the Piros, the Rodríguez-Chamuscado party apparently did not stray much from its riverside route. Although this suggests that Gallegos' own observations refer to lowland pueblos only, he also seems to have picked up second-hand information on pueblos located away from the Rio Grande. The natives, he noted, "indicated...that there were in their nation twenty-odd pueblos" (Hammond and Rey 1966: 82). In later testimony in Mexico City, he added that he and his companions "were told that there were many other Indian pueblos of their same nation and way of life on both sides of the river and at some distance from it" (Hammond and Rey 1966: 134).[4] Obregón (1997: 239) again provides a different figure, however. "[T]he foremost and oldest" among the natives, so Obregón, told the explorers that there were 12 pueblos in their territory *("en su parcialidad, tierras y leguas").*

Additional information on Piro settlement comes from two near-identical lists of the pueblos seen by the Rodríguez-Chamuscado party. One is in Gallegos' account (Hammond and Rey 1966: 102-106), the other a copy drawn up in Mexico City in the late 1590s by the viceregal scribe Martín Pedrosa (Hammond and Rey 1966: 115-120). The two lists contain names and brief descriptions of more than 60 pueblos. The descriptions refer to pueblo size, given in *"casas"*, a term which can be translated as "houses" or "households", but in this context clearly refers to the "architectural referents" of the latter (Earls 1985: 128), and number of stories. For pueblos along the Rio Grande, locations are described with reference to the river ("upriver", "west/east bank") and/or neighboring pueblos ("above/below" or "across from" Pueblo X). No reliable distances are given. Names of pueblos are those of Catholic saints (San Felipe, San Miguel), towns in Spain

[4] Testimony of Hernán Gallegos, Mexico City, May 16, 1582.

(Cáceres, Valladolid) or New Spain (Mexicalcingo, Taxomulco), or else toponyms (La Pedrosa, Malpaís) (Table 6.2). Few native names are recognizable, none of pueblos in the Piro area (Hammond and Rey 1966: 62). Other than a few textual snippets, it is only the lists' sequential ordering that allows general placement of these randomly named pueblos. The first eight to 10 entries in each list undoubtedly were Piro pueblos. How many of the subsequent names also represent Piro pueblos is unclear. Comparisons with later records leave a possibility that the pueblo named Tomatlán was the last (i.e. northernmost) Piro pueblo, but the association cannot be proved conclusively.

Table 6.2. Likely Piro pueblos in the Gallegos and Pedrosa lists.

Gallegos list	**Pedrosa list**
San Felipe del Nuevo México: 45 houses (2 and 3 stories)	San Phelipe: 45 houses (2 stories), 2 plazas
San Miguel: 47 houses (2 stories)	San Miguel: 47 houses (2 stories)
Santiago: 25 houses (2 stories)	Santiago: 25 houses (2 stories)
San Juan: 40 houses (2 stories)	San Juan: 40 houses (2 stories)
Piastla: about 35 houses (2 stories)	Piastla: 35 houses (2 stories)
Piña: c. 85 houses (2 stories), 2 plazas	Piña: 85 houses (2 stories), 2 plazas
Elota: 14 houses (2 stories)	Elota: 14 houses
El Hosso: 50 houses (2 stories)	El Osso (or Oso): 50 houses (2 stories)
La Pedrosa: 14 houses (2 stories)	La Pedrosa: 14 houses (2 stories)
Ponsitlán: 25 houses (2 stories)	Pueblo Nuevo: 20 houses (2 stories)
Pueblo Nuevo: 25 houses (2 stories)	Ponsitlán: 25 houses (2 stories)
Caxtole: 15 houses (2 stories)	Caxtole: 15 houses (2 stories)
Piquinaguatengo: 100 houses (2 stories)	Chiquinagua: 100 houses (2 stories)
Mexicalcingo: 40 houses (2 stories)	Mexicalcingo: 40 houses (2 stories)
Tomatlán: 70 houses (2 and 3 stories), divided into 2 sections "one harquebus shot apart"	Tomatlán: 70 houses (2 and 3 stories), divided into 2 sections

(Adapted from Hammond and Rey 1966: 102-106, 115-120).

Gallegos and his companions left New Mexico in February 1581. Within a year of their departure, a follow-up expedition led by fray Bernardino Beltrán and Antonio de Espejo appeared among the Pueblos. Similar in size and composition, the Espejo-Beltrán party reached Piro territory in late January 1583 (Hammond and Rey 1966: 21). The main sources for this expedition are the two first-hand accounts by Diego Pérez de Luján and Antonio de Espejo (Table 6.1) (*AGI*, *Patronato*, *legajo* 22; *CDII* 1865-84, 15: 164-189; Hammond and Rey 1966: 153-231). A third account, based on observations by Bernardo de Luna, another participant, is in Obregón's *Historia* (1997: 256-273). There are also a few references to other sources, most notably an account by the friar Beltrán, but to date these have not been discovered (cf. Chávez 1972: 62; Wilson 1992: 248).

For the first part of the journey, the records of the Espejo-Beltrán party are similar to those of the Rodríguez-Chamuscado expedition. Traveling up the Rio Grande, the party spent only a few days among the Piros. There are no lists of pueblos, but Espejo, Luján, and Luna give a few population and settlement figures. According to Espejo (Hammond and Rey 1966: 219), "more than twelve thousand people, including men, women, and children" inhabited the area. He mentions 10 pueblos along the river and an unspecified number away from it, a statement recalling Gallegos' remarks on the subject. Luján's account gives no total figure, but contains references to 14 lowland pueblos. The latter include the ruins of San Felipe and a "hamlet" of 20 *"casas"*. A pueblo named *El término de Puala* appears to have been the last Piro pueblo. As described by Luján, the pueblo (60 and 20 "houses", "two harquebus shots apart") resembles the Tomatlán of the Gallegos/Pedrosa lists (see above). For five pueblos, Luján has population figures of 400 and for one a figure of 800 "souls". He also states that four pueblos were in ruins *("arruinado")* and abandoned (*AGI*, *Patronato*, *legajo* 22; Hammond and Rey 1966: 172-174). Luna's account mentions 12 pueblos *"en veinte leguas de longitud y seis de latitud"*. The largest pueblos reportedly had up to 250 "flat-roofed" or "terraced houses" *("casas de terrado")*. Except for a generic figure of three persons per "house", Luna provides no population data (Obregón 1997: 272).

With the Espejo-Beltrán party's passage of *El término de Puala*, the Piro area disappears from the historical record. Not until the Oñate colonizing expedition of 1598 are there again references to the Piros. In 1591, soldiers led by Juan Morlete may have passed through the area on their way to seize the illicit Castaño de Sosa expedition which had come to New Mexico via the Pecos River (*AGI*, *Audiencia de México*, *legajo* 220; Schroeder and Matson 1965; Hammond and Rey 1966: 245-317). Though Morlete's northbound route is uncertain (cf. Hammond and Rey 1966: 43-44), he subsequently led the Castaño party out of New Mexico via the Rio Grande trail. Another unauthorized run for New Mexico was made in 1593 by Francisco Leyva de Bonilla and a troop of frontier militia from the Santa Bárbara area. The episode is known only in barest outline, for none of the 30 Spaniards involved survived it. Having apparently retraced the route of the Rodríguez-Chamuscado and Espejo-Beltrán parties, Leyva spent the better part of a year at the Tewa pueblo of San Ildefonso. In 1594/95, he and all his soldiers perished on the Great Plains (*AGI*, *Audiencia de Guadalajara*, *legajo* 252, *Patronato*, *legajo* 22; cf. Hammond and Rey 1966: 323-326; Hickerson 1996: 131).[5]

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[5] Vicente de Zaldívar, *información de méritos y servicios*, n.d. (c. 1602).

The Early Colonial Period, 1598-1626

THE PIROS ENCOUNTER OÑATE

Already in April 1583 the Spanish Crown had instructed the viceroy of New Spain to begin planning for the colonization of New Mexico (*AGI*, *Audiencia de México*, *legajo* 1064),[6] but it was not until 1598 that the project finally got off the ground. In the spring of that year, the mining magnate Juan de Oñate led several hundred colonists with more than 60 carts and thousands of draft and farm animals up the Rio Grande toward Pueblo territory (Sánchez 1987: 41-50; Simmons 1991: 48-107). At a point just south of the Jornada del Muerto, Oñate left the slow-moving cavalcade with a group of horsemen to obtain provisions and "to pacify the land so that the Indians would not become excited at the appearance of such an array" (Hammond and Rey 1950, 1: 317).[7] A few days later, the party reached a Piro pueblo which, according to a summary account of this trip, was "the second pueblo, called Qualacu". Its residents had left the pueblo, "suspicious and excited" *("recelosos y alborotados")*, but Oñate managed to ease their suspicions "with gifts of trinkets", and by pitching camp some distance away from the pueblo (*CDII* 1865-84, 16: 250; Hammond and Rey 1953, 1: 317-318).[8]

Oñate's arrival in Piro territory marked the end of a 15-year span that saw at least five Spanish expeditions come through the area. For the Rodríguez-Chamuscado and Espejo-Beltrán parties the documents leave no doubt that Piro-Spanish encounters were fleeting. The same can be assumed of the Morlete and Castaño parties. The few records of their return from New Mexico contain no references to the Piro area, but the peculiar

[6] Philip II to Viceroy conde de Coruña, Madrid, April 19, 1583.
[7] *Discurso de las jornadas que hizo el campo de Su Magestad desde la Nueva España a la provinicia de la Nueva México*, May 22, 1598.
[8] *Discurso de las jornadas…*, May 28, 1598.

circumstances of their departure suggest that they spent no more than a few days among the Piros. Nor, it seems, did Leyva's group on their run to New Mexico. In general, all encounters during this period appear to have been brief. On the nature of the encounters, Gallegos and Luján give the impression that they were mostly friendly, yet this was not a given for either of their parties (e.g. Hammond and Rey 1966: 93-99, 199-205). Nor can it be certain that it applied to Morlete/Castaño, let alone Leyva (cf. Schroeder and Matson 1965: 56-57; *CDII* 1865-84, 16: 245; Hammond and Rey 1953, 1: 316).

For the Piros, repeated contacts probably took some of the novelty out of such encounters. At the same time, the contacts seem to have done little to reassure them as to the Spaniards' intentions. Facing Oñate's incursion, they may have sensed that this was more than just another fleeting visit. At Qualacú, Oñate's vanguard stayed encamped for three weeks. Later, the party moved three leagues (c. 12-15 km) upriver to a pueblo called Teypana or Teypama, which according to the expedition's records was one of only three pueblos where the residents did not flee on the Spaniards' approach. In an oft-recounted episode the Piros of Teypana provided "much maize" to Oñate's party, and the pueblo's *"capitán"* gave Oñate "a very accurate and truthful" description of the settlements that lay ahead.[9] In response, the Spaniards named the place *Socorro* (*AGI*, *Patronato*, *legajo* 22; *CDII* 1865-84, 16: 251; Hammond and Rey 1953, 1: 318; cf. Marshall and Walt 1984: 250-251; Marshall 2005: 51). Although the site of Teypana cannot be identified from the known references, it was probably located on the west side of the Rio Grande, not far from the mission-period Socorro, Pilabó Pueblo (see below).

[9] *Discurso de las jornadas...*, June 14, 1598.

From Teypana, Oñate and his men traveled another three leagues to a small pueblo *("pueblecillo")* they named "Nueva Sevilla" (*CDII* 1865-84, 16: 251-252). This was clearly the pueblo later records call Sevilleta (Marshall and Walt 1984: 245-246; Marshall 2005: 69). Nueva Sevilla was the first pueblo the party used for lodging, which implies that it, too, had been abandoned by its residents. The Spaniards stayed at Nueva Sevilla for a week, during which time a few of them explored the pueblos in the Abó Pass area (Hammond and Rey 1953, 1: 319; Hickerson 1996: 134-135). Nueva Sevilla marks the last recorded stop of Oñate's vanguard in Piro territory. Continuing up the Rio Grande, Oñate eventually chose a Tewa pueblo at the confluence of Rio Chama and Rio Grande as the site for his colony. It was there that he was joined, in mid-August 1598, by the main body of colonists (Simmons 1991: 108-109, 114; Kessell 2002: 78).

EARLY PIRO-SPANISH RELATIONS

The encounter at Teypana represents only a minor episode in the course of Oñate's New Mexican venture. Even so, in hindsight the Spaniards' need to acquire provisions from the natives at such an early stage was a sign of things to come. At their outpost among the Tewas, the colonists were from the beginning dependent on levies of food and labor from surrounding pueblos. Soldiers went out to ensure that supplies were forthcoming. It was an attempt to obtain provisions at Acoma Pueblo that led to the infamous three-day battle (in January 1599) in which a Spanish force conquered the pueblo, killing or capturing hundreds of its residents (Villagrá 1992: 193-302; cf. Robison 1997; Minge 2002). Similar troubles occurred early on in the Salinas area (Vivian 1964: 14-15; Hayes et al. 1981: 4-5). In 1601, the Spaniards attacked the Jumano pueblo of Cueloce (most likely the pueblo of Las Humanas/Gran Quivira) (Hickerson 1996: 134-140). Vicente de Zaldívar, the man in charge of both the Acoma and Cueloce campaigns, later claimed that he had faced not only Jumano warriors, but also "many others of different nations". This points to a larger regional alliance (Hickerson 1996: 130), which perhaps included some of the Plains Indian groups that traditionally seem to have had close commercial ties to the Jumano pueblos (cf. Hickerson 1994: 68-70; Spielmann 1982, 1983, 1989).

Despite these conflicts, however, contemporary records are mum on most things native. Almost all documents deal with the initial colonization, ensuing explorations, and internal problems plaguing the Spanish camp (Trigg 2005: 53, 81-82). The events at Acoma are treated at some length in official records (*AGI*, *Patronato*, *legajo* 22; *CDII* 1865-84, 16; Hammond and Rey 1953) and, less prosaically, in Gaspar Pérez de Villagrá's epic *Historia de la Nueva México* (1992), but there is little information on the Salinas area (Hickerson 1996). As for the Piros, they figure even less in the documents. Spanish parties likely collected tribute from them, yet no records of such forays exist. Nor are there any accounts from the Spanish messengers, deserters, search parties, and reinforcements going up and down the Rio Grande trail during this time. Representative of the few existing references to the Piro area is one colonist's statement that he never saw "as many as 400 Indians at one time", in particular not "along the route from the pueblo of Qualacu to the one called Socorro" (Hammond and Rey 1953, 2: 659).[10]

Perhaps the most intriguing reference to the Piros is a missionary assignment from September 1598. In the assignment, the various Pueblo provinces were parceled out to the 10 Franciscan missionaries in Oñate's party (Scholes and Bloom 1944: 320-322;

[10] Declaration of Captain Juan de Ortega, Mexico City, July 31, 1601.

Sánchez 1987: 48-50). To fray Juan Claros fell “the province of the Chiguas, or Tiguas”, and “the province of Atzigues down the river, with all its pueblos” (Hammond and Rey 1953, 1: 346). The latter refers at least in part to the Piro area. Forty-four “Atzigues” pueblos are named, 24 west and 20 east of the Rio Grande (Table 6.3) (Hammond and Rey 1953, 1: 346) – figures far higher than any other for the area. Many names are obviously transcriptions of native terms. In this, too, the reference is unique, and more so as four names occur also in later documents. While some entries are repetitive, word structure suggests that others are part of longer names (Baldwin 1982: 34-35; Marshall and Walt 1984: 250; Snow 1988: 104-105). Some may refer to Tompiro, Jumano, or Salinas Tiwa pueblos, for the term “Atzigui” appears in the missionary assignment of fray Francisco de San Miguel, which included the Salinas area. A few names (“Emxa”, “Vumaheyn”, “Aponitze”) in the Claros assignment are similar to names (“Amaxa”, “Machein”, “Apona”) in the San Miguel assignment (Hammond and Rey 1953, 1: 345; cf. Scholes 1937-38: 401; Schroeder 1964, 1979: 240).

There is only one other early reference to the Piro area in the form of the so-called “Martínez map” of 1602. It is the only known pictorial representation of early colonial New Mexico (cf. Barrett 2002: 6-8) and depicts 32 pueblos in the Rio Grande Valley and nearby areas. Twenty-five are named, including the Piro pueblos of “Calicu” (Qualacú), Socorro, and “Nueua Sevilla” (Fig. 6.3). If different symbols indicate large and small pueblos, three small and between six and nine large Piro pueblos are shown. Half of these pueblos are unnamed, which again leaves unknown the extent of Piro territory beyond Nueva Sevilla/Sevilleta. Nor is it certain that all Piro pueblos then extant are on the map. The Salinas pueblos, for instance, were omitted entirely.

Table 6.3. The "Atzigues" pueblos listed in the Claros mission assignment.

West of Rio Grande	East of Rio Grande
Pencoana	*Puguey*
Quiomaqui	Tuzahe
Peixoloe	Aponitze
Cumaque	Vumaheyn
Teeytzaan	*Quiapo*
Puguey	Cunquili
Canocan	Pinoe
Geydol	Calziati
Quiubaco	*Aquiabo*
Tohol	Emxa
Cantemachul	Quiaguacalca
Tercao	*Quialpo*
Poloaca	Tzelaqui: doubtless the pueblo named "Seelocu" in mission-period records, the Nueva Sevilla of Oñate, known since 1620s as Sevilleta
Tzeyey	*Puquias*
Quelquelu	Ayqui
Ategua	Yanamo
Tzula	Teyaxa
Tzeygual	Qualacu: site of first Spanish camp in Piro territory (May-June 1598), called Calicu on the 1602 Martínez map
Tecahan	Texa: perhaps part of the name "Texamo", which could have been the original name of San Pascual
Qualahamo	Amo: see above
Pilogue: this is very probably the pueblo later recorded as Pilabó and renamed Socorro, site of the first Piro mission	
Penjeacu	
Teypama: the first pueblo of Socorro	
Tzenaquel *"de la Mesilla"*, "the first settlement in this kingdom toward the south and New Spain": this is clearly the mission-period Senecú Pueblo	

(The list seems to run north to south. Italics indicate possible double entries [Hammond and Rey 1953, 1: 346; cf. Schroeder 1979: 241; Marshall and Walt 1984: 245-256]).

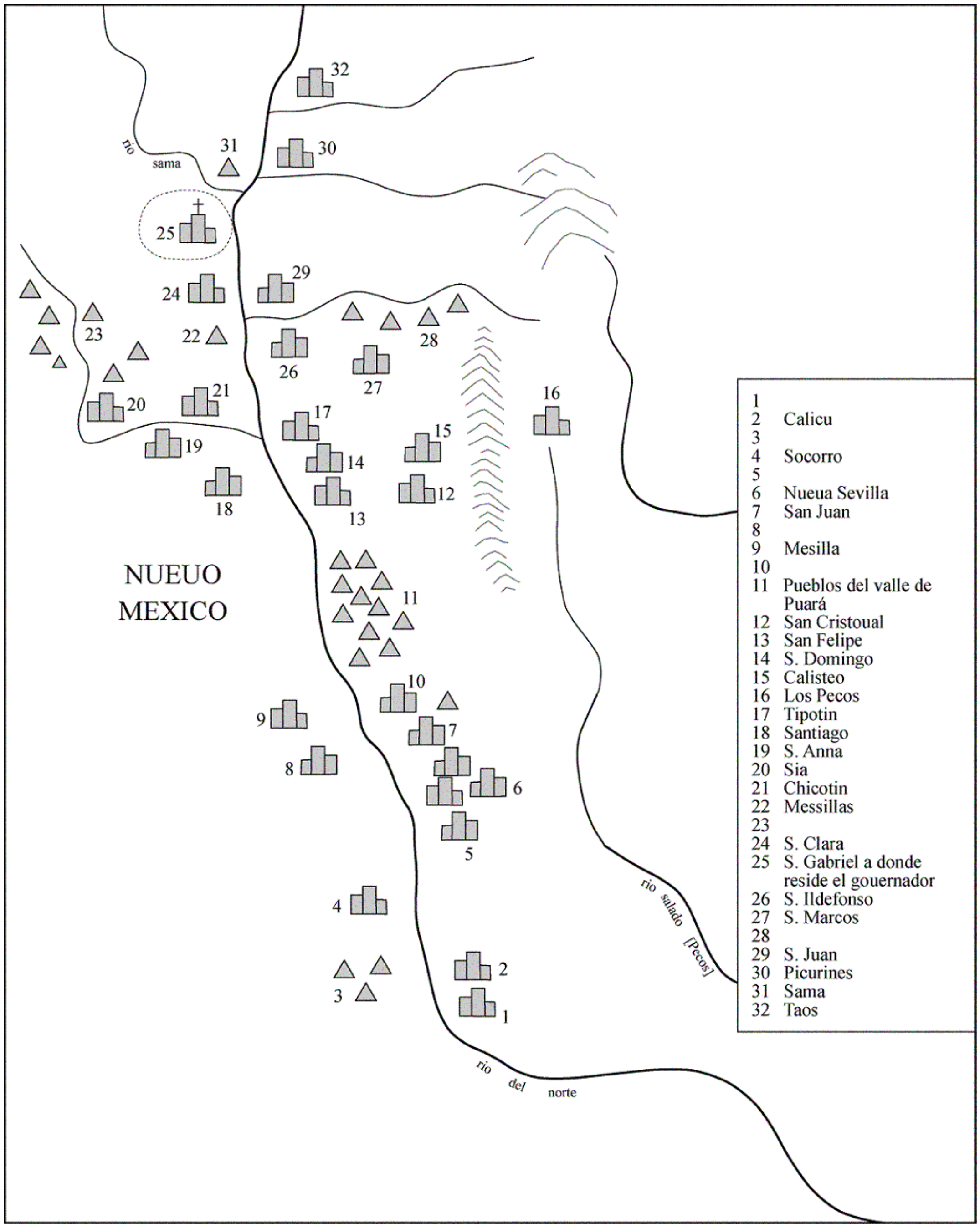

Fig. 6.3. Pueblos shown on the Martínez map of 1602. A caption in the original states that the gaps in the listed entries are pueblos with names unknown to the author *("De los demas pueblos cuyos números en la orden desta tabla faltan no tengo noticia de sus nombres")* (adapted from Hammond and Rey 1966, frontispiece).

THE YEARS AFTER OÑATE

Despite the ruthless assertion of authority at Acoma and Cueloce, the state of Oñate's colony remained precarious as the colonists continued to impose themselves on the Pueblos. Contemporary sources contain numerous complaints about everything from the poverty of the land to Oñate's activities, lack of missionary success, and the vagaries of local climate. Discontent bred factionalism until most colonists decided to abandon New Mexico. Reinforcements were few and subject to the same disillusionments. In the end, it was only a sudden claim by the missionaries to have baptized large numbers of natives that kept the authorities in Madrid and Mexico City from abandoning New Mexico altogether (Scholes 1937; Scholes and Bloom 1944; Simmons 1991: 165-185).

After 1608/9, New Mexico was maintained by the Crown chiefly for the purpose of missionization. Not surprisingly, it is the spread of missions that best exemplifies the gradual expansion of the colony in those early years. From the first missions at San Ildefonso and Santo Domingo, the Franciscans by 1615 had established themselves at the Tewa pueblo of Nambé (1613), the Tano pueblos of Galisteo (1610-13) and San Lázaro (1613), the Keres pueblo of Zia (1610-12), and the Tiwa pueblos of Sandía (1610-12), Isleta (1613), and Chililí (1613/14) (Scholes and Bloom 1944: 332-336; Gerhard 1993c: 319). But as the number of missionaries fluctuated as wildly as that of the colonists, it is doubtful that the missions were always fully or permanently staffed during those years (cf. Scholes 1932; Scholes and Bloom 1944).

From 1598 to 1626, there is no record of missionaries in the Piro area. The scope of the 1598 assignments and the high turnover rate among colonists and missionaries, makes it unlikely that the Piros saw much of fray Juan Claros (Scholes and Bloom 1944:

320-330). At the same time, in the account of his own work at Pilabó/Socorro, fray Alonso de Benavides notes that the Piros thought "if a friar only looked at them, they would become Christians, and if this happened everything would go wrong with them" (Hodge et al. 1945: 63), a reaction that perhaps reflected earlier encounters with missionaries. Opportunities for such encounters were there, as all traffic from New Spain went through Piro territory. After 1613, missionaries could also have visited from the new Isleta mission. That for nearly three decades no effort would have been made to convert the strategically placed Piros seems unlikely, but what little information there is on this issue is not consistent. In the early 1630s, for instance, fray Estévan de Perea claimed that it had not been until the arrival in 1629 of a group of new missionaries that the Piros (and Tompiros) were baptized (Bloom 1933: 225-226). By contrast, in 1621 a viceregal order to stop collecting tribute from still unconverted pueblos *("que son gentiles")* put only the Zuni and Hopi pueblos in this category (*AGI*, *Audiencia de México*, *legajo* 29).[11] In 1648, Governor Luis de Guzmán also noted that the last pueblos to be converted *("reducido a nuestra santa fee catholica")* had been the Zuni and Hopi pueblos (*BNM*, *legajo* 1, *no.* 19; cf. Scholes 1942: 261).[12]

Even murkier than the early phase of missionary activities among the Piros are the beginnings of local Hispanic settlement. When and how colonists began to fan out from Oñate's initial core settlement is not known. By 1610, the *villa* (chartered town) of Santa Fe was established, but had only a small number of *vecinos* or permanent residents (50 plus dependents reported for 1620) (*AGI*, *Audiencia de México*, *legajo* 29; Villagutierre

[11] Marqués de Guadalcázar to Governor Juan de Eulate, Mexico City, February 5, 1621.
[12] Declaration of Governor Luis de Guzmán y Figueroa, Santa Fe, June 13, 1648.

1953, 3: 111-112; cf. Trigg 2005: 69-70).[13] Throughout the Rio Grande Valley and adjacent areas, farmsteads or ranches (variously referred to as *estancias* or *haciendas*) were the typical forms of early Hispanic settlement (Simmons 1969: 8-11; Snow 1979: 42-46, 1992a: 189-190; Trigg 2005: 68-73). Without land records, however, these rural establishments can be traced only loosely through chance references to individual *estancias.* Such references have yet to be found for the Piro area.

The Early Mission Period, 1626-c. 1640-50

CHRONOLOGY OF THE PIRO MISSIONS

Few events figure as prominently in Piro history as the founding of the Piro missions. In the spring of 1626, newly arrived fray Alonso de Benavides selected Pilabó Pueblo as the site of the first mission. Direct and indirect references to this endeavor are in various Inquisition records (e.g. *AGN*, *Inquisición*, *tomos* 356, 363) and in two *Memoriales* written by Benavides in the late 1620s and early 1630s (Table 6.1) (Ayer 1916; Hodge et al. 1945). The Pilabó mission was christened Nuestra Señora del Socorro, and the pueblo entered the historical record as *Socorro de los Piros* (*AGN*, *Inquisición*, *tomos* 356, 363; cf. MSS 360, Box 3B, Folder 24).[14] The Socorro of Oñate's time had been the pueblo of Teypana. The name shift is nowhere explained, nor is the relationship between the two pueblos. Already with the Claros assignment, Teypana vanishes from the record, while Pilabó makes its first appearance under the variant spelling "Pilogue" (Table 6.3).

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[13] Marqués de Guadalcázar to Philip III, Mexico City, May 27, 1620.

[14] Declarations of Captain Manuel Correa Falcón, Santa Fe, July 29, 1626; Captain Diego de Santa Cruz, Santa Fe, August 3, 1626; Captain Antonio Baca, Socorro, February 22, 1627; and Captain Juan Gómez, Socorro, October 22, 1627.

In the brief description of Pilabó/Socorro in Chapter 3, I cited Benavides' remark that this was the "principal pueblo" of the Piros. There are no clues as to Pilabó's size, but missionaries in general first tried to gain a foothold in the larger communities of the groups they targeted (e.g. Ricard 1933; Baudot 1990; Román Gutiérrez 1993; Nolasco Armas 1998; González Salas 1998; Jackson 2000; Rubial García 2002; Vázquez Loya 2004). That Benavides opted for Pilabó suggests as much. Also, together with the transfer of the "Socorro" name and with Pilabó's proximity to Teypana in the Claros assignment, this hints at a population shift from Teypana to Pilabó – i.e. a *reducción*-type relocation as is assumed to be behind Plaza Montoya's abandonment. Aside from the processual implications of such potentially overlapping assumptions, this could raise the question of whether the Plaza Montoya site actually *is* the site of Teypana Pueblo.

At the time of Benavides' efforts in the Piro area, *reducciones* or *congregaciones* had long been used in New Spain to "reduce" the number of native communities through resettlement of smaller populations (Cline 1949; Gerhard 1977; Griffen 1979; *Archivo Histórico Municipal de Querétaro [AHMQ]* 1994; Quezada 1995; Christlieb and Urquijo Torres 2006). *Reducción* was viewed as *"el remedio más conveniente"* for conversion, "harmony and order", and for making the natives "forget the errors of their ancient rites and customs" *("[que] vivan en concierto y policía, olvidando los errores de sus antiguos ritos y ceremonias")* (Gonzáles de Cosío 1973: 215).[15] Most *reducciones* targeted non- or semi-sedentary groups, or areas with extreme population loss. Lack of sedentism was not an issue with the Pueblos, nor, it seems, was demographic decline until the late 1630s (Chapter 7). In the Piro area, the mission pueblo of Selocú/Sevilleta, resettled at the time

[15] Philip II to Viceroy Martín Enríquez, San Lorenzo, May 20, 1578.

of the founding of its mission in the late 1620s, is the only pueblo associated in the documents with a specific case of *reducción* as a recipient community for an unknown number of settlements in the northern part of the Piro province (see below).

During the time when he was active at Pilabó/Socorro, Benavides also established the mission of San Antonio de Senecú (*AGN*, *Inquisición*, *tomos* 356, 363).[16] Although Senecú is the best-documented Piro pueblo and known to have been located near Black Mesa, it has not been identified on the ground (Bletzer 2005: 16-17). After Socorro and Senecú, Benavides founded the mission of San Luis Obispo at Selocú/Sevilleta. This was a special challenge, for the pueblo had been "depopulated by wars with other nations" (Ayer 1916: 17, 96). A fourth mission was added at Alamillo after Benavides left New Mexico in 1629. First mentioned in a document from 1638, its beginnings are unknown. Located about halfway between Socorro and Sevilleta, Alamillo is the most obscure of the four Piro mission pueblos, both archaeologically and historically (no site, no original name, no precise founding date, etc.) (Marshall and Walt 1984: 245-255).

THE PROCESS OF MISSIONIZATION

While information on the finer points of missionary work among the Pueblos is limited, Benavides' two *Memoriales* provide a few details on early mission structure. In his *Revised Memorial* of 1634, he recaps the initial stages of the Socorro mission. In response to the frantic reaction that greeted his arrival, Benavides states that "[t]he first thing I did, as in all the other conversions, was to conjure and banish the devil from this

[16] Fray Alonso de Benavides to the Franciscan provincial in Mexico City, Senecú, September 8, 1626; declarations of Captain Manuel Correa Falcón, Santa Fe, July 29, 1626; and *alférez* Diego de Montoya, Senecú, July 10, 1628.

place through the exorcism of the church". A "100-year old chief" accepted the new faith, compelled his son to do likewise, and, so Benavides, ordered "that a house should be given to me in which to live and gave me some advice as to how I ought to proceed to convert the people of this nation, according to his opinion" (Hodge et al. 1945: 63, 248).

The appropriation of space within a pueblo was not unique to Benavides' foray. Oñate had taken over an entire Tewa pueblo during the colony's early days (cf. Agoyo 1987; Ellis and Dodge 1992), and on a smaller scale a number of missions started as modified sections of pueblo room blocks (Hodge 1937: 87; Montgomery 1949: 117-137; Ivey 1988, 1992, 2005). In Chapter 4, I briefly described the structural modifications that turned the western edge of Las Humanas Mound 7 into the first *convento* at the pueblo. Documentary evidence suggests that work on *convento* and the accompanying church of San Isidro was seasonal, lasting some five years (1629/30-35), including a hiatus of more than a year (Ivey 1988: 157-171). Completion of the Socorro mission and church may have taken about as long (1626-30) (cf. Ivey 1988: 54). During the first years, Benavides shuttled back and forth between Santa Fe, Socorro, and Senecú (*AGN*, *Inquisición*, *tomos* 356, 363; cf. Scholes and Bloom 1945: 80).[17] Friars residing at the new missions were in charge of day-to-day operations and further development. Benavides' two *Memoriales* are mostly first-person accounts, but there is evidence that at least five friars were involved in the establishment of the Piro missions (MSS 360, Box 2b, Folder 31; Bloom 1933: 225-226; Hodge et al. 1945: 62-63; Vetancurt 1960-61, 3: 265-266, 4: 18).

[17] E.g. declarations of Captain Manuel Correa Falcón, Santa Fe, July 29, 1626; Captain Juan Gómez, Socorro, October 22, 1627; and *alférez* Diego de Montoya, Senecú, July 10, 1628.

Early Mission Structure and Organization

Missions were the primary setting of Pueblo-Spanish interaction. The Franciscans brought to New Mexico a bi-partite system of fully staffed missions (*cabeceras*) and periodically visited outposts *(visitas)* (Ivey 1988: 30-31; Weber 1992: 400, n. 67 ; Gerhard 1993c: 319). Depending on population levels and availability of missionaries, a *cabecera* could become a *visita* and vice versa. Several such shifts are indicated in later documents for the Piro area (see below). The distribution of the Piro villages clearly influenced the organization of Franciscan activities among the Piros. Benavides (Hodge et al. 1945: 62) stresses that he converted "many pueblos" and "baptized the majority [of their residents] and the important persons" during a span of 18 months. This suggests that initial proselytizing was not restricted to the later mission pueblos. There also are a few references to Benavides visiting *"pueblecillos"* and *"pueblos pequeños"* during his first trips to the Piro area (*AGN*, *Inquisición*, *tomo* 356).[18] In setting up missions at Senecú, Socorro, and Sevilleta, the Franciscans quickly covered the southern, central, and northern parts of Piro territory (Fig. 6.2).

While Benavides' comments at least in part tell of his Piro experiences, the only physical evidence for the Piro missions is Room Block 8 at Sevilleta (LA 774), the remains of the San Luis Obispo mission. Interior dimensions of the likely church are 23 x 6.5 m and c. 14 x 8 m for the adjacent *convento.* A line of rubble runs north from the *convento* for nearly 50 m and then west for another 20 m before petering out. Size and structure suggest that this was the mission's *campo santo* wall (Fig. 5.1) (Marshall and Walt 1984: 203-207). By comparison, at Las Humanas the San Isidro church has interior

[18] Declarations of Captain Manuel Correa Falcón, Santa Fe, July 29, 1626; and Captain Diego de Santa Cruz, Santa Fe, August 3, 1626.

dimensions of 33 x 9 m, while the attached *campo santo* measures c. 25 x 16 m, and the Mound 7 *convento* c. 14 x 14 m (Fig. 4.11) (Vivian 1964: 62-83; Ivey 1988: 157-176). At Abó, the first church (c. 1623-28) of the San Gregorio mission had interior dimensions of 25 x 8 m. The probable first *convento* (1622/23) was part of one of the pueblo's room blocks (Mound I) and measures roughly 8 x 8 m. The second *convento* (1623-28), built adjacent to the church, had an original size of 25 x 24 m, including a large patio. The attached *campo santo* enclosed an area of c. 33 x 30 m (Fig. 6.4) (Ivey 1988: 55-66; cf. Hayes 1974: 2-5).

The similarities between the Sevilleta, Abó, and Las Humanas missions reflect a basic organizational framework common to most 17th-century missions in New Mexico and other frontier provinces like Nueva Vizcaya (Bolton 1917; Spicer 1962: 288-298; cf. *AGI*, *Audiencia de México*, *legajos* 2732, 2736, *Audiencia de Guadalajara*, *legajos* 63, 67-68; Griffen 1979), La Florida (cf. *AGI*, *Patronato*, *legajo* 179; Hann 1990, 1991, 1996; McEwan 1991, 1993; Galgano 2005), or Yucatán (cf. *AGI*, *Audiencia de México*, *legajo* 367; Jones 1989; Andrews 1991; Hanson 1995; Chávez Gómez 2001). Again, though, Benavides' accounts of his Piro work are brief, other sources do not exist, and there is no archaeological information other than what the few walkovers of Sevilleta have produced. In his 1630 *Memorial*, Benavides (Ayer 1916: 19, 99) gives a figure of 14 Piro pueblos, which suggests that 11 non-mission pueblos were then extant. His statement that each mission had "under its charge other nearby pueblos" *("tiene cada uno a su cargo otros pueblos comarcanos")* (Ayer 1916: 17, 96), points to an early *cabecera-visita*-type structure, but no *visita* pueblos are named.

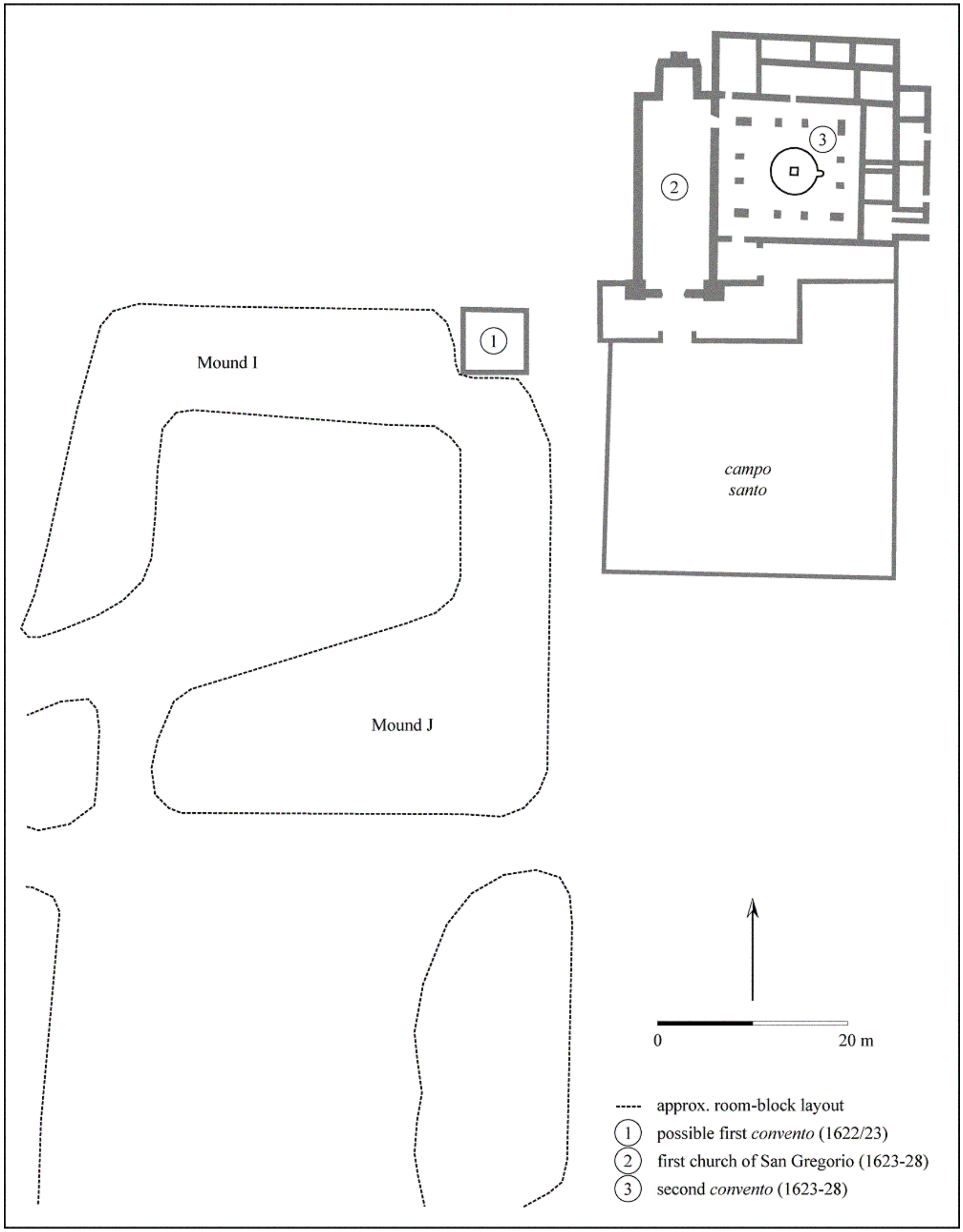

Fig. 6.4. Partial plan of Abó Pueblo with early *convento*, church, and *campo santo* of the San Gregorio mission (adapted from Ivey 1988, Figs. 2, 3).

Settlement Consolidation

Settlement consolidation is a subject of some prominence in the record of the early Piro missions, thanks to Benavides' (re)establishment between c. 1627 and 1629 of Selocú/ Sevilleta as a *reducción*-type settlement. The pueblo had been abandoned and destroyed in an otherwise unrecorded conflict. It appears as "Nueva Sevilla" in the journals of the Oñate expedition and as "Tzelaqui" in the Claros mission assignment (see Table 6.3). The two entries indicate that the pueblo's demise occurred after 1598. According to Benavides, its residents were "scattered over sundry hills" *("desparramados por algunos cerros").* With the refugees and "many others" he resettled Selocú to form what in his opinion was "one of the best pueblos" in New Mexico (Ayer 1916: 17, 96).

References to *reducciones* are rare in New Mexican records. In 1601, the head of New Mexico's Franciscans noted that "[i]t would be well if...these Indians be gathered into congregations and be taught the Spanish language, as was done in Peru" (Hammond and Rey 1953, 2: 696).[19] A viceregal order to that effect existed since 1609, but facing other problems Oñate and his successors apparently deemed *reducciones* impractical (Bloom 1929: 184; Hammond and Rey 1953, 2: 1089). The first record of a *reducción* is from the early 1620s, when fray Gerónimo de Zárate Salmerón consolidated the pueblos of the Jemez Plateau into two mission pueblos, San José de Guisewa and San Diego de la Congregación. The effort was short-lived, however, and it fell to Benavides to resettle "what Indians there were of this nation [that] were going about astray" *("trayendo alli los Indios que auia de aquella nacion, que andauan descarriados")* (Ayer 1916: 24, 107; cf. Scholes 1938: 61-71; Elliott 2002; Barrett 2002: 67-68; Kulisheck 2005: 252-254).

[19] Fray Juan de Escalona to Viceroy conde de Monterrey, San Gabriel, Oct. 1, 1601.

For the Piro province, there is no record of resettlement other than that of Selocú/ Sevilleta (Forbes 1960: 116-117). Even in this case, Benavides' references merely skim the subject. The *reducción* would have changed local settlement structure, but without references to pre-*reducción* settlement scale of change remains unknown. Archaeology is of no help, for there are no structural data from Sevilleta or nearby sites. The only site in the vicinity that seems to have been occupied in the early 1600s is Pueblo San Francisco (LA 778), a block of eight masonry rooms with Glaze E sherds on the surface indicating a contact-period occupation (Fig. 4.1, Table 4.2) (Marshall and Walt 1984: 211-212, 341-343). While the place could have been swept up in the Sevilleta *reducción*, Benavides' description reads as if there should be others like it. None are known, however.

BEYOND THE MISSION

The missions are key elements in 17th-century records both as subjects that were written about and as contexts in which writing took place. Quantity and quality of information may be fragmentary, but overall they stand in marked contrast to what is available on other facets of the Spanish presence among the Pueblos. In the following paragraphs, I review the documentary evidence for the development of colonial settlement beyond the main Piro missions. Outside the *villa* of Santa Fe, there were two main types of non-mission settlement in 17th-century New Mexico: mission *estancias* and privately-owned *estancias*. The former were the economic underpinnings of the missionary enterprise, the latter the basic units of civil settlement and subsistence production.

Mission Estancias

The scale and organization of mission land holdings are perhaps the most obscure aspects of the Pueblo mission system. With their order owning vast tracts of lands in both Europe and the Americas, Franciscans had a strong tradition of economic production and self-reliance (cf. Daniel 1975; Wobeser 1983; Schwaller 1985; Jackson 2000; Berg 2001; Todeschini 2004). While there is no clear information on how the New Mexican Franciscans reached a position of economic prominence, there are references to mission *estancias*, ranches, fields, and cattle and horse herds, as well as agricultural surpluses used for charity and commerce, from the years after 1640 (Ivey 1992, 2005: 341-346). References are most frequent (including to Piro mission stores) for the years after 1660, a reflection, perhaps, of the role of the mission economy in times of drought, disease, and warfare (e.g. *BNM*, *legajo* 1, *no.* 29; MSS 360, Box 2B, Folder 34).[20]

Mission *estancias* were probably established not long after the founding of a mission. This would place their appearance in the Piro area in the late 1620s and early 1630s. The missions at Socorro, Senecú, Sevilleta, and later Alamillo all must have had one or more such *estancias*, but not one is described in the documents I examined. For the Rio Grande Valley from San Juan Pueblo in the north to Socorro in the south, the documents register some 25 mission *estancias* for the early 1640s, with a concentration of 14 *estancias* between the Tiwa mission pueblos of Sandía and Isleta. Two decades later, there were 60 mission *estancias*, 46 of them in the Tiwa province (Scholes 1929: 46-50, 52-57; Ivey 1988: 26, 1992, 2005: 343-344), but it is impossible to make much of

[20] *Auto* of Governor Fernando de Villanueva, Santa Fe, February 18, 1668 (see Fig. 6.1); fray Fernando de Velasco ("special commissary of this province of the Piros"), memorandum of expenses for Socorro, Alamillo, and Sevilleta for 1671/72, Socorro, August 26, 1672; fray Nicolás de Hurtado, memorandum of expenses for the mission of San Antonio de Senecú for 1671-72, Senecú, June 24, 1672.

such figures without more information on mission affiliation, scale of operation, and organization of labor. While there are some references to Puebloan involvement in the mission economic system, there is nothing along the lines of basic structural-organizational data available for other parts of Spanish America (Spicer 1962: 291-292; Jackson 2000: 4-10; e.g. Hu-DeHart 1981; Deeds 1991; Jackson and Castillo 1995; Milanich 1999).

Private Estancias

The first references to Spanish settlers in the Piro area roughly coincide with the establishment of the Socorro, Senecú, and Sevilleta missions. In two Inquisition records drawn up in late 1631, the "farmer" *("labrador")* and "soldier" *("soldado")* Francisco Márquez and his wife María Núñez described themselves as *"moradores del pueblo de nuestra señora del Socorro de la prouincia de los piros"* (*AGN*, *Inquisición*, *tomo* 372).[21] Francisco Márquez was the son of Captain Gerónimo Márquez, who in the early 1630s was the owner of an estancia in the Rio Abajo called *"Acomilla"* (*AGN*, *Inquisición*, *tomo* 304; Chávez 1992: 69).[22] Late 17th-century topographical descriptions as well as layout and artifact assemblage of site LA 286 suggest this site may be the old Márquez estancia (Marshall and Walt 1984: 199-201, 256, 344). Located at the southwestern base of San Acacia Butte, the main structural remains are two room blocks with the L-shape commonly associated with Spanish sites in northern New Mexico (Figs. 6.2, 6.5, see Chapter 4). At present, the Márquez references and surface data from LA 286 represent the earliest traces of Hispanic settlers among the Piros.

[21] Declarations of Francisco Márquez and María Núñez, Sandía, October 1 and 14, 1631.
[22] Declaration of Captain Alonso Ramírez, Sandía, May 30, 1631.

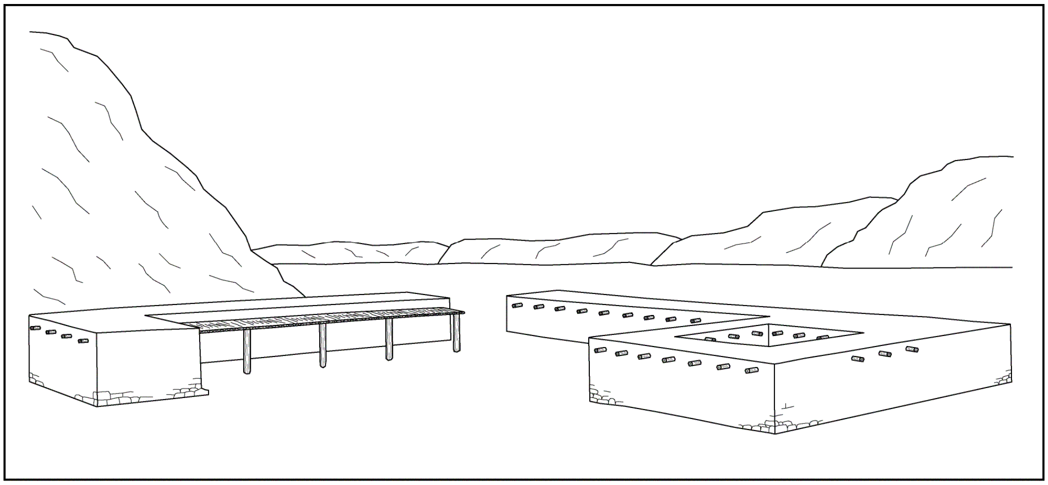

Fig. 6.5. Reconstruction drawing of Estancia Acomilla (LA 286). For site plan, see Fig. 5.4 (redrawn from Marshall and Walt 1984, Fig. 9.68).

Gerónimo Márquez appears with some frequency in early colonial documents. A loyal follower of Oñate, he is *"el buen Márquez"* in Villagrá's *Historia* (1992: 267). In 1614, he was condemned to perpetual banishment from New Mexico for various transgressions committed during the Oñate years, but apparently the sentence was not carried out (Hammond and Rey 1953, 2: 1116-1117; cf. Snow 1996: 85-86). In 1627, he was accused of "having always been an enemy of the church" and Benavides in his function as *comisario* of the Inquisition in New Mexico had him investigated. Affidavits were taken in Santa Fe from six witnesses who all knew Márquez.[23] None of the witnesses are mentioned as residents of the Piro area, however (*AGN*, *Inquisición*, *tomo* 318; cf. Chávez 1992).

[23] Testimonies of Captain Bernardo de Hinojos, *alférez* Juan de Vitora, *alférez* Pedro Varela, *alférez* Francisco Pérez Granillo, *alférez* Juan López Holguin, and Captain Juan de Vitoria Carvajal, Santa Fe, June 27, 1627.

Excavation of LA 286 might throw some light on the development of Hispanic settlement in the Piro area, but such work remains in the future. There is also an off-chance that documentary research could produce additional references to settlers and/or *estancias*. Until then, the late 1620s and early 1630s can only be considered an approximate *terminus ad quem* for the Spanish colonization of the area. As for scale, this seems to have been small. In 1639, ex-governor Francisco Martínez de Baeza noted that there were only about "ten or twelve farms of Spaniards, who plant wheat and maize by irrigating", between Santa Fe and Senecú, a distance of some 200 km (Hackett 1923-37, 3: 119; cf. Levine and Tainter 1982: 25; Ivey 1988: 26).[24]

Land and Encomienda Grants

Lack of information on Spanish settlers is largely the result of a lack of data on land and *encomienda* grants. As I pointed out earlier, no land or *encomienda* titles have yet been found in 17th-century documents (Kessell 2002: 395-396, n. 22). Records from other parts of New Spain may reflect legal and practical patterns that also apply to New Mexico (Taylor 1975: 190; cf. Cutter 1998: 99-100), but regional or local particulars – e.g. location, date, and size of a grant, grantee(s) and pueblos involved – are unknown. For the Piro area, references to land, land use, and *encomiendas* are few and generally indirect, limited as they are to notes about settlers encroaching on pueblo lands or chance references to *encomienda* tributes.

[24] Petition of Francisco Martínez de Baeza, Mexico City, February 12, 1639.

Land Use and Land Grants *(Mercedes de Tierra)*

A major driving force in the colonization of New Mexico was the prospect of finding rich silver ores (Simmons 1991: 64-65), but these never materialized and mining remained a low-key, low-yield affair throughout the colonial period (Trigg 2005: 96-97, 176-177; cf. Warren and Weber 1979; Warren and Mathien 1985; Milford and Swick 1995). One area where the Spaniards did extract ores were the uplands west of Socorro. Benavides (Ayer 1916: 18-19, 97-99) in his *Memoriales* touts *"el cerro del pueblo de Socorro"* as a bonanza from which silver might be extracted with ease *("La facilidad de sacar plata deste cerro es la mayor y mejor de todas las Indias").* He writes of ore samples sent to New Spain for assaying and suggests that the Piros should be induced to work the mines under the supervision of persons of only "moderate greed" *("de moderada codicia")*, for this would facilitate the conversion effort. Other friars had similar views and accused the colonists of having "no means" and "less enthusiasm" for mining.[25] Material evidence of mining comes from the base of Socorro Peak in the form of late glaze ceramics (including soup-plate and cup forms), ring-base vessels, mayólica, and metal objects (including chain-mail) (Chapter 4). Slag, litharge, magnetite, and local silver ores suggest smelting, but the low grade, refractory ores can have yielded little metal. How many sites of 17th-century affiliation may have existed here is impossible to say, due to the scale of more recent mining operations and the growth of modern Socorro (Robert H. Weber, personal communication, January 7, 2004; cf. Scurlock 1998: 119).

[25] The quote is from the 1628 *Relaciones* of Zárate Salmerón (Milich 1966: 56). See also the petition of fray Juan de Prada, Mexico City, September 26, 1638 (Hackett 1923-37, 3: 109).

Documents from 16th- and 17th-century mining centers in northern New Spain indicate that while early mining ventures were often small, in many cases some formal or informal note of discovery or operations was recorded (e.g. *AGI*, *Audiencia de Guadalajara*, *legajos* 28, 37; *BNE*, ms. 3047; Acuña 1988).[26] Whatever the story behind Benavides' remarks and the metal-working residues near Socorro, there is no evidence that there ever was a concerted effort at mining in the Piro area. Local settlers are always identified as *"labradores"*, *"estansieros"* [sic] or *"criadores"*, never *"mineros"* (*AGN*, *Inquisición*, *tomos* 372, 608; *Provincias Internas*, *tomo* 34).[27] All these terms reflect the agricultural focus of Hispanic settlement and as such also, indirectly, the importance of land tenure. In the Piro area as elsewhere in New Mexico, authority to distribute land rested with the governor in Santa Fe (Jenkins 1961: 48-51; Simmons 1968: 78; Kessell 2002: 113). What references there are suggest New Mexican land grants *(mercedes de tierra)* were consistent with three standard types of grants in New Spain: *caballerías de tierra* (farm land), *sitios* or *estancias de ganado mayor* (land for cattle/horses), and *sitios de ganado menor* (land for sheep/goats). Non-standardized measurements translate into inconsistent size assessments of such grants in modern terms (cf. Stampa 1949). Laid out as a square whenever possible, a *caballería* covered c. 43 hectares (106 acres), a *sitio de ganado mayor* roughly 1,700 hectares (4,200 acres), and a *sitio de ganado menor* 800 hectares (2,000 acres) (Simpson 1952; Taylor 1975: 195; Melville 1997: 123-125; Aguilar Robledo 2003).

[26] E.g., Anonymous, *real de minas de Topia*, c. 1590; Anonymous, *relación de minas de San Andrés [de la Sierra]*, 1644; Anonymous, *relación de las minas de Xocotlán*, Xocotlán, October 15, 1584; Pedro de Medina, *relación de las minas de San Demetrio*, Fresnillo, January 1, 1585; Juan Huidobro, *relación de las minas del Fresnillo [II]*, Fresnillo, January 20, 1585.

[27] Declarations of Francisco Márquez, Sandía, October 1, 1631; Captain Joseph Téllez Jirón, Socorro, April 19, 1667, and Senecú, April 20, 1667; Captain Juan García Holgado, Senecú, April 21, 1667, and Socorro, April 22, 1667; cf. declaration of Mateo de Manzanares, estancia de San Martín, December 7, 1636.

In 17th-century New Mexico, the recipients of *mercedes de tierra* were individuals and missions. Persons higher up in the colony's social hierarchy could hold several *caballerías* and *sitios/estancias* (*AGN*, *Tierras*, *tomo* 3268, cf. Kessell 1979: 186; *AGN*, *Inquisición*, *tomo* 608),[28] a pattern of distribution also following practice in New Spain (e.g. Library of Congress, Kraus Collection [LOC-K], 24; *AGN*, *Civil*, *tomos* 82, 1160; cf. Chevalier 1952; Taylor 1975; Licate 1981; Deeds 1985).[29] The missions as a rule appear to have received multiple grants; collectively, they became the biggest landowners before the Pueblo Revolt (Ivey 1992: 225; Kessell 2002: 113).

The demand for and allocation of land not surprisingly brought with it much potential for conflict between settlers, friars, and natives, especially over the fertile Rio Grande bottomlands which were not only spatially limited but partly under cultivation by the latter (Rodríguez 1991: 106). As the number of missions and *estancias* increased up and down the Rio Grande Valley, the takeover of land as seen from the Pueblos' perspective must have been startling. Spanish colonial law stated that grants should be made *"sin perjuicio"* to (i.e. without violating) native rights (Taylor 1975: 195-196), but in practice the principle proved vulnerable to fraud and corruption. Many native communities in New Spain went to court over land claims, which shows that *sin perjuicio* was at least not wholly devoid of legal weight (Taylor 1975). Issues ranged from land theft to denial of related use (above all water) rights, to Spanish livestock destroying

[28] Juan Manso, inventory of possessions of Francisco Gómez Robledo, Santa Fe, May 4, 1662; declaration of Captain Joseph Téllez Jirón, Socorro, April 19, 1667, and Senecú, April 20, 1667.

[29] E.g., *Licencia a don Francisco de Mendoza para que pueda tener despoblados durante dos años tres sitios de estancias que tiene en el río de Apaceo, cerca de un unas estancias de Francisco de Villegas*, January 9, 1551; *Títulos y recados de dos sitios de ganado mayor y doce caballerías de tierra en el puesto que llaman de la Cieneguilla e Las Mujeres, jurisdiccion de la villa de San Miguel, que vendió dª Isabel Bocardo...*, 1562; *Merced...a Pedro de Lezcano de dos caballerías de tierra y un sitio de ganado menor, distante del pueblo de Pasayuca y San Juan Tetzaguapa mas de legua y media*, 1617.

native crops (e.g. LOC-K, 217-218; 362-363; Newberry Library Chicago, Ayer Collection [NL-A], 169-170; *AGN*, *Civil*, *tomo* 694; cf. Jiménez Pelayo 1989; Aguirre Beltrán 1991; Ruiz Medrano 1991; Melville 1997).[30] For New Mexico, there is evidence that Spanish ranching operations affected native fields early on (*AGI*, *Audiencia de México*, *legajo* 29),[31] but there is no specific information on localities or pueblos affected. Also unknown are the timing and proliferation of grants during this period, a deficit of some significance given that the bulk of early colonial pueblos probably remained occupied into the 1630s (Chapter 7).

The *Encomienda*

The power to allocate pueblos in *encomienda* was another privilege the Crown granted its representatives in New Mexico. During Oñate's shaky regime, few *encomiendas* seem to have been assigned, however (Trigg 2005: 57). The earliest reference to a grant dates from 1606, when Juan Martínez de Montoya was entitled to collect tribute from a pueblo in the Jemez area (Scholes 1944: 340; Anderson 1985: 360). The identity of the pueblo is not clear, but the grant fell within the first phase of missionization of the area (cf. Elliott 2002: 46, 48; Kulisheck 2005: 251). As every *encomendero* was obliged to instruct tributaries in matters of faith, nominal conversion and *encomienda* grants may have gone

[30] E.g., *Comisión a don Rodrigo Maldonado, alcalde mayor de Mechuacan, para averiguar y hacer justicia en la queja de los indios de Acámbaro contra el ganado de varias estancias asentadas en sus términos*, October 8 1551; *Comisión al corregidor de los pueblos de Pucenquia y su partido y justicia en los Chichimecas para amojonar los términos del pueblo de San Miguel, amparando a los indios en la posesión de sus tierras*, January 8, 1552; *Comisión a Pero Hernández, corregidor de Cinapécora, para averiguar una queja de los chichimecas de la estancia de Aurelio, sujeta a Acámbaro, sobre que las estancias de ganado de Bocanegra y Gonzalo Gómez les perjudican*, November 9, 1552; *Los indios de San Juan Teotihuacán contra los principales y alcaldes del dicho pueblo, sobre lo que les acusan de haberles quitado sus tierras a los naturales*, 1569.

[31] Viceroy marqués de Guadalcázar to Governor Juan de Eulate, Mexico City, February 5, 1621.

more or less hand in hand. Though it is unlikely that the rule was always observed, only natives who had ostensibly accepted Christianity (i.e. had been baptized) were to be given in *encomienda* (Trigg 2005: 137). Nonetheless, as mentioned earlier, in 1621 the viceroy saw a need to remind New Mexico's governor not to levy tribute from the unconverted pueblos in the Zuni and Hopi areas.

With few other sources of income, *encomienda* grants were potent tools for the governor to assert control over the colonists (Scholes 1935a: 75-80, 1942: 40-45; Snow 1983; Anderson 1985). Complaints, lawsuits, and accusations of fraud and favoritism reveal something of the volatility deriving from the governor's power of (re)assignment and the fierce competition for *encomiendas.* There were attempts to rein in overly capricious use of grants, but the documents suggest the system remained muddled throughout the pre-Revolt period. Most drastic on paper was a cap at 35 *encomenderos*, ordered by the Crown probably in the 1640s. Prior to this, there may have been up to 60, many of them members of a few extended families of "first settlers" *("primeros pobladores")* (Gerhard 1993c: 316; Trigg 2005: 139). Whether the number was really reduced is not known, however. A pueblo could be held en bloc by one *encomendero* or in *"partes"* by several, and an *encomendero* could hold *partes* in several pueblos (*AGN*, *Tierras*, *tomo* 3268; cf. Scholes 1935a: 98-102; Kessell 1979: 186; Anderson 1985: 361).[32] Such arrangements were long common in New Spain (Simpson 1966; Himmerich y Valencia 1991). The mix of partial and multiple grants offers little room for estimating *encomendero* figures, and even less when one considers the practice of *escudería.* If an *encomendero* was unable to meet his military obligations, the governor

[32] E.g., declarations of Joseph Téllez Jirón, Santa Fe, October 16; and Felis de Carvajal, Santa Fe, October 24, 1661; Juan Manso, inventory of possessions of Francisco Gómez Robledo, Santa Fe, May 4, 1662.

could name an *escudero* to fill in as *"encomendero sustituto"* (for a share of the tribute) until the original grantee or an heir could reassume responsibility. Known references to *escuderos* are from the years after 1650 (*AGN*, *Inquisición*, *tomo* 507; Scholes 1942: 130-133, 214-215).[33] They show *escuderías/encomiendas* being used as bait in disputes within the Spanish camp, but say nothing about origin or extent of the practice, possible fluctuations in the number of *encomenderos*, or the effects on pueblos that were subject to such disputes (cf. Snow 1983).

Encomienda tributes collected from the Pueblos were generally in kind. For the early colonial and early mission periods, the documents indicate consistent levies of one *fanega* (c. 2.6 bushels or 90 l) of corn and a piece of cotton cloth of c. 50 square inches (c. 0.3 m^2), or alternatively a hide of the same size, all per household per year. Another aspect of the *encomienda* in New Mexico was that *encomenderos* would sometimes settle near their tributaries and use them as a private labor pool (Anderson 1985). This was forbidden under *encomienda* rules, but the frequent edicts issued by the Crown to that effect suggest it was common practice. Regardless of what *encomenderos* were or were not officially entitled to, the system was of course unacceptable to the Pueblos. By the 1640s, *encomenderos* were complaining that Pueblo families joined together in larger households to reduce tribute payments (Barnes et al. 1981: 69-71; Snow 1983; Barrett 2002: 68-69). In the Piro area, *encomiendas* are only attested for the later colonial period (Earls 1985: 92-93; Tainter and Levine 1987: 84). Undoubtedly, Piro pueblos were given in *encomienda* earlier, but there are no clear clues as to how much earlier. That tribute could be collected lawfully only from converted pueblos may point to the mission

[33] Governor Diego de Peñalosa, *título de escudería de la encomienda del sargento mayor Diego Romero*, Isleta, May 4, 1662; testimony of Captain Cristóbal Durán y Chaves, Sandía, March 9, 1664.

establishments of the mid- to late 1620s as a *terminus post* for the first Piro encomiendas. On the other hand, the viceregal edict of 1621 does not mention the Piros as *gentiles.* If not an oversight, this leaves open the possibility that by the early 1620s the Piros had received sufficient clerical attention for the authorities to regard them – at least *de iure* – as converted and thus as subjects that could be legitimately incorporated into the *encomienda* system.

SUMMARY: THE PIROS IN THE EARLY COLONIAL/MISSION PERIODS

Amid the various, often blurry, references to missions, *estancias*, and *encomiendas*, the Piros are featured only sporadically in the documentary record. There is no evidence that the Piros had anything but periodic contacts with the Spaniards prior to the mid-1620s. The founding of the Socorro, Senecú, and Sevilleta missions was probably the first permanent intrusion of colonial authority into the Piro area. Whether this was preceded or paralleled by secular Spanish settlement cannot now be determined. Though references to settlers and *estancias* appear in documents from the years after the first mission establishments, nothing is known of the initial settlement process.

Except for the Sevilleta area, Piro population and Piro settlement seem to have been fairly stable into the 1630s. Benavides in the late 1620s counted 14 pueblos from Sevilleta to Senecú, a figure in the general vicinity of contact-period estimates. As is illustrated by the example of Sevilleta, this trend does not necessarily imply continuity on the level of the individual pueblo. It does suggest, however, that the regional scale of settlement underwent few changes up to and beyond Benavides' time (Earls 1985: 138-141). With this, the Piros do not appear to have been better or worse off than most

Puebloan groups during the same period (Barrett 2002: 60). Most striking here is the lack of references to epidemic disease. For example, when and how Old World pathogens first impacted the Pueblos is rather less clear than it is for the native populations of central Mexico and other parts of Mesoamerica (cf. Crosby 1976; Dobyns 1983, 1989, 1991, 2002; Reff 1987, 1989; Prem 1991; Lovell 1991; Whitmore 1992). In Chapter 7, I look more closely at how historians, historical demographers, and archaeologists address the issue of timing and scale of disease-driven population loss in colonial New Mexico. Here it suffices to point out that the earliest reference to epidemic disease among the Pueblos is an oft-quoted passage written in 1638 by fray Juan de Prada, the Franciscan commissary general in Mexico City (Hackett 1923-37, 3: 108; cf. Scholes 1936: 322-325; Earls 1985: 160-161; Gerhard 1993c: 321; Dobyns 2002: 176; Barrett 2002: 78).[34]

The Late Colonial/Mission Period, c. 1650-80

As one moves from contact-period to early to late colonial sources, references to the Piro area become both more varied and more fragmented. Relatively coherent descriptions like those by Gallegos or Benavides are absent from the later record. Instead, Piros, missionaries, settlers, and civil officials appear in incomplete records that run from Inquisition cases to mission account ledgers to administrative and legal files on land status or *encomienda* grants. While the sources are indicative of the range of records amassed by both civil and ecclesiastical authorities, there is again nothing in terms of quantifiable data. Population figures exist only for the mission pueblos, and are both few and far between and not always clear as to which pueblo(s) they refer to.

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[34] Petition of fray Juan de Prada, Mexico City, September 26, 1638.

THE MISSION PUEBLOS

Administrative Structure

The establishment in the early to mid-1630s of the Alamillo mission raised the number of Piro mission pueblos to four. In the record for the years between 1630 and 1680, these are the only pueblos mentioned. References can be found in mission registers and in various documents on legal, economic, and military matters. While hardly satisfactory overall, quantity and quality of information differ for each pueblo. Due in part to its position as New Mexico's southernmost pueblo, Senecú appears more often in the surviving sources than the other Piro pueblos. Throughout the late mission period, the colonial authorities tried to maintain Senecú under increasingly adverse conditions. The record for Socorro, Benavides' "principal" Piro pueblo, is similar in scope to that of Senecú. On Sevilleta and especially Alamillo the documents are largely silent.

The founding of the missions placed the Piro area within a broader hierarchical administrative structure. In 1638, Fray Juan de Prada wrote that there were in New Mexico 30 *conventos* and a large number of *visitas* (Hackett 1923-37, 3: 108).[35] In contrast to the former, nothing is really known of the latter. Few *visitas* are named and identification on the ground depends on whether a site includes the remains of a chapel. But chapels were not only smaller and structurally simpler than mission churches and *conventos*, it is also uncertain if every *visita* even had a chapel for what might have been only very sporadic use. As mentioned in Chapters 4 and 5, a *visita* chapel may have existed at Tenabó (LA 200). The structure in question has been tested, but not to an extent necessary to be certain of its function (Baldwin n.d. b; cf. Ivey 1988: 17-19).

[35] Petition of fray Juan de Prada, Mexico City, September 26, 1638.

There is no clear historical or archaeological evidence for a "true" *visita* in the Piro area. In Chapter 5, I pointed out that the post-Revolt references to a possible chapel at San Pascual cannot be confirmed from surface observations at the site thought to have been San Pascual Pueblo (LA 487). Nor is there any evidence of a chapel at other sites in the area. In the documents, the term *visita* occurs mainly in conjunction with the mission pueblos of Sevilleta and Alamillo and, it seems, contexts of crisis. The first references to Sevilleta and Alamillo as *visitas* dates from the early 1640s, when both were listed as *visitas* of the Socorro mission. This was just after the first recorded instance of epidemic disease among the Pueblos. Interestingly enough, at this point Senecú is not mentioned (Scholes 1929: 50; cf. Barrett 2002: 62, 64). In 1664 and 1665, Alamillo appears again as a *visita* of Socorro. Another source from the same period describes Socorro as having two *visitas*, which though unnamed were probably Sevilleta and Alamillo. The Senecú mission is also listed, but without a *visita* (MSS 360, Box 3b, Folder 58; *AGN*, *Inquisición*, *tomo* 608; Scholes 1929: 55; cf. Marshall and Walt 1984: 247-248).[36] In 1668, a request from Governor Fernando de Villanueva to the missions for horses and provisions mentions only Senecú and Socorro, indicating that Sevilleta and Alamillo were then still *visitas* (*BNM*, *legajo* 1, *no.* 29).[37] In 1672, a priest was once more installed at Alamillo (Bloom and Mitchell 1938: 115), and by 1675 Sevilleta, too, seems to have returned to full-time mission status (*AGN*, *Civil*, *tomo* 511).[38]

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[36] Declarations of fray Tomás de Torres, Santa Fe, September 15 and October 1, 1665; Letter of fray Domingo Cardoso, Mexico City, 1667.
[37] *Auto* of Governor Fernando de Villanueva, Santa Fe, February 18, 1668.
[38] Decree of Governor Juan Francisco Treviño to Juan Martín Serrano, *"alcalde mayor de los Piros"*, Santa Fe, June 3, 1675; declaration of Juan Martín Serrano, Socorro, June 15, 1675. Treviño's decree and Serrano's declaration are part of the 1676 *"Residencia que dio el general don Juan de Miranda, del tiempo que fue gobernador y capitan general de las provincias de la Nueva Mexico".*

Residential Stability

Together with the lack of documentary prominence of the Piro mission pueblos, the recorded changes in mission status convey a sense of organizational and residential instability. The scarcity of more specific references may be at least partly the result of scribal oversight or archival loss, but when viewed against the overall record some of the major gaps match up with known or likely periods of increased stress and population loss. Other than the immediate burdens on the Pueblos of Spanish tribute and labor demands, the main factors in this were droughts and resulting food shortages, disease, and conflicts with non-Puebloan groups like Apaches, Navajos, and Utes. The potential scale and intensity of impact of these factors on Piro population and settlement is discussed in more detail in the next chapter. As a summary overview here, during the late 1630s the number of Pueblos who had been baptized dropped from more than 60,000 to less than 40,000, the result of the first recorded epidemic in New Mexico. By 1666, there were about "24,000 Indian men and women in all the missions" (Hackett 1923-37, 3: 108, 396).[39] Subsequently, an intense drought caused crops to fail several times and by 1670 a "very great famine" was ravaging the province. Just prior to the Pueblo Revolt, about "17,000 Christian Indians" in 46 pueblos (including 25 mission pueblos) remained (*AGI*, *Audiencia de Guadalajara*, *legajo* 138; Hackett 1923-37, 3: 299; cf. Schroeder 1979; Ivey 1994: 76-100; Barrett 2002: 63-66). Apparently all but 12 of these pueblos became actively involved in the Revolt (*AGN*, *Inquisición*, *tomo* 666).[40]

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[39] Petition of fray Juan de Prada, Mexico City, September 26, 1638; declaration of fray Miguel de Menchero, Santa Bárbara, May 10, 1744.

[40] Petition of fray Francisco de Ayeta, Mexico City, May 10, 1679; Ayeta to Viceroy Payo Enríquez de Rivera, El Paso, August 31, 1680; *Cabildo* of Santa Fe, *paraje de la Salineta*, October 3, 1680.

For the Piro area after 1650, the documents provide glimpses of the flagging fortunes of Sevilleta and Senecú. Temporary abandonment of Sevilleta in the late 1650s shows how an entire pueblo could be dislocated almost on a whim. A summary account of this episode survives as part of the judicial fallout from the López de Mendizábal administration. According to López, his predecessor had ordered Sevilleta's residents to relocate to Alamillo (Fig. 6.6). The move had been endorsed by fray Benito de la Natividad, resident priest of the Socorro mission, for which he received, again according to López, "a number of sheep and a valuable horse". The pueblo was then sold to a local rancher. Claiming the threat of increased Apache attacks through the deserted area, López had Sevilleta resettled, but he, too, may have looked mainly to his own profit, for he was later accused of illegally taking advantage of Sevilleta's residents in various commercial ventures (Hackett 1923-37, 3: 188-189, 220; Scholes 1942: 29; Marshall and Walt 1984: 246-247, 254-255).[41]

While the exact circumstances of the tussle over Sevilleta Pueblo remain obscure, the episode indicates how swiftly Spanish interests could alter native settlement structure. How many people were moved is not known, but whatever their number, the seemingly cavalier evacuation of an entire mission pueblo, even one already relegated to *visita* status and perhaps not very stable to begin with, offers a clue as to what may have happened to the 10 pueblos not chosen as mission sites. Unfortunately, for the remainder of the late colonial/mission period, the scarce references to Sevilleta give no indication of the state of the pueblo other than that it continued to be occupied.

[41] Testimony of Captain Andrés Hurtado, Santa Fe, September 1661; *Primera audiencia de don Bernardo López de Mendizábal*, Mexico City, 1663.

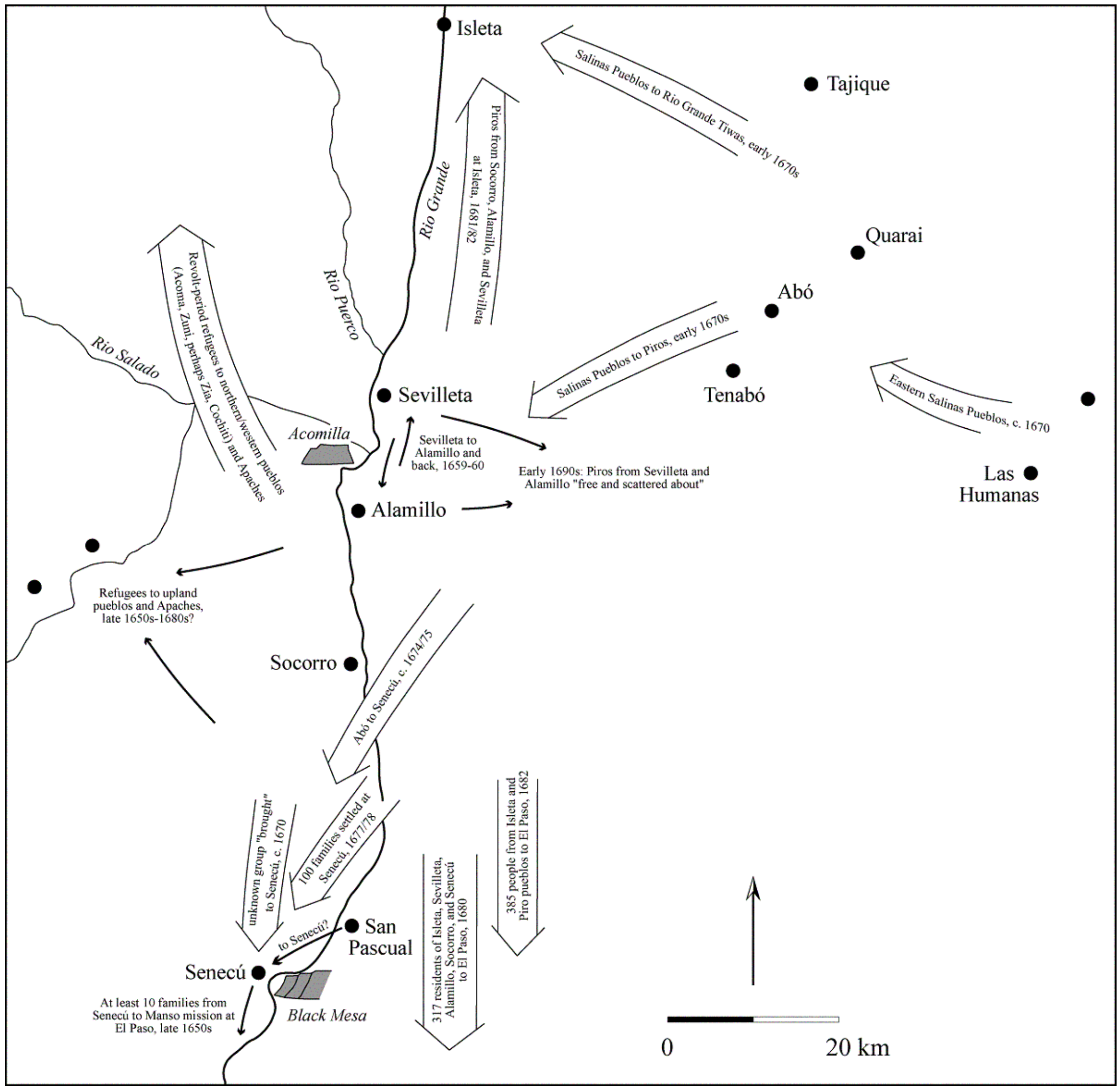

Fig. 6.6. Piro-area population movements between c. 1650 and 1692/93 as indicated in contemporary records.

For Senecú, the first bit of interest here is that its friars began in the 1650s to work among the Mansos of the El Paso area (Sánchez Reyes 1994). For support, they brought at least 10 Piro families from Senecú to live with the Mansos (Fig. 6.6), a move that met with little enthusiasm on the part of Senecú's *encomenderos* (*AGN*, *Inquisición*, *tomos*

507, 587, 594; Hackett 1923-37, 3: 158).[42] In 1667, the Mansos rose in a rebellion that soon spread to the Piro area. One prominent Spanish victim was the *alcalde mayor* of Senecú, killed by Piros and Apaches in the Magdalena Mountains. Spanish reprisals at Senecú quelled Piro resistance. According to one source, six "Christian Indians" were hanged, while another states that several persons "were hanged and burned as traitors and witches" (Hackett and Shelby 1942, 2: 266, 299; MSS 360, Box 3B, Folder 24; cf. Forbes 1960: 162-163; Marshall and Walt 1984: 252-253; Wilson 1985: 114-116).[43]

Despite (or because of) this, tensions remained and detachments of militia were sent to garrison both Senecú and Socorro. In June 1671 Apaches and perhaps Piro rebels managed to trap the incoming new governor Juan de Miranda with the triennial supply train at the *paraje* of El Muerto south of Senecú. Disaster was avoided only through the timely arrival of a relief force from Senecú (MSS 360, Box 2B, Folder 34).[44] Probably shortly after that, Senecú itself was attacked and a large number of horses and livestock driven off. A Spanish-Piro party went in pursuit of the raiders, but were ambushed and barely managed to escape with just a few casualties (Forbes 1960: 166-167).

Although none of the sources give figures that might indicate changes in Senecú's population, this was doubtless a period of decline. In 1670, an unspecified number of natives were "brought" to Senecú, a move which prompted the local missionaries to increase the mission's livestock by some 400 head to help feed the new arrivals (MSS

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[42] *Primera audiencia de don Bernardo López de Mendizábal*, Mexico City, 1663; declaration of fray Nicolás de Freitas, Mexico City, January 24, 1661.
[43] Declarations of Juan Domínguez de Mendoza, "place of the Rio del Norte", December 20, 1681; and Diego López Sambrano, hacienda of Luis de Carbajal, December 22, 1681.
[44] Fray Nicolás de Hurtado, memorandum of expenses..., Senecú, June 24, 1672.

360, Box 2B, Folder 34).[45] By 1674, however, the population again had dropped to a level that made it possible, indeed desirable, to settle refugees from Abó at Senecú (Fig. 6.6). The move was apparently engineered by fray Alonso Gil de Ávila, last priest at Abó and now assigned to Senecú. If this provided a boost to Senecú's fortunes, the effect can only have been short-lived. In early 1675, Ávila and reportedly many inhabitants were killed in what may have been a combination Apache attack and Piro rebellion (MSS 360, Box 3b, Folder 57; cf. Marshall and Walt 1984: 252-253; Wilson 1985: 116; Ivey 1988: 231-232).[46] Though the pueblo is next referred to as abandoned, some survivors appear to have stayed on at least into early summer (*AGN*, *Civil*, *tomo* 511).[47] In 1677/78, the civil and ecclesiastical authorities organized its resettlement with "more than one hundred families of Christian Indians". For their protection, a troop of militia was again stationed there (*AGN*, *Historia*, *legajo* 25; Hackett 1923-37, 3: 292, 297-298).[48] As a result, Senecú most probably remained occupied right up to the Pueblo Revolt.

Mission Economies

With the entire colonial venture depending largely on the native economy, missions, civil officials, and settlers (especially *encomenderos*) often were at loggerheads over who was entitled to what share of Puebloan products and labor. For the missions, income came directly from tithes or indirectly from labor. Figures are again rare, but there is enough evidence to show that many missions managed to build up large stores of foodstuffs and

[45] Fray Nicolás de Hurtado, memorandum of expenses..., Senecú, June 24, 1672.
[46] In the early 1880s, residents of the post-revolt Piro settlement of Senecú del Sur south of El Paso told Bandelier (1890-92, 2: 273) that they were "the last descendants of the Abó tribe".
[47] Declaration of *alcalde mayor* Juan Martín Serrano, Socorro, June 15, 1675.
[48] Petitions of fray Francisco de Ayeta, Mexico City, undated (c. 1679) and May 10, 1679; fray Francisco de Ayeta to Viceroy Payo Enríquez de Rivera, El Paso, August 31, 1680.

other supplies. In times of food shortages, these stores could become vitally important to Puebloan subsistence (Scholes 1942; Ivey 1988: 229-235). In 1661, for example, a settler noted that the friars in various pueblos, including Socorro and Senecú, handed out rations "on Sundays for the entire week" (Hackett 1923-37, 3: 187,191-192).[49]

Although the extent to which the missions contributed to Piro subsistence is not known, a few supply figures for the time of the "great famine" of the early 1670s exist. From September 1671 and August 1672, fray Fernando de Velasco, "special commissary for this province of the Piros", recorded donations from the Socorro mission to the Piros of Socorro, Alamillo, and Sevilleta of 39 cows and bulls, 10 calves, 12 sheep, 46 ewes and goats, 87 *fanegas* of maize, 27 of wheat, 22 of barley, 18 of beans, and three of chick peas. Wool, too, would be distributed, but the friar noted that none was available at the time because the herds had been sent to northern New Mexico because of Apache raids. Fray Lucas Maldonado Olasqueaín, at Socorro from c. August 1670 to January 1672, wrote that during his stay the mission supplied to the Piros more than 300 sheep, ewes, and goats; 100 cows and bulls; and more than 500 *fanegas* of wheat, maize, beans, and other grains. For Senecú, fray Nicolás de Hurtado summed up supplies to the pueblo between 1669 and June 1672: 1,100 *fanegas* of maize, 45 of wheat, 20 of beans, 1,400 fleeces of wool, plus 95 head of cattle from the mission herds, 72 head obtained elsewhere, and the 400 head apparently acquired for the otherwise unknown group settled at Senecú in 1670 (MSS 360, Box 2B, Folder 34).[50]

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[49] Testimony of Captain Andrés Hurtado, Santa Fe, September 1661.
[50] Fray Fernando de Velasco, memorandum of expenses..., Socorro, August 26, 1672; *Memorial* of fray Lucas Maldonado Olasqueaín, Acoma, August 28, 1672; fray Nicolás de Hurtado, memorandum of expenses..., Senecú, June 24, 1672.

Another sign of the missionaries' economic influence is the fact that the civil authorities relied on mission supplies to sustain military activities. In early 1668, for instance, Governor Villanueva asked the Franciscans to furnish horses and provisions for campaigns against Apaches who had raided pueblos and *estancias* throughout the Rio Abajo. Among several missions, the request mentions Socorro and Senecú (Fig. 6.1), but not Alamillo or Sevilleta, which then probably had only *visita* status (*BNM*, *legajo* 1, *no.* 29).[51] A rare documented case of material support is that rendered by the Senecú mission for Governor Miranda and the supply train at El Muerto in June 1671: 18 sheep, three oxen, two cows, eight *fanegas* of wheat in bread and biscuit, and four *fanegas* of maize (MSS 360, Box 2B, Folder 34).[52] For September 1671 to August 1672, there also exists a detailed month-by-month record, compiled by fray Fernando de Velasco, of supplies to the militia troops stationed at Socorro and to detachments on patrol, all of which came on top of what the natives received during the same period. The totals were: 51 sheep, three cows "with their young", 2 yearling heifers, 58 *fanegas* of wheat, 51 of maize, three of barley, plus vegetables and candles. "Approximately the whole of the above amount", so Velasco, "has been and is the usual expenditure of this said convent". Somewhat higher, if less specific, is Father Olasqueaín's claim that during his 16 months at Socorro the militia consumed more than 100 sheep, 100 ewes, 80 head of cattle, and more than 200 *fanegas* of wheat, maize, beans, and other grains (MSS 360, Box 2B, Folder 34).[53]

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[51] *Auto* of Governor Fernando de Villanueva, Santa Fe, February 18, 1668.
[52] Fray Nicolás de Hurtado, memorandum of expenses..., Senecú, June 24, 1672.
[53] Fray Fernando de Velasco, memorandum of expenses..., Socorro, August 26, 1672; *Memorial* of fray Lucas Maldonado Olasqueaín, Acoma, August 28, 1672

Aside from emergency supplies such as those for the El Muerto relief party, the Senecú mission also incurred expenses for the militia troop stationed at the pueblo until May 1672. Although there is no itemized list as there is for Socorro, volume and value of support were probably similar to what the Socorro mission recorded at that time. One entry in the ledger reveals something of an otherwise little known item: campaign costs. In August 1671, Governor Miranda set out to attack the Gila Apaches. For his force, the Senecú mission contributed three cows, 14 sheep, 40 head of unspecified livestock, and 10 *fanegas* of wheat in bread and biscuit (MSS 360, Box 2B, Folder 34).[54] As the figures are unique, it is impossible to gauge how much military operations may have strained mission stores over periods longer than a year or two. At the same time, the documents suggest a surge in hostilities with Apaches and Navajos in the years after 1660 (Scholes 1942; Forbes 1960). With supplies in greater demand in the mission pueblos, campaign-related outlays in animals and foodstuffs must have weakened the missions' economic base just when it would have played an increasingly critical role in the native subsistence system.

BEYOND THE MISSION PUEBLOS

Beyond the mission pueblos, scale and structure of settlement in the Piro area during the late colonial/mission period is unknown. Notwithstanding the apparent productivity of the Socorro and Senecú missions, there is no record of mission *estancias.* Nor is there any written evidence of pueblos occupied outside the *cabecera*-*visita* structure. The only other type of settlement mentioned in the documents is the private *estancia*, references to

[54] Fray Nicolás de Hurtado, memorandum of expenses..., Senecú, June 24, 1672.

which again epitomize the snapshot-like nature of the late colonial record. So far, I have seen about two dozen documents with information on settlers and/or their places of residence in the Piro lowlands. Going by these references, there may have been from six to 10 private *estancias* between Sevilleta and Senecú after 1650 (Fig. 6.2) (MSS 360, Box 1, Folder 75; Marshall and Walt 1984: 256-257; Tainter and Levine 1987: 84, 88). Given the fragmentary nature of the sources and the absence – aside from the possible Márquez estancia at San Acacia (LA 286) – of archaeological remains, both number and location are at best approximations (Fig. 6.2). The references date primarily to the 1660s and early 1670s. Locations are invariably given as distances to one of the Piro pueblos. In the early 1660s, for instance, the *estancia* of Francisco Pérez Granillo was said to be two leagues from Socorro, that of his brother Alonso Pérez de Granillo two leagues from Alamillo. One *estancia* called Las Barrancas was in the *"jurisdicción del Pueblo del Socorro"*, close enough to the pueblo for a cow from the *estancia* to fall into the Rio Grande there (*AGN*, *Inquisición*, *tomo* 608; *Tierras*, *tomo* 3283; MSS 360, Box 1, Folder 75; Chávez 1992: 88; cf. Tainter and Levine 1987: 84, 88).[55]

Of all *estancias*, only two can be placed more precisely. The *"estancia llamada San Antonio, jurisdicción del convento de Sevilleta"* in the 1660s belonged to Felipe Romero, one-time *alcalde mayor* of the *"jurisdicción de los piros"* (*AGN*, *Inquisición*, *tomo* 608; *AGI*, *Civil*, *tomo* 511).[56] Located near Sevilleta, its previous owner, Romero's father-in-law Diego de Guadalajara, had been involved in the row over the pueblo in the late 1650s and was accused of acting "like an *encomendero*" and other transgressions. In

[55] E.g., *"Bastimentos recibido por...fray Juan Ramírez"*, October 1662; various testimonies in Inquisition proceedings against Luis López, 1665-67.
[56] Testimony of Jacinta de Guadalajara y Quiroz, *estancia de San Antonio*, April 17, 1667; declarations of Cristóbal Enríquez, Sebastián de Herrera, and Lorenzo de Madrid, Santa Fe, June 21 and 22, 1675.

1661, Romero himself was charged with encroaching on lands and shooting livestock owned by the pueblos of Sevilleta and Alamillo (*AGN*, *Inquisición*, *tomo* 608; *Tierras*, *tomo* 3268; Hackett 1923-37, 3: 188-189; Chávez 1992: 97).[57] For two centuries after the Pueblo Revolt, Romero's name remained attached to a site north of Sevilleta. There no longer are any remains that may be related to the *estancia*, but the post-Revolt allusions at least generally confirm the early references to its location (Wilson 1977).

The second *estancia* is of particular interest to the Plaza Montoya area. Its owner, Luis López, appears in documents from the 1660s, most prominently as subject of an inquiry by the Inquisition (*AGN*, *Inquisición*, *tomo* 608). At some point in the early 1660s, López also was *"alcalde mayor de los Piros"*. Information on the man is limited to those years (Chávez 1992: 58), but the ruins of his *estancia* are occasionally mentioned in 18th-century records. Place and name were still associated with each other when the hamlet of Luis López was founded in the 1840s. The hamlet was later moved to higher ground. Its 19th-century site has been identified just north of Plaza Montoya. Some of its structures may have been built over the 17th-century *estancia*, but to verify or refute this would require archaeological testing (Marshall and Walt 1984: 277-278, 303-304).

PIRO-SPANISH RELATIONS

With the overall paucity of information on people like Felipe Romero and Luis López, it is not surprising that the development of relations between Piros and settlers remains obscure. Given what is known of Romero's involvement with Sevilleta and of settlers' activities elsewhere, however, relations must have been shaped mainly by mutual

[57] Declarations of Captain Andrés Hurtado, Santa Fe, September 1661; and Captain Juan García Holgado, Senecú, April 21, 1667.

animosity. The same no doubt also applies to relations between the Piros and their *encomenderos.* The record for the latter is very sketchy, but at least to some extent Piro *encomiendas* seem to have been assigned, as the law required, to settlers living outside the province. In the 1660s, Senecú had at least two *encomenderos*, Felis de Carvajal and Juan de Mondragón, neither of whom resided in the Piro area (Hackett 1923-37, 3: 158; Chávez 1992: 15, 75).[58] Carvajal reportedly held *"una parte"* of Senecú, which then amounted to 30 households *("casas")* (*AGN*, *Tierras*, *tomo* 3268).[59] Conversely, local settlers in theory could only hold *encomiendas* outside the Piro area. One example of this is Captain Joseph Téllez Girón, *"estansiero...que biue en la jurisdiccion del pueblo de Senecu"*, who in the 1650s had title to *"dos partes"* of each of the Keres pueblos of San Felipe and Cochiti (*AGN*, *Inquisición*, *tomo* 608, *Tierras*, *tomo* 3268).[60]

But even if such regulations were upheld in some cases, in others they were not. Encroachment and exploitation could be facilitated and become entrenched through close associations of settlers, *encomenderos*, and officials (cf. Chevalier 1952; Mörner 1970). Kinship ties played a major role in this, to the extent that a few prominent family groups came to control the colony economically, politically, and socially (Cutter 1986: 36-40; Kessell 2002: 110-113). With governors using their power to assign *encomiendas* to build up networks of political and economic support, legal provisions against misuse and exploitation of the native population were often ignored (Scholes 1942; Garner 1974; Gutiérrez 1991: 118-130; Trigg 2005: 148-161).

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[58] Testimony of fray Nicolás de Freitas, Mexico City, January 24, 1661;
[59] Testimony of Felis de Carvajal, Santa Fe, October 24, 1661.
[60] Declarations of Captain Joseph Téllez Girón, Santa Fe, October 16, 1661, Socorro, April 19, 1667, and Senecú, April 20, 1667.

Some indication of how official collusion and factionalism left the Piros exposed to abuse comes again from the records of the López de Mendizábal and Peñalosa cases. In a medley of accusations and counter-accusations over abuses of office and other transgressions, the records show governors, *alcaldes mayores*, and *encomenderos* at work in varying constellations throughout New Mexico (Scholes 1942; Forbes 1960; Garner 1974; Kessell 1979; Cutter 1986; Sánchez 1987; Gutiérrez 1991). For the Piros, this translated into lengthy trips (sometimes as far as the mining center of Parral in Nueva Vizcaya) collecting and transporting salt, piñon nuts, hides, and maize, plus weaving, and building storage facilities (recorded for Senecú), all for little or no compensation (*AGN*, *Tierras*, *tomo* 3268; *Provincias Internas*, *tomo* 35; Scholes 1942: 29, 48; Earls 1985: 97-99).[61] There is evidence that Piros from Senecú were used to transfer Apache prisoners to mines in Sonora (*AGN*, *Tierras*, *tomo* 3268).[62] Other grievances were requisitioning of Piro horses and foodstuffs, overbearing behavior by civil officials, and, most importantly, damage to native fields from Spanish livestock (*AGN*, *Tierras*, *tomo* 3268; *Civil*; *tomo* 511; cf. Scholes 1942; Garner 1974; Earls 1985; Cutter 1986).[63] Internal affairs were also catalysts for conflict, as the colonial authorities set up native administrations, based on Spanish practice, which paralleled traditional institutions. The Pueblos were to elect their new officials without outside interference, but occasional reminders to that effect from Mexico City suggest the reality was different. While the

[61] Fray Cristóbal de Quiros to Viceroy marqués de Cadereyta, Santo Domingo (?), November 28, 1636; *Protector de indios* Antonio González, *"en nombre de los yndios del pueblo del Socorro"*, Santa Fe, Oct. 25, 1661, Antonio González, *"demanda en nombre y con bos de los yndios de senecu"*, Santa Fe, Oct. 26, 1661. All "demands" were made against Governor Bernardo López de Mendizábal.
[62] Antonio González, *"demanda...de los yndios de senecu"*, Santa Fe, Oct. 26, 1661.
[63] E.g. Antonio González, *"en nombre...del pueblo del Socorro"* and *"demanda...de los yndios de senecu"*, Santa Fe, Oct. 25-26, 1661; testimonies of Juan Domínguez de Mendoza, Francisco de Valencia, Diego López Sambrano, Thome Domínguez *"el mozo"*, Cristóbal Enríquez, Sebastián de Herrera, and Lorenzo de Madrid, Santa Fe, June 18-22, 1675.

pre-Revolt record is little forthcoming on the issue, later documents and ethnographic observations indicate that the "Spanish" officials added a new dimension to the robust factionalism already extant among the Pueblos (*AGI*, *Audiencia de México*, *legajo* 29; MSS 360, Box 3b, Folder 34; e.g. Parsons 1939; Spicer 1962: 152-209, 390-393; Ortíz 1969; Dozier 1969, 1970a, 1970b; Rodríguez 1991: 8-162; Feinman et al. 2000; Brown 2004).[64]

Similar burdens came from the presence of the missionaries. Like other Pueblos, Piros built, decorated, and maintained churches and *conventos*; and tended mission fields, orchards, and livestock. Some were selected by the friars to help implant Catholic ritual. Also, the known references to *reducciones* suggest that the friars were primary decision-makers in cases of settlement consolidation. As the example of the Senecú Piros sent to live among the Mansos shows, groups of presumably loyal Christians could be relocated to support conversion efforts elsewhere. In terms of socio-political impact within the mission pueblo, the friars' native helpers were divisive figures. Their position within the new religious structure gave them a prominent place among Christian converts, while at the same time putting them at odds with religious traditionalists. This, too, fostered socio-political fragmentation, not only between Christian and non-Christian factions, but also, as references to events outside the Piro area indicate, between religious and civil officials and their supporters (cf. Scholes 1942; Kessell 1979; Ivey 1988).

How the Piros dealt with all this the documents reveal merely in faint outline. As far as they could discern Piro reactions, Spanish observers commented only on behavior they deemed deviant (notably armed resistance) and such comments as there exist are

[64] Viceroy marqués de Guadalcázar to Governor Juan de Eulate, Mexico City, February 5, 1621.

brief in the extreme. Given this, and given the momentary success of the Pueblo Revolt, it is easy to overlook that the Piros did not suffer colonial life lightly before August 1680 (Forbes 1960; Wilson 1985; Earls 1992). The troubles around Senecú in the late 1660s apparently involved an anti-Spanish Piro faction in alliance with a band of Gila Apaches. Through the 1660s and 70s, the situation in the southern Piro area remained volatile as more Piro "rebels" seem to have joined the Apaches, a strategy documented for other Puebloan groups during this and later periods (Forbes 1960; Brugge 1969; Schaafsma 2002a). Recorded hostilities thus likely involved opposing Piro factions on the Apache and Spanish sides (Wilson 1985; Earls 1992).

Amid all this, it is possible that some Piros opted for relocation away from the centers of Spanish control. Puebloan mobility as avoidance and passive resistance and the issue of identifying potential refuges have become subjects of research only recently (Preucel 2002, 2006: 210-246; Elliott 2002; Kulisheck 2003, 2005). While movements away from areas frequented by the Spaniards are mentioned in pre-Revolt documents, the very nature of such movements means that there is little information on them. For the Piro area, sites in the uplands west of Socorro and in the Chupadera Basin have been suggested as refuges for Piros from the mission pueblos (Marshall and Walt 1984: 139-141; Kulisheck 2003), but to test such assumptions requires a much better understanding of chronology and material inventories of peripheral sites than currently exists.

The End of the Piro Province

According to Spanish accounts of the Pueblo Revolt, the Piros and the Tiwas of Isleta did not participate in the uprising. Explanations for this range from lack of preparation due to isolation from the centers of resistance, to lack of manpower resulting from reduced population levels, to lack of enthusiasm for the anti-Spanish cause (e.g. Hackett 1911, 1912; Forbes 1960; Silverberg 1970; Garner 1974; Simmons 1980; Earls 1992; Knaut 1995; Reff 1995). No clear picture emerges from the sources, though one can probably assume that given their experiences many Piros had little sympathy for friars or settlers. The records of the Spanish withdrawal indicate that the Piros of Socorro, *"por Caussa de un Embajador que les bino de parte del Enemigo"*, planned to join the Revolt even as hundreds of Spanish refugees were encamped near the pueblo (*AGN*, *Provincias Internas*, *tomo* 37).[65] In response to the threat, the latter decided to remove the remaining residents of Isleta and the four Piro pueblos – 317 "women and men, old and young" – to the El Paso area (Hackett and Shelby 1942, 1: 159).[66]

Though mentioned only in passing, the 317 evacuees clearly did not represent the whole surviving Piro and Tiwa populations. Even if losses from disease, conflict, and malnutrition were severe, it is unlikely that the Spaniards would have maintained a mission pueblo for (on average) just 60 residents, let alone five of them. References to rebel plans to carry the fight to El Paso furthermore indicate that Piros and Tiwas were to play a major role in such a thrust (Forbes 1960: 180-181; Kessell and Hendricks 1992: 16-17). Where those Piros and Tiwas resided is not explicitly mentioned, but from the context it is doubtful that it was in the Piro area. While some Piros were reportedly living at Zuni, among the Keres, and with Apache groups, in 1681 a substantial number had gathered at Isleta (Fig. 6.6). There they were found by Governor Antonio de Otermín in early December 1681. Marching up the Rio Grande, Otermín and a force of 260 men

[65] *Auto* of Alonso García, Socorro, August 24, 1680.
[66] Muster at the *paraje de la Salineta*, October 3, 1680.

from El Paso (including c. 60 Piro conscripts) had passed the riverside pueblos of the Piro province but encountered no people, only signs of people, especially at Sevilleta, where a kiva had been built with materials taken from the mission. Otermín burned the Piro pueblos and Isleta, taking from the latter 385 persons back to El Paso, among them more Piros from Sevilleta, Alamillo, and Socorro (Hackett and Shelby 1942, 2: 203-208, 361-364; Marshall and Walt 1984: 245-257; cf. Forbes 1960: 187-190; Barrett 2002: 91-93).

Otermín's order of destruction marks the final act in the history of the old Piro pueblos. The records of the campaign of reconquest under Diego de Vargas a decade later contain nothing to suggest that any Piros who had escaped Spanish relocation ever returned to their pueblos (Kessell and Hendricks 1992; Kessell et al. 1995). Yet even so, there apparently remained a dispersed population, for in January 1693 Vargas observed that the "inhabitants" of Sevilleta and Alamillo were "free and scattered about". These, he noted, ought to be "reduced" to their old pueblos, where they could be joined by Hopis brought in from their remote mesa-top villages. As for Socorro, Vargas suggested it be reoccupied by Piros from El Paso. Senecú he deemed unsuited for resettlement, "because the river has ruined the fields, and it is Apache country" (Kessell et al. 1995: 114-115).[67]

Vargas' ideas were the first in an irregular string of proposals on what to do with the abandoned Piro province. Aside from returning the Piros, suggestions ranged from stationing soldiers at Sevilleta to establish some measure of control over both Pueblos and Apaches, to placing "continuous Spanish settlements in the Rio Abajo in the most advantageous places", to relocating to the Rio Abajo "the Taos, Picuris, and Tewa nations...to keep an eye on them" (a strategy also pondered for Pecos Pueblo) (Kessell et

[67] Diego de Vargas to Viceroy conde de Galve, El Paso, January 12, 1693.

al. 2000: 25-26, 29-31).[68] Similar schemes were hatched occasionally in the 1700s, but it was not until late in the century that Hispanic settlers founded the village of Sevilleta, called later La Joya, just south of the old pueblo. Around 1815, other settlers occupied the site of Socorro and started a settlement which grew into the modern town of the same name. Neither these nor subsequent establishments, however, included a concerted effort to bring the Piros back to their ancestral land (Marshall and Walt 1984: 259-287).

A final peculiarity in the historical record of Piro settlement is the fact that a few pre-Revolt sites first appear, or appear again after a long absence, in Revolt-period and post-Revolt documents. For example, Qualacú is mentioned as a "ruined pueblo" in the journals of Otermín's 1681/82 foray, the only reference to the place 80 years after it turns up in the Claros mission assignment and on the Martínez map (Fig. 6.3, Table 6.3). Neither Benavides nor any other mission-period sources mention Qualacú (Marshall and Walt 1984: 249-250). Even murkier is the case of San Pascual. The earliest reference to this pueblo comes from an elderly Piro who in July 1681 stated that he was a "native" of San Pascual", but had grown up in Senecú *("que es natural de San Pasqual y sea criado en Senecu")* (SANM, Reel 1, frame 40).[69] As the man was said to be "more than 70 years" old, the reference indicates only that San Pascual was occupied in the early colonial period. Abandoned prior to the Pueblo Revolt, San Pascual is later described as located close to Senecú. The remains of a chapel were apparently still visible in the 18th century, which together with the use of a saint's name suggests San Pascual had once been a *visita* (see Chapter 5) (Marshall and Walt 1984: 251-252; Barrett 2002: 63).

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[68] E.g. *Regidor* and *procurador general* Lázaro de Mizquía to the *cabildo* of Santa Fe, Santa Fe, December 1696; declaration of fray Francisco de Vargas, Santa Ana, December 28, 1696.

[69] Statement of Diego, *"indio viejo cristiano de nación Piro"*, El Paso, July 6, 1681.

As a final point, it is worth recalling that the only documentary reference to an upland pueblo is Vargas' 1692 description, partly quoted in the previous chapter, of the site known now as Pueblo Magdalena (Espinosa 1940: 243-244; Kessell and Hendricks 1992: 590; Marshall and Walt 1984: 256). Together with nearby Bear Mountain Pueblo, Pueblo Magdalena exemplifies once more the twin predicaments of Piro history and archaeology: limited documentary information and a broad, yet mostly unstudied, archaeological record. It also indicates again that between the two fields, only the latter has real potential for producing the kind of data needed to address questions relating to local and regional developments in Piro population and settlement.

CHAPTER 7

PIRO POPULATION AND SETTLEMENT

Based on the foregoing archaeological and historical descriptions, this chapter takes a closer look at those data that relate specifically to Piro population and settlement. Its chief purpose is to outline patterns and trends in the database and examine various factors known or likely to have affected Piro settlement structure in the years before 1680. The chapter begins with a synthesis of archaeological and historical data on Piro settlement. Comparisons highlight some of the problems arising from the nature of the data, which allows one to balance (at least to some extent) the strengths and weaknesses of different kinds of information. The focus then shifts to four factors and their possible roles in the demise of the Piro province. The factors are: (1) the Spanish presence among the Piros; (2) the incidence of infectious diseases like smallpox or measles; (3) conflicts with Spaniards, other Pueblos, Athapaskan groups, plus factionalism/internecine conflict; and (4) subsistence shortfalls and malnutrition. Contemporary records and paleodemographic and paleoclimatological reconstructions suggest that relative and absolute population losses were most severe at times when two or more factors combined to produce multi-year periods of stress.

The Ancestral- and Colonial-Period Occupation of the Piro Area

ANCESTRAL PIRO SETTLEMENT PATTERNS

To Hernán Gallegos of the 1581/82 Rodríguez-Chamuscado party, Piro "houses", fields, pottery, and cotton clothing compared favorably to the native cultures of central Mexico (Hammond and Rey 1966: 82).[1] What he and later observers recorded of Piro settlement, archaeologists today recognize as a centuries-long process of expansion, consolidation, and aggregation that extended far beyond the Piro area (cf. Adler 1996; Cordell 1997; Adams and Duff 2004). Though data are scarce, basic trends in the development of Piro settlement can be outlined. As among the Rio Grande Pueblos in general, Glaze A ceramics are key temporal markers for the transition from Pueblo III to Pueblo IV times. Introduced c. 1300/1350, Glaze A forms quickly replaced earlier carbon- or mineral-painted whitewares. Marshall (1987: 78-81) in his "Rio Abajo Ceramic Group-Complex Sequence" suggests a 50% replacement rate of whitewares during Ceramic Group VIII, which represents roughly the first 50 years of the Ancestral Piro phase. Fig. 7.1 shows the five Ancestral/Colonial Piro "group complexes" in the sequence.

For glazewares, the main trend in the sequence is the decline of Glaze A forms in the overall glaze sample from 100% in Ceramic Group VIII to less than 10% in Group XII. Paralleling this is a decline in the use of sand temper from more than 50% of all glaze specimens in Group VIII to 15% in Group XII. Reverse trends are the emergence in Group X and dominance in Group XI of Glaze D forms; the appearance in Group XI of Glaze E; the appearance and dominance, together with E forms, in Group XII of Glaze F; and a steady increase in the use of basalt temper.

[1] Hernán Gallegos' Relation of the Chamuscado-Rodríguez Expedition, 1581.

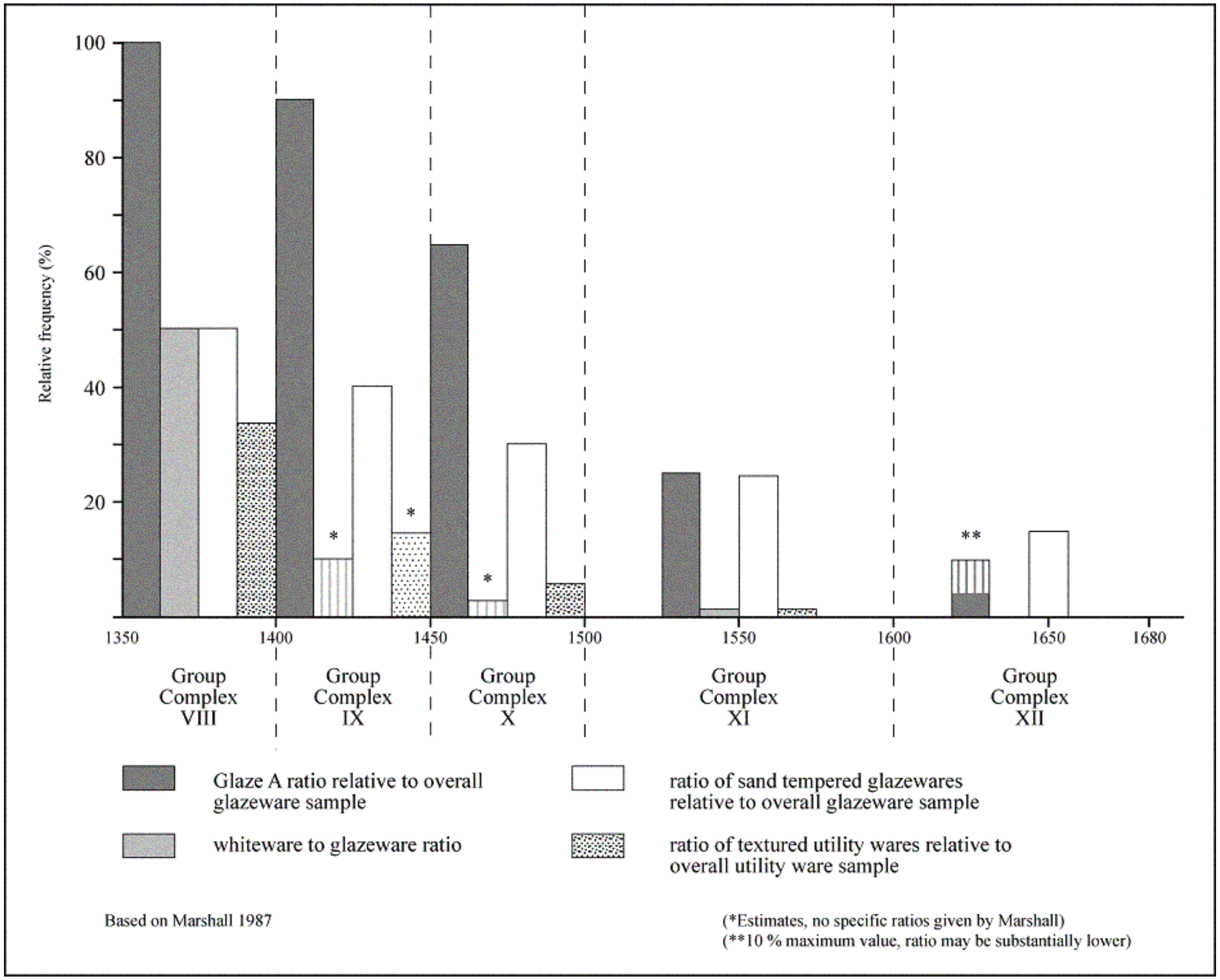


Fig. 7.1. Rio Abajo Sequence: Ancestral and Colonial Piro ceramic group complexes (after Marshall 1987). (Since the area targeted by the salvage excavations at Qualacú produced mostly early glaze ceramics, specific ratios for late glazewares are lacking).

Beyond the glazewares, the near-concurrent disappearances after Ceramic Group VIII of Pueblo III whitewares and textured utility wares are also notable. Although Marshall defined the five late group complexes primarily on the basis of the Qualacú assemblage, the limited data from Las Huertas (Earls 1987) and Pargas (Marshall 1986) appear suitably analogous to validate their function as a working chronology for Ancestral and Colonial Piro sites.

When applied to the 40 Ancestral/Colonial Piro sites with structural remains listed in Tables 4.1 and 4.2, the criteria of Marshall's Rio Abajo Sequence indicate 11 "fully ancestral" sites, i.e. sites whose ceramics suggest pre-contact occupation only (Fig. 7.2). Architecturally, they range from clusters of 10 or fewer above-ground rooms and the odd pit structure to pueblos with 100 rooms. Eight sites, including the southernmost Piro site (LA 1110), are located in the lowlands and foothills east of the Rio Grande. The northern pueblo of Abeytas (LA 780) is the only "pure" Glaze A lowland site west of the river. Two sites, La Jara Peak (LA 786) and Mira Ladrón (LA 20938), occupy remote locales in the western uplands. Eight sites with Pueblo III and/or Glaze A ceramics have yielded scattered Glaze E and F sherds, but a lack of intermediate (C-D) forms suggests periodic use. Structural variability is similar to the 11 single-component pre-contact sites. Except for Silver Creek (LA 20954), all sites are close to the Rio Grande. The two largest, Cerro Indio (LA 287) and Piedras Negras (LA 2004), are hilltop pueblos with long perimeter walls (Fig. 7.3). Both may have been colonial-period refuges. In the early days of the Pueblo Revolt, "the height of the pueblo of Acomilla", a reference, no doubt, to San Acacia Butte and Cerro Indio Pueblo (Chapter 5), was used as a lookout post (Marshall and Walt 1984: 108-110, 150; Marshall 2005: 51, 69).

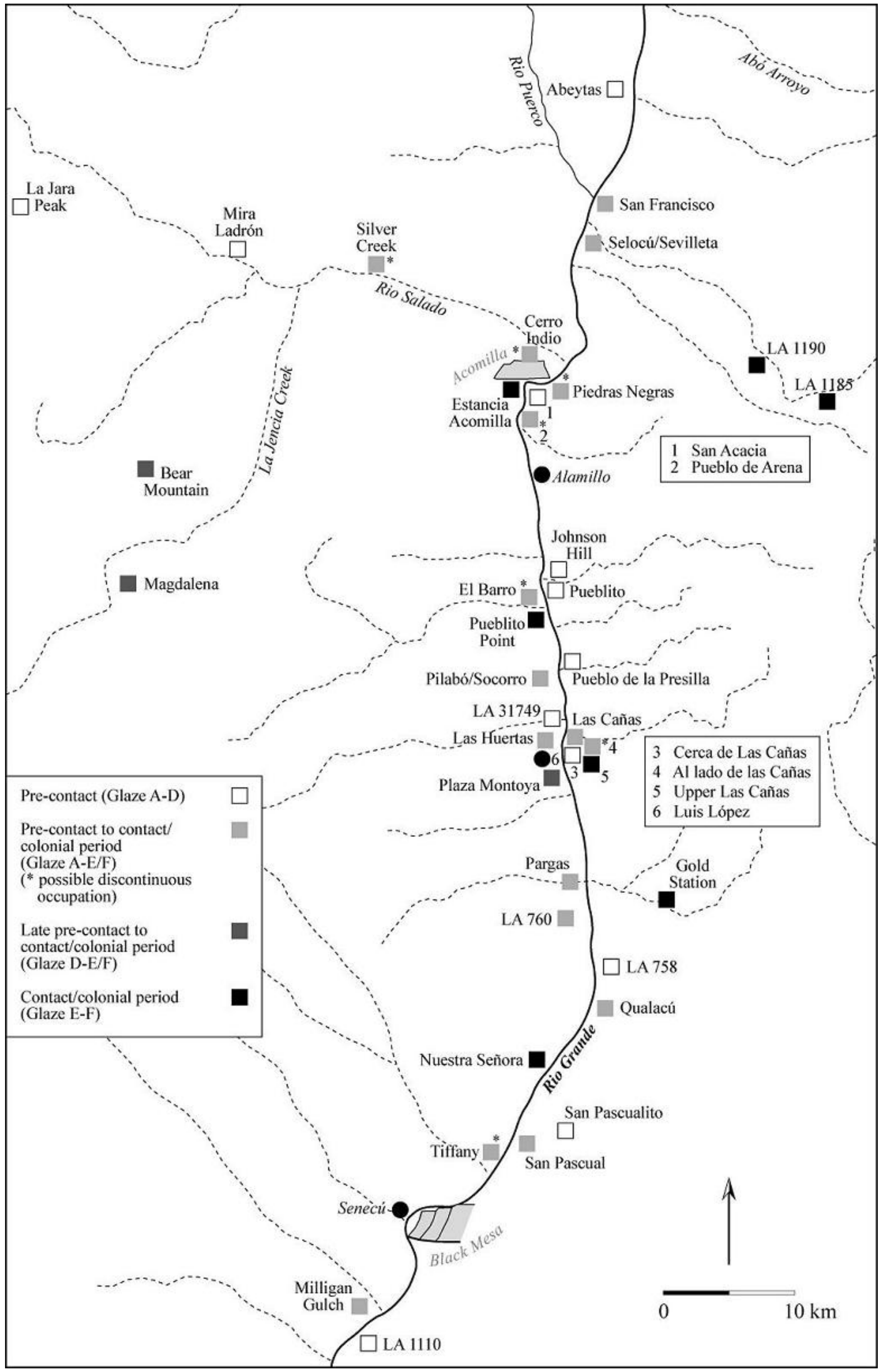


Fig. 7.2. Likely temporal affiliation of Ancestral/Colonial Piro sites following the Rio Abajo Sequence.

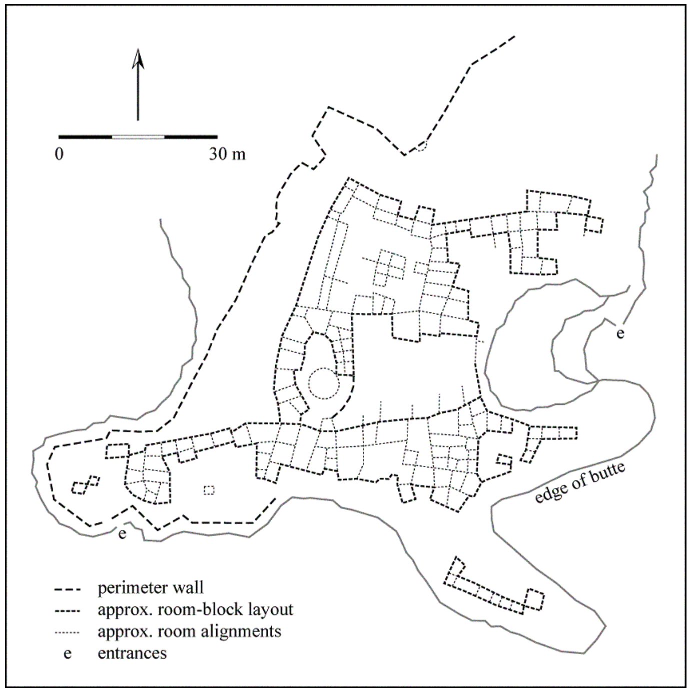
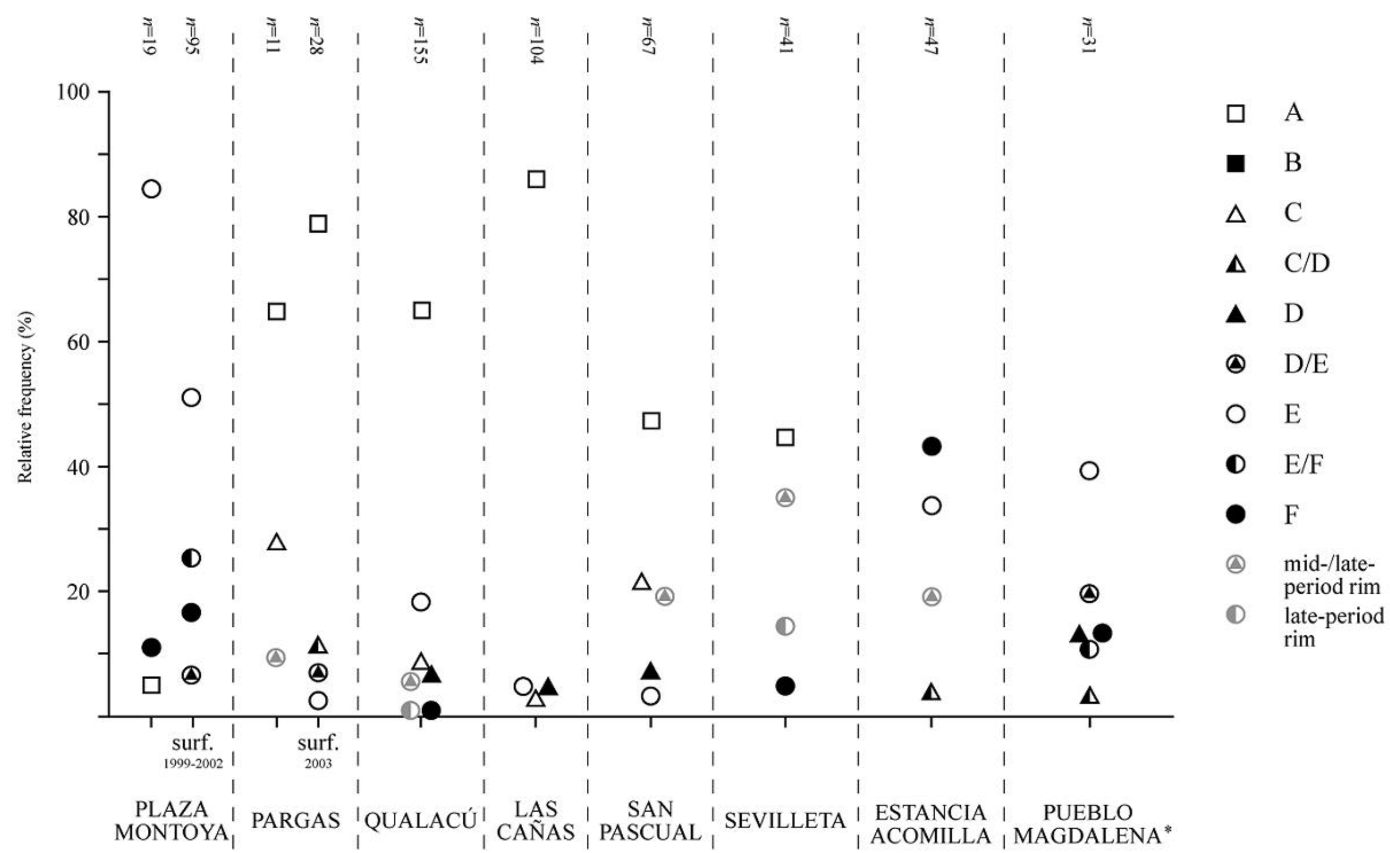


Fig. 7.3. Sketch map of Piedras Negras Pueblo (adapted from Marshall and Walt 1984, Fig. 7.11).

As can be seen from the site descriptions in Chapter 5, Glaze A ceramics also occur at most of the large plaza-type pueblos along the Rio Grande. At San Pascual (LA 487), Qualacú (LA 757), Las Cañas (LA 755), Las Huertas (LA 282), and Sevilleta (LA 774), Glaze A sherds are part of assemblages that include all glaze forms (Fig. 7.4) (Marshall and Walt 1984; Marshall 1987; Earls 1987).[2] Despite limited surface sampling and (except for Qualacú and Las Huertas) lack of sub-surface testing, the presence of the whole range of glazes indicates continuous, if not quantitatively and spatially persistent, settlement of these pueblos.

[2] Except Glaze B, see Chapter 4, n. 1.



(*Except for the 1999-2002 Plaza Montoya and the 2003 Pargas samples, all data are taken from Marshall and Walt 1984, App. 1, Table 7. The Magdalena data are based on rim-forms illustrated in ibid., pp. 214-215).

Fig. 7.4. Glazeware rim frequencies (surface) at selected Ancestral/Colonial Piro sites.

At the now lost Milligan Gulch Pueblo (LA 597), recorded glaze rims were mostly of the A variety. Other glazes occurred only in small numbers and F forms were lacking altogether. The distribution suggests that the pueblo was no longer occupied during the contact period and thus may indeed have been the abandoned San Felipe Pueblo of the Rodríguez-Chamuscado expedition (Chapters 5 and 6). At Pargas Pueblo (LA 31746), glaze rims from the surface and from Marshall's (1986) clearance project were mainly Glaze A (Fig. 7.4). Ten of the 18 Glaze A sherds in the excavated sample of 22 bowl rims were tempered with sand, while the four non-A rims contained basalt and rock temper (Marshall 1986: 46-47).

Compared to Pueblo III (Late Elmendorf) sites, Marshall and Walt (1984: 135-138) note an expansion of Ancestral Piro settlement into previously unoccupied areas. The result was a locational diversity greater than at any other point in the Rio Abajo Sequence (cf. Winter 1980: 24-25; Oakes 1986: 6-7). Also during Ancestral Piro times, lowland settlement reached its greatest north-south extent. Upland settlement is a largely unknown quantity, but the three sites in the Salado drainage indicate an early glaze occupation outside the Rio Grande Valley proper. Besides this regional expansion, some lowland sites grew into aggregated plaza-type pueblos, especially in the area between Socorro and San Antonio (Pueblito, Pilabó, Las Cañas, Las Huertas, Pargas, and perhaps LA 760) and further to the south (Qualacú, San Pascual, the missing Senecú, Milligan Gulch, and perhaps LA 758) (Fig. 7.2) (Lekson et al. 2004: 56-57, Fig. 6.1a).

If all this suggests an overarching pattern of Ancestral Piro settlement expansion and aggregation, there is little information on individual sites. As noted in Chapter 2, one problem is residential mobility. While documented historically and ethnographically, archaeological assessments of mobility and its impact on settlement structure have exacting data needs. Surface observations with limited temporal control do not suffice to define short-term changes in Piro settlement. At present, only better-studied sites outside the Piro area indicate something of the complexities of such changes. In the northern Rio Grande, occupation patterns include recurring cycles of aggregation, dispersal, relocation, and re-aggregation (e.g. Chapman and Biella 1977; Biella and Chapman 1979; Cordell and Gumerman 1989; Wills and Leonard 1994; Crown et al. 1996; Adams and Duff 2004). At Arroyo Hondo Pueblo, for instance, the entire occupation covered c. 120 years (c. 1300-1420), including a hiatus from c. 1340 to 1370. For the earlier (Component I) occupation, structural data and tree-ring dates suggest a total of 1,000 rooms, at least 90% of which are estimated to have been in use in 1330. By contrast, post-hiatus (Component II) rooms number about 200, which were partly built over Component I foundations. Similarities between the two occupations perhaps reflect domestic/communal continuity (Dickson 1979; Wetterstrom 1986; Habicht-Mauche 1993; Creamer 1993).

At Pueblo del Encierro (Fig. 7.5), occupation of the earliest rooms in the south room block paralleled that of Component II at Arroyo Hondo (Creamer 1993: 40). The pueblo's four other room blocks probably post-date the south block. Room-block expansion seems to have been mainly through double-room additions to older rooms, some of which were abandoned as rooms were added. The data suggest a high point of occupation in the early 1400s, with a lasting decline setting in after c. 1450. Ceramics, dendro-dates, and differences in distribution of rooms with multiple floors indicate substantial variability in scale and persistence of occupation within and between room blocks. Limited construction took place in the northeastern part of the pueblo as late as c.

1520. Final abandonment cannot be dated precisely, but the excavators consider it unlikely that the pueblo was still occupied when the Coronado expedition came into the area in 1540/41 (Snow 1976a; Warren 1976; Warren and Snow 1976).

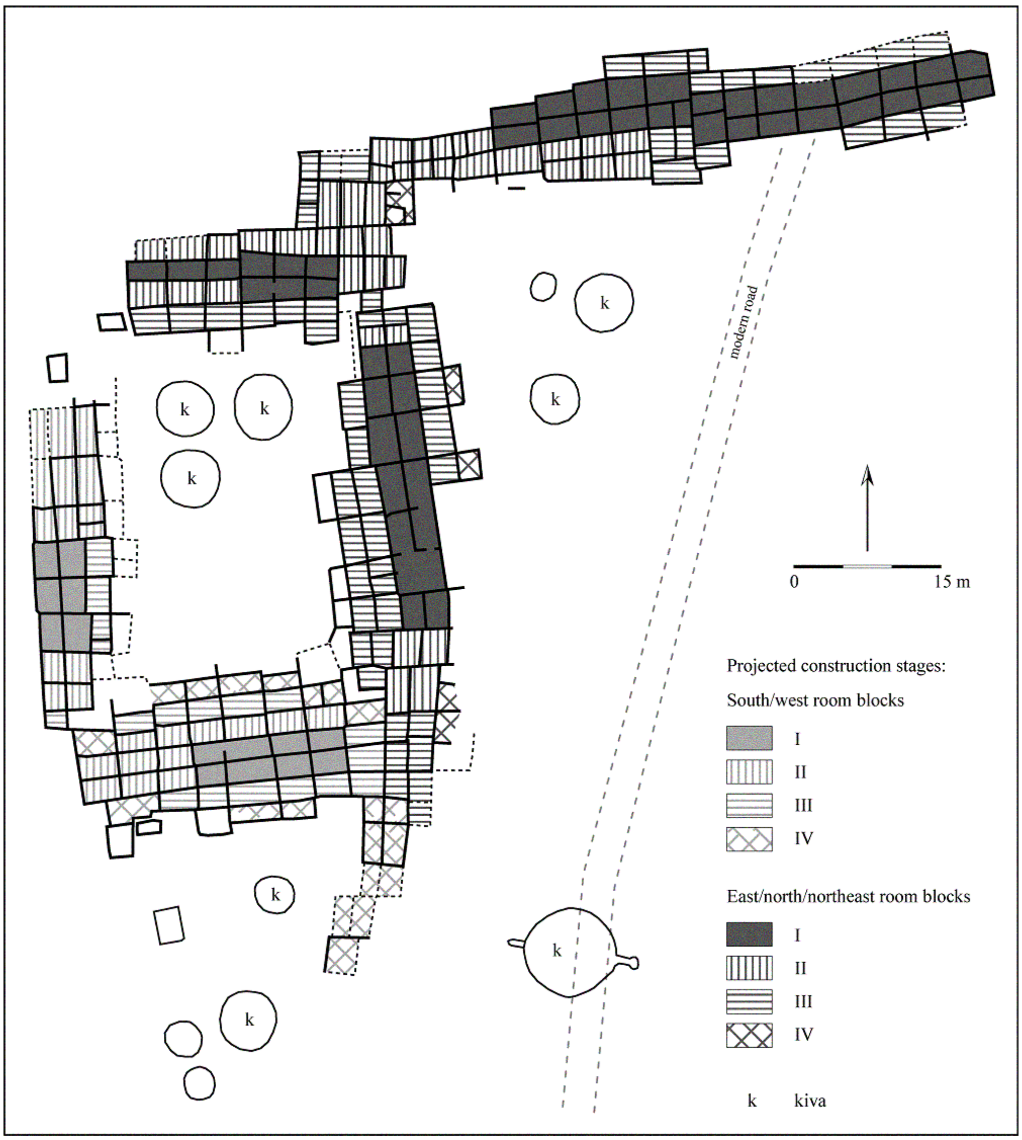


Fig. 7.5. Pueblo del Encierro, projected room-block construction sequences (adapted from Snow 1976a, Figs. A 60 and A 61).

For the Tiwa area, data from sites like Tijeras Pueblo (LA 581) (Cordell 1975, 1977, 1980), Kuaua (LA 187) (Vivian 1935; Tichy 1939; Dutton 1962; Lister 2000), Pottery Mound (LA 416) (Hibben 1966; Ballagh and Phillips 2006, 2008), or Valencia Pueblo (LA 953) (Brown and Vierra 1997) suggest similar fluctuations in Pueblo IV settlement (cf. Cordell 1979; Marshall 1985; Vierra 1989; Eckert and Cordell 2004). This is also true of the data from Las Humanas (LA 120) (Vivian 1964; Beckett 1981; Caperton 1981; Hayes 1981; Hayes et al. 1981), Quarai (LA 95) (Reed 1939; Hurt 1990; Wait and McKenna 1990; Spielmann 1994), and other Salinas-area sites (e.g. Baldwin 1983, 1991, n.d. a, n.d. b; Rautmann 1995, 2000; Spielmann 1998; Graves 2004). For the sites in the Chupadera Basin, repeated sampling of surface ceramics indicates occupation mainly in Glaze A times (Mera 1940: 6-13; Kyte 1988; Montgomery and Bowman 1989). The distribution of early transitional western glazewares like Los Padillas and Kwakina Glaze Polychrome and derivative Rio Grande Glaze A types (Agua Fria Glaze-on-red, San Clemente and Pottery Mound Glaze Polychrome, Cieneguilla Glaze-on-yellow) is understood to reflect population shifts within and between settlements in a wider context of increasing aggregation during the early Pueblo IV period (Kyte 1988, 1989a, 1989b).

As for early Pueblo IV settlement in the high country west and southwest of the Piro lowlands, ceramics at Gallinas Springs Pueblo (LA 1178), Pinnacle Ruin (LA 2292), and the Roadmap Site (LA 45157) suggest occupation during the Pueblo III/IV transition, but only into the late 1300s. Two other upland sites, LA 1131 and LA 1134, were most likely occupied after 1300 and abandoned by 1500 (Knight and Gomolak 1987; Gomolak and Knight 1990; Lekson et al. 2002; Lekson et al. 2004). Considering the overall dual pattern of growth and expansion of Ancestral Piro settlement in the Rio Grande lowlands, it is tempting, though at this point very much conjectural, to view the seemingly parallel decline of upland settlement in the context of an upland-to-lowland population shift (cf. Marshall and Walt 1984: 137).

COLONIAL PIRO SETTLEMENT PATTERNS

Archaeological Patterning

With limited stratigraphic data, archaeological distinction between contact- (i.e. mid- to late 16th-century) and colonial-period (i.e. 17th-century) contexts is tricky, as it largely hinges on the dating of the Glaze E and F ceramic complexes (Marshall and Walt 1984: 139). In Chapter 4, I reviewed some of the problems associated with the Rio Grande glaze sequence in general and its application in the Piro area in particular. Two issues need to be recalled here: overall use life of Glaze A forms and timing of the Glaze E and F appearances. Based on the sample from Las Huertas, Earls (1985: 29-30, 1987: 71-72) suggested that in the Piro area Glaze A (primarily in the form of the long-lasting Agua Fria Glaze-on-red type) persisted into contact and even colonial times (see Fig. 4.4). That early and late glaze vessels were used concurrently for some time has also been suggested for other areas, but precise dating of overlapping use remains problematic even for relatively well-known ceramic assemblages (e.g. Hayes et al. 1981; Baldwin 1982, 1991: 4-6; Eckert and Cordell 2004: 35; Franklin 1997, 2007, 2008). At Las Huertas, limited excavation coverage calls for caution in drawing inferences from the site to the regional level. To a lesser extent, this applies also to Marshall's (1987) Qualacú sample. Marshall, too, sees an overlap of early and late glaze forms, but puts figures on the problem that show a clear decline in the frequency of Glaze A forms across the five late group complexes in the Rio Abajo Sequence (Fig. 7.1). For the last, Ceramic Group XII, Marshall (1987: 80) gives a Glaze A ratio of "10% or less" of all glazewares. The ratio seems to represent surface samples only, for no Glaze A sherds were reported found with E or F forms in sub-surface contexts at Qualacú. This lack of stratigraphic association (also noticeable at Pargas Pueblo, see Marshall 1986) leaves open the possibility that the Glaze A ratio in Ceramic Group XII may be even lower, or that Glaze A forms were not part of the colonial-period glaze inventory at all.

For Glaze E and F ceramics, Baldwin (1983, 1991, n.d. a; Baldwin et al. 1986) suggests that Glaze F vessels were made as early as 1550 and that E and F ran more or less parallel. While he makes his case on the basis of work around Abó, Earls (1985: 29-31) for the Piro area and Kyte (1988: 161-169, 1989a, 1989b) for the Chupadera Basin also propose a Glaze F start date of c. 1550. If accurate, Glaze F could not be considered a *prima facie* colonial-period marker. Again, however, the Qualacú and also Pargas data offer a different perspective in the near-complete absence of E and total lack of F forms in the excavated samples. Marshall (1987: 73) in his Rio Abajo Sequence suggests a Glaze E start date of 1550 and an exclusively colonial-period affiliation for Glaze F. Neither the Qualacú nor Pargas excavations were in late-glaze contexts, yet Marshall's estimates are close to the dates established for Glaze E and F at Las Humanas through stratigraphic and structural associations backed by tree-ring dates (Chapter 4). The Las Humanas data place the appearance of Glaze E forms a few years before 1545, with a sharp drop in distribution in the early to mid-1600s (Hayes et al. 1981: 54-74, 97-98). Glaze F is dated to between 1625/30 and 1650 and the abandonment of the pueblo in the early 1670s (Hayes et al. 1981: 98-101; Warren 1981a: 180-182, 1981b: 70-72).

Some 30 sites with Glaze E or E and F forms are known in the Piro area (Fig. 7.2) (Marshall and Walt 1984: 138-234, App. 2; Marshall 2005). Nine of 10 large pueblos have both E and F sherds in their surface assemblages (Milligan Gulch Pueblo lacks Glaze F). Relative frequencies of early and late glazes differ, however (Table 4.3, Fig. 7.4). Among lowland pueblos only Sevilleta, Plaza Montoya, and – to the limited extent that it can be defined – the site of Pilabó (LA 791) have assemblages with predominantly late glaze forms. Glaze E and F are present at Qualacú, San Pascual, Pargas, Las Huertas, and Las Cañas, but the majority of glazewares are Glaze A. At the upland pueblos of Magdalena and Bear Mountain glaze forms are D, E, and F only.

At smaller sites, glazeware distributions follow similar patterns. Tiffany Pueblo (LA 244, c. 40 rooms) and the now destroyed El Barro Pueblo (LA 283) have/had A, E, and F sherds in their surface assemblages (Mera 1940: 7; Marshall and Walt 1984: 227-229). The unusual linear 36-room Pueblo de Arena (LA 31717) (Fig. 7.6) has traces of Pueblo III Elmendorf Black-on-white sherds to go with Glaze E and F forms (Marshall and Walt 1984: 175-176). At the smaller (c. 8-10 above-ground rooms, one pit structure) Al Lado de las Cañas Pueblo (LA 768) only Glaze A and E are present. For the smallest site (3-4 masonry rooms, one pit structure), LA 31749 (located near Las Huertas and across the Rio Grande from LA 768 [Figs. 4.1, 7.2]) Marshall and Walt (1984, App. 1, Table 3) recorded Pueblo I Cibola whitewares in the masonry rubble and unspecified glazewares at the pit structure. A visit to the site in 2004 confirmed the scarcity of ceramics on the surface noted by Marshall and Walt (1984: 60). The only visible glaze specimens were two very weathered rim fragments of likely D or E affiliation.

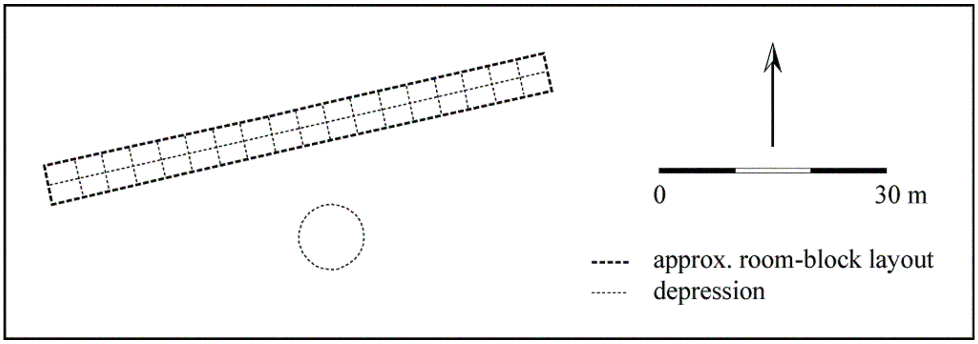


Fig. 7.6. Sketch map of Pueblo de Arena (adapted from Marshall and Walt 1984, Fig. 9.37).

In contrast to these discontinuous distributions of white- and/or early glazes versus late glazes, other small-site assemblages comprise only Glaze E or E and F forms. For Nuestra Señora Pueblo (LA 19266, c. 35 rooms [Fig. 7.7]), Marshall and Walt (1984: 142-144) record only Glaze E sherds.[3] At Upper Las Cañas Pueblo (LA 31698, c. 25 rooms), they noted Pueblo III whitewares and early glazes associated with offsite features and E and F forms at the pueblo itself (Marshall and Walt 1984: 167-168). Comparable late-glaze assemblages have been recorded for Site LA 286, the possible *estancia* below San Acacia Butte; at the Gold Station site (LA 45885) east of San Antonio; the likely field houses LA 1185 and LA 1190 in the foothills southeast of Sevilleta; and at eight-room Pueblito Point (LA 31751) north of Socorro (Marshall and Walt 1984, App. 2; Hogan and Winter 1981). Similar in size to Pueblito Point is Pueblo San Francisco (LA 778), the northernmost east-bank site of likely Piro affiliation (Figs. 4.1, 7.2). Its glaze assemblage includes only E forms (Mera 1940: 8; Marshall and Walt 1984: 211-212).

[3] During a visit to Nuestra Señora in the summer of 2005, I noted two Glaze E/F or related plainware rim sherds along the site's southwestern periphery.

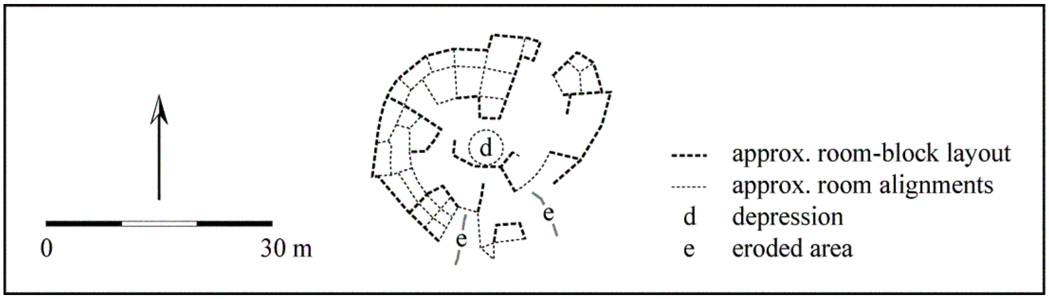


Fig. 7.7. Sketch map of Nuestra Señora Pueblo (adapted from Marshall and Walt 1984, Fig. 9.4).

Beyond site-specific patterns of assemblage composition, spatial distributions of surface ceramics also vary. At the larger sites, late glazes tend to be restricted to certain room blocks and/or midden areas. At San Pascual, Marshall and Walt (1984: 183) observed that Glaze E and F forms cluster in two (of nine) room blocks near the center of the site. In the same area, they also found a glazeware soup-plate rim and a mayólica sherd. At Las Cañas, Glaze E and F are present only in the two southern and western room-block areas (Marshall and Walt 1984: 173). Best documented is the distribution of late glazewares at Qualacú. Excavation of the channel-cut profile in the south-plaza complex confirmed the scarcity, suggested by surface observations, of E and F forms in that part of the pueblo. Late glazes occur in appreciable numbers in the northwestern part of the pueblo only (Marshall and Walt 1984: 178-182; Marshall 1987). For Milligan Gulch Pueblo, information is confined to old survey records, but these indicate a limited distribution of Glaze E in the northern and western parts of the site (Mera 1940: 7; Marshall and Walt 1984: 229-230).

At four of the larger pueblos, surface ceramics are distributed differently. At Sevilleta, Glaze A sherds are restricted to parts of the western and central Room Blocks 1, 2, and 7. Across the rest of the site, including the remains of the San Luis Obispo mission, decorated ceramics are almost entirely late glaze- and plainwares (Salinas Red), plus Tabirá whitewares (Marshall and Walt 1984: 203-207, 345). The two pueblos (LA 284, 285) near Magdalena have no early glazes in their surface assemblages (Mera 1940: 7; Marshall and Walt 1984: 213-217). Even so, the possibility of an earlier occupation cannot be wholly disregarded (see the discussion in Chapter 5 of Davis and Winkler's [1960] Bear Mountain test). The fourth pueblo with a distinctly late glaze assemblage is Plaza Montoya. In their ceramic sample from the site, Marshall and Walt (1984, App. 1, Table 7) recorded a single Glaze A sherd – one more than all walkovers before and during the Plaza Montoya project produced (see below).

All these patterns suggest several trends in Piro settlement structure during the glazeware continuum. For most of the larger sites the main trends are: (1) establishment in riverside locations at a time when Glaze A was the dominant ware; (2) expansion into plaza-type pueblos with more than 100 rooms; (3) peak occupations when Glaze A vessels were still widely used; and (4) contraction of occupied space during and after the emergence of Glaze E and F forms. At Sevilleta, the last two trends are reversed, which most likely reflects the pueblo's mission-period reorganization. At Pueblo Magdalena, Bear Mountain, and Plaza Montoya, ceramic patterns indicate more compact sequences, with the pueblos being founded in late pre-contact or early contact times and remaining occupied into the colonial era without any discernible decrease in settlement size.

For the smaller sites the picture is less clear, mainly because ceramic assemblages are typically also small. One observation applies to all sites, namely that none has a full suite of glazewares to suggest continuous pre- to post-contact occupation. Indeed, of a dozen sites with Glaze A or older whitewares, only five also have Glaze E and/or F. This is a pattern that differs from what has been noted for most large pueblos. It may reflect (recurring) short-term use as has been documented historically and ethnographically for smaller Puebloan sites such as field houses (e.g. Bandelier 1890-92; Castetter and Bell 1942; Bradfield 1971; Ellis 1974; Ellis et al. 1974; Ellis and Dunham 1974; Gerald et al. 1974; Vlasich 2005). Though lack of visibility can make identification of site function from the surface problematic (cf. Talmage and Chesler 1977; Ward 1978; Halbirt et al. 1984; Upham 1988; Preucel 1990; Schwartz and Falconer 1994; Clark 2004), the group of smaller Ancestral/Colonial Piro sites considered here contains only three (LA 1185; LA 1190; LA 45885) with the limited structural remains and material record (grinding stones, roasting pits, outdoor hearths, etc.) indicative of field-house sites. If most of the smaller sites were habitation sites, the number of sites with early glazes suggests that many were abandoned with the emergence of the larger plaza pueblos. Conversely, the existence of late-glaze sites like Nuestra Señora or Upper Las Cañas may be related to the contraction of larger sites during Glaze E and F times. Such shifts would be consistent with pan-Puebloan patterns of aggregation and dispersal that typify much of Pueblo IV and early Pueblo V settlement (Preucel 2002; Adams and Duff 2004). For the contact, early colonial, and early mission periods in the Piro area, they also suggest variability in settlement persistence – more so, certainly, than do the surviving Spanish sources.

Settlement Trends in the Documentary Record

Comments by Spanish observers present an intriguing, if frustratingly vague, picture of post-contact Piro settlement. In the previous chapter, I pointed out that the records of the Rodríguez-Chamuscado and Espejo-Beltrán parties mention pueblos individually and/or in terms of location to adjacent pueblos without offering much in the way of distances or directions (cf. *AGI*, *Patronato*, *legajo* 22; *CDII* 1865-84, 15; Hammond and Rey 1966). Together with naming practices, this lessens the value of the Gallegos/Pedrosa lists of pueblos. Still, with the evident south-to-north order of the first two dozen or so names, and with the 19th name being that of the Tiwa pueblo of Puaray (which appears also in colonial-period documents) (e.g. *AGN*, *Tierras*, *tomo* 3268), and a figure of 12 pueblos in Obregón's (1997: 239) account of the Rodríguez-Chamuscado expedition, it seems likely that the first 10 or so names represent Piro pueblos. But muddling this calculation is a passage in Gallegos' *relación* in which he states that the first "nation" his party encountered in New Mexico occupied more than 20 pueblos (Hammond and Rey 1966: 82). This is either inaccurate or else his list (and naturally Pedrosa's copy, too) is substantially incomplete. The figures of the Espejo-Beltrán party offer little to resolve the discrepancy. Bernardo de Luna in Obregón (1997: 272) also has 12 pueblos, Diego Pérez de Luján mentions 14 (including four he describes as in ruins) (Hammond and Rey 1966: 172-174), and Antonio de Espejo offers 10 pueblos *"poblados"*. Espejo alludes to settlements off the route of travel *("que pareçian desviados")*, but gives no details (*AGI*, *Patronato*, *legajo* 22; *CDII* 1865-84, 15: 172). Though clustered tightly chronologically, the records of the two expeditions point only generally to a dozen riverside pueblos, with additional settlements located away from the river. Not all pueblos seem to have been inhabited simultaneously, but as information on occupation is limited to a few comments on the flight of residents of the first occupied pueblo seen by the Chamuscado party or Luján's casual reference to four ruined pueblos, there is no indication of cause, permanence, or scale of any site abandonment.

The next record of consequence, the early colonial Claros assignment of so-called "Atzigues" pueblos, perhaps reflects a settlement total in the high teens or low twenties (Hammond and Rey 1953, 1: 346). As pointed out also in Chapter 6, the 44 names in the assignment (Table 6.3) cannot be taken at face value, and a lack of similar references makes it impossible to identify the "true" number of behind the names (Schroeder 1964: 244-247, 1979: 240; Snow 1988: 104-105; Barrett 1997: 5-6, 2002: 20-22). Ironically, the problem is the opposite for the 1602 Martínez map, the only other period-reference. The number of pueblos the map shows for the entire Rio Grande Valley is far lower than the combined total of the Claros and other missionary assignments. It is also lower than the totals of the Rodríguez-Chamuscado and Espejo-Beltrán expeditions. The map may depict between nine and 12 Piro pueblos, among which Qualacú ("Calicu"), Socorro (the name given to Teypana), and Sevilleta ("Nueua Sevilla") are the only ones named. Neither upland pueblos, nor the neighboring Salinas-area pueblos are indicated (Fig. 6.3).

More than two decades separate the Claros list and Martínez map; and almost half a century the observations of Gallegos, Luján, et al.; from the statement by fray Alonso de Benavides that the Piros were living in 14 pueblos. Comparing the sources, Benavides must be deemed more reliable on account of his involvement in the missionization of the Piros. While Benavides in his two memorials (Ayer 1916; Hodge et al. 1945) leaves little to question his role and effort in the venture, other documents also indicate that he spent considerable time not only at the incipient mission pueblos of Pilabó/Socorro, Senecú, and Selocú/Sevilleta, but also visited non-mission settlements (*AGN*, *Inquisición*, *tomos* 356, 363; MSS 360, Box 3B, Folder 24; Hodge et al. 1945: 62).

If one assumes that Benavides was more familiar with the Piro province than earlier observers, his figure gains special weight as a benchmark for assessing potential post-contact changes in the regional settlement pattern. As Earls (1985: 152-153) and Barrett (2002: 61-62) have noted, comparisons of all known figures indicate no drastic changes between c. 1580 and 1630. Luján's abandoned pueblos and Benavides' story of the (re-)founding of Sevilleta may denote a certain level of residential volatility, but there is nothing to suggest a major disruption of regional settlement. With 14 pueblos still extant in Benavides' time, the terminal decline of Piro settlement appears to post-date the creation of the missions. After Benavides, the record up to the Pueblo Revolt contains references only to the mission pueblos, a possible indication of the demise of non-mission pueblos from foreign disease and a combination of other factors.

ESTIMATING PIRO POPULATION LEVELS

Piro population history is even more obscure than settlement structure. Archaeologically, there is very little material with which one can address demography. This is all the more unfortunate since in the absence of useful historical documentation it is the material record (archaeology, architecture) that drives estimates of past population levels (cf. Naroll 1962; Zubrow 1976; Hassan 1981; Brown 1987; Bagnall and Frier 1994). Such estimates are common in Southwest archaeology not only because of the number of well-preserved sites, but also because modern Puebloan settlement offers opportunities for comparing archaeological patterns with ethnohistoric and ethnographic observations of residential behavior (e.g. Lange 1959; Adams 1983; Schlanger 1985; Cameron 1991a; Rothschild 1991; Crown 1991; Dohm 1990, 1996).

Most archaeologists probably agree that population estimates need to be based on six structural-chronological variables: (1) site size in rooms, (2) length of occupation, (3) number of habitation rooms, (4) number of rooms occupied simultaneously, (5) rooms per household, and (6) persons per household (Hassan 1978: 56, 1981; Paine 1997; cf. Snow 1976a: A 223-A 227; Cameron 1991a: 72-75). None of these variables lends itself easily to quantification. Creamer (1993: 152) in her discussion of population at Arroyo Hondo Pueblo talks of "multiple levels of assumptions". Those can range anywhere from building chronology to room function (cf. Dean 1969; Adams 1983) to size of households or residence units (cf. Eighmy 1981; Netting et al. 1984; Wetterstrom 1986; Dohm 1990). Variability is the rule and estimates call for caution. The same is true of using floor or roof area to calculate populations. Although studies of residential space in sedentary societies around the world have yielded widely varying values (e.g. Hassan 1981; Kolb 1985; Brown 1987), an oft-used mean (or "constant") computed by Naroll (1962) is 10 m^2 of roofed area per person. Neither this nor other ratios have much use without data on site structure and sequence, however (Chamberlain 2006: 126-127)

For Ancestral and Colonial Piro sites, just two variables – site size and length of occupation – can be approximated, and that only very broadly. Most glaring is the lack of data for assessing time of room use at every site except, to a limited extent, at Qualacú. Accordingly, local and/or regional estimates are scarce. Only Marshall and Walt (1984) offer figures per main culture-historical phase. From Pueblo II Early Elmendorf (c. 950-

1100) to Pueblo III Late Elmendorf (c. 1100-1300) times, they see an increase in the regional room count from 252 to 443 and in roofed space from c. 2,100 to 4,200 m^2. For the Late Elmendorf phase they estimate a population of 1,000 to 1,500 persons (Marshall and Walt 1984: 75-77, 95-97). With more and larger sites during the Ancestral Piro phase, they propose a 15th-century peak population of 7,500 persons. For the Colonial Piro phase, they give no summary figure, due to, perhaps, what they call the "good deal of reshuffling" indicated by the survey data and the data limits in defining patterns of settlement development. They suggest only that Pueblo Magdalena and Bear Mountain Pueblo may have held one-third of the total colonial-period Piro population (Marshall and Walt 1984: 135-141). Earls (1985: 126), using a regional total (based on the Rio Abajo Survey) of 2,551 rooms of Glaze E and F affiliation, a mean household size of six rooms and five persons, and an assumed room occupancy rate of 65%, arrives at 276 households or 1,380 residents. As she points out, these figures are much lower than contemporary ones. This cuts again to the core of the problem. Survey data and regional interpretation may indicate settlement growth from Early Elmendorf through Ancestral Piro times, but obscure potential variability within phases and at site level. Marshall's (1987) work at Qualacú illustrates how variable the residential history of part of one site can be. Differences in size, structure, and composition of surface assemblages can thus be expected to represent only glimpses of much more complex occupation patterns.

Disappointingly little information is found in the documents. The only regional population figures (Table 7.1) come from the same sources that offer the settlement data discussed above. Espejo offers the high figure with 12,000 "souls" *("ánimas")* (*CDII* 1865-84, 15: 172), but this and his figures for other Puebloan groups have been viewed as inflated (Earls 1985: 125, 132; Barrett 2002: 12). Hyperbole is a problem with many accounts and has long been recognized as such. As a member of Oñate's original colony noted, "some people have given free rein to their pens telling of things which do not exist in this land, making provinces out of pueblos" (Hammond and Rey 1953, 2: 695).[4]

Table 7.1. Spanish population figures for the Piro area, 1580-1630.

Source	**Estimate**
Gallegos 1581/82	No population figure, c. 20 pueblos along and away from the Rio Grande
Espejo 1582/83	12,000 *"hombres y mujeres y niños"*, 10 pueblos along the river
Luján 1582/83	Five pueblos each with 400 and one with 800 "children and adults", plus two pueblos with no population given, and four abandoned pueblos, all located along the river
Luna (Obregón) 1582/83	12 pueblos at 250 *casas* each, three residents per *casa*
Benavides Mid- to late 1620s	6,000 "souls", 14 pueblos

(*AGI*, *Patronato*, *legajo* 22; Obregón 1997; Ayer 1916; cf. Barrett 2002, Table 12).

High figures need not automatically imply willful exaggeration, though. Earls (1985: 122-123) mentions the possibility that seasonal residence patterns and the timing of Spanish exploration could account for different observations.[5] Nor is it clear what some of the figures actually refer to. Earls (1985: 128, 135-139, 1992: 14) assumes that

[4] Fray Juan de Escalona to Viceroy conde de Monterrey, San Gabriel, Oct. 1, 1601.

[5] The Rodríguez-Chamuscado party was among the Piros in late August 1581 and early February 1582. Gallegos' description appears to reflect observations from the inbound journey only. The Espejo-Beltrán party passed through Piro territory in early February 1583 (*AGI*, *Patronato*, *legajo* 22; *CDII* 1865-84, 15; Hammond and Rey 1966).

Benavides in using the term "souls" excluded women and children. She bases this assumption on the occasional practice by missionaries in New Spain to limit population counts to adult males. If Benavides did likewise, his figure would significantly underrate Piro population in the initial mission phase. To correct this supposed discrepancy, Earls (1985: 136-138, 1992: 14) multiplies Benavides' figure by four, a factor worked out from 18th-century census records (cf. Snow 1983: 351-353). Yet neither Benavides' memorials nor other documents relating to his activities give any clues that such an adjustment is needed (Wilcox 1992: 103). It may also be noted that Espejo – though not a cleric – explicitly relates *ánimas* to *"hombres y mujeres y niños"* (*CDII* 1865-84, 15: 172).

Another tricky term, discussed briefly in Chapter 6, is *"casas"*. In all accounts it is an indicator of settlement size. The structural attributes of large pueblo sites make it clear that what the Spaniards called *casas* were in fact "households" or "apartments" (Earls 1985: 128-130; James 1997; Bice 2001). Assuming that identification and figures are more or less accurate, all that is missing for a passable population estimate is a relatively narrow range of residents per household. Alas, no such range exists. Instead, Luján's and Luna's accounts show how records of identical context can be incongruous on something as seemingly simple as household size. Luján's figures indicate an average of eight persons per household (Hammond and Rey 1966: 172-174; cf. Earls 1985: 135; Schroeder 1992: 29); Luna (Obregón 1997: 272) has only three people *("moradores")* in a *casa.* Luna's, however, appears to be a stock figure, as it is the same for nearly all the Pueblo provinces he describes.

All this shows how ambiguous the figures really are. If one looks at their origins, however, Benavides again sticks out as the source most likely to be accurate. Counting people takes more time than counting settlements, and except for Benavides all observers spent only a few days among the Piros. This may explain why his population figure seems more at variance than his settlement figure with observations 50 years earlier. As with archaeological estimates, interpreting historical figures entails multiple assumptions with much room for cumulative error. Two analyses of the Gallegos/Pedrosa lists epitomize this point. The first uses 16 pueblos with 753 *casas* (Schroeder 1992: 29), the second 11 pueblos with 402 *casas* (Wilcox 1992: 103). Differences in how household size is assessed produce more variation. David Wilcox (1992: 102-106) expands on his original assumption by assuming that 18 of the sites in Marshall and Walt's (1984) Rio Abajo Survey were occupied in 1581. Using a regional total of c. 2,400 rooms, a ratio of 4.33 rooms per *casa*, and Luján's figure of eight persons per *casa*, he arrives at a population of c. 4,500 Piros. With this and Benavides' figure in mind, the conclusion is that overall Piro population increased by some 30% between 1581 and c. 1630. I am not sure such estimates are presently of much use without a better grasp of archaeological data on site occupation. Nevertheless, an argument like Wilcox's underscores the necessity to look beyond figures and ratios to establish whether a more coherent historical framework might not help reduce some of the ambiguity in assessing the timing and scale of post-contact demographic trends.

Settlement Decline and Abandonment: Possible Factors of Post-Contact Change

THE PHYSICAL SPANISH PRESENCE

Spanish expansion into New Mexico quickly subjected the Pueblos to demands for land, tribute, labor, and spiritual conversion. Documents suggest that tribute collecting affected all Puebloan groups in the Rio Grande corridor from the very beginning of the Oñate colony. The frequency with which Spanish parties visited a given pueblo appears to have been governed mainly by distance from the center of Spanish settlement at San Gabriel. Both in this and the actual presence of missionaries and settlers the Tewa pueblos around San Gabriel were the first to face the newcomers on a permanent basis (Agoyo 1987; Ellis and Dodge 1992).

If distance from San Gabriel and, after c. 1610, Santa Fe, determined the scale of interaction, the Piros for some time may have seen relatively little of the Spaniards. With the Spanish route of travel running the length of Piro territory, however, contacts cannot have been uncommon, especially during the tumultuous Oñate years (1598-1607). Vague references to Piro-Spanish encounters exist (e.g. Hammond and Rey 1953, 2: 659; Hodge et al. 1945: 63), but no evidence of lasting relations. The first documented instance of a permanent Spanish presence in the region is the founding of the Socorro mission. With Senecú, Selocú/Sevilleta, and Alamillo, plus perhaps the only posthumously mentioned *(visita?)* chapel at San Pascual, the Piro mission network never had more than four or (counting San Pascual) five establishments. Alamillo and Sevilleta are at times described as *visitas* of Socorro, which implies that for part of the mission period only Socorro and Senecú were regularly staffed. San Pascual's status is nowhere recorded.

The record of civil settlement is even murkier. Spaniards were living among the Piros by 1630, albeit in minute numbers. Judging by the known references, there were no more than 10 private *estancias* in the Piro area during the "peak" of Spanish occupation after c. 1650 (Tainter and Levine 1987: 84-88; Bletzer 2005: 31-35). With 10 *estancias* and a projected household size (including servants/slaves) of 10 to 15 persons, a high estimate of regional "Spanish" population is 150 persons. To this may be added four to six missionaries and perhaps a dozen mission servants.[6] Even with households of 20 or 25 persons, the total represents barely one-tenth of Pueblo Revolt refugees from the entire Rio Abajo region. This only stresses the marginal character of the Spanish presence in the Piro area (e.g. Hackett 1923-37, 3: 119; *AGN*, *Historia*, *tomo* 25).[7]

However modest their numbers, missionaries and settlers directly affected Piro settlement. Sevilleta's *reducción* and the later quarrel about its lands, plus the transfer of Piros from Senecú to El Paso and Senecú's resettlement on at least two occasions in the 1660s and 70s are known examples, but doubtless there were other incidents, especially of land encroachment. Although no land records survive and no archaeological record of *estancia* sites comparable to that of contemporary pueblos exists, the tenor of the few remarks about Spanish settlement in the Rio Abajo in general suggests that proximity of *estancias* (and their livestock) posed all kinds of problems for native communities.

[6] There are no Spanish population totals for the Piro area, nor indeed for the rest of New Mexico prior to 1680. *Estancias*, as the primary "units" of co-residence in what was essentially a rural society, seem to have varied substantially in number of occupants. My estimates of household size are based primarily on tallying members of the Romero, García (Holgado), and Téllez Girón families who feature in documents at *AGN*, *AGI*, and *BNM*. The three families are the ones that occur most frequently in the Piro-area record (see Table 6.1.; a number of references are printed in Chávez 1992).

[7] Petition of Francisco Martínez de Baeza, Mexico City, February 12, 1639; fray Francisco de Ayeta to Viceroy Payo Enríquez de Rivera, El Paso, August 31, 1680.

DISEASE

More disastrous demographically than the Spanish presence per se seems to have been its role as a conduit for foreign pathogens. Without detailed records, however, this role, too, is difficult to quantify (Lycett 1995). For areas with few records potential evidence is limited to victims' remains, changes in burial populations, and, indirectly, changes in use of residential space. Analyses require sizeable data sets for mortality patterns to emerge. Even if databases seem adequate, results are seldom clear-cut as degenerative conditions rarely produce diagnostic bone lesions (cf. Blanchard et al. 2007; Simmonds et al. 2008). Exceptions include leprosy, tuberculosis, and some treponematoses (Schultz 2001; Roberts and Manchester 2005: 164-220; Lefort and Bennike 2007). Smallpox *(Variola vera)* can be diagnosed in joints, humeri, ulnae, and/or radii of children, but not adults (Schwartz 1995, Table 8.1; cf. Jackes 1983; Malgosa et al. 1996).

Genetic analysis vastly expands detection prospects not only for specific bone-altering pathogens, but also for all those pathogens that do not visibly affect the skeleton. Claims of molecular isolation from human remains of otherwise unidentifiable pathogens include *Salmonella typhi* (Papagrigorakis et al. 2006) and *Yersinia pestis* (Raoult et al. 2000; Garrelt and Wiechmann 2003; Wiechmann and Grupe 2005; Gutsmiedl 2005). While some studies are more problematic than others (e.g. Thomas et al. 2004; Shapiro et al. 2006; Papagrigorakis 2006), as methods evolve identifications are likely to become more consistent (Grupe and Peters 2003; Roberts and Manchester 2005).

Paleopathological studies are not common in Southwest archaeology, especially when it comes to post-contact populations (Lycett 1995, Tables 6.6, 6.7; Stodder 1990, 1994, 1996; Beck 2006; Rakita 2006). Puebloan groups are wary of exposing human remains they consider ancestral (Bray 2001; Fine-Dare 2002). As thousands of burials were removed, often indiscriminately, in early excavations across the Southwest, this is not surprising. Many burials were poorly recorded, not analyzed, or the bones have since been lost from the collections where they were housed. Losses include a sizeable number of remains excavated at the mission pueblos of Las Humanas, San Cristóbal, Pecos, and Hawikuh (Hayes et al. 1981: 169; Reed 1981; cf. Beck 2006; Rakita 2006). Still, data available from these sites suggest, when compared to burial data from pre-contact sites like Arroyo Hondo and Grasshopper Pueblo, a lower life expectancy for mission-pueblo residents, with higher fertility rates offset by higher juvenile mortality, dietary stress, and more prevalent endemic diseases like tuberculosis and treponematosis (Lycett 1995, Fig. 6.1; cf. Palkovich 1980, 1985; Turner 1981; Hinkes 1983; Merbs and Miller 1985; Merbs 1992; Stodder 1990, 1994, 1996; Stodder et al. 2002; Schultz et al. 2007, 2008).

That Native American populations suffered severe losses from foreign diseases is widely accepted as demographic fact (Harris 2001: 97-143; but cf. Henige 1998; Lovell 2002). Yet there is little agreement on specifics such as type(s) of disease, rate/manner of transmission, or severity of impact (cf. Cook and Simpson 1948; Cook and Borah 1960; Borah and Cook 1960; Rosenblat 1967; Denevan 1976; Meyer and Thornton 1988; Cook and Lovell 1991; McCaa 1995a, 1995b; Brooks 2001). Scores of studies illustrate the complexity of the subject, indicating that regional differences alone make generalizations problematic (McCaa 1995b; Newson 2001; e.g. Dobyns 1966, 1983, 1993; Crosby 1967, 1972; Reff 1987, 1989; Ramenofsky 1987, 1990; Whitmore 1992; Verano and Ubelaker 1992; Larsen 1994; Larsen and Milner 1994; Baker and Kealhofer 1996; Hutchinson and Mitchem 2001; Cook 2002).

Mark Lycett's (1995) New Mexico-centered discussion of contact-period disease and demography provides the basis for this review of the two factors most likely to have directly affected Colonial Piro settlement: appearance and scale of foreign pathogens. Pueblo-Spanish contacts in the late 1530s, early 1540s, and early 1580s offer a scatter of prospective early dates for direct disease transfer, though after 1600 the likelihood of such a transfer obviously increased. Also possible is indirect transfer in advance of European hosts (Dobyns 1983, 1989, 1993; Reff 1987, 1989; Ramenofsky 1987, 1990). This scenario has far-reaching implications. Not only is there a greater window within which a disease could have spread to a given group, but if an epidemic preceded the appearance of Europeans, descriptions of that group may not reflect "pristine" pre-contact conditions. This means modern observers risk underrating contact-period populations and mistaking as original social or cultural patterns that may represent post-epidemic developments (Lycett 1995: 131-135; Kulisheck 2005: 80-88).

What, then, can be said about the entrance of foreign diseases into the Pueblo world? The earliest references to an epidemic date from the mid- to late 1630s, decades after the arrival of the first Spanish colonists, or, from a Piro perspective, a dozen years after the establishment of the first missions. Details are lacking, however, and it is not even clear whether there were one or more outbreaks of the same or different diseases (Scholes 1936: 322-325; Earls 1985: 160-161; Barrett 2002: 78). Nor is it clear if this was the first epidemic to hit New Mexico. That the Pueblos should have been spared over a relatively long time of frequent contact with the Spanish world may seem unlikely if one considers the case of central Mexico. There, population levels fell off within a few years of the Spaniards' arrival. Figures are contested, but by 1600 localized epidemics and at least three pandemics probably reduced central Mexican populations to a fraction of what they had been at contact (see Fig. 2.5) (Cook and Borah 1960; Sanders 1976; Somolinos d'Ardois 1982; Márquez Morfin 1993; Prem 1991; McCaa 1995b).

In view of the early Spanish penetration of central and western Mexico and the possibility of indirect disease transfer, some researchers suggest a pre-1600 beginning for disease-driven population decline among the Pueblos (Upham 1982, 1986, 1992; Dobyns 1983, 1991, 2002; cf. Palkovich 1994; Kulisheck 2005, Table 3.4). The state of early records does not allow one to deny such a scenario categorically, but aside from trends in other areas there are no direct clues to pursue the argument further. It is a basic problem: how gauge the relevance of data from other geographic/cultural contexts when disease type, source(s) and route(s) of transmission, population density, and other locational and biological variables are known to drive pathogenic incidence and virulence (Reff 1987, 1989; Ramenofsky 1987, 1996; Thornton et al. 1991; Lycett 1995)?

While epidemiological and environmental data offer at least a general frame of reference for assessing the potential impact of certain diseases, the descriptive deficits of the documents means that the above factors are largely unknown variables. And so far archaeology has not helped much. Due to the shortage of representative data sets from subsurface contexts, analyses especially of Pueblo V settlement trends depend on survey work and studies of surface ceramics (e.g. Preucel 2002; Hinz et al. 2008). As mentioned in Chapter 2, the resulting lack of analytical resolution at the site level is reflected in a prevalence of regional approaches to demography and settlement. Apart from this, studies of pre-contact abandonments indicate causality to be defined by ecological push-pull processes, socio-political and ideological factors, or combinations thereof (e.g.

Graves et al. 1982; Upham 1984; Schlanger 1985, 1988; Kintigh 1990; Preucel 1990; Milo 1994; Adler 1996; Adler et al. 1996; Hegmon et al. 1998; Spielmann 1998; Adams and Duff 2004). With growing awareness of residential variability and recognition that site size is not always a good proxy for scale or permanence of occupation, causality can be difficult to establish even in cases for which fairly broad archaeological data exist (cf. Palkovich 1994; Eckert 2005). Considering the lack of data from post-contact sites, the caveat applies also to attempts at identifying disease episodes with the help of mostly limited surface assemblages.

Even unusual burials may not necessarily indicate epidemics. Mass interments suggest episodes of high population loss, yet to determine perimortem context calls for detailed pathological and depositional data (Sigler-Eisenberg 1985; Roberts et al. 1989). An example of this is a mass grave in the *campo santo* of San Isidro at Las Humanas. Traced partially on the surface, 12 to 15 skeletons were exposed, some still articulated. The grave was estimated to hold up to 60 individuals who may have died in a recorded famine in the late 1660s (Vivian 1964: 80-81). Contrasting with this example is a study of clustered burials at the Tano pueblo of San Cristóbal. Analysis of bones from these burials revealed lesions consistent with tuberculosis and an age distribution suggesting virulent post-contact endemicity of the disease (Stodder 1990, 1994, 1996).

Despite data limitations, this last pattern is not unique. Pueblo V samples indicate a growing incidence of endemic infections like tuberculosis and treponematosis in some mission pueblos (Palkovich 1980, 1985; Stodder 1990, 1994, 1996). In the remains from San Cristóbal, Stodder (1994: 104) found that the frequency of osteolytic lesions suggests "a substantial increase in tuberculosis during the later stages of occupation". Comparison with samples from Hawikuh further suggests “fundamental differences in the nature of skeletal infection” (Stodder 1994: 103). The absence of infectious lesions in skeletons from Las Humanas Mound 7 (Coyne 1981: 155) points also to regionally variable disease incidence (cf. Stodder et al. 2002, Table 16.2). While observations such as these suggest locally distinct disease milieus, analytical variation and sample disparities limit their overall interpretive value. Invisibility of post-contact pathogens is another problem, for it leaves a biologically and temporally crucial segment of the disease spectrum outside the reach of paleopathological research. Perhaps the closest one can get to isolating foreign contagion is by tracing post-contact increases in tuberculosis, which is an “opportunistic” disease in that it flourishes in stress situations (Stodder 1994: 104; Lycett 1995: 189).

In assessing the demographic impact of disease, lack of population estimates, episodic character of contemporary references, and uncertainty over which pathogens were introduced must be viewed against the fact that “dissemination, perpetuation, and recurrence of infectious disease occur within an ecological matrix defined by interactions of host, parasite, and environment” (Lycett 1995: 155). In this matrix, the one “true” parameter is the absence in native populations of immunological mechanisms capable of combating foreign pathogens. This susceptibility affects all age groups, not just those (infants, juveniles, the elderly) already vulnerable to indigenous pathogens. In other words, all members of a host population carry the same biological risk of infection. Initial disease incidence may thus cause death rates in excess of, but largely proportional to, standard mortality levels (Chamberlain 2006: 74-76, 123-125). An exception is the young adult cohort, which normally experiences low mortality and is therefore prone to suffer disproportionate loss from alien pathogens (Lycett 1995: 155-204).

These are textbook conditions for virgin-soil epidemics. Several such epidemics, involving different pathogens, afflicted 16th-century New Spain (Fig. 2.5). Contemporary descriptions of symptoms prevent definite identification of pathogens, but *Variola* probably triggered the first epidemic, while the latter two may have been caused by more than one pathogen (Sanders 1976; Prem 1991; Acuña-Soto et al. 2002). Geographic and cultural factors (e.g. dispersed vs. aggregated settlement) influenced regional patterns of disease incidence, with mortality rates varying between 30 and 90% of pre-epidemic population levels (Gerhard 1993a: Table D; Lycett 1995, Tables 5.2, 5.3).

Non-immunity and aggregated settlement pattern left the Pueblos exposed above all to density-dependent pathogens, secondary disease(s), and resultant disruptions of the social sphere (Lycett 1989, 1995: 122-214). Spanish figures indicate a population decline of two-thirds or more between 1600 and 1680, but timing and pace are unclear. In 1638, fray Juan de Prada noted that disease had reduced baptized "people" in New Mexico from 60,000 to 40,000 "or a little less" (Hackett 1923-37, 3: 108). With Prada, Benavides, and three other sources, the years from 1625 to 1645 are the best documented of the pre-Pueblo Revolt period in terms of population figures. Yet even for this short span figures vary widely and local correlations are uncertain (cf. Barrett 2002, Table 13).

Considering the scale of Puebloan losses, the material record of 17th-century sites ought to hold evidence of structural changes. Disparate distributions of glazewares point to disparate occupations, with the limited distribution of E and F forms suggesting post-contact contractions of occupied space in many larger settlements (Lycett 1995: 212-214; 2002). But since the main level of analysis is still the region, changes in occupation are unlikely to be discernible from surface distributions of ceramics with decade- if not century-long run-times (Fig. 4.4). An example of this is a historical-archaeological synthesis by the historical demographer Henry Dobyns (2002), in which he associates the (dis)appearance of Puebloan glaze forms with recorded or postulated disease episodes. Shifts in glazeware production, he claims, derived from disease-driven changes in native exchange networks. While links between epidemics, demographic collapse, and socio-economic shifts have been attested for other contexts (Harris 2001: 388; cf. Miller and Hatcher 1978; Rao 1989), Dobyns' Puebloan case demonstrates the need for caution when ill-defined variables like ceramic run times are involved. Most notably, Dobyns ignores the issue of form overlap and does not assess potential factors other than disease. Given the flaws in the historical and archaeological data, such omissions only weaken the consequent generalizing arguments.

To sum up, neither historical nor archaeological data point to a disease outbreak with signal demographic decline in the Piro area prior to 1630. The few population and settlement figures from the early 1580s and late 1620s are roughly equivalent. Limited distribution of Glaze E and especially F ceramics at many large sites suggests loss of residential space within the temporal range of the Glaze E/F transition. If intensity of contact raises infection risk, a mission- rather than contact-period appearance of foreign pathogens is most likely (Lycett 1995: 183-188). As there is no evidence of a Spanish presence in the Piro area prior to 1626, the earliest mention in the late 1630s of an apparently pan-regional epidemic may reflect the first destructive incidence of foreign disease among the Piros (Earls 1985: 155; Barrett 2002: 78-79).

CONFLICT

The demographic impact of conflict presents a different challenge in that conflict, unlike disease, is primarily a behavioral factor without clear biological parameters. In addition, physical traces tend to be rare even in established historical contexts of pre-modern conflicts (e.g. Fiorato et al. 2007; Scott et al. 2007). Beyond actual battle/burial sites, settlements may yield signs of destruction suggestive of conflict, but on closer inspection those signs may be more consistent with other factors (e.g. Furger 1994, 1998; Knierriem 1996; Verhoeven 2000). Analyses thus must build on separate lines of evidence (e.g. architecture, weapons, weapon-induced trauma), but even then it is not always possible to ascertain primacy of cause, let alone determine demographic ramifications (cf. Orschiedt 1998, 1999; Schröter 2000; Berszin and Wahl 2002; Roksandic 2004).

The record of pre- and post-contact conflicts in the Americas highlights these problems. In some regions, epigraphic, iconographic, and material data suggest warfare was endemic before the arrival of Europeans (Verano 1986, 2001; Hassig 1988, 1992; Lázaro Ávila 1997; Trejo 2000; Chacon and Mendoza 2007). For others, the only clues to the nature of conflict come from European observers, which raises the question of how far such writings reflect original patterns of conflict (cf. LeBlanc 2003; Weber 2005). In the face of European invasion, old enmities prompted some groups to side with the intruders. Once in control, the latter might recruit both allies and vanquished opponents for further campaigns (Mirafuentes Galván 1993). An oft-overlooked example is the Coronado expedition, which included about five times as many warriors (c. 1,500) from central and western Mexico as it did Spanish soldiers (Flint 2003, 2005).

In the annals of native-Spanish warfare the Chichimecas hold a special place. Around 1550, these mobile bands of foragers began contesting the Spanish advance into northern New Spain and the Spaniards proved unable to subdue them militarily (Powell 1944, 1952). If the conflict seems exceptional, its component parts exemplify colonial warfare in much of the Americas. In New Spain, the last battles before the 19th century to involve thousands of combatants took place during the Mixtón War of 1541/42 (López Portillo y Weber 1939; Flores Tiscareño 2001; Haecker et al. 2007). Spanish "victory" led to a guerrilla war, which after 1550 merged into the wider Chichimec conflict (Powell 1952; Román Gutiérrez 1993; Weigand and García de Weigand 1996). The latter petered out in the 1590s, but as other conflicts emerged raids and ambushes continued unabated across much of northern New Spain (Spicer 1962; Galaviz de Capdevielle 1967; Griffen 1979; Naylor and Polzer 1986; Gradie 2000; Mirafuentes Galván 1989-2004).

Physical evidence of such conflicts is rare. Metal blades and, in a more limited way, projectiles can cause skeletal lesions that allow reconstruction of the perimortem injury record (Willey and Scott 1996; Mackinnon 1998; Czarnetzki and Weber 2000; Weber and Czarnetzki 2001a, 2001b; Grellner et al. 2004; Sudhues 2004; Alunni-Perret et al. 2005; Mitchell et al. 2006; Patrick 2006; Novak 2007). Such lesions are potential markers of colonial conflict, but unfortunately relevant osteological studies are in short supply. While the best regional record in the Americas is probably that for the U.S. Southeast (e.g. Mathews 1984; Blakely 1988; Blakely and Mathews 1990; Larsen 2001; Larsen et al. 1996; Bridges 1996; Hutchinson 1998, 2006; Milner et al. 2000), the most publicized case comes from Lima, where 72 skeletons have been linked to a 1536 Inca-Spanish battle. Gunshot and blade trauma attest to Spanish involvement in the deaths of these individuals. Most lesions, though, seem to have been caused by clubs or maces – evidence of native warriors on the Spanish side (Gaither et al. 2007; Murphy et al. 2007). Despite a good deal of physical traces of prehistoric conflict in the Americas (e.g. Verano 1986, 1997, 2001, 2003; Walker 1989; Owsley et al. 1994; Bridges 1996; Hogue 2006; Lambert 2007), evidence of post-contact conflicts between native groups is very rare.

Archaeological studies of conflict in the Puebloan Southwest show similar trends. Conflict and "ritualized violence" are full-fledged research topics in prehistoric context (e.g. White 1992; Turner 1993; Haas and Creamer 1993, 1995; LeBlanc 1999; Ogilvie and Hilton 2000; Rice and LeBlanc 2001; Kuckelman et al. 2002; Schaafsma 2007; Lambert 2007; Lambert et al. 2000), but the post-contact period is not well studied (cf. Stodder et al. 2008, Table 16.2). There is, for instance, only one reported association of Spanish weaponry and human remains, at the Tiwa pueblo of Santiago (LA 326), which was apparently attacked in Coronado's war on the Rio Grande Tiwas (Chapter 4) (Tichy 1939: 145-146; Vierra 1989: 12; Gagné 2003: 243-244).[8]

Colonial references to raids and counter-raids by Pueblos and non-Puebloan groups indicate a hit-and-run style of warfare not unlike that in northern New Spain (Forbes 1960; Wilson 1985; Naylor and Polzer 1986; Griffen 1988; Haas and Creamer 1997; Schaafsma 2002a, 2002b). At the same time, native mythologies and oral histories hint at conflict situations ranging from the personal to the collective and from the ritual to the mundane (Lummis 1910; Harrington 1916; Bunzel 1929; Parsons 1939; Eggan 1950;

[8] Recent remote-sensing at nearby Piedras Marcadas Pueblo (LA 290) revealed metal weapon fragments, stone projectile points, and other artifacts, all scattered in ways that also suggest attack by Coronado's soldiers (Mathers et al. 2008a, 2008b). Earlier salvage excavations identified Site LA 54147 as a likely campsite of Coronado's force. Objects found included fragments of Pachuca obsidian, which is very rare evidence for the presence of the expedition's central Mexican contingent (Vierra 1989, 1992).

Kluckhohn 1967). From an archaeological perspective, the intricacy of inter-/intra-group violence on a relatively small scale creates a need for detailed data on everything from depositional environment to forensic taphonomy to define behavioral contexts (Walker 1998; Hurlbut 2000). Without such data, evidence of conflict between Pueblos and Spaniards, among Pueblos, or between Puebloan and non-Puebloan groups is limited mainly to historical sources (cf. Stodder 1996, Table 7.6; Stodder et al. 2002).

For the Piro area, these sources are again highly episodic. In 1581, Hernán Gallegos understood the Piros to be at war with a "nation" to the north, a notion repeated in Obregón's (1997: 239) account of the same expedition. A year later, Antonio de Espejo saw no signs of conflict, to Diego Pérez de Luján the simplicity of weaponry indicated that the natives were not "bellicose", and Bernardo de Luna thought the Piros less "bellicose" than their neighbors in the Salinas area (*AGI*, *Patronato*, *legajo* 22; *CDII* 1865-84, 15: 112; Hammond and Rey 1966: 82-83, 221; Obregón 1997: 260-261). In 1598, Juan de Oñate found only three Piro pueblos occupied. Temporary abandonment of all other pueblos was likely a reaction to the approaching Spanish host; later tribute demands seem to have prompted similar efforts at avoidance (Hammond and Rey 1953, 2: 609, 659, 692; cf. Earls 1985: 187-188). Whether subsequent Spanish actions in the Salinas area affected the northern Piro pueblos is not known, though it may be noted that Selocú/Sevilleta is the first pueblo mentioned in a clear context of conflict. In his reminiscences of his work among the Piros, fray Alonso de Benavides states that Selocú had been abandoned in "wars with other nations" (Ayer 1916: 17, 96), but who these "nations" were he omits to say.

For the southern part of the Piro province, contemporary sources provide a more detailed picture. Benavides' *Memorial* of 1630 hints at a tradition of friendly visits to the pueblo of Senecú by *"Apaches de Xila"* from the mountains to the southwest. When Benavides showed up at Senecú, the *"Capitan mayor"* of the Gila Apaches was already a familiar face there (Ayer 1916: 133-136). This is a unique peek at Piro-Apache relations; later sources consistently portray Gila and other Apaches as enemies of the Piros. Why things should have turned hostile is unclear, but there is reason to suspect Spanish slave raids as a key cause. Spaniards seem to have initially traded for captives of the Apaches, then began targeting the latter, especially in times of high labor demand in the mines of New Spain (Forbes 1960: 120-163; Bailey 1966: 11-55; Hendricks and Mandell 2004). A popular pretext was to "punish" *("castigar")* real or imagined Apache offenses. Some Piro-area references show Piros as the rank-and-file in "punitive" expeditions emanating from southern New Mexico. Owing to the lack of early 17th-century documents, it is uncertain when the first raids were carried out, though the slow emergence of a Spanish presence in the Piro lowlands makes a date before 1640 unlikely.

Overall, references to Senecú best indicate possible developments. Piros from this pueblo are known, for instance, to have escorted Apache prisoners en route to Sonora (*AGN*, *Tierras*, *tomo* 3268).[9] Such an assignment helps explain why Apaches struck at Senecú at least four times in the 1660s and 70s. In one attack, fray Alonso Gil de Ávila and a number of the pueblo's residents were killed, and most, if not all, survivors fled.

[9] *"Mas ynbio* [el gobernador López] *por su horden nuebe yndios de a caballo desde el dicho pueblo de senecu asta el paraje de las mimbres del Camino de Sonora Con unas apaches que ynbio llebandolas los dichos yndios Con sus bestias, Cuidando dellas y belandolas de noche y acudiendo a todo lo que se les hordeno. En todo el biaje que ay mas de cien leguas de yda y buelta en lo qual Tardaron los dichos yndios Beynte dias"* (Antonio González, *"demanda...de los yndios de senecu"*, Santa Fe, Oct. 26, 1661).

Subsequent raids jeopardized Senecú's resettlement to such an extent that a troop of militia had to be stationed at the pueblo. Under guard, some sort of occupation continued until the general exodus of 1680/81 (*AGN*, *Historia*, *legajo* 25; MSS 360, Box 3b, Folder 57; Hackett 1923-37, 3: 292, 297-298; Marshall and Walt 1984: 252-254).

Despite the frequency of Apache references, conflicts involving the Piros were probably more complex. The death in 1667 of Senecú's *alcalde mayor* may have been the work of Piro rebels and Gila Apaches (Chapter 6). Factionalism and its potential for conflict are ethnographically and historically well attested among Puebloan societies generally (Spicer 1962: 152-393; Brugge 1969; Ortíz 1969; Dozier 1969, 1970a, 1970b; Rodríguez 1991: 8-162; Feinman et al. 2000; Brown 2004). A famous example is the 18th-century destruction of the allegedly pro-Spanish Hopi pueblo of Awatovi by anti-Spanish warriors from nearby Oraibi (Brew 1949a; James 1974; Lomatuway'ma et al. 1993; Malotki 2002). For the Piros, factionalist conflict is one of the most obscure potential factors in their colonial-period decline. For example, while some of the sources for the events of 1680-82 state that not all Piros joined the Spanish exodus to El Paso, it is impossible to gauge how decisions to move, stay, or go elsewhere may have been driven by choice, kinship ties, and/or other factors, including factional relations.

Specific data with which to estimate scale of conflict and demographic impact among the Piros are lacking. The Piros like other Pueblos might abandon settlements when under threat, but known pueblo figures suggest that up to 1630 such abandonments would have been mostly temporary. Except for Selocú/Sevilleta, there is little evidence of conflict causing lengthy abandonment prior to mid-century. For the last two decades before the Pueblo Revolt, references to conflict suggest a process of population attrition through increased casualties and abduction of women and children in Apache raids. The repeated abandonment of Senecú in the 1670s also shows that flight/relocation could derail efforts at settlement preservation even if the pueblo in question was important enough to propel both civil and religious authorities into action to save it.

DIETARY STRESS

The last of the four factors considered in this chapter, dietary stress, has the advantage of an analytical frame of reference separate from archaeological/historical data. By charting past weather conditions, paleoclimatological (in the Southwest primarily tree-ring) data offer a proxy against which archaeological and historical patterns can be compared. Statistical analyses reveal multi-year patterns of positive and negative deviations from the "normal" mean. Climate data can thus help bridge gaps in the historical documentation of dietary stress, and suggest periods of negative demographic trends (Dean and Robinson 1977; Dean et al. 1985, 1994; Parks et al. 2006).

As stress factors for the human organism, dietary deficiencies have a quantitative and a qualitative dimension. Primary distinction is between absolute food consumption and relative intake of nutrient-rich versus nutrient-deficient food. While lack of food will in time cause death by starvation, metabolic diseases caused by nutritional deficits need not be fatal. There is consequently much variability in cause and effect of dietary stress. Chronic deficiencies may manifest themselves in osteological conditions like pitting and thickening of cranial cortical bone (porotic hyperostosis, cribra cranii; in the orbital roofs cribra orbitalia) or porosity, fragility, and hyperplasticity (in severe cases fractures and necrosis) of postcranial bone (Ortner 2003; Brickley and Ives 2008). Given, however, the wide morphological range of these conditions, etiologies are not entirely clear (Schultz et al. 2007: 371-374). Suggested causes of cribra and porotic hyperostosis range from iron-deficiency or inherited hemolytic anemia and scurvy (Vitamin C deficiency) to metabolic parasitic or infectious diseases with chronic gastrointestinal bleeding and nutrient loss. Deficiencies thought to produce porotic or periostitic lesions in postcranial bone include avitaminosis A, scurvy, rickets (Vitamin D deficiency in children under age five) and osteomalacia (adult Vitamin D deficiency), and lack of minerals, especially calcium (Ortner 2003; Brickley and Ives 2008; cf. Mann and Hunt 2005: 22-32).

Other potential indicators of dietary stress are the dental enamel defects known as hypoplasia. Appearing as grooves or pits in the enamel matrix, hypoplasia forms during the development of the permanent dentition. Studies of metabolic bone diseases show a strong statistical fit between increased dietary stress and increased rates of dental enamel defects (Brickley and Ives 2008: 241-249). Co-occurrence of porotic/periostitic lesions, enamel hypoplasia, and Harris lines of arrested bone growth further supports causal association with malnutrition (McHenry and Schulz 1976). Yet as Harris lines form through mineralization of bone ends (particularly of long bones) during growth disorders prior to epiphyseal fusion, such co-occurrences are largely restricted to juveniles. In addition, as Harris lines are subject to bone remodeling, over time they are eradicated from the affected bones. This age-dependent etiology limits use as an indicator of dietary stress (Mays 1995; Grolleau-Raoux et al. 1997; Ortner 2003: 78, 200-203).

Skeletal samples clustering in the sub-adult age group and demonstrating a high incidence of these pathologies may suggest high levels of mortality within the cohort, but when based solely on pathological data the inference is not without problems due to the mutually aggravating effects of malnutrition and disease. As Donald Ortner (2003: 114-115) points out, malnutrition can weaken immune responses to such an extent that death may occur before otherwise chronic (i.e. with adequate diet) diseases affect the skeleton. This can obviously limit the "evidence of skeletal disease in an archaeological sample" and imply "better health when, in fact, people would have been very sick and dying quickly" (cf. Schultz et al. 2008: 141-142). To assess the scale of the discrepancy requires statistically relevant data on life expectancy and demographic makeup of the burial population under study (cf. Sobolik 1994; Mays 1997, 1999).

In the Southwest, paleopathological analyses of dietary stress follow along much the same lines as studies of disease. Although especially microscopic analyses are still limited, there is good evidence to suggest a high incidence of pathologies related (more or less specifically) to dietary stress in pre-contact Puebloan populations. Deficiency and endemic infectious diseases caused high infant/child mortality rates and a low overall life expectancy (Stodder et al. 2002). At Grasshopper Pueblo, for example, recent analysis of sub-adult (0-14 years) skeletons has shown that 306 in a sample of 356 individuals had not reached age six. Cribra orbitalia and dental enamel hypoplasia were found in 143 of 245 and 49 of 218 crania. Identified deficiency diseases include scurvy (n=84/260) and chronic anemia (n=129/257). There was also evidence of different infectious conditions, most markedly sinusitis maxillaris (n=65/129) and generic meningeal reactions (n=189/262). Interestingly, beneath the overall pattern of mortality and morbidity, correlation of analysis results and sample proveniences shows some variability in the presence of stress indicators between sub-samples from the pueblo's three main room blocks (Schultz et al. 2007, 2008).

Such is also the case with comparisons beyond the site level. Local and regional patterns are coherent enough to show a deterioration of public health that paralleled the rise in aggregated settlement and reliance on maize (which is iron- and [if not alkalized] also niacin-deficient) as a staple food during Pueblo III/IV times. Although bone pathologies are difficult to pin on specific stressors, "daily" nutritional deficits and periods of food shortage clearly brought on chronic deficiency diseases and exacerbated infections, especially among children (Lycett 1995; Stodder et al. 2002; cf. Palkovich 1980; Turner 1981; Hinkes 1983, Merbs and Miller 1985; Wetterstrom 1986; Stodder 1990, 1994, 1996; Reinhard 1992, 2007; Ezzo 1992, 1994; Schultz et al. 2007, 2008). Yet in colonial times things got worse. Tribute and labor demands and new diseases materialized as new stress factors, and there were recurring harvest failures (especially after 1660). All this affected life expectancies. Where at 14th-century Arroyo Hondo, 15- to 19-year olds could have expected to live 19 more years (Palkovich 1985, Tables 11, 12), live expectancy for 15-year olds at nearby mission-period San Cristóbal was only 17 years, and for 16-year olds at distant Hawikuh 16 years (Stodder et al. 2002: 490-492).

The role of dietary stress in the decline of Puebloan living conditions crops up but sporadically in 17th-century documents (Ivey 1994; Scurlock 1997: 7-48; Barrettt 2002: 68-77). The food- and tribute-gathering forays of the Oñate colonists feature in a number of sources that also mention food shortages and starvation in pueblos visited by the collecting parties. Given their distance from the center of Spanish settlement, the Piros were perhaps mostly spared such encounters. On the other hand, the June 1598 episode in which Oñate collected supplies at Teypana (Chapter 6) could also indicate similar situations with later travelers on the *camino real.*[10] More permanent demands of tribute, labor, and land would have come with the arrival, after 1625, of missionaries and settlers, and the installation of the *encomienda* system, presumably around the same time. Again, there are no details on how this may have influenced Piro subsistence. The many allegations in the documents of exploitation, encroachment, and other abuses only indicate that those involved – missionaries, settlers, and civil officials – took advantage of a wide range of native resources (Earls 1985; Bletzer 2005).

For the later colonial period in the Piro area, dietary stressors are somewhat better documented due to the acute drought that began in the mid-1660s. While reconstructions of colonial-period precipitation patterns show that this was not the first drought in the 1600s, contemporary observers mention how missionaries handed out rations to their native parishioners. Piro stores apparently no longer sufficed. Few details are known, yet a combination of continuing Spanish pressures, high disease morbidity and mortality, and destruction of food stores in Apache raids undoubtedly magnified the crisis, especially during the "great famine" of the early 1670s (cf. Wilson 1985; Ivey 1994; Barrett 2002: 74-77). The paucity of references to Sevilleta and Alamillo in the 1660s and 70s may be at least partly a result of all this.

An independent, more systematic approach to identifying possible climate-driven subsistence shortfalls is through analysis of past climate conditions. For the Piro area, paleoclimatic reconstruction means chiefly reconstruction of precipitation patterns. This is based on statistical comparisons of *Pinus edulis* rings (from a stand in the Sevilleta

[10] According to an oft-quoted eyewitness statement from 1601, the food demands Oñate's settlers placed on the Pueblos amounted to up to 6000 *fanegas* (c. 15,000 bushels or 500,000 l) of maize and beans (Hammond and Rey 1953, 2: 630; cf. Vivian 1964: 19; Earls 1985: 185).

National Wildlife Refuge) with recent (1892-1991) precipitation data from the Socorro weather station (see Chapter 3) (Parks et al. 2006: 214-219). Potentially adverse precipitation trends reconstructed for the colonial period begin with a span from c. 1615 to 1640 during which precipitation fluctuated between average and below-average (Fig. 7.8a). The documents, it may be noted, have so far yielded no references to crop failures and/or food shortages in the Piro area at that time. After 1640 followed c. 15 years of continuous above-average precipitation, the longest and most pronounced such stretch during the colonial era. Beginning in 1665, however, precipitation plunged to deeply below-average levels from which it did not emerge again until the late 1680s (Fig. 7.8a). This was the longest and most pronounced period of precipitation shortfall in the 17th century, and probably one of the three worst droughts ever to hit the area (Parks et al. 2006: 222-224; cf. Grissino-Mayer et al. 1997, Table 6; Barrett 2002, App.).

Precipitation data for the eastern uplands and the Salinas area with the Tompiro, Tiwa, and Jumano pueblos show similar trends (Fig. 7.8b) (Parks et al. 2006: 217-223). Higher elevations translate into more precipitation, but without permanent bodies of water (other than the salt lakes after which the Spaniards named the area) those pueblos were more at risk from drought than the Piro pueblos on the Rio Grande (Baldwin 1988). The demise of all Salinas pueblos by the early 1670s bears out the fatal impact of the post-1665 drought on the regional Puebloan occupation. According to one of the most dramatic contemporary references, in 1668 more than 450 people died from starvation at Las Humanas Pueblo alone (Hackett 1923-37, 3: 272-273; Ivey 1994).[11]

[11] Fray Juan Bernal to the Holy Office of the Inquisition in Mexico City, Santo Domingo, April 1, 1669.

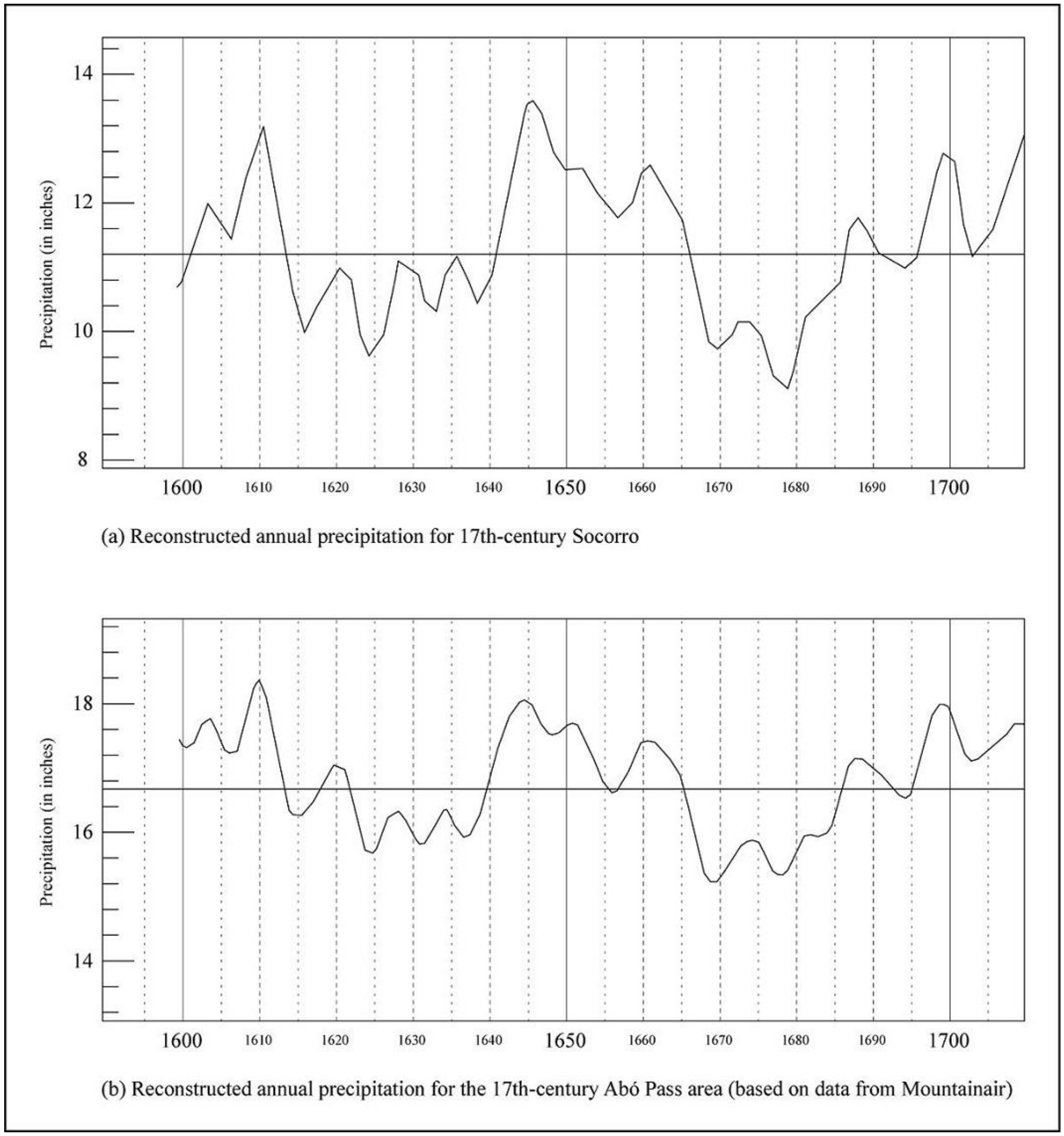


Fig. 7.8. Reconstruction of 17th-century precipitation in the Piro (Socorro) and Abó Pass areas (adapted from Parks et al. 2006, Figs. 11.4, 11.5).

Altogether, the data on the Spanish presence in the Piro area and on the incidence and impact of infectious disease, conflict, and dietary stress point to complex interplay between these factors as the key force driving population and settlement decline. Several patterns emerge from the combined historical-archaeological records. Primarily, there seems to have been no lasting population crisis prior to the founding of the first missions. A few communities (e.g. Selocú/Sevilleta) may have struggled early on, but those appear to have been localized affairs lacking Spanish involvement. If regional demographics and number of pueblos were thus relatively stable up to c. 1630, the recorded epidemic(s) of the late 1630s would have likely been the first major (or "virgin-soil") intrusion of foreign pathogens into the Piro area. While one has to bear in mind the vague record on disease transfer, similar claims have been made for other areas of Puebloan settlement (cf. Lycett 1989, 1995; Barrett 2002; Eckert 2005; Kulisheck 2003, 2005).

It was probably after the late 1630s that the scale of Piro settlement began to drop severely due to absolute and relative population losses. The colonial authorities can be assumed to have merged with the mission pueblos those villages that had the highest mortality rates. It is also possible that disease survivors sought refuge elsewhere. After c. 1640, Spanish settlement and its associated effects seem to have become increasingly oppressive. All this would have marked a decline from conditions in the early mission period. After c. 1650, the situation grew more and more critical for the surviving Piro villages, which at that point were most likely just the four mission pueblos. In the run-up to the Pueblo Revolt, the synergist dynamics of economic exploitation, disease morbidity and mortality, Apache raids and Spanish counter-raids, and chronic food shortages effectively finished off what remained of the old settlement structure.

CHAPTER 8

THE PLAZA MONTOYA CASE STUDY, PART I: SITE STRUCTURE

This and the next chapter deal primarily with structural sequences, stratigraphies, and artifact assemblages at Plaza Montoya Pueblo. Data from each of these areas are used to evaluate assumptions of demographic and occupational trends on the site and regional level. Cameron's (1991a) Oraibi study and research at a number of mostly prehistoric pueblos (e.g. Rinaldo 1964; Reid 1973; Reid and Shimada 1982; Reid and Whittlesey 1999; Wilcox 1975; Snow 1976; Dickson 1979; Creamer 1993; Riggs 2001) have shown that detailed analyses of vertical and horizontal distributions of artifacts and architecture are needed if questions of settlement structure, residential stability, and, ultimately, abandonment behavior are to be addressed effectively.

The two chapters are partly descriptive and partly analytical. Following here is a review of surface data and resulting assumptions regarding Plaza Montoya's occupation history, and a comprehensive room block by room block look at structural sequences and stratigraphies. In Chapter 9, the structural data are placed in chronological context and, together with data on artifact distribution, examined for patterns that might reflect major trends in site occupation. Initial assessments are based on personal observations and Marshall and Walt's (1984) site description (Chapter 5). Excavations show these assessments to be fairly accurate for general site layout, but also to be more complex in the configuration of intra- and extramural space than appears at first glance. From the perspective of the pre- to post-contact transition, the main challenge is to identify patterns relating to this transition in the excavation record. In other words, what structural and depositional differences can be seen between early and late occupation levels? Tied to this is the question of stability. Gaps in sequences may indicate differential occupation or even breaks in site occupation. Such gaps might, for instance, dispute the assumption of a continuous contact-period occupation of Plaza Montoya.

The Plaza Montoya Surface Record

SITE STRUCTURE

Research at Plaza Montoya was undertaken with the above considerations in mind. The site was selected for several reasons: locational context (i.e. proximity to the site of the Socorro mission), site size, surface ceramics indicating post-contact occupation, and the assumption that as a non-mission pueblo abandonment had probably occurred some time before 1680. Important from a practical perspective was the overall state of preservation. Despite visible disturbances, this compared favorably to other Piro sites.[1]

Initial observations added little to Marshall and Walt's (1984, Fig. 9.62) original sketch map (Fig. 5.12). Room blocks and a central plaza are arranged in a quadrilateral layout, with the only level access to the plaza apparently through a gap in the northeast plaza corner. The east and west room blocks are low (height c. one meter) dirt mounds. There is no appreciable accumulation of structural debris in the south room block; the only visible traces are a few basalt wall footings. The north room block survives as a low

[1] The prospects of obtaining landowner consent obviously constituted a crucial factor as well – all the more so as the site is located on three private plots (two vacant, one partly developed).

mound only in its central and eastern sections. The graded road running through its western half completely destroyed a substantial number of rooms. Other alterations to the land surface are visible around the site and toward the intensively farmed Rio Grande floodplain, which lies c. 100 m to the east. The Luis López *acequia*, a farm road, and a railroad right-of-way mark the transition from the floodplain to the higher ground of the site area (Fig. 8.1).

Fig. 8.1. Aerial view (USGS photograph, 1996) of the Plaza Montoya site with current site plan superimposed. Visible are ranch buildings, railroad right-of-way, Luis López *acequia*, and floodplain edge.

The bench formation on which Plaza Montoya is located rises two to four meters above the floodplain. Northeast of the site are several farm buildings. Access to these is by the graded road that runs through the pueblo's north room block. Built before 1980, the road obliterated perhaps up to 30 ground-floor rooms, the most extensive disturbance across the site area. A few tracks run around and across the site, but do not as yet affect larger swathes of structural remains. Prior to excavation, the bulk of the room blocks and central plaza area were hidden from view by dense stands of tree cholla *(Opuntia imbricata)* and honey mesquite *(Prosopis glandulosa)* (Figs. 8.1, 8.2).

Fig. 8.2. The site of Plaza Montoya Pueblo. View is northeast across the Rio Grande floodplain (T. O'Laughlin, 6/2004).

Based on these observations, Marshall and Walt's ballpark figure of 200 rooms for the pueblo seemed reasonably accurate prior to initial wall-scraping and testing. So did their identification of possible multi-story construction in the central and northern parts of the west and east room blocks (though these were the areas most densely covered by mesquite and cholla). In the southwestern corner of the pueblo Marshall and Walt noted possible differences in wall alignments that might indicate separate construction episodes. This could not be confirmed during walkovers, and later excavations at the juncture of the west and south room blocks produced no evidence of structural super-positioning.

During initial wall-scraping and testing several problems emerged. Most serious was the scale of disturbance in the eastern third of the north room block. Marshall and Walt (1984: 197) noted that the surface in this part of the room block had been bladed. Visible traces at the east end of the room block were push-piles of cobbles, probably wall footings uprooted by the grader. This, I learned, had been done to facilitate installation of a drip-irrigation system for a planned tree farm. The project was later scrapped, but not before ¾-inch plastic piping had been placed atop most remaining wall alignments. As wall-scraping progressed, it became clear that grading, piping, and the generally east- and south-trending slope of the mound had combined to destroy top floors and wall joints of both the most easterly and almost all plaza-fronting rooms.

Two other points could not be resolved during survey and walkovers. One is the apparent absence of formal midden areas within and around the site (Marshall and Walt 1984: 195). Given the appearance of the room-block mounds, one must assume that if middens did exist they have since eroded away. More puzzling is the lack of possible plaza kivas (Marshall and Walt 1984: 194). At many Piro sites, large circular depressions are visible in plaza areas or outside room blocks. Las Huertas, for example, has two (Fig. 5.8). One depression can even be seen in the general area of Pargas Pueblo (Fig. 5.14). Similar depressions occur at the upland pueblos near Magdalena (Figs. 5.25, 5.29), Sevilleta (Fig. 5.1), and various other sites, both large and small. In contrast to this, Plaza Montoya has only a few very shallow depressions in the plaza area and off the west room block. Whether these might be associated with the pueblo's occupation could not be determined without remote-sensing and/or test excavation.

SURFACE CERAMICS

Although collection of diagnostic surface sherds continued throughout the project, most sherds were found between 1999 and 2002. Runoff from winter rains and (at times) snowmelt repeatedly exposed new sherds in previously surveyed areas. During summer seasons the same would happen after evening thunderstorms. The sample described here covers the 1999-2002 sherds, with the focus being on the 95 identifiable bowl rims in the sample (Fig. 7.4). The majority of rims were found in the mound areas; relatively few came from the central plaza or areas on the far side of room blocks.

Figs. 8.3a-b show a selection of rims from each room block, plus plaza and peripheral areas. The sample's chief characteristic is the complete absence of early glaze- and whiteware specimens. Relative frequencies of identified rims are c. 50% Glaze E, 25% transitional forms combining both E and F traits, 18% "pure" F forms, and 7% D/E forms (Fig. 7.4).[2] The distribution is not unlike that of Marshall and Walt's

[2] Also part of this sample is a single Tabirá Black-on-white sherd found in the south room block.

(1984: 326) smaller (*n*=19) sample of identified rims, though there no categories for transitional forms were defined (Fig. 7.4). That sample also included the only reported Glaze A rim sherd from the surface at Plaza Montoya. A comparison with ceramics from Pargas Pueblo highlights the sample makeup, for my 2003 sample of 28 bowl rims from Pargas was essentially the reverse of the Plaza Montoya sample: 22 (or almost 80%) Glaze A sherds and only one distinctly Glaze E specimen (Figs. 5.16a-c, 7.4). Though limited and poorly provenienced, my Pargas sample is practically identical to that from Marshall's (1986: 34, 46-49) salvage excavations in the north-block area. Ceramics and radiometric dates together suggest a 15th- to early 16th-century occupation for Pargas.

While the disparity with Pargas is obvious, the peculiar character of the Plaza Montoya sample vis-à-vis assemblages at Las Huertas, Qualacú, and most other large Piro sites also needs to be stressed. As mentioned earlier, ceramics at Pueblo Magdalena and Bear Mountain Pueblo are the nearest parallels to those at Plaza Montoya. The Sevilleta assemblage (as far as it is known) is similar, too, but includes a noticeable (if small) Glaze A component which the three other sites lack. Compared to its nearest neighbors, Plaza Montoya seems to have been founded late enough to fall almost wholly outside the temporal range of early glazes. That the site's surface ceramics in their composition fit right into Marshall's (1987: 78-81) Ceramic Group-Complex XII might even suggest a primarily colonial-period occupation (Fig. 7.1). To make a case for such narrow association is problematic, however, given both the limited excavated sample underlying Marshall's sequence and a possible run time for Glaze E of over 100 years (Fig. 4.4).

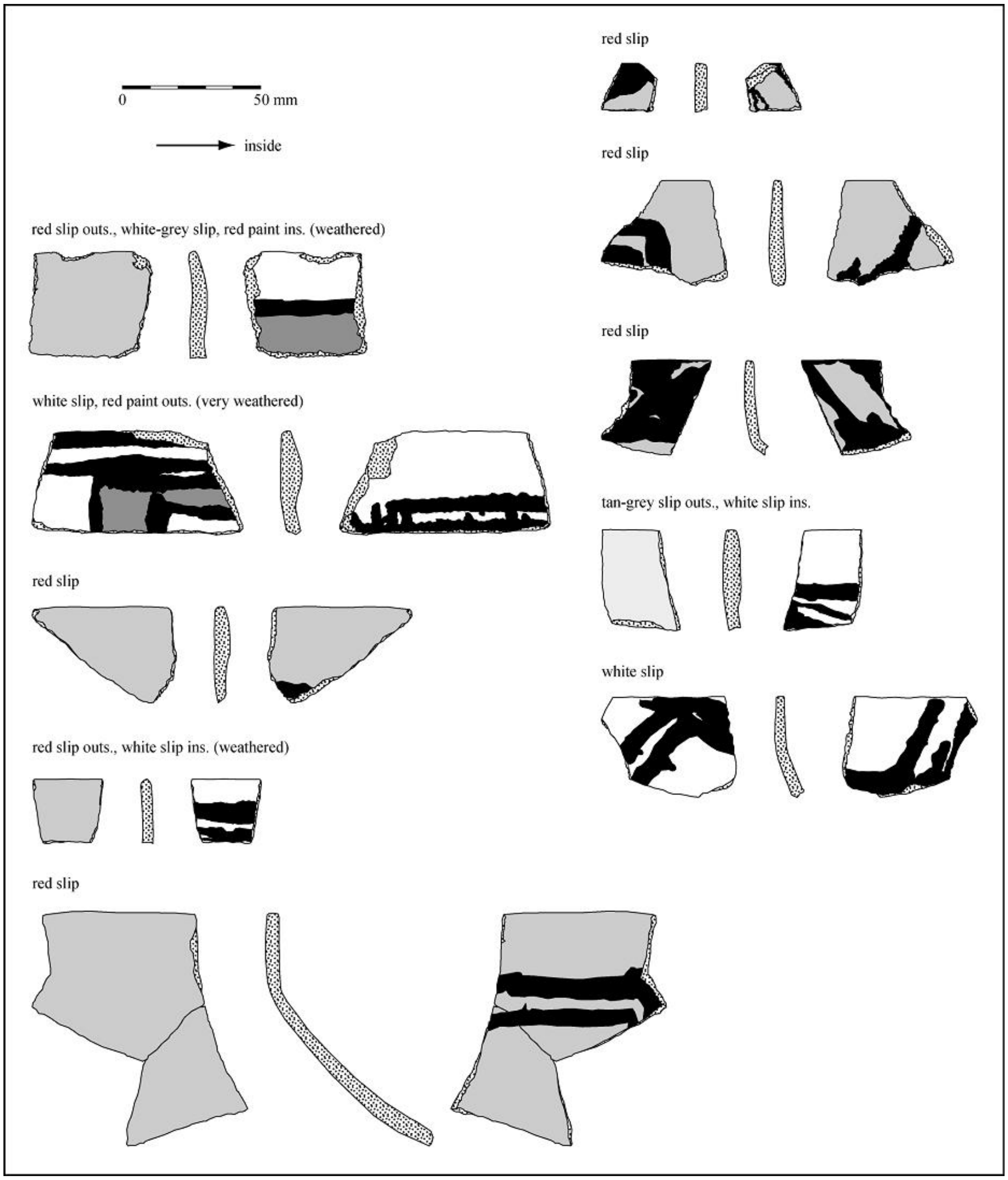


Fig. 8.3a. Plaza Montoya, glazeware bowl rims, surface, west and south room blocks.

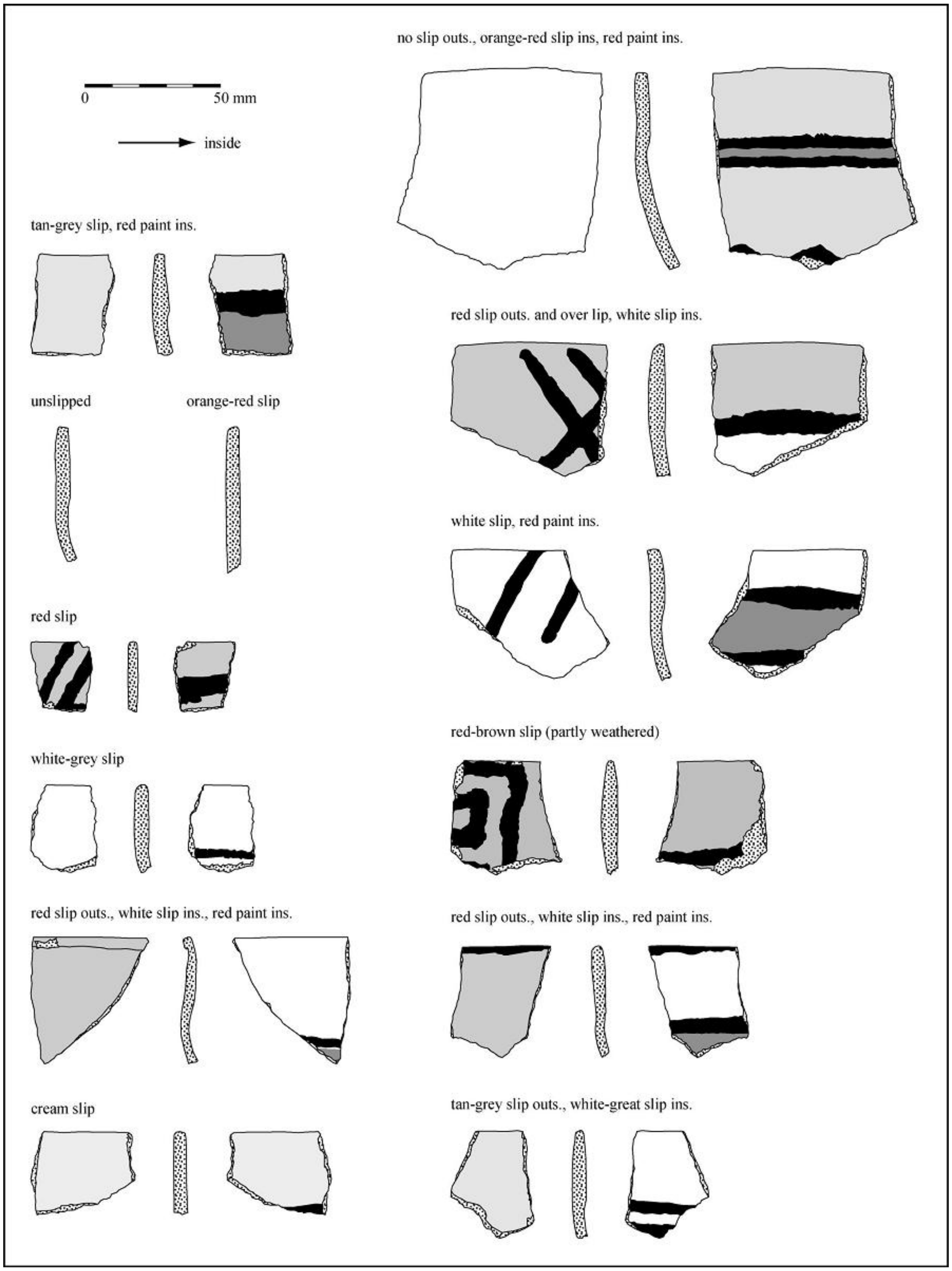


Fig. 8.3b. Plaza Montoya, glazeware bowl rims, surface, east and north room blocks (all drawings M. Bletzer, 12/2004).

Summary and Outlook

As it stands, the overall historical-archaeological context can only indicate a rough working chronology for Plaza Montoya. For the site as a whole, the date ranges of glazewares in the surface sample indicate a 16^{th}-/17^{th}-century occupation. The small proportion of Glaze D or D/E and earlier sherds in the sample may reflect a founding date in the early to mid-1500s, but clearly the bulk of occupation lay in the later 1500s. Also, a combined sample ratio of over 40% E/F and F sherds suggests a sizeable occupation at least into early colonial times and probably into the early mission period as well.

Whatever the exact timing of its founding, Plaza Montoya almost certainly was one of the 14 Piro pueblos fray Alonso de Benavides mentioned as occupied *after* he established the first Piro missions (Chapters 6 and 7). In makeup and spatial distribution the Plaza Montoya ceramic sample differs from surface assemblages at neighboring Las Huertas and Pargas. At both these sites, as well as at Qualacú and San Pascual, late glazes occur over much smaller areas than early glazes. For Qualacú in particular the data suggest that the presence or absence of different glaze forms correlates with different proveniences and elevations. Such differential distribution is believed to reflect a contraction of occupied space from early to late glaze times (Marshall 1987: 19-20; Marshall and Walt 1984: 139-141). A decline in occupation from the early to the late glaze spectrum in turn suggests a gradual process of attrition. Much in this hinges on the dating of Glaze A forms. If the latter went out of use closer to 1500, then the limited distribution at least of Glaze E forms could even be a pre-contact phenomenon. Clearly, a great deal of conjecture remains without data from secure stratigraphic contexts.

Since the population/settlement figures from the early 1580s and late 1620s seem consistent enough to suggest no dramatic changes during contact and early colonial times, the question must be how and how long after the mid-1620s the non-mission sites among Benavides' 14 pueblos remained part of the regional settlement landscape. In the case of Plaza Montoya, the "traditional" (i.e. pre-mission) local environment included the pueblos of Las Huertas to the north, Pargas to the south, and Las Cañas to the northeast (across the Rio Grande), as well as a few smaller sites of varying temporal affiliation whose relationships to these larger sites are unknown (Fig. 8.4).

Plaza Montoya's position in this "cluster" is unclear. The ceramics suggest that while Las Huertas and Las Cañas were in decline (and with Pargas perhaps already abandoned), Plaza Montoya continued to be more or less fully occupied. Such divergent trends may well have entailed people from the other pueblos in the cluster relocating to Plaza Montoya, but this is an issue that cannot be sorted out with the data at hand. What seems reasonably certain is that when missionaries first began working at Pilabó/Socorro (starting with Benavides himself in early 1626), Plaza Montoya was a major settlement between Socorro and Senecú. Without a comparable archaeological site south of modern Socorro, Plaza Montoya may well be the Socorro of Oñate's time, Teypana, which the 1598 Claros mission assignment appears to place south of Pilabó ("Pilogue") (Chapter 6). Proximity to the mission at the "new" Socorro/Pilabó would have brought the pueblo's residents into regular and regulated contact with the Spanish world. Although there had been earlier encounters (perhaps even quite a few), it was the coming of the missionaries and their soldier escort that placed a permanent Spanish presence in the vicinity of Plaza Montoya.

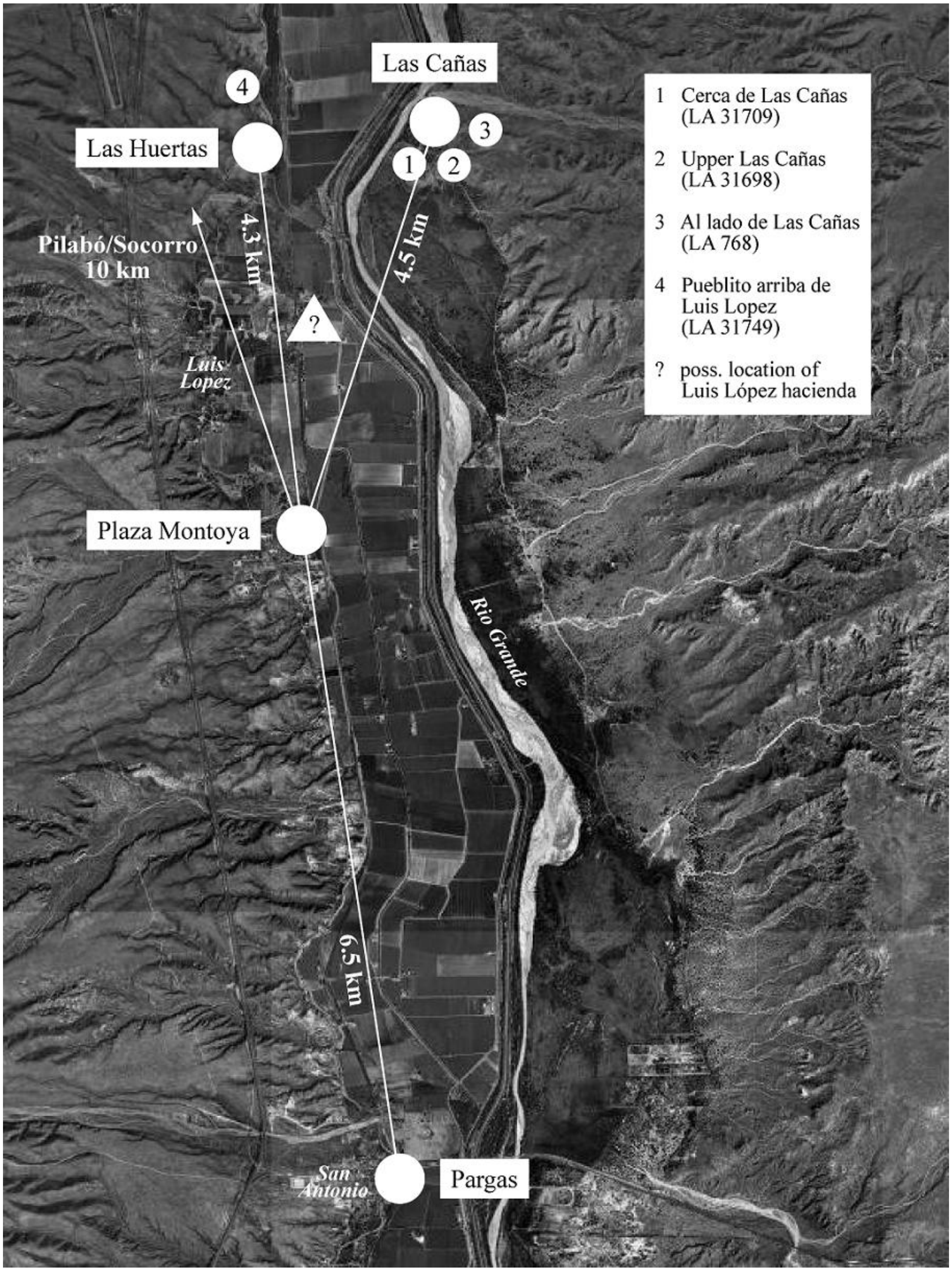


Fig. 8.4. Plaza Montoya, nearby Ancestral/Colonial Piro sites, and possible location of the Luis López *estancia/hacienda* (base photograph USGS, 1996).

While there are no references to connect the two places, the establishment of the Socorro mission must have been a turning point in Plaza Montoya's history. By picking Pilabó/Socorro as mission seat or *cabecera*, the missionaries elevated that pueblo over its neighbors (as did the civil authorities when they selected Socorro as seat of an *alcalde mayor*). Effort, resources, and goals in and for mission construction would have the resident friars pay special attention to the needs of their *cabecera.* At the most basic, this would mean maintaining population, if necessary by bringing people in, *reducción*-style, from surrounding pueblos. In Socorro's case, outright *reducción* of a large pueblo like Plaza Montoya seems unlikely; Benavides and the scant evidence for New Mexican *reducciones* suggest as much. Yet this situation must have changed with the epidemic(s) of the late 1630s, when Puebloan populations may have fallen by as much as one third (Chapter 7). As centers of native-Spanish contact, the Piro missions were likely primary points of infection, similar to the better-documented missions of California and La Florida (e.g. Loucks 1979; Larsen 1990; McEwan 1993; Jackson 1994; Jackson and Castillo 1995; Hann 1996; Milanich 1999). With potentially severe losses both within and beyond the *cabecera*, residents of outlying settlements would face resettlement at the mission pueblo in a process perhaps similar to what happened at Selocú/Sevilleta in the late 1620s (Chapters 6 and 7). For Plaza Montoya, this would probably have been the end, as it seems doubtful that the pueblo would have lasted much longer with a weakened occupation. If nothing else, the existence of the Luis López *estancia/hacienda* suggests that Plaza Montoya was no longer occupied by 1660, i.e. that final abandonment occurred before the drought of the 1660s and 70s. That the *estancia* may have been set up little more than a stone's throw from the pueblo might reflect a takeover of old Piro fields.

While the *estancia* is not mentioned before 1660, the earliest references to it hint at an already well-entrenched operation. Presumably it was one of the *estancias* established after the ten or twelve Rio Abajo *estancias* already in existence in the 1630s (Chapter 6).

Collectively, these inferences and assumptions suggest a combination of absolute population decline driven by disease and relative decline driven by large-scale (perhaps directed) out-migration as primary causes of Plaza Montoya's abandonment. Rate of abandonment cannot be estimated narrowly, but may have ranged anywhere from a few weeks to several years. Without clear documentary clues to the contrary, even a remnant occupation up to 1680 is theoretically feasible, considering the temporal range of the Glaze F ceramics on the site. On the other hand, Spanish supervision of the abandonment process through the *reducción* policy would probably have emptied the pueblo fairly quickly. Whether this would have ended all site use right away is uncertain, however.

In the event that Plaza Montoya was indeed "reduced", its residents would not have needed to travel far to their new village. Socorro is just a short walk to the north, past Las Huertas, on the same side of the Rio Grande (Figs. 7.2, 8.4). Proximity would have facilitated removal of most, if not all, transportable objects, which in turn would translate into limited deposition on room floors and outdoor surfaces of high-value items (i.e. potential de facto refuse) like ceramic vessels and grinding stones. If the pueblo was abandoned en bloc, such depletion should be relatively consistent across the site. Moreover, abandonment in that manner would mean fewer early abandoned rooms, and thus fewer opportunities for extensive structural modifications of rooms or suites of rooms (i.e. changes in size and/or layout of individual households), as well as fewer opportunities for discarding refuse in abandoned rooms.

Short-distance relocation would also leave open the possibility of returning to the site. Continued use of fields in the vicinity of the pueblo could have offered strong motivation for sporadic site visits. In that case, salvaging or scavenging of residual materials may have continued for some time after abandonment. Similarly, while longer-term reoccupation of any size appears unlikely, use for shelter especially during planting and harvesting season cannot be ruled out. To provide workers with places to stay, some rooms would have needed maintenance or repair to become, in effect, field houses.

It is also possible that abandonment behavior at Plaza Montoya was more varied. Some residents could have moved to a different mission pueblo, or to one or the other of the two upland pueblos near Magdalena, or perhaps to one of the late-glaze sites in the Chupadera Basin. The latter would have meant moving out of the area of immediate Spanish control, but whether this could have sufficed to escape the colonial system is uncertain (cf. Marshall and Walt 1984: 141, 256; Shelley 1989; Kyte 1989b; Kulisheck 2003). Neither the Magdalena nor the Chupadera Basin sites are in secluded/defensible locations, and at least the *"sierra de Magdalena"* was clearly known to the Spaniards. Regardless of motivation, in movements to more remote sites the factor distance would have played a role in determining the kind of materials left behind upon abandonment, as well as the likelihood of return and post-abandonment scavenging by former residents.[3]

Such scenarios epitomize the potential for variability in abandonment and post-abandonment processes at Plaza Montoya. Historical-archaeological context may render one scenario (disease-driven population loss, short-distance relocation of survivors, site

[3] Compared to Socorro, the (approximate) locations of Senecú and Alamillo are c. 35 and 25 km from Plaza Montoya, while Sevilleta and the pueblos near Magdalena are c. 40 km and the sites in the Chupadera Basin c. 50-60 km away (Figs. 3.3, 7.2).

easily reached by former residents) more plausible than others (e.g. population attrition and gradual decline, long-distance relocation, little possibility of return), but given the nature of the underlying data the impression may be erroneous. While better data may not always reveal distinct cause-effect patterns, it is only through detailed analysis of structural and depositional contexts that possible abandonment processes can be identified and perhaps differentiated further.

Review of Fieldwork at Plaza Montoya Pueblo

Beyond specific research objectives, two parameters were crucial in the collection of data at Plaza Montoya: site size and preservation. An estimated total of 200 rooms presents an obvious challenge as to how best investigate such a site. While research goals provide a first check on choices, a number of constraints usually affect work on the ground. Aside from external factors (time, funding, personnel), preservation is probably the most important, especially at "visible sites", i.e. sites whose structure can be at least in part monitored through walkovers and remote-sensing (Orton 2000: 140-147; Roskams 2001: 41-42). Despite low overall visibility, Plaza Montoya's remains were conspicuous enough to convey a general idea of site layout and size of room blocks. Throughout the project, wall-scraping, shovel-testing, augering, and remote-sensing were used to improve visibility prior to establishment of the main excavation units.

Five major excavation seasons and several shorter stints of surveying and wall-scraping were spent at Plaza Montoya. Preliminary research began in the summer of 2000; the first season of excavation was in June/July 2001, the last in June/July 2005. In contrast to neighboring Las Huertas (LA 282) where information on space had been deemed “realistically less important than information on site structure” (Earls 1985: 245), spatial coverage figured prominently at every level of fieldwork at Plaza Montoya. As site structure exists in both the horizontal and vertical planes, the study of a pueblo with potentially hundreds of rooms should ideally be based on spatial and stratigraphic sample data relevant to approximate site size and layout (cf. Riggs 2001: 24-34).

THE EXCAVATED SAMPLE

Creation and analysis of sample data representing part of a quantitatively unknown record are key aspects of archaeological research (Clarke 1973: 17; Cowgill 1975; Orton 2000: 1, 40). Formerly deemed a more “intuitive exercise” (Orton 2000: 5), archaeological sampling over the last decades has seen much development and application of statistical techniques (Mueller 1975; Redman 1987: 249; Shennan 1988: 298-299; Orton 2000: 14-17, 112-114). Especially in regional analyses and survey work, systematic sampling has become the rule, with both theory and practice being widely discussed (e.g. Plog 1976; Plog et al. 1978; Plog and Hegmon 1997; Nance 1983; Nance and Ball 1986; Cowgill 1990). But while archaeologists working at individual sites must also make fundamental decisions on what part(s) to excavate, references to such decisions are not always explicitly made in site-based studies (Redman 1987: 250; Schiffer 1996: 355; Roskams 2001: 40-41; cf. Reid 1973; Nance 1981).

The kinds of research questions underlying the Plaza Montoya project require spatial and chronological data extensive and diverse enough to allow one to isolate patterns from which to draw inferences about key aspects of site occupation with a reasonable degree of confidence. Given this, and given the shortcomings of probability-based sampling schemes in “illuminating contiguous spatial patterns” (Redman 1987: 251; Roskams 2001: 41), the placement of excavation units at Plaza Montoya was largely based on a purposive approach (cf. Nelson and LeBlanc 1986: 17-25; Riggs 2001: 194). Factoring in the decision-making process were site topography (Fig. 8.5), vegetation density, surface observations of possible wall alignments, as well as data from remote sensing and brush-and-trowel wall-scraping.

By the end of the fifth field season in 2005, 12 areas, labeled I-XII, had been tested. Excavations tests were distributed across room blocks, plaza areas, and offsite locations (Fig. 8.6).[4] Labeling reflects progression of work and is based loosely on the level-locus system as described by LeBlanc (1976). Area I in the west room block was the first to be tested, Area XII in the north room block the last. Each room block was tested in at least two locations. Areas I and XI covered the west room block, II and III the south room block, IV and VI the east room block, and VII, IX, and XII the north room block. Area VIII includes all excavations in the central and eastern plazas, plus one offsite test, with the exception of an initial test in the central plaza which was labeled Area V. In addition, one offsite excavation southwest of the pueblo became Area X in the excavation log.

[4] I use the term “offsite” for locations that are outside the main quad of the four room blocks and the central plaza. The term is only a general spatial reference and does not imply that a location so described was functionally detached from the pueblo.

Fig. 8.5. Plaza Montoya Pueblo, site-area topography (contours are 20 cm, zero-elevation is main site datum).

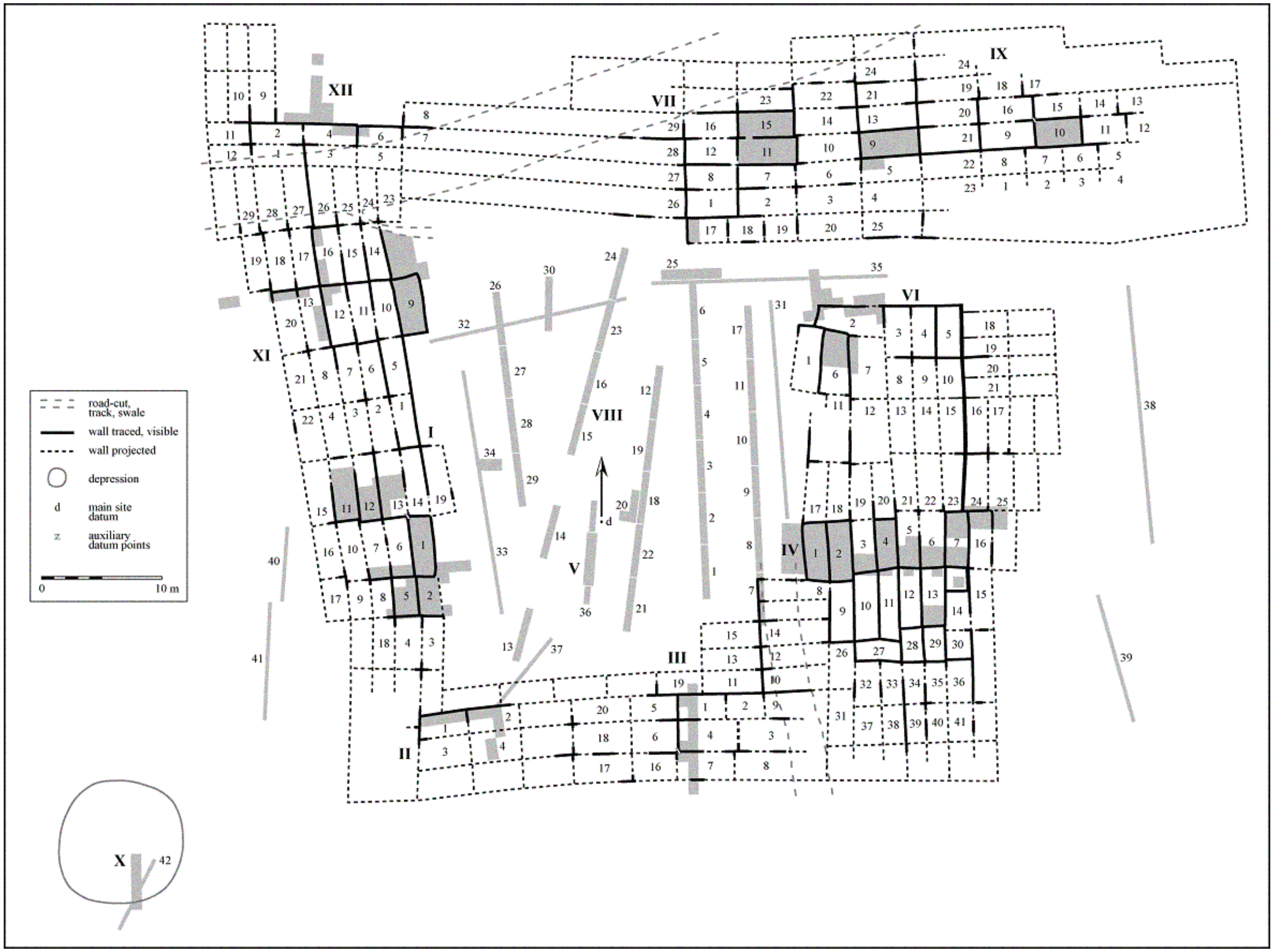


Fig. 8.6. Plaza Montoya Pueblo, excavated areas, 2001-5.

The nine room-block tests cover c. 8% of the approximate total of 2,700 m^2 of roofed space at Plaza Montoya. Of some 250 ground-floor rooms, 13 were completely or almost completely and another 27 partly excavated. A further 62 rooms were sufficiently exposed (i.e. at least three corners could be established) through wall-scraping and excavation to yield basic room dimensions. A total of 42 trenches mostly in the central plaza comprise Area VIII. Area V refers to an early plaza test and Area X to a single offsite trench (Fig. 8.6). Beyond all this, the site was subjected to repeated walkovers within a radius of c. 200 m from the main datum point in the central plaza.

THE WEST ROOM BLOCK

Excavation started in June 2001 with a cluster of 1x1 m test-units in the west room block. The cluster was labeled Area I. Eventually, 22 units comprising all or part of Rooms I-1 through I-7 were excavated in 2001 and 2002 (Figs. 8.6-8.8). The tests provided the first data on room-block stratigraphy and construction sequence, and the basis for further work in the area in 2002 and 2003. In early 2002, wall-scraping to the north of the excavated Area I rooms revealed a peculiar adobe-brick wall running north from Rooms I-7 and I-10. The bricks had been set narrow side up in adobe mortar (Fig. 8.9). In 2004, when excavations were expanded northward, the brick wall turned out to form the narrow (5.95x1.60 m) Room I-12 (Fig. 8.7). This was the only room so built to be uncovered during the entire project.

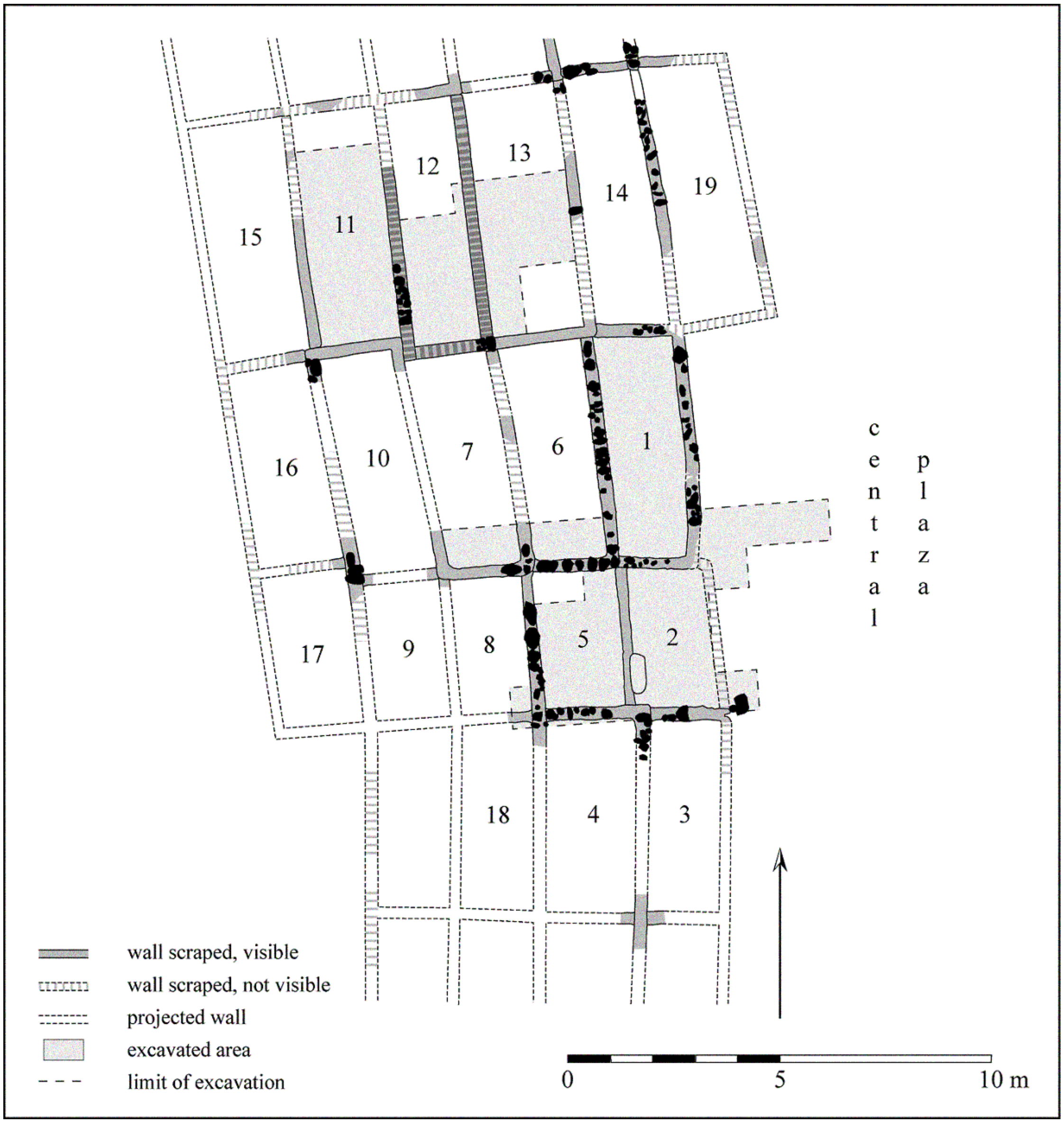


Fig. 8.7. West room block, plan of Area I excavations.

Fig. 8.8. West room block, Area I excavations. Visible are Rooms I-2 (center), 5 (left), 6 (upper left corner), and 1 (top, behind label board) (T. O'Laughlin, 6/2001).

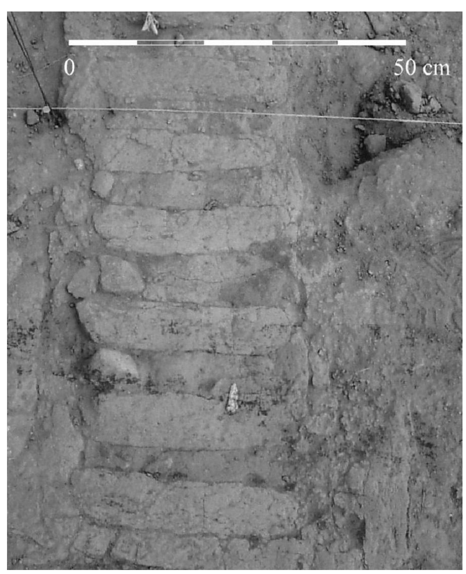


Fig. 8.9. West room block, Area I, Room I-12, section of adobe-brick wall (M. Bletzer, 7/2004).

In 2004, excavation tests were placed in Area XI in the room block's northern section. The northernmost six to 10 rooms in this area originally linked up with the north room block, but as the graded road runs right through the junction of the two room blocks almost nothing remains of these rooms (Figs. 8.5, 8.6). Further obscuring the situation is a swale that cuts from the road into the plaza. Despite the disturbances, it was hoped that major alignments could be verified and perhaps one or two interior corners of plaza-fronting rooms traced. The first test-units were therefore laid out along the projected plaza front in and north of what turned out to be Room XI-9, which was then completely buried. Only as excavations progressed did it become clear that the room protruded from plaza-fronting Rooms XI-1, 5, and 14. The three rooms, partly visible through surface rock alignments, had been outlined during earlier wall-scraping (Fig. 8.10).

In 2005, work in the area focused on several rooms located west of Room XI-9, i.e. in the high part of the room-block mound (Figs. 8.5, 8.6, 8.10). Up to that point, wall-scraping had been mostly restricted to the edge of the road cut and the plaza front. While interior walls had remained uncharted, mound height suggested relatively deep deposits, with walls perhaps still standing up to one meter high. In view of this, objectives were to locate walls and corners, measure room-block width, establish room stratigraphies in three adjoining rooms (XI-12, 13, and 16), and to find evidence of possible upper-story construction. To complicate things, the top of the mound was hidden under a mass of mesquite, so chances were that plant growth had obliterated at least some of the structural details targeted by the new excavations.

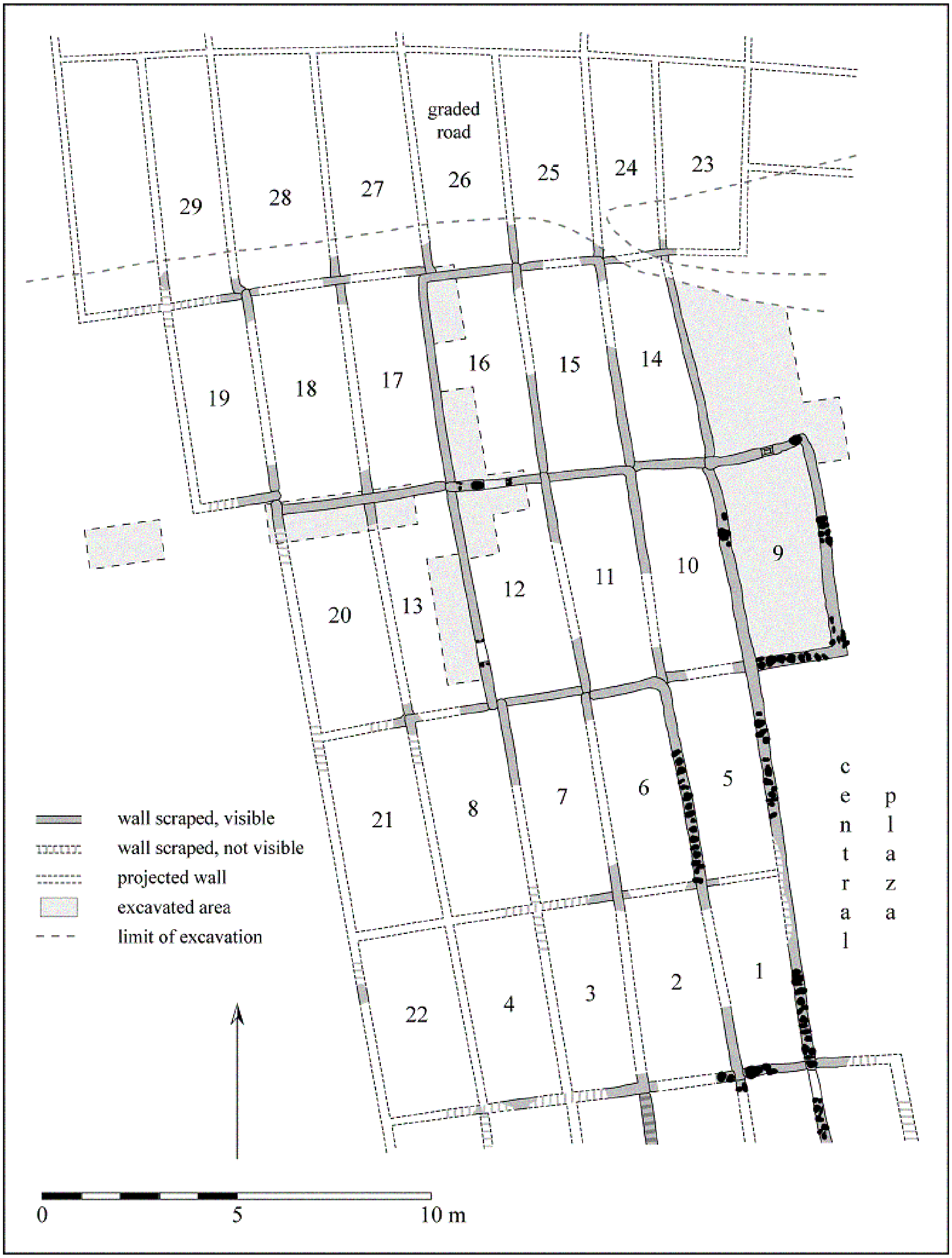


Fig. 8.10. West room block, plan of Area XI excavations.

As it was, root disturbance made it difficult to identify wall abutments especially in the western and southern parts of Area XI. In the rooms proper, this was not as much of a problem, simply because the rooms had few features susceptible to damage from roots. Walls survived to a height of 75 cm in Rooms XI-12 and XI-13, but occupation sequences were shallow. No more than two floors were encountered in any of the rooms tested, all buried under 50 to 80 cm of fill, much of it collapsed adobe. This and the presence in the fill of plastered and burned adobe fragments support the idea of a second story, a point examined more closely below. Across Area XI, the room-block was on average between five and six rooms wide. There was no clearly definable wall to mark the western edge of the room block, however (Fig. 8.10).

In all, 19 rooms were defined in Area I and 29 in Area XI. In Area I, 13 rooms could be measured for basic room dimensions. In Area XI, by contrast, this could be done in only 15 rooms. Rooms XI-24 through XI-29, for example, extended into the road cut, with the result that only the southern corners, cross-walls, and about 1.5 to 2.5 m^2 of adjacent floor areas were left (Fig. 8.10). Even less remained of Room XI-23. Here only the southwest room corner was visible. As suggested by wall-scraping and excavations, the room block was about 12 rooms long and five to six rooms wide, with extreme widths of three rooms at the southern and seven to eight rooms at the northern end. The southern end is still largely undefined. Few walls are left here, which makes it impossible to trace edges and outline peripheral rooms with any certainty (Figs. 8.5, 8.6).

THE SOUTH ROOM BLOCK

In June 2001, a number of 1x1 m test-units were excavated in the south room block in Areas II and III (Figs. 8.6, 8.11). Area II is located south of Area I at the junction of the west and south room blocks. Work in the area uncovered sections of Rooms II-1 through II-4. Rooms II-1 and II-2 turned out to have been partly built over refuse deposits which abutted the west room block. The first metal fragments found at the site came from this floor/sub-floor interface in Room II-1. Though depositional context is not entirely clear, the find has important chronological implications for this part of the pueblo.

Other than basic architectural data and the metal fragments, Area II produced little material of analytical value. Remains of walls and floors were badly preserved, a problem encountered throughout most of the room block, including large parts of Area III. Work there began with a trench of six 1x1 m units, which quickly revealed two east-west-trending rows of rooms extending north from the trench baseline, an alignment of large cobbles in the south wall of Room III-4 (Fig. 8.11). With very little material on the surface south of this alignment, it seemed to mark the room block's southern edge. This impression was shown to be false when brushing along the south face of the presumed outer wall exposed traces of a weathered adobe floor (Room III-7). Subsequent extension of the test-trench intersected a nearly eroded, east-west-trending, adobe wall. No other floors, walls, or structural features were found south of this line. The eroded wall itself could only be documented in and east of the test-trench, and at the junction of Rooms III-16 and III-17 (Fig. 8.11).

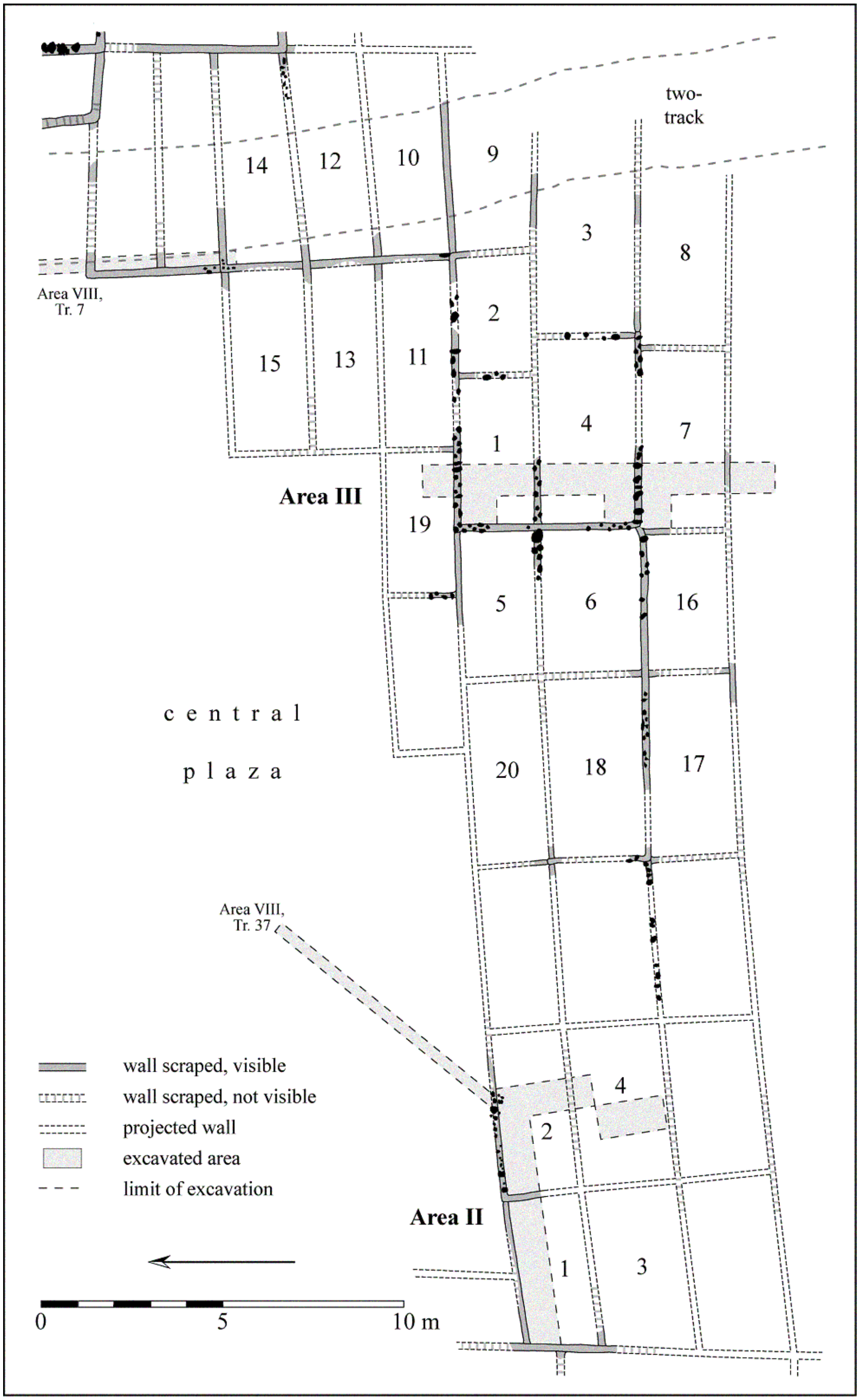


Fig. 8.11. South room block, plan of Area II and III excavations.

Defining peripheral walls on the plaza side of Area III was similarly difficult. The north wall of Rooms III-1 and III-2 could be followed with relative ease due to the large number of rocks in its foundation. This lead to the assumption that the two rooms had fronted the plaza. It also appeared as if the plaza front here had been recessed, for wall-scraping west of Room III-1 exposed a short section of a cross-wall extending into likely plaza space. Through further wall-scraping in the plaza and off the east room block, however, more wall alignments, all of adobe, were uncovered. These alignments suggest that the southern plaza front in this area had been staggered, with a number of east-west-trending rooms built into the corner formed by the south and east room blocks. Unfortunately, not enough adobe was left to clearly establish room outlines and identify room corners. In particular along the two-track between the two room blocks, the surface had been scoured to a depth that exceeded all wall foundations (Figs. 8.5, 8.6, 8.11).

Overall, the south room block was no more than eight rooms long and three to four rooms wide. Given the lack of a defined mound, there were probably no upper-story rooms. Total number of rooms thus seems to have been between 25 and 30. The estimate includes the east-west-trending rooms in the southeast plaza corner. Six rooms of the south room block (three in Area II and three in Area III) were tested through excavation. A total of 11 rooms (10 in Area III) could be traced and measured, but again the level of structural deterioration within and across rooms was such that many gaps remain in the plan view of this room block (Fig. 8.11).

THE EAST ROOM BLOCK

Testing of the east room block began in 2001 in Area IV with six 1x1m units laid out along a visible east-west wall alignment. The units were spaced so as to cover the width of the room block. Between 2002 and 2004, excavations were expanded to include all of Rooms IV-1 and IV-2, as well as parts of Rooms IV-3 through IV-7 (Figs. 8.6, 8.12). In addition, more wall-scraping was done in the room block's southern portion and on the plaza front north and south of Room IV-1. While wall abutments showed IV-1 to be a late addition to the Area IV rooms, exploration of its outer wall face and work in the adjacent plaza area (Area VIII, Trench 7) revealed the additional wall foundations, mentioned above, in the corner between the south and east room blocks.

By the end of the 2005 season, 11 rooms had been extensively tested, with three (IV-1, 2, 4) completely and one (IV-7) almost completely excavated. Wall alignments and room corners had been documented across much of the south-central part of the room block (Figs. 8.6, 8.12). Most surprising had been the discovery through excavation in and around Room IV-16 of a plaza surface east of the room block. Neither surface distribution of artifacts nor wall-scraping had suggested the presence of such a surface. As in the other room blocks, however, peripheral walls and floors/surfaces were poorly preserved. While some interior walls were found to be up to 60 cm high, there were at best a few centimeters of walls in rooms fronting the central plaza area. Even less remained of exterior rooms on the east side of Areas IV and VI where the slope of the mound was steepest (Fig. 8.5). Another problem was the very dense and deep-rooted vegetation between Areas IV and VI. This prevented exploration of more than a dozen walls and room corners in the center of the room block (Figs. 8.12-8.14).

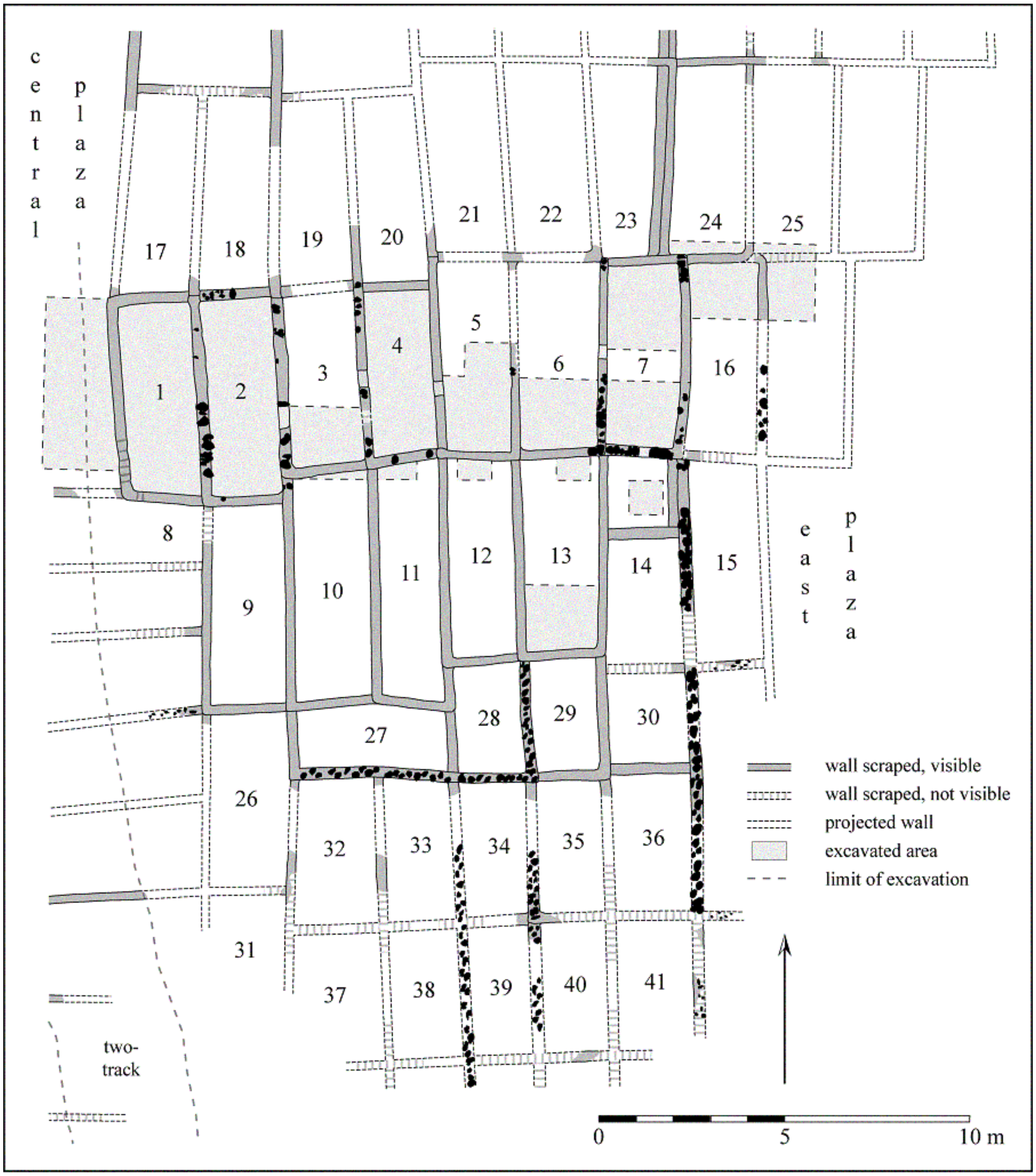


Fig. 8.12. East room block, plan of Area IV excavations.

Fig. 8.13. East room block, cholla/mesquite vegetation between Areas IV and VI. View is to the southeast (T. O'Laughlin, 6/2004).

In Area VI, wall-scraping and testing began in 2002. Initial work targeted a partly visible rock alignment which seemed to mark the northern edge of what would become Rooms VI-2 and VI-3 (Figs. 8.6, 8.14). The rationale behind this selection was twofold: (1) more data were needed to evaluate the assumption that peripheral rooms were primarily late rooms, and (2) such rooms had yet to be clearly identified in Area VI. This also meant that the plaza entrance Marshall and Walt (1984: 194) had projected in this area still remained conjectural. Interior walls in the southern part of the area were largely out of reach due to vegetation. As far as could be traced, the layout of Area VI rooms south and east of Room VI-3 seems to be quite regular. Plaza-fronting rooms on the west side of the area were apparently more diverse in size and alignment, with the most irregular being Room VI-2 in the northwestern corner of the room block (Fig. 8.14).

Fig. 8.14. East room block, plan of Area VI excavations.

Similar to Area IV, work in the eastern part of Area VI revealed more extensive structural remains than could be expected from surface observations. From Room VI-5 south to Room IV-23, wall-scraping showed that the east walls of these rooms had been reinforced by a wall addition to the inner face of the original wall, producing a double wall up to 70 cm wide. As wall-scraping proceeded, it seemed increasingly likely that this double wall marked the final edge of at least the northern half of the east room block. Next, however, exploratory brushing along the outer face of the original wall uncovered a series of six wall abutments. Five of the abutments suggest east-west- and one suggests north-south-aligned rooms (Fig. 8.14). How many rooms were attached to the room block is unclear, however (Figs. 8.5, 8.6). If surface distribution of artifacts is any indication, the eight easternmost rooms in Figs. 8.12 and 8.14 represent the eastern limit of architecture in the east room block. Otherwise, the rooms are conjectural, for no vestiges of walls and floors survive on the lower slope of the east-block mound.

Excavations in Area VI focused on Rooms VI-2, 6, 7, and the presumed plaza entrance. With no walls extending north from VI-2 and VI-3, existence of the ground-level entrance was confirmed. A lack of plaza features in the area outside Room VI-2 suggests that the entrance was kept empty, surely to facilitate access to the central plaza area. As for the rooms tested, walls and floors were much eroded and, in Room VI-6, partly disturbed by looting. Rooms VI-1 and VI-11 in the projected plaza front could not be completely outlined as key stretches of walls were missing. In all of Area VI, only seven of 21 numbered rooms furnished reliable dimensions (Fig. 8.14).

THE NORTH ROOM BLOCK

Preliminary work in the north room block began in the summer of 2002. A 5x5 m magnetometer test grid was laid out opposite Area VI to help define the plaza entrance, supplemented later by a 7x12 m test grid (Kemrer 2002a, 2002b). Wall-scraping initially concentrated on Area VII in the central part of the room block. In February 2003, this effort was expanded eastward to Area IX, and followed in May 2003 by a magnetometer survey of an 11x30 m grid in the same area (Kemrer 2003). Despite the leveled surface and furrows of the old drip-irrigation system, walls showed up reasonably well along a central east-west axis between Rooms VII-12 and IX-10. Given the slight west-to-east dip of the north-block mound and its pronounced slope toward the plaza, however, preservation was poor elsewhere (Figs. 8.5, 8.6, 8.15, 8.16). Of the final plaza front in Area VII, only five rooms (VII-17 through VII-20, plus VII-25) were identified. In Area IX, all plaza-fronting rooms were gone. Possible alignments shown as anomalies on the magnetic map of the Area IX test grid could not be traced further east than Rooms IX-12 and IX-13 (Figs. 8.16, 8.17).

To get a first idea of room sequences, test-units were placed in the summer of 2003 in a portion of Area VII where depositioning seemed deepest. This test came to encompass all of Rooms VII-11 and VII-15. Additionally, two 1x1 m units were set up in poorly preserved Room VII-17 (Fig. 8.15). Its downslope location promised little in the way of room features or artifacts, yet since wall-scraping had indicated that it was one of the last rooms built in Area VII it seemed a good spot to try to establish a plaza-front stratigraphy. Similarly, wall-scraping suggested a later position (relative to Rooms VII-11 and VII-15) for Rooms VII-5 and VII-9. Located just inside the leveled part of the mound, these two rooms, too, were tested in 2003. There remained only enough of their walls to outline VII-9 (Fig. 8.15). Excavation of the room revealed that at least one floor had been destroyed during the grading of the area. This probably also applies to Area IX rooms, for excavation of what proved to be a badly deteriorated Room IX-10 uncovered traces of a multi-floor sequence (Figs. 8.16, 8.17).

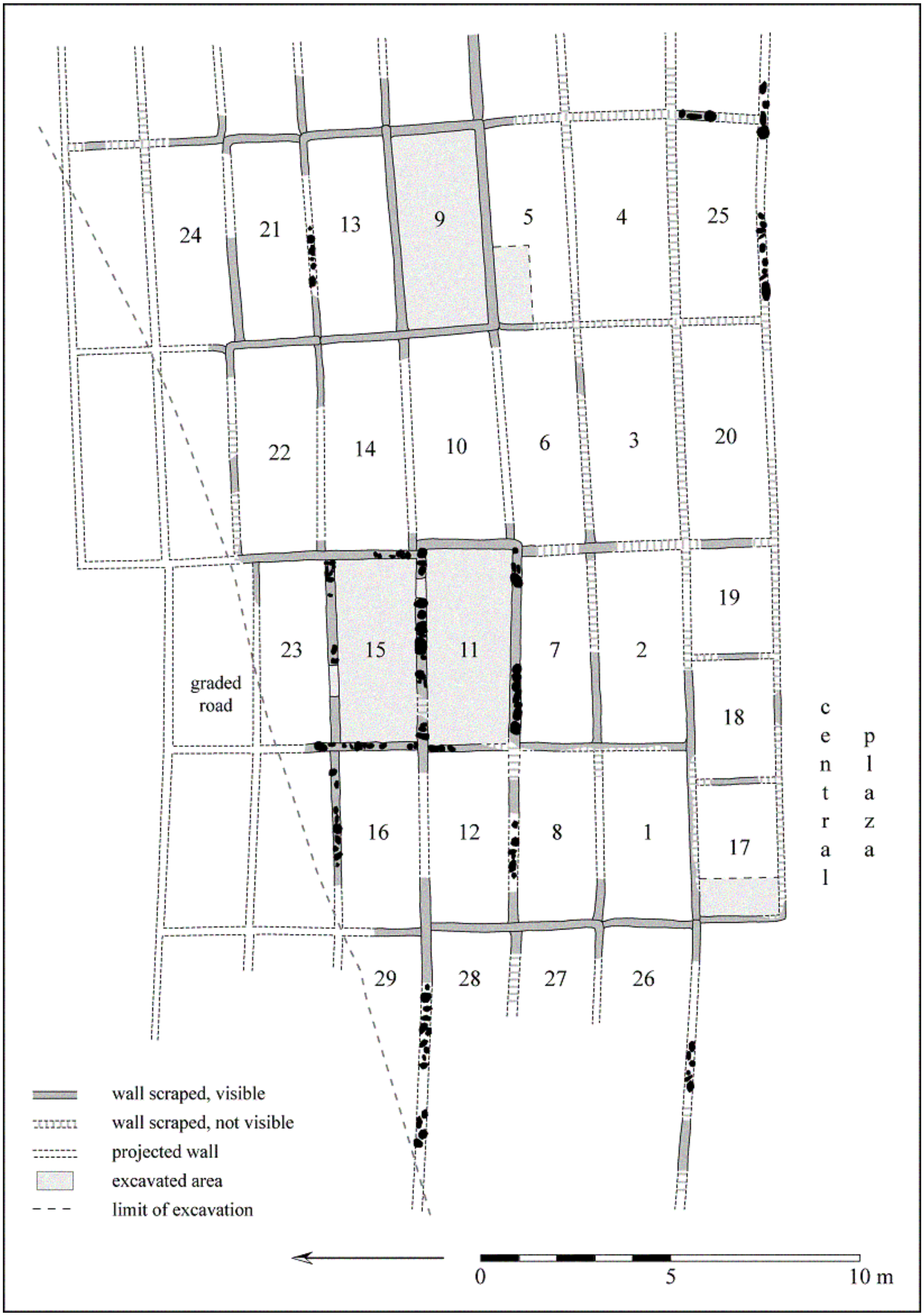


Fig. 8.15. North room block, plan of Area VII excavations.

Fig. 8.16. North room block, plan of Area IX excavations.

Fig. 8.17. North room block, Area IX, wall foundations with pin flags marking room corners. Partly overgrown mounds in background are material pushed out during grading of the area (before 1980). View is to the east (M. Kemrer, 5/2003).

In 2005, final test excavations in the north room block were carried out on the far side of the graded road. Here, in Area XII, a rock foundation between Rooms XII-7 and XII-8 lined up with walls in Areas VII and IX (Figs. 8.6, 8.18). Clearing of the edge of the road cut revealed several cross-walls. With twice as many such walls recorded on the south side of the road in Area XI, the Area XII cross-walls suggest that most of the north room block in this area had only two rows of east-west-trending rooms, and that most of the rooms at the junction with the west room block were oriented north-south. Wall-scraping and excavation outside Rooms XII-4 and XII-6 unearthed no further structures, but four shallow wall alignments extending north and east from Room XII-2 hint at a structural annex of unknown size at the western end of the room block (Fig. 8.18).

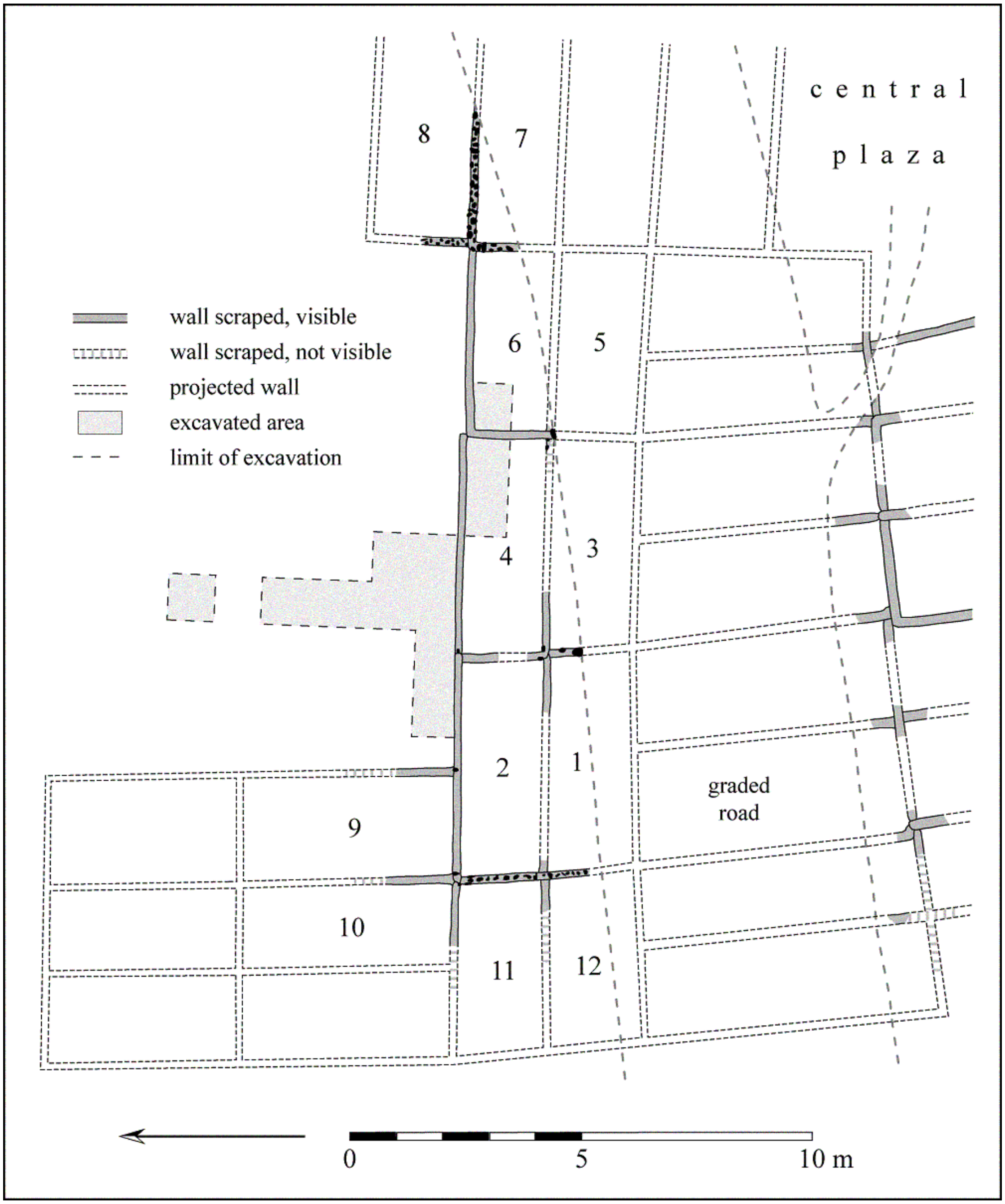


Fig. 8.18. North room block, plan of Area XII excavations.

The realization that another suite of rooms could be attached to the northwestern margins of Area XII recalled the earlier discovery of rooms east of the double wall in Area VI. As in that case, no rooms could be outlined, but given the absence of artifacts on the ground outside Room XII-2 it seems unlikely that there were more rooms than are projected in Fig. 8.14. In all, 65 rooms were labeled in the three areas of the north room block (Figs. 8.6, 8.15-8.18). Thirty-one rooms (20 in Area VII, eight in Area IX, and three in Area XII) were traced to an extent that allowed measuring or calculating of room dimensions. Eight rooms were excavated, four of them (VII-9, 11, 15, and IX-10) completely. In the final stage of construction, the room block probably had about 100 ground-floor and a smaller number of upper-story rooms. Taking into account the various disturbances and the condition of peripheral rooms, the total figure can only be an approximation, however.

PLAZA AND OFFSITE LOCATIONS

As I mentioned in Chapter 7, among the more conspicuous surface characteristics of the Plaza Montoya site is the lack of depressions that might indicate kivas. At neighboring Las Huertas Pueblo (LA 282), for instance, one such depression cannot be missed by even the most casual observer (Fig. 5.8; cf. Earls 1987, Figs. 4, 5). Considering the nature of architecture at Plaza Montoya, there remains the possibility that a kiva or kivas could have been filled over time with adobe rubble and wind-/water-born sediments (cf. Marshall and Walt 1984: 194). A closer look at space beyond room blocks seemed therefore warranted, all the more so as there is also no surface evidence of midden areas or outlying structures. Between 2002 and 2005, excavation tests were placed in three areas, labeled V, VIII, and X. Areas V and X were limited tests in the central plaza and off the west room block, respectively. Area VIII, by contrast, included an extensive array of test-trenches in the plaza as well as off the east and west room blocks (Fig. 8.6).

Area V

In the sequential order of labeling areas of excavation, Area V marks the locale of the first plaza test. In August 2002, five contiguous 1x1 m units were placed in a sandy, roughly circular, area with little vegetation in the southern half of the plaza (Figs. 8.6, 8.19). The area appeared to be slightly lower than the surrounding surface. Laid out so as to intersect the edge of this apparent depression, the test-units could be expected to uncover a perimeter wall if the depression really were a kiva. No wall or other feature was encountered, however, and there were only few artifacts. Nor did augering of a 10x20 m grid around the test-units yield any more tangible results.

Area VIII

Shortly after the Area V test, there arose the opportunity to run a magnetometer survey of the central plaza area. To that end, three roughly north-south-trending transects were cleared of vegetation (Figs. 8.19, 8.20). The transects skirted the densest stands of cholla and mesquite because these could not be cut back by hand, and because at that point, with little understanding of plaza stratigraphy and distribution of plaza features, use of heavy equipment seemed imprudent. The survey recorded several magnetic anomalies in each transect (Kemrer 2002a). Based on the magnetometry readings, test excavations of the transects were planned for the following field season.

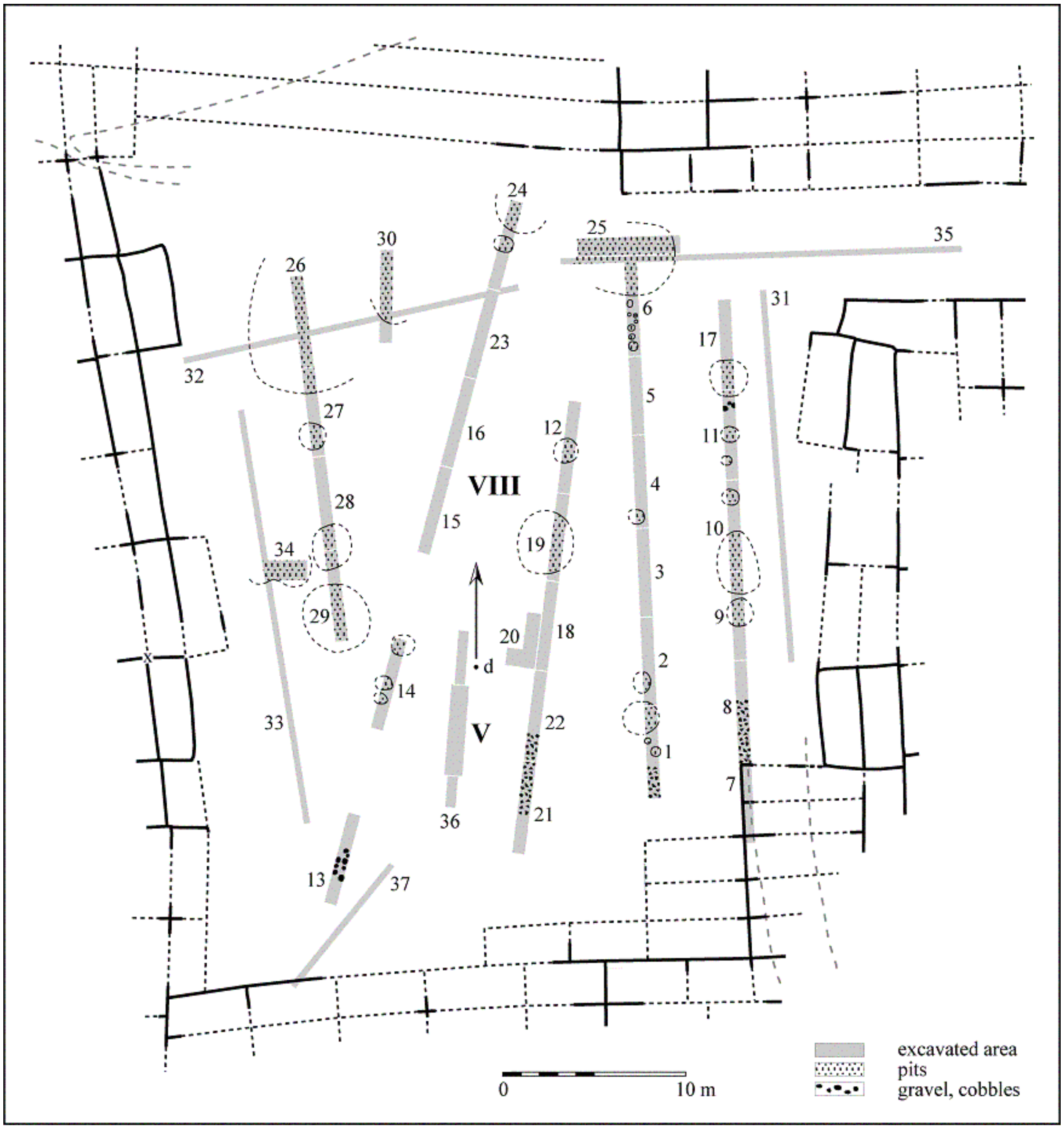


Fig. 8.19. Central plaza, plan of Area VIII excavations, trenches with major features uncovered during testing (not all features shown). Trenches VIII-1 through 6; VIII-12, 18, 19, 21, 22; and VIII-13 through 16, 23, and 24 are on the three magnetometer transects. Note also the location of the Area V test.

Fig. 8.20. Central plaza, Area VIII, the line of (from near to far) Trenches VIII-12, 19, 18, 22, and 21. View is to the south (T. O'Laughlin, 6/2003).

For practical reasons and to facilitate documentation, the magnetometer transects were divided into 5x0.5 m segments. Numbering of segments selected for testing mostly followed the order in which work was done. Along the transects, a total of 18 trenches were excavated in 2003 and 2004, as were another 12 trenches (VIII-7 through 11, 17; VIII-25; VIII-26 through 29; and VIII-30) that were not aligned with the transects but located nearer the east, west, and north room blocks (Figs. 8.19, 8.20). The goals of these excavations were to learn what natural or cultural features were responsible for the anomalies seen on the magnetic survey maps, to make out possible kiva locations, establish plaza stratigraphy in different areas, and to identify patterns of plaza use by tracing distribution of plaza features and artifacts.

In 2005, seven more trenches (VIII-31 through 37) were placed inside the plaza, some of them in less accessible areas avoided previously (Fig. 8.19). Vegetation in these areas had been thinned during backfilling the previous summer. The main reasons for the expansion of trenches were to investigate gaps that might still contain a kiva, and to broaden the databases on plaza stratigraphy, features, and artifact assemblages. At the same time, two trenches (VIII-38, VIII-39) were also opened in what the Area IV excavations indicated had been a plaza surface outside the east room block, while on the other side of the pueblo two trenches (VIII-40, VIII-41) were placed just west of Area I. The last trench (VIII-42) was dug through Area X, but for descriptive consistency it was included with the Area VIII trenches (Fig. 8.6). All 2005 trenches were excavated with a mechanical trencher at a blade width of one foot (30 cm).

Area X

In 2004, a small test c. 15 m west of the southern tip of the west room block was labeled Area X. Five 1x1 m units were placed in a shallow, near-circular, depression measuring c. 10 m in diameter (Figs. 8.5, 8.6). Noted during walkovers because of its deep sandy soil and sparse vegetation, the depression was surveyed by magnetometer in October 2002 (Fig. 8.21). The resulting magnetic map indicated that a few cobbles visible on the surface just south of the depression might be part of a larger sub-surface alignment (Kemrer 2002b). Neither the excavation nor a deeper trench dug mechanically in 2005 confirmed the presence of such an alignment, however. There was no evidence of structural remains and the excavated material contained no artifacts.

Fig. 8.21. Offsite location, Area X. Stakes and string mark the plot surveyed by magnetometer in 2002. View is to the northeast (M. Kemrer, 10/2002).

Room-Block Sequences

The combination of remote-sensing, wall-scraping, and excavation generated a large amount of spatial and stratigraphic data for both room-block and plaza proveniences. Compared to what was visible on the ground prior to fieldwork, the horizontal extent of structural remains uncovered during the project is surprising, especially if one considers again the problem of identifying room-block peripheries. As shown on the site map and plans of excavated areas, peripheries are largely projected from known alignments, mound size, or, in the case of the north room block, size of disturbances. For the balance of this chapter, I describe such structural patterns as emerge from the study of wall relationships and stratigraphies in the four room blocks. Except for minor tests in Areas I (Rooms I-6, I-7) and IV (Rooms IV-13, IV-14), all room-block proveniences are included in this description. There is nothing unusual in the omitted proveniences, but given their proximity and structural similarity to more extensive tests nearby they need not be considered here. With the focus on room and room-block structure, I decided also to keep discussion of plaza and offsite proveniences to a minimum. These are of interest mainly in assessing the distribution of diagnostic artifacts, a subject taken up in the next chapter. As for the following description, this broadly reflects the order of excavations within and between room blocks. For each room block, I first look at bond-abut data per area, then at stratigraphic data for rooms tested per area. In Chapter 9, the resulting sequences are placed in absolute chronological context through analysis of diagnostic artifacts and radiometric dates. This sets the stage for the exploration of potential abandonment assemblages and a concluding verdict on Plaza Montoya's place in Piro settlement from pre-contact to late colonial/mission times.

THE WEST ROOM BLOCK

Area I Bond-Abut Patterns

Wall-scraping and excavation in Area I exposed 18 of a projected total of 28 room corners. Fourteen of the 18 corners could be fully traced, i.e. bond-abut relationships were defined for all walls making up these corners. For four corners only partial wall relationships could be recorded. Gaps remain south and west of Rooms I-3, 4, 8, 9, and 18; along Rooms I-15, 16, and 17; and between Rooms I-11, I-15, XI-4, and XI-22 (Figs. 8.7, 8.10). Little to nothing was left of wall foundations in these areas due to erosion and root disturbances. All recorded walls were of adobe, with only few having rock footings. Remaining wall height ranged mostly from five to 30 cm; nowhere did it exceed 50 cm. Traces of wall plaster could only be found in or near room corners.

Based on the bond-abut data, Room I-12 with its unique brick wall was the first room in Area I. In general in Puebloan architecture, expansion along the central long axis of a room block rarely seems to have been by single but rather by two or more adjoining rooms, a pattern suggesting early aggregation of households (Snow 1976a: A 159; Hayes et al. 1981: 16-17, 25-36; Cameron 1991a; Creamer 1993: 140-148; Riggs 2001). Considering this and the narrow shape of Room I-12, plus the position of nearby Room I-13 and that room's link with Rooms XI-2 and (by extension) XI-6, simultaneous construction of all four rooms appears most likely (Figs. 8.7, 8.10). The chart in Fig. 8.22 shows the position of Rooms I-12 and I-13 relative to the rest of Area I and the closest Area XI rooms. In its representation of a horizontal succession of room construction, the chart follows some of the basic principles of a Harris matrix used normally for illustrating vertical stratigraphic sequences (cf. Orton 1980: 66-73; Roskams 2001: 156-159).

After Rooms I-12 and I-13, the next rooms built were I-7 and I-11. The former abuts Room I-12 on the south, the latter on the west. Possibly also put up at that time or shortly thereafter was Room I-6. It abuts I-7 on the east, but pre-dates Rooms I-1, I-8, and all connected rooms. Without it, I-7 would have been a one-room extension of the core room block. Room I-1 was the only plaza-fronting room clearly defined in Area I, though the last addition to the plaza front may have been Room I-19. If indeed a room, I-19 could have been built with or after Room I-14 (which abuts Rooms I-13, XI-1, and, very likely, I-1) in a niche between Rooms I-1 and XI-1 (Figs. 8.7, 8.22).

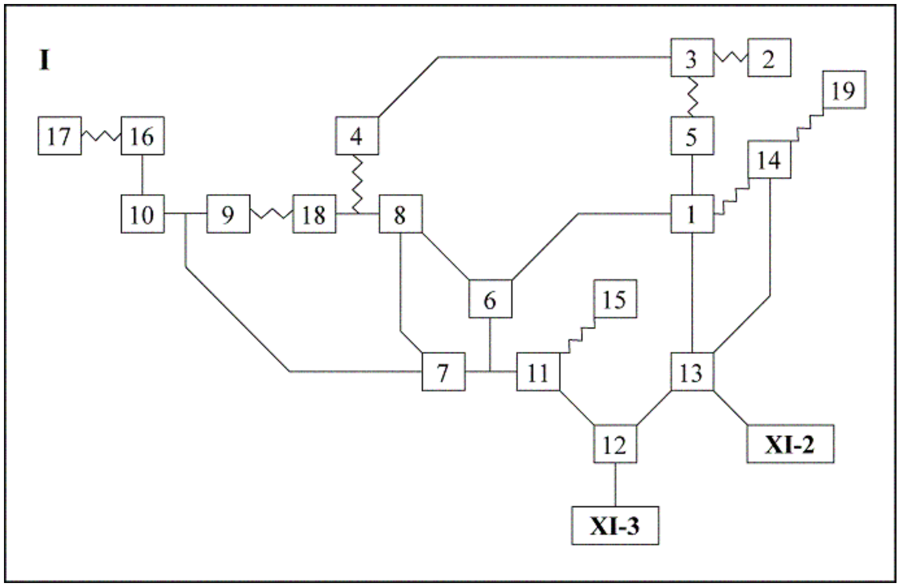


Fig. 8.22. West room block, Area I, room sequence based on wall relationships. Vertical and diagonal lines indicate wall abutments (i.e. sequential construction), horizontal lines wall bondings (i.e. simultaneous construction). Zigzag lines indicate likely relationships. No absolute time intervals are inferred.

West of I-7, Rooms I-9 and I-10 share a long west wall, and to the south Rooms I-8 and I-18 a long east wall (which abuts I-7 and, partly, I-6). Although few corners were exposed, it is possible that the rooms were added in one construction episode that may also have included a room (not numbered) west of I-18. To the east, Room I-4 was probably built after I-8 and I-18, and Room I-3 after I-4. A niche between Rooms I-4 and I-1/6 was closed with a wall that abuts I-4 and both I-6 and I-1, forming Room I-5. A similar wall from I-1 to I-3 may have created Room I-2, but no such wall was found. On the west side of the room block, Rooms I-15, 16, and 17 abut the rooms to the east. Relationships between the three rooms remain conjectural, however.

Area I Stratigraphies

Rooms I-1 and I-5

Given the moderate depth of above-ground remains across the site, all units were excavated in natural/cultural layers. In Area I, Room I-1, the uppermost such layer consisted of one to 10 cm of sand and between five and 10 cm of silty loam with some adobe rubble. In a few areas, it included lenses of water-lain clay and ash. Below all this lay a weathered adobe floor (Level 2, Floor 1) (Fig. 8.23a). No more than three centimeters of adobe remained, and in places even this was gone. In the room's center and off the east wall looters had dug two pits through the floor. Features associated with the floor were three mealing bins, two likely storage bins (b_1 and b_2 in Fig. 8.23a), a clay-lined hearth (h_1 in Fig. 8.23a), and a small unidentified depression. The southern third of the room with the mealing bins was two to four centimeters higher than floor level in the rest of the room. The walls of the mealing bins were eroded, but enough of the plastered basins remained to show the imprint of the missing metates (Figs. 8.23a, b).

No evidence of a lower floor related to the room was found. Along the east wall, however, two large pits extending under the wall were clearly plaza features (Fig. 8.23c). Excavation around the southern pit revealed a patch of adobe plaster which seems to have been part of a pre-room plaza surface (Level 3, Floor 2). The extent of the plaster is not known; in other areas the plaza surface was apparently just compacted soil. Both pits were filled with ash and charcoal. The excavated portion of the southern pit was 20 cm deep and had unlined walls and an irregular bottom. Its fill contained a number of burned and calcined bone fragments. No other plaza features were excavated.

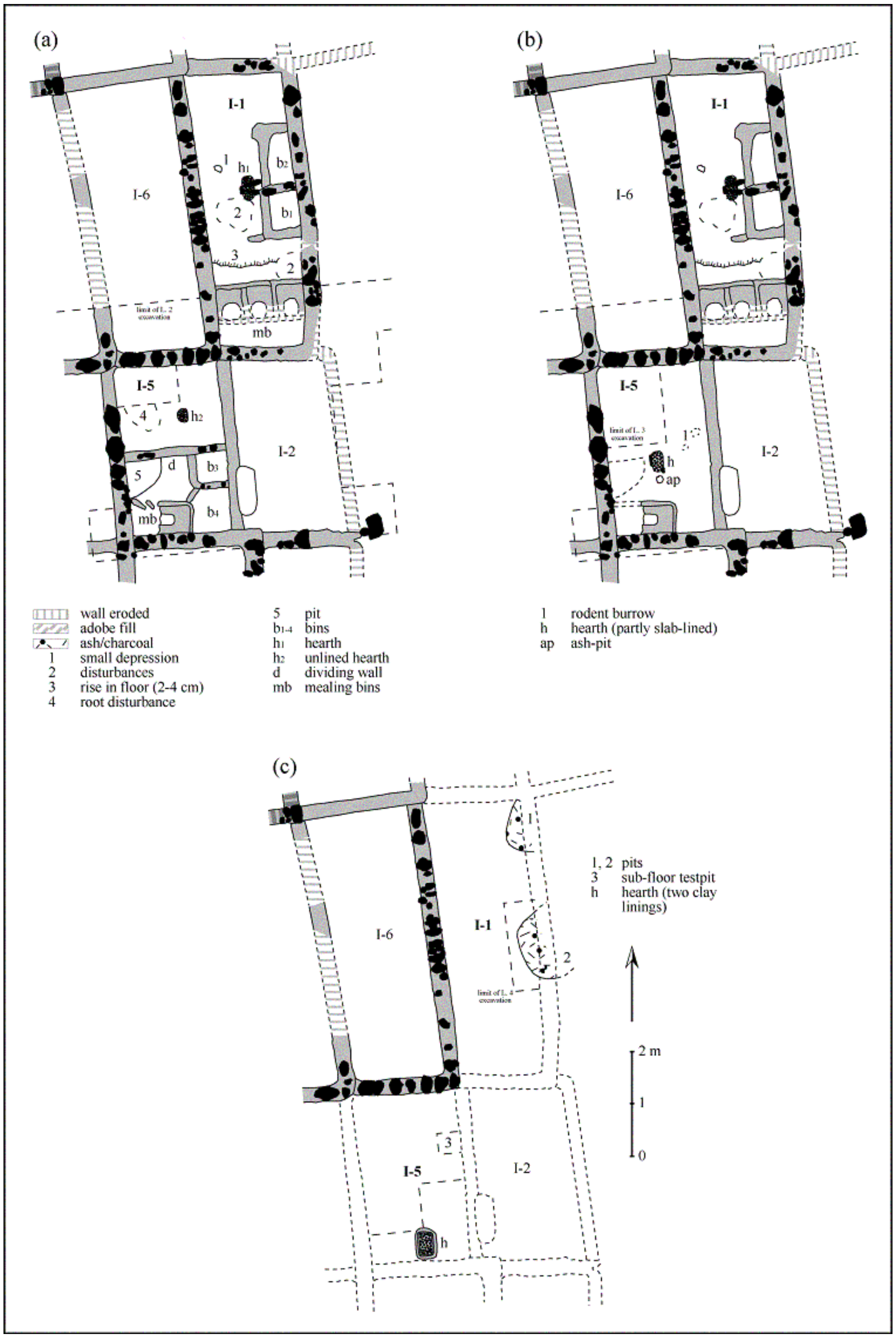


Fig. 8.23. West room block, Area I, Rooms I-1 and I-5, spatial-stratigraphic sequence: (a) I-1 and I-5, Level 2, Floor 1; (b) I-1, Level 2, Floor 1; I-5, Level 3, Floor 2; (c) I-1, Level 3, Floor 2 (plaza); I-5, Level 4, Floor 3 (plaza).[5]

[5] In all units, topsoil was labeled Level 1. As it was always without features, I excluded this level from room plans (but not from profiles). Numbering ascends from top to bottom levels. Also, as levels between adjacent rooms may be only roughly correlated, each room should first be considered separately.

In Room I-5, excavation of a top layer of 10 to 15 cm of sand and 10 cm of adobe rubble revealed a dividing wall and, in the room's southern half, two possible storage bins (b_3 and b_4 in Fig. 8.23a) and a single mealing bin (metate gone, but imprint visible). All bin walls save for those of the mealing bin sat atop an adobe floor (Level 2, Floor 1) six to eight centimeters thick (Fig. 8.24). Floor features were a hearth (h_2 in Fig. 8.23a) north and a pit south of the dividing wall. The pit at first seemed recent, but its sandy fill contained both organic and inorganic materials. A flotation sample from the pit produced 113 calcined fragments of human bone. Number/kind of fragments (long-bone, rib, skull) suggest a cremation burial of a sub-adult or older individual (O'Laughlin 2001-8).

Floor 1 rested on another adobe floor (Level 3, Floor 2) between four and eight centimeters thick. A few ash/dust lenses separated the floors.[6] Associated with Floor 2 were a partly slab-lined hearth (Figs. 8.23b, 8.24, 8.25) and a small ash-pit. The mealing bin, too, may originally have been a Floor 2 feature (Figs. 8.23b, 8.24). Below the floor, a thin layer of sand and ash (Level 3a) covered a level of compact soil (Level 4, Floor 3), into which had been sunk a large rectangular hearth (Figs. 8.23c-8.25). The hearth was 23 cm deep and had two clay linings. Both hearth and density of soil suggest that Floor 3 had been an outdoor surface. No other features were uncovered in the limited Level 4 excavation. Elevation below unit datum of Floor 3 was 55 cm (Fig. 8.24), very close to the 52 cm measured from the same datum point for the plaza-floor patch in Room I-1.[7]

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[6] Labeling of levels/floors follows the order in which they were encountered. Floors are labeled 1, 2, 3, etc. when separated by fill. A resurfaced floor and older floor with no fill in between are labeled 1a and 1b, 2a and 2b, etc., but only if the two floors cover the entire area excavated. In cases of partial resurfacing, only the lower floor carries a suffix (e.g. 1 and 1a).

[7] I use the term unit datum in reference to datum points established for two or more contiguous rooms. A datum point for one room is a room datum. Measurements taken from a given room datum cannot as such be used for comparisons with measurements from other rooms or groups of rooms.

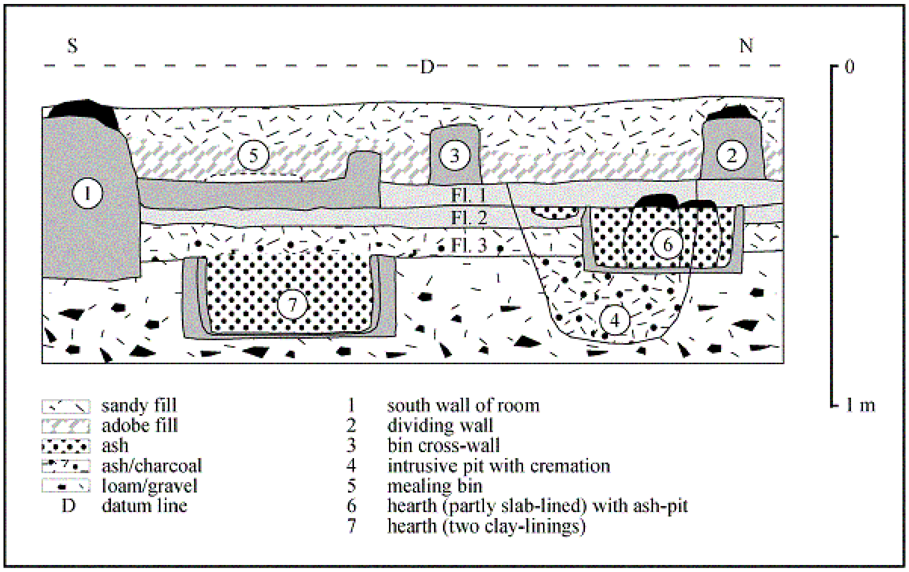

Fig. 8.24. West room block, Area I, Room I-5, south half of room, south-north stratigraphic sequence.

Fig. 8.25. West room block, Area I, Room I-5, hearths in Floors 2 (above label board) and 3 (below label board). Pit with cremation visible at upper left (M. Bletzer, 7/2001).

Rooms I-11, 12, and 13

The three contiguous Rooms I-11, 12, and 13 mark the transition from the lower southern to the higher northern half of the west room-block mound (Fig. 8.5). Bond-abut analysis identified Room I-12 as the earliest of the Area I rooms. Room I-13 was almost certainly built at the same time, and Room I-11 was probably added not long after that. Prior to excavation, both Rooms I-11 and I-12 were covered by a layer of sandy topsoil between five and 40 cm thick. The difference reflects the mound's south-to-north rise in this area. Removal of the topsoil in Room I-11 revealed a weathered adobe floor (Level 2, Floor 1) (Fig. 8.26a). As the room had to be partly cleared of dense vegetation, it was not much of a surprise to find that root disturbances had destroyed almost all residues of floor and walls in the northern third of the room. Such was also the case in Room I-12. Only one feature, a clay-lined hearth near the center of the room, was located in the remaining floor area of I-11 (Fig. 8.26a).

Other than Floor 1, no use surface was directly associated with the room. The adobe floor was between four and six centimeters thick and had been laid down on c. five to seven centimeters of sand, sandy loam, and some adobe rubble (Level 2a). Limited excavation below this level uncovered a plane of moderately compact soil. Though in itself not very conspicuous, the plane was labeled Level 3, Floor 2, because of ash and charcoal that had been scattered on top of it. The bulk of the scatter underlay the southern end of the room's west wall (Fig. 8.26b). This points to an outdoor surface used for, if nothing else, refuse disposal. No further cultural material or features were found in the sub-floor test. Average elevation of Floor 2 below unit datum was 36 cm.

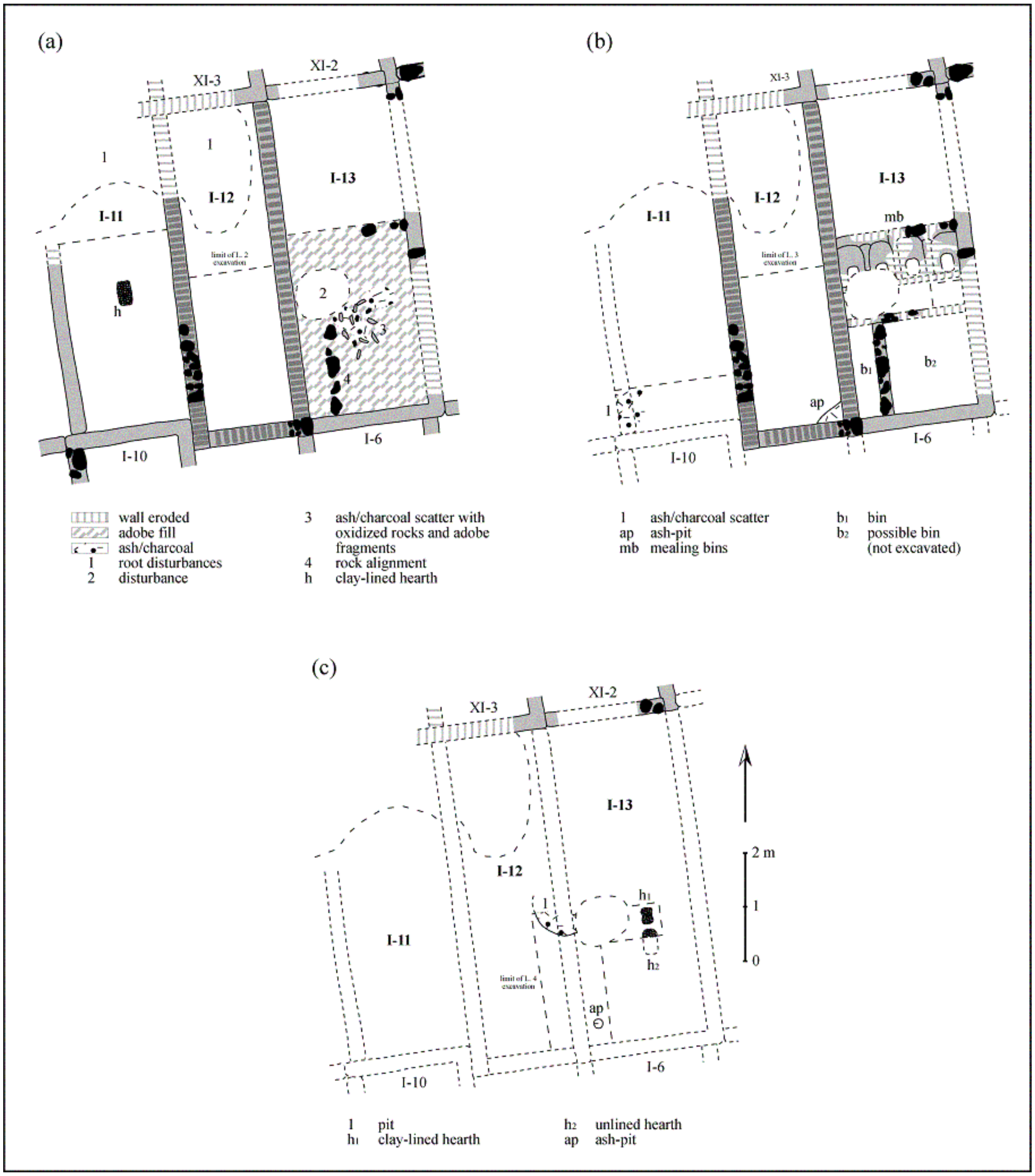

Fig. 8.26. West room block, Area I, Rooms I-11 through 13, spatial-stratigraphic sequence: (a) I-11 and I-12, Level 2, Floor 1; I-13, Level 2; (b) I-11, Level 3, Floor 2 (pre-room surface); I-12, Level 3, Floor 2; I-13, Level 3, Floor 1; (c) I-12, Level 4, Floor 3 (plaza); I-13, Level 4, Floor 2 (plaza).

As in Room I-11, the first floor (Level 2, Floor 1) encountered in Room I-12 was a layer of adobe from four to six centimeters thick. Due to a dense stand of mesquite and the extent of root disturbances noted during wall-scraping, only the southern half of the room was excavated. No features (Fig. 8.26a) and only few artifacts were found in this area. Excavation below Floor 1 exposed another, slightly less substantial (3-5 cm), adobe floor (Level 3, Floor 2). While also lacking in features, a small ash-pit (sunk less than one centimeter into the floor) was located in the room's southeastern corner (Fig. 8.26b). It contained one artifact: a large, Archaic-looking, projectile point (Fig. 8.27). Neither in size nor structure did the ash-pit resemble a Spanish-style fireplace (cf. Fig. 4.13), nor was there any sign of *in-situ* burning. Even so, its presence in, of all places, Room I-12 is intriguing. Along the east wall, excavation was carried below the floor into fill (Level 3a). In depth and texture, this level was identical to Level 2a in I-11, and it likewise ended with a plane of compact soil (Level 4, Floor 3). The top of a large circular pit (filled with sand/ash and continuing under the wall into Room I-13) paralleled this obvious pre-room surface (Fig. 8.26c). Elevation of the surface below unit datum ranged from 42 cm at the edge of the pit to 37 cm near the room's south wall.

Unlike Rooms I-11 and I-12, Room I-13 produced several features in the half of the room that was excavated. The sandy topsoil covering the room varied in depth from three centimeters in the southeast to 25 cm in the northwest corner of the room. Below it was a compact layer of adobe debris (Level 2) up to 25 cm deep. Except for an apparent looters' pit near the west wall, the entire excavated area was filled with this material (Fig. 8.26a). In the middle of the area, an ash/charcoal scatter was found mixed in with the adobe. Associated with the scatter were oxidized fragments of basalt slabs and chunks of plastered adobe, all no doubt from an upper-story hearth. Near the west wall, some basalt cobbles formed a short alignment parallel to the wall. As work progressed, this became a rock-adobe wall that abutted a cross-wall 1.8 m from the room's southern end. The walls created at least two possible storage bins, and the cross-wall was also the base wall of four mealing bins (Fig. 8.26b). Despite the unusual location within the room and despite their bad condition, enough of the bins remained to show where the metates had been (Fig. 8.28). In the westernmost bin, the fill contained a piece of sheet copper. What had been an adobe room floor (Level 3, Floor 1) survived in some places. Just under the floor was a layer of hard-packed soil (Level 4, Floor 2) (Fig 8.26c). Two hearths, an ash-pit, and the large pit first seen in Room I-12, Floor 3, were part of this layer. Elevation was between 39 and 41 cm below unit datum. Deeper test-pits in both Rooms I-12 and I-13 proved sterile and only revealed a sub-floor matrix of sand, silty loam, and gravel.

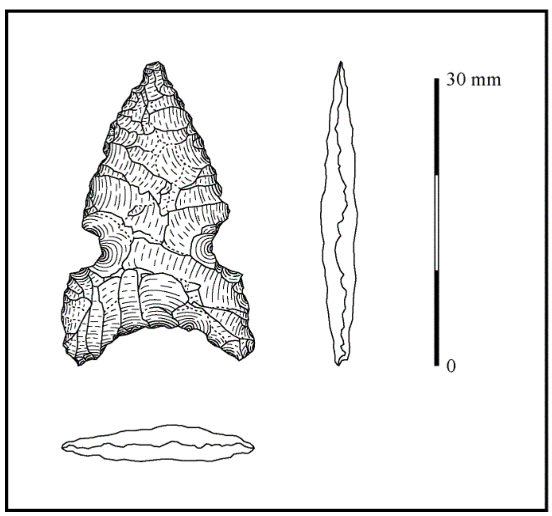

Fig. 8.27. West room block, Area I, Room I-12, projectile point (white chert) from Level 3, Floor 2, corner ash-pit (M. Bletzer, 8/2006).

Fig. 8.28. West room block, Area I, Room I-13, remains of mealing bins on Floor 1. Disturbance visible at lower right (M. Bletzer, 6/2004).

Area XI Bond-Abut Patterns

As mentioned earlier, identification of room corners in Area XI was difficult because of the profuse plant growth in the area. Ultimately, 22 could be recorded, but 10 projected corners eluded trowel and brush. In the southwestern part of the room block, walls were least preserved, resulting in a significant gap in the structural record of Rooms XI-3, 4, 7, 8, 21, and 22 (Fig. 8.10). A further problem emerged during wall-scraping in that many traced walls were short and ended in four-way abutments. As recorded, the distribution of recorded corners can only suggest that the first rooms in Area XI were part of a cluster that included Rooms XI-3, 4, 7, 8, 12, 13, and 20 through 22. Fig. 8.29 illustrates established and projected relationships between these and later Area XI rooms.

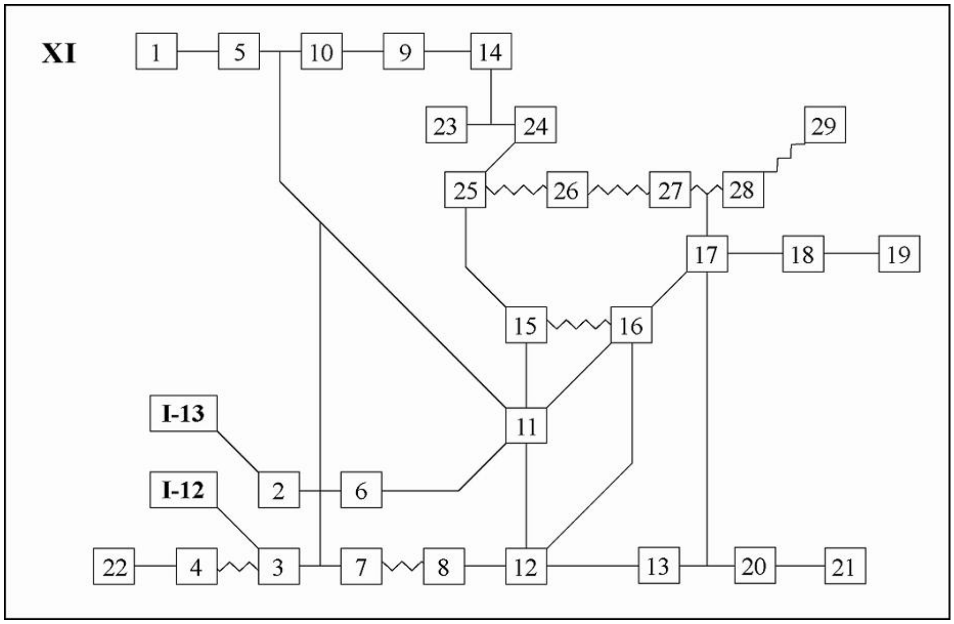

Fig. 8.29. West room block, Area XI, room sequence based on wall relationships.

The earliest additions to the original nine-room cluster were Rooms XI-2 and XI-6. Added to XI-6 was Room XI-11, to which was then joined Room XI-15. The latter was probably erected when Room XI-16 was appended to the north side of Room XI-12. Sometime thereafter, the niche between XI-16 and Rooms XI-13 and XI-20 was filled with Rooms XI-17, 18, and 19. Not much later, perhaps, rooms were added in the area now cut by the graded road. The last of these rooms were XI-23 and XI-24, and possibly XI-29 with one more room (not numbered) to the west of it. For Rooms XI-25 through 28 the sequence is conjectural. Toward the plaza, Rooms XI-1, 5, 9, and 10 were added to the row of Rooms XI-2 to XI-15. Room XI-14 was likely built at the same time into the niche between Rooms XI-9/10 and XI-23/24 (Fig 8.10).

Area XI Stratigraphies

Room XI-9

Excavation of Room XI-9 was part of an effort to define the plaza front in Area XI. Removal of from two to 10 cm of sandy topsoil revealed two cross-walls, which showed that this was a room. Except for the northwest corner and a recent disturbance, the room was full of adobe debris (Level 2). Ash, charcoal, and burned basalt cobbles were scattered across a small area of the rubble layer (Fig. 8.30a). Up to 15 cm deep, the debris covered a battered adobe floor (Level 3, Floor 1). Associated with the floor were four mealing bins, an apparent storage bin, and a clay-lined hearth with ash-pit (Fig. 8.30b). Below the remaining floor, which was nowhere more than two centimeters thick, a thin (<5 cm) layer of sandy loam with some adobe rubble (Level 3a) was encountered. This material rested on the hard soil of a plaza surface (Level 4, Floor 2). More than a dozen plaza features were exposed in the room and in the area north of it (Figs. 8.30c, 8.31a). In a pit under the east wall of Room XI-14, three calcined human incisors and a number of bone fragments (long-bone, scapula, skull) were noted. The pit was not excavated, but judging by the visible remains it probably held several cremations. Floor 2 capped a layer of loam with some adobe debris (Level 4a). In the northwest room area a badly corroded iron bolt was found embedded in adobe (Figs. 8.30d, 8.31b, 8.32). Below this material lay a plane of packed soil all but identical to the upper plaza surface. Another dozen or so features marked the plane as an older plaza surface (Level 5, Floor 3). The features (which included at least two cremations) were arranged differently than those on the upper surface. At 60 cm below room datum, the lower plaza surface was the oldest cultural layer encountered in the Room XI-9 excavation (Fig. 8.30d, 8.31b).

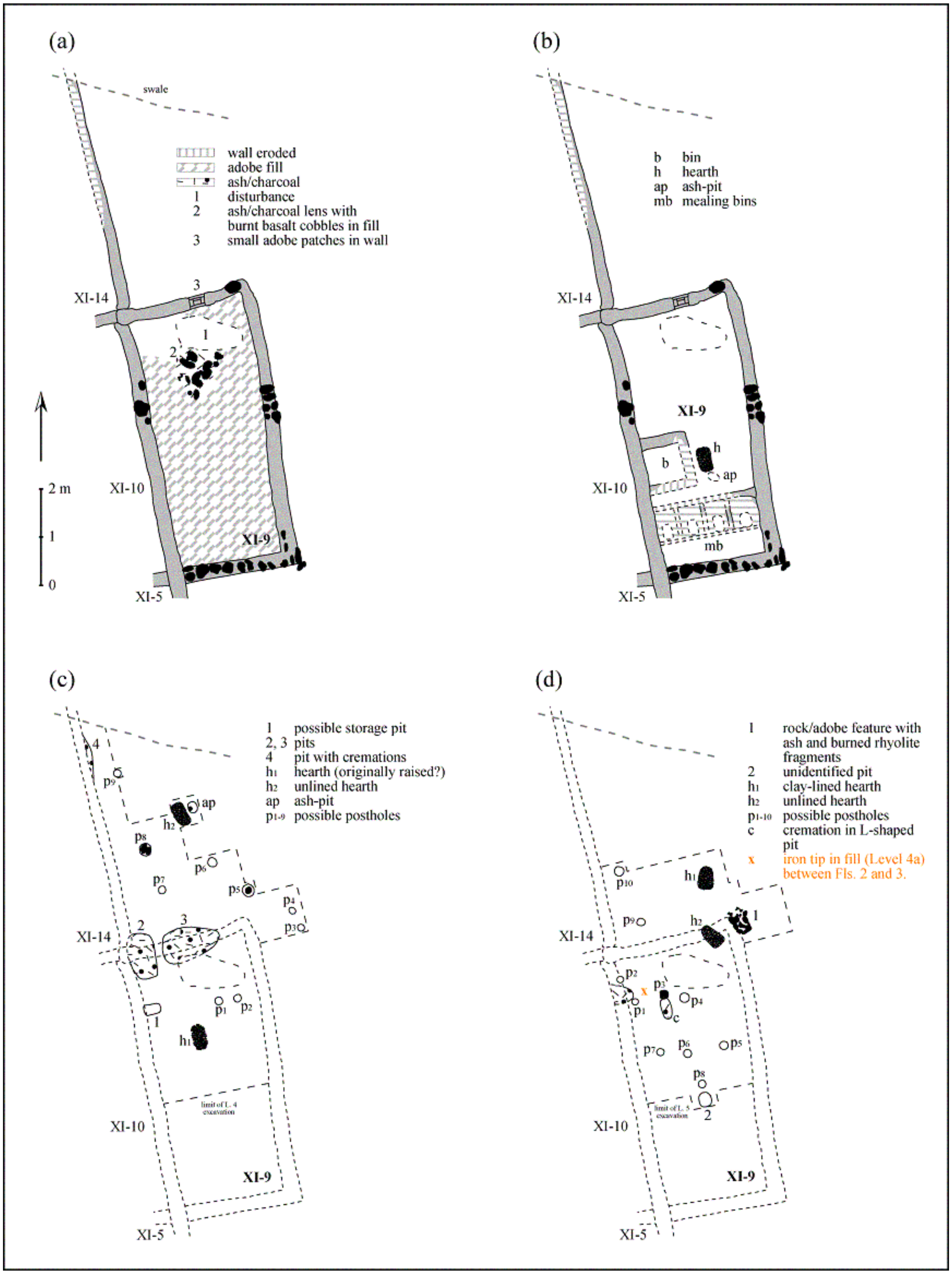

Fig. 8.30. West room block, Area XI, Room XI-9, spatial-stratigraphic sequence: (a) Level 2; (b) Level 3, Floor 1; (c) Level 4, Floor 2 (plaza); (d) Level 5, Floor 3 (plaza).

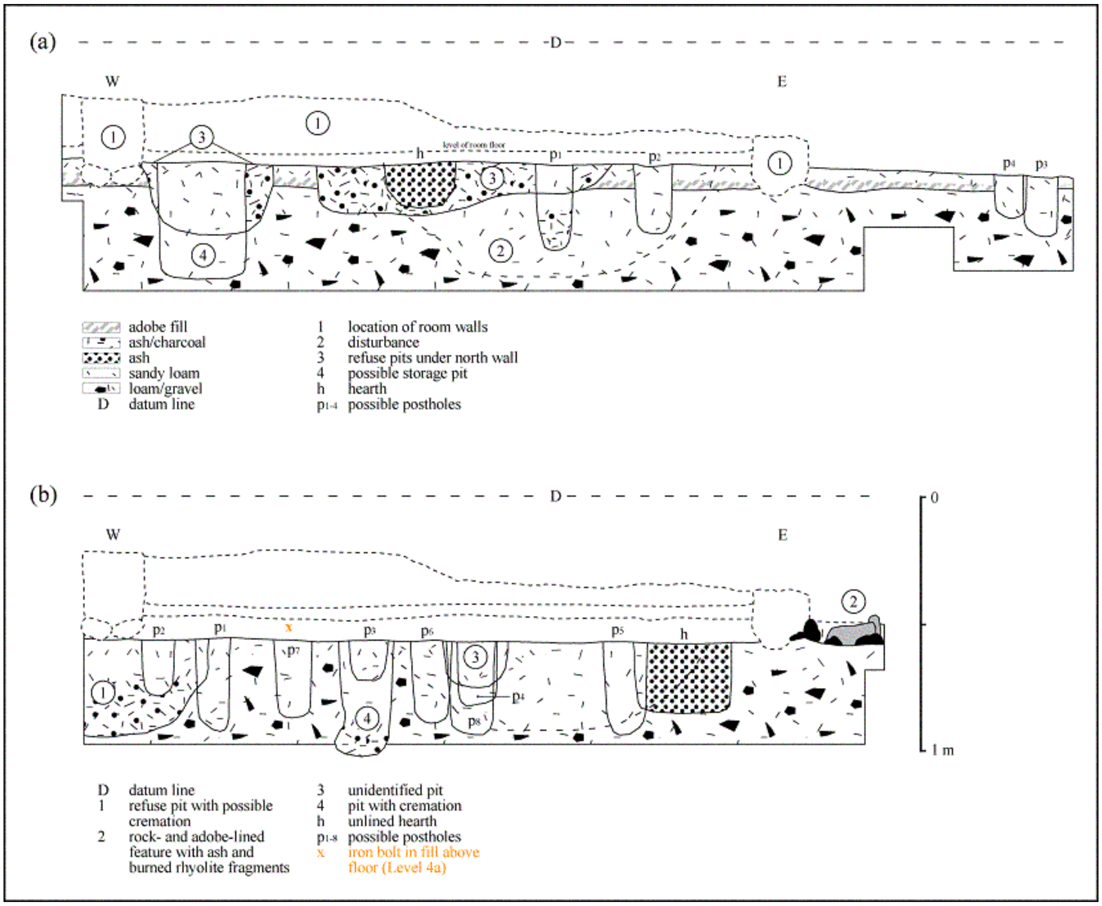

Fig. 8.31. West room block, Area XI, Room XI-9, west-east plaza-floor stratigraphy: (a) Level 4, Floor 2; (b) Level 5, Floor 3. Not all features are shown (cf. Figs. 8.30c, d).

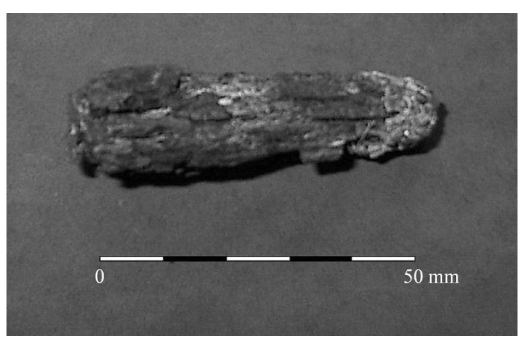

Fig. 8.32. West room block, Area XI, Room XI-9, iron bolt from Level 4a (fill between Level 4, Floor 2, and Level 5, Floor 3 [Figs. 8.30d, 8.31b] (M. Bletzer, 6/2004).

Rooms XI-12, 13, and 16

Testing of these three interior rooms began at the north wall of Room XI-12. Prior to wall-scraping, between two and 25 cm of sandy topsoil had covered the wall, with the drop-off following the eastward slope of the mound. An additional 15 to 25 cm of sand filled the room. Below this, from 10 to 30 cm of adobe rubble had accumulated (Level 2) (Figs. 8.33a, 8.34). Excavation of the adobe uncovered the lower portion of a plugged doorway in the north wall and a bin wall abutting it. At the base of Level 2, the bin wall rested on a plane of compact soil (Level 3, Floor 1), which in places was covered with sprinkles of ash (Figs. 8.33b, 8.34). No evidence of adobe plaster was found in the excavated area. The packed floor marked the upper limit of a mix of sandy loam and more adobe rubble (Level 4) (Figs. 8.33c, 8.34). This layer was c. 15 cm thick (with the lower 10 cm being solid adobe) and covered a fine floor (Level 5, Floor 2) of c. six centimeters of adobe. Depth of floor surface below unit datum was 96 cm. The floor had no features in the area tested (Fig. 8.33d). Further excavation to 130 cm below datum produced only sterile sediments, mostly sandy loam (Fig. 8.34).

The stratigraphy of Room XI-13 was virtually identical to that of its neighbor to the east. A sandy layer between three and 23 cm thick covered all walls. Inside the room, this layer was up to 46 cm deep. In the northern half of the excavated area, adobe rubble formed a compact deposit (Level 2), but in the southern half roots had broken up much of this material. Roots had also destroyed the room’s west wall and much of the northwest corner. About halfway (i.e. 15 cm) down the rubble layer, an ash/charcoal scatter and several plastered and burned adobe pieces were lodged in the debris. Clearly, these were the remnants of an upper-story hearth (Fig. 8.33a).

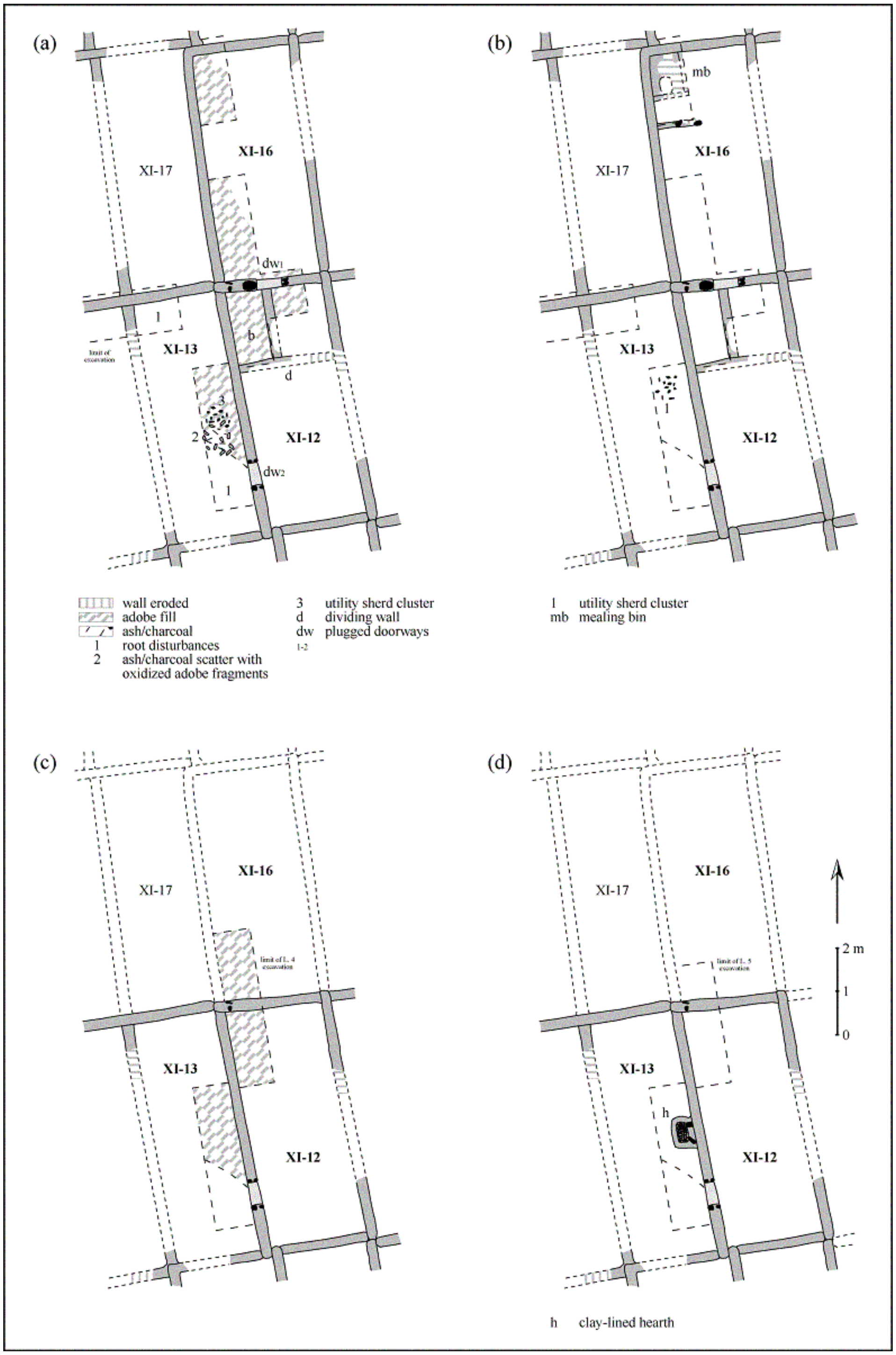

Fig. 8.33. West room block, Area XI, Rooms XI-12, 13, and 16, spatial-stratigraphic sequence: (a) XI-12, 13, and 16, Level 2; (b) XI-12, 13, and 16, Level 3, Floor 1; (c) XI-12, 13, and 16, Level 4; (d) XI-12 and XI-13, Level 5, Floor 2.

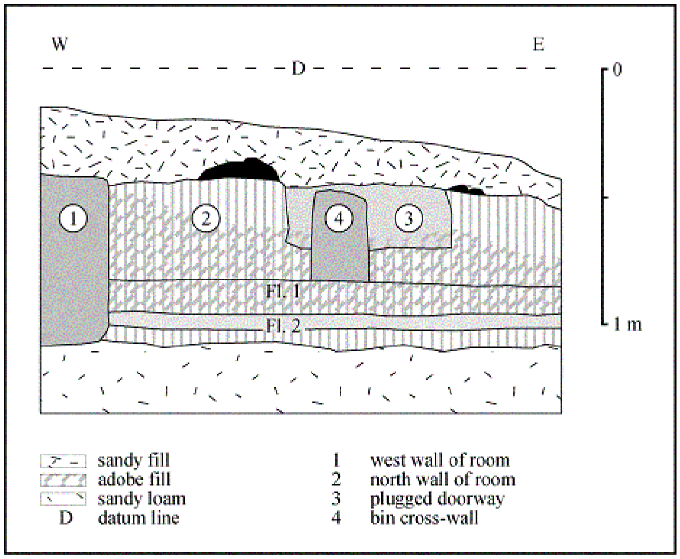

Fig. 8.34. West room block, Area XI, Room XI-12, north wall of room, partial west-east stratigraphic sequence.

Close to the collapsed hearth a scatter of sherds from a single utility jar was embedded in the fill (Fig. 8.33a). Sherds of another jar were found at the bottom of the rubble on a hard, partly disturbed, surface of packed earth (Level 3, Floor 1) (Fig. 8.33b). Also at this stage of the excavation, a plugged doorway to Room XI-12 was exposed near the southern end of the excavated area. The Floor 1 surface capped another layer of adobe debris (Level 4), which in depth and texture was similar to the Level 4 fill in Room XI-12, but also included partly burned patches of grass and reeds. This debris covered an adobe floor (Level 5, Floor 2). Roots had damaged much of the floor and penetrated the only floor feature, a clay-lined hearth set against the east wall (Figs. 8.33d, 8.35). Where the floor remained it was c. five centimeters thick. A sub-floor test revealed the same kind of sterile sandy loam that had been seen under Room XI-12.

Fig. 8.35. West room block, Area XI, Room XI-13, hearth in Floor 2 (mesquite root visible in hearth) (M. Bletzer, 7/2005).

In contrast to Rooms XI-12 and XI-13, Room XI-16 was tested at its northern and southern ends (Fig. 8.33a). As elsewhere in the area, topsoil was mostly sand. Depth varied from six centimeters in the northwest corner to 45 cm near the center of the west wall. It covered a layer of collapsed adobe between 15 and 30 cm deep (Level 2). The debris overlay an adobe floor (Level 3, Floor1) that had been largely broken up by roots. In places, the adobe was still between two and four centimeters thick. Work in the northern part of the room exposed traces of a mealing bin paralleling the north wall (Fig. 8.33b). Given the width of the room, the bin was probably part of a set of three bins. It was the only feature found in the room. Two sub-floor tests in the southern part of the room showed that the floor had been laid down on a thin (<5 cm) layer of adobe debris (Level 4) (Fig. 8.33c). This layer was less substantial than the sub-floor debris in Rooms XI-12 and XI-13, and at 65 cm below unit datum was at a higher elevation than the layers in XI-12 and XI-13 (located at c. 80 cm below datum). In addition, the room's west wall was grounded at 75 cm below datum, compared to 110 cm for the Room XI-12 cross-wall and the wall separating XI-12 and XI-13 (Fig. 8.34). Excavation of one test-pit down to 100 cm revealed no further floors or cultural layers in Room XI-16 (Fig. 8.33d).

THE SOUTH ROOM BLOCK

Area II-III Bond-Abut Patterns

As wall-scraping goes, work in the south room block proved less rewarding. Especially in Area II, long stretches of walls and a considerable number of room corners had eroded completely. In the four numbered rooms in Area II, a grand total of three corners were found, and even these only with difficulty (Fig. 8.11). As a result, all that can be said about construction sequence in this area is that Room II-1 was built after the (unlabeled) west-block rooms it abuts, and probably also after Room II-2. Yet even though evidence is scant, for the south room block as a whole it appears that the Area II rooms represent the final stage in a general east-west expansion of the room block.

In Area III, 17 of a projected 30 room corners were documented in three wall-scraping campaigns. Walls were relatively well preserved only around Rooms III-1 and III-4. The junction of south and east room block is still ill-defined, as are plaza front and extent of peripheral construction (Fig. 8.11). The earliest rooms identified in the area were III-1, 2, and 4. Room III-3 may have been part of this unit, but as the wall between III-2 and III-3 could not be properly traced its position remains unclear (Fig. 8.36). Abutting the shared west wall of III-1 and III-4 were Rooms III-5 and III-6. This and the fact that the south wall of III-6 continued halfway around Room III-18 indicate that these three rooms plus Room III-20 were a four-room expansion of the two central rows of rooms. Rooms III-7, 8, 16, and 17 abut the south side of either this or the initial core unit, with the west wall of III-17 also abutting a later (unlabeled) interior room (Fig. 8.11). The continuous south wall of Rooms III-16 and III-17 shows that both rooms were built at the same time, but relationships with and between the other rooms in this outer row are unknown. On the plaza side, rooms north and east of III-1 and III-2 were add-ons as well. As far as can be told from the known alignments, Rooms III-10 through 13 were probably erected as one unit, which was then extended north with Rooms III-14 and III-15. The last recognized addition here was a two-room unit (Room IV-8 and an unlabeled room) between Rooms III-14 and IV-1 (Figs. 8.11, 8.12, 8.36). Though no plaza-fronting rooms could be fully outlined, the collective data from remote-sensing, wall-scraping, and testing of room and plaza locations point to the existence of a partly stacked plaza front at the end of construction activity in the south room block (Fig. 8.6).

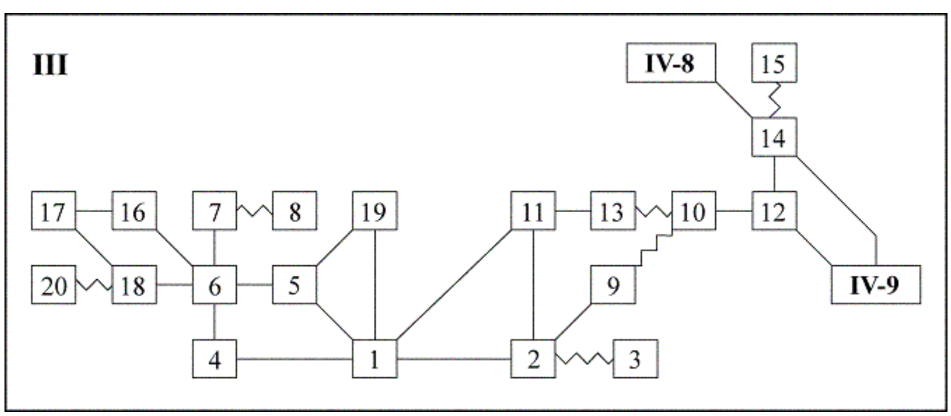

Fig. 8.36. South room block, Area III, room sequence based on wall relationships.

Area II Stratigraphies

Rooms II-1, 2, and 4

The lack of preservation of walls in Area II also applied to floors and floor features in the three rooms tested. Above all, it proved difficult to impossible to distinguish between floor and sub-floor contexts because the combined depth of all structural/cultural levels barely exceeded 15 cm (Fig. 8.37). In Rooms II-1 and II-2, for instance, a thin (1-8 cm) topsoil of sand and small pebbles covered a layer (no more than five centimeters thick) of melted adobe, which partly overlay a mix (one to three centimeters thin) of sand, ash, charcoal, and artifacts (Level 2) (Fig. 8.38a). The kind of material (which included three small brass ring fragments [Chapter 9]) and its distribution in this layer suggest that it was refuse that had been deliberately dumped in the area of the room.

Fig. 8.37. South room block, Area II, Room II-1, Level 2/3, Floor 1. On the right is the modern surface. This shows the lack of depth of Area II deposits (M. Bletzer, 6/2001).

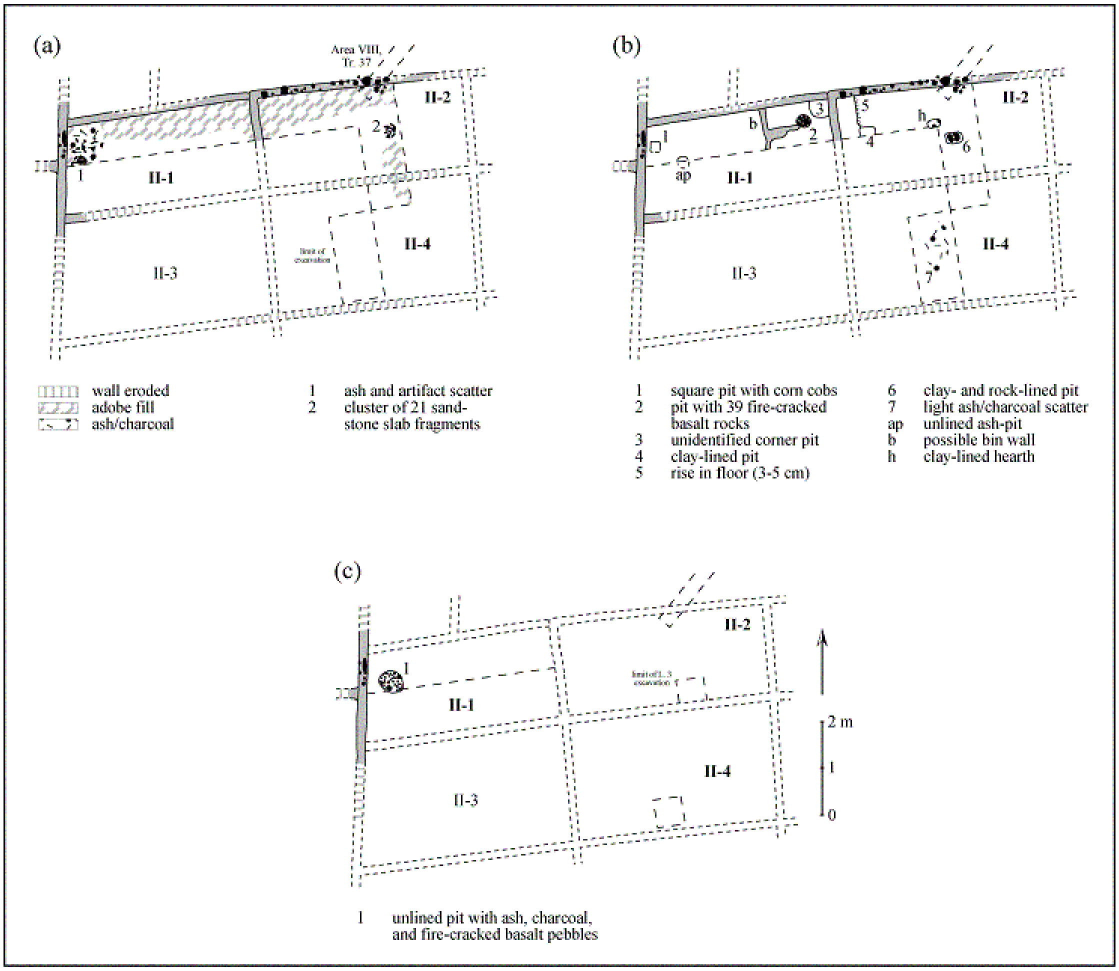

Fig. 8.38. South room block, Area II, Rooms II-1, 2, and 4, spatial-stratigraphic sequence: (a) Level 2; (b) Level 3, Floor 1; (c) Level 4, Floor 2 (plaza).

The floor on which the refuse had been scattered remained only as a rough layer of adobe (Level 3, Floor 1) (Fig. 8.37). A few patches were up to five centimeters thick, but elsewhere nothing was left of the floor. Owing to this disparate preservation, it was not clear which features were floor or sub-floor context. As illustrated in Fig. 8.38b, the Floor 1 inventory includes mostly pit features based on depositional association or elevation. One or other of the pits may in fact be a plaza feature, but can no longer be identified as such on stratigraphic grounds. In Room II-1, a pit (Feature 2 in Fig. 8.38b) filled with charcoal, corn cobs, and 39 fire-cracked basalt pebbles was probably associated with the Level 2 refuse deposits, for it had been dug into what seems to have been a Floor 1 bin wall. The latter was the only architectural feature in II-1. In Room II-2, there was also just one such feature, a platform close to the west wall which extended three to five centimeters above the floor level in the rest of the room. No structural or pit features were found in Room II-4 (Fig. 8.38b).

Excavation below Floor 1 in Rooms II-1 and II-2 revealed a complex, if again thin (c. 10 cm), matrix of adobe debris, chunks of layered adobe, sand, silty sand, and ash (Level 3, Floor 2). In Room II-1, a pit filled with sand, charcoal, and two dozen oxidized basalt fragments was the only feature uncovered in the limited sub-floor excavations and the main reason why Level 3 was also designated Floor 2 (Fig. 8.38c). Although the density of the various sub-layers left little room for determining the extent and nature of the original surface, there can be no doubt that Level 3 was a use surface that pre-dated construction of the Area II rooms. In Rooms II-1 and II-2 (but not in II-4), the level produced numerous small artifacts (utility sherds and lithic waste), bone fragments, burned corn, ash, and some charcoal. Sub-floor tests showed that this material had been deposited over sediments ranging from sandy silt to silty loam. None of the sediments contained any artifacts or organic remains. Mean elevation of Level 3 was 51 cm below unit datum in Rooms II-1 and II-2. Room II-4 had a separate datum point, from which the Level 3 elevation was established at c. 53 cm below datum.

Area III Stratigraphies

Rooms III-1 and III-4

While wall-scraping had shown Rooms III-1 and III-4 to be part of a structural unit of at least three rooms, testing revealed that the two rooms were similar stratigraphically. In both, a thin (3-8 cm) layer of sandy topsoil covered some adobe rubble along walls and sandy loam in room interiors (Level 2) (Fig. 8.39a). The mix was four centimeters thick at most and extended (excepting a disturbance in III-1) across a rough adobe floor (Level 3, Floor 1). In Room III-4, this floor had two layers (Floors 1a/b). The upper layer probably represented a resurfacing episode (Fig. 8.40).[8] Aside from what may have been a set of mealing bins in III-1, no features were found (Fig. 8.39b). A light ash/charcoal scatter in III-4 was the only evidence of possible pre-room activities. Elevation of the scatter ranged from 61 to 67 cm below unit datum (Figs. 8.39c, 8.40).

Rooms III-7 and III-19

Although separated by the two interior rooms, Rooms III-7 and III-19 also had similar stratigraphies. Topsoil (sand, sandy loam) was no more than 10 cm deep in either room. Near walls, it overlay shallow (<2 cm) accumulations of melted wall adobe and bits and pieces of adobe and packed-earth floors (Level 2, Floor 1) (Fig. 8.39a). In Room III-7, a narrow band of adobe plaster stuck to the room's north and east walls, while in III-19 a small patch of compact soil was encountered near the room's south wall. Elsewhere, the floor level had eroded completely, and in III-7 it had also been disturbed. Altogether, only about 5% of the level survived in the excavated portions of the two rooms.

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[8] See note 6 for a description of depositional contexts behind different floor labels.

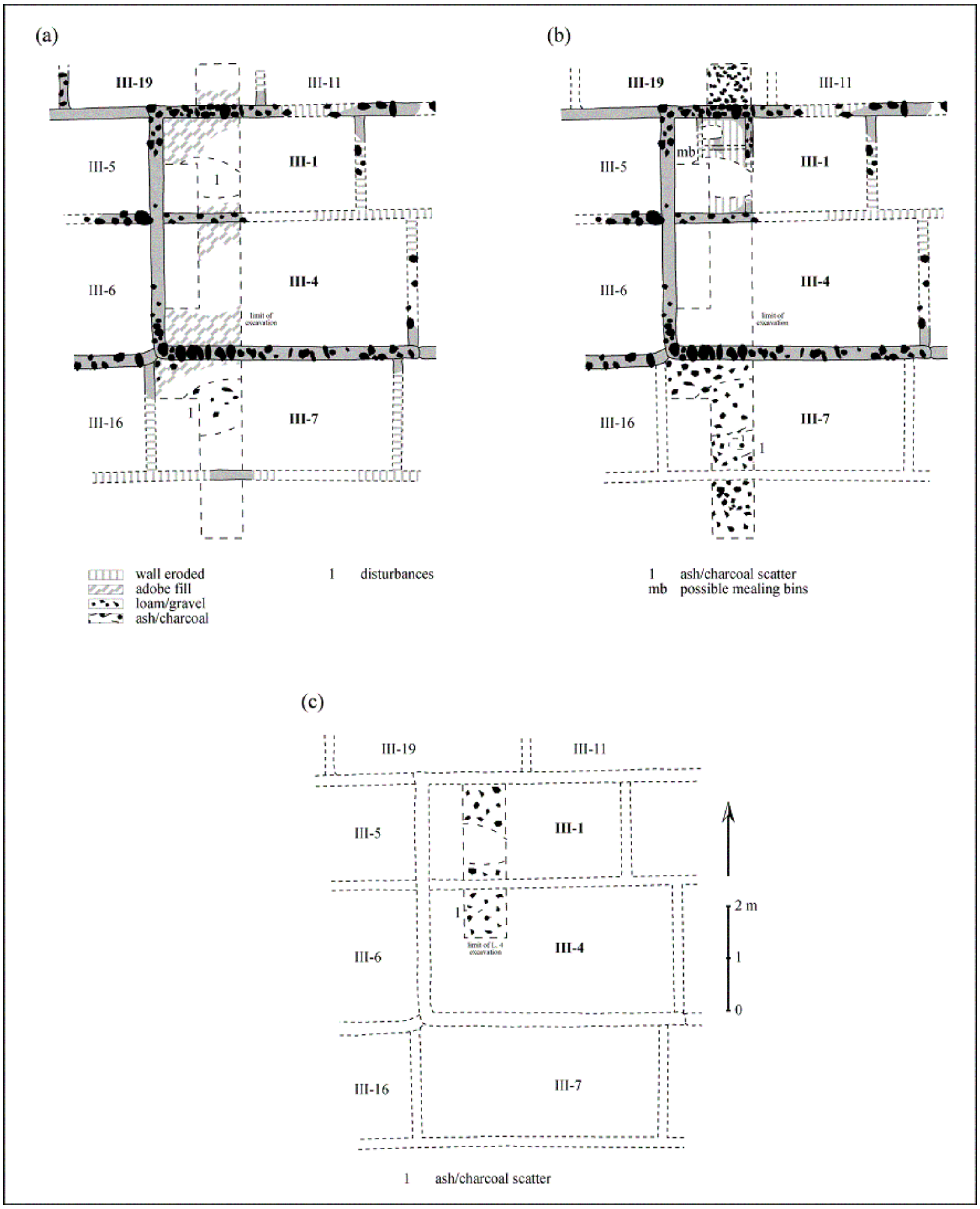

Fig. 8.39. South room block, Area III, Rooms III-1, 4, 7, and 19, spatial-stratigraphic sequence: (a) III-1 and III-4, Level 2; III-7 and III-19, Level 2, Floor 1; (b) III-1, Level 3, Floor 1; III-4, Level 3, Floors 1a/b; III-7 and III-19, Level 3; (c) III-1 and III-4, Level 4.

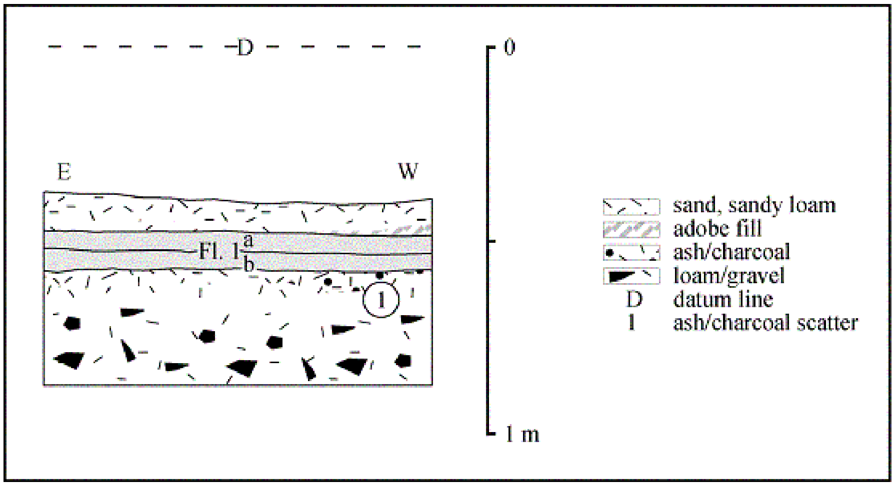

Fig. 8.40. South room block, Area III, Room III-4, Unit III d, east-west stratigraphic sequence.

Given the appearance of the floors, it is not surprising that no signs of features was found in either room. Perhaps in part due to the loss of structural substance, samples of artifacts and organic material were minuscule in size, particularly when compared to what were already only modest collections from Rooms III-1 and III-4. Even fewer artifacts were recovered from below the approximate floor level in III-7 and III-19. Sub-floor deposits consisted of sandy loam, loam, and gravel (Level 3) (Fig. 8.39b). They were the same underneath the Level 3 floors in Rooms III-1 and III-4 (Figs. 8.39c, 8.40). Also similar to Room III-4, ash and charcoal had been scattered on top of these deposits near the south wall of III-7 (Fig. 8.39b). This again suggests pre-room use of the area. Average elevation of the Room III-7 scatter was 71 cm below unit datum. No artifacts were associated with it.

THE EAST ROOM BLOCK

Area IV Bond-Abut Patterns

Between 2001 and 2005, 38 room corners in Area IV were outlined in full and another six were traced at least in part. Extrapolating from known alignments, about 18 to 20 corners remain unidentified in the area. The most significant gaps are on the north side of Rooms IV-19 through IV-23, i.e. where these rooms adjoin Area VI. As noted earlier, this is the most densely overgrown part of the east-block mound (Fig. 8.13). On the sloping east side of Area IV, little was left of the walls of Rooms IV-15, 16, and 24. Room IV-25 is conjectural. Wall-scraping in the southern part of the room block also produced few clear-cut results. Although a few rock alignments were visible, only two of a projected 18 to 24 room corners could be identified south and west of Rooms IV-32 through IV-36 – a large gap which includes the junction of the south and east room blocks (Figs. 8.5, 8.6, 8.12).

The earliest rooms identified through bond-abut analysis were Rooms IV-5, 21, and 22. Most likely, Room IV-6 was at once added to the single protruding Room IV-5. Fig. 8.41 shows the wall relationships for these and later Area IV rooms. Initial expansion of the room block was east with Rooms IV-7 and probably IV-23, west with IV-4 and IV-20, and – after construction of IV-7 – south with IV-12 and IV-13. Next came (from north to south and west to east) Room IV-19 and at least two Area VI rooms (VI-12 and VI-7); Rooms IV-3, 11, and 10; and Rooms IV-27, 28, and 29. Apart from a niche east of IV-13 and IV-29, the rooms as a group form a rectangular block. Combined with the sequence of wall relationships, this perhaps reflects a relatively brisk early pace of room-block construction in Area IV (Figs. 8.12, 8.41).

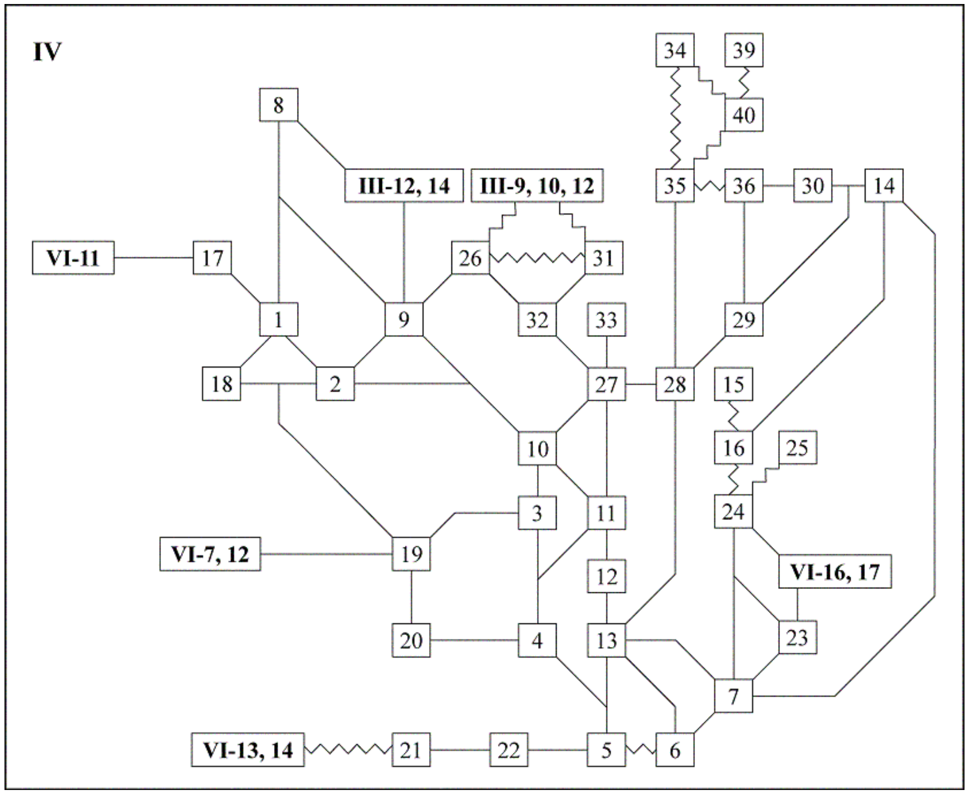

Fig. 8.41. East room block, Area IV, room sequence based on wall relationships.

The order of subsequent additions in the area is less clear. Work in Rooms IV-1 and IV-2 showed that rooms located closer to the edges of the room block were generally so eroded that corners could be defined only through excavation. Room IV-2 abutted Rooms IV-10 and IV-19, and was likely built with Room IV-18. Room IV-1 was joined to IV-2 and IV-18, while a niche between IV-2 and IV-10 was filled with Room IV-9. Attached to the west wall of IV-9 were Room IV-8 (also attached to IV-1), its unlabeled neighbor to the south, plus Rooms III-14 and III-12. The last room and Rooms III-9 and III-10 probably also abutted Room IV-26 (and III-9 also Room IV-31), but walls could not be traced to corners. On the east side of the room block, Room IV-24 abutted IV-7 as well as Rooms VI-16 and VI-17 (Figs. 8.11, 8.12, 8.41). The south wall of Room IV-16 was set against IV-7. None of the other corners of the room could be identified, but given the sequence of neighboring rooms IV-16 may well have been added to IV-24 or a projected Room IV-25. Room IV-14 abutted Rooms IV-6, 7, and 16, and shared an east wall with Rooms IV-30 and IV-36. Divisions within IV-14, 30, and 36 are unclear, however, and while it is possible that the rooms, perhaps with Room IV-35, formed one structural unit, the end of the east wall was not found. Indeed, the southwest corner of IV-35 was the only interior corner traced between IV-32 and IV-41. About those last rooms little can be said except that they, like Rooms IV-26 and IV-31, must have been later additions to the room block (Figs. 8.12, 8.41).

Area IV Stratigraphies

<u>Rooms IV-1 and IV-2</u>

Room IV-1 was the westernmost room in Area IV to be fully documented. Abutting both Rooms IV-2 and IV-18, it was one of the later north-south-trending rooms built on this side of the room block. Though walls only remained to a height of a few centimeters, scraping and excavation revealed a mix of puddled adobe, rock, and brick and mortar construction. Bricks were similar in shape to those found in the walls of Room I-12, but varied in size and were set farther apart. Topsoil (sandy loam and some gravel) over Room IV-1 was no deeper than c. 10 cm. It covered a layer of silty loam containing rocks, adobe debris, and a number of groundstone implements (Level 2) over a thin layer of dark soil (Level 2a) (Fig. 8.42a). Adobe chunks with impressions of reeds and poles were probably remnants of the room's roof.

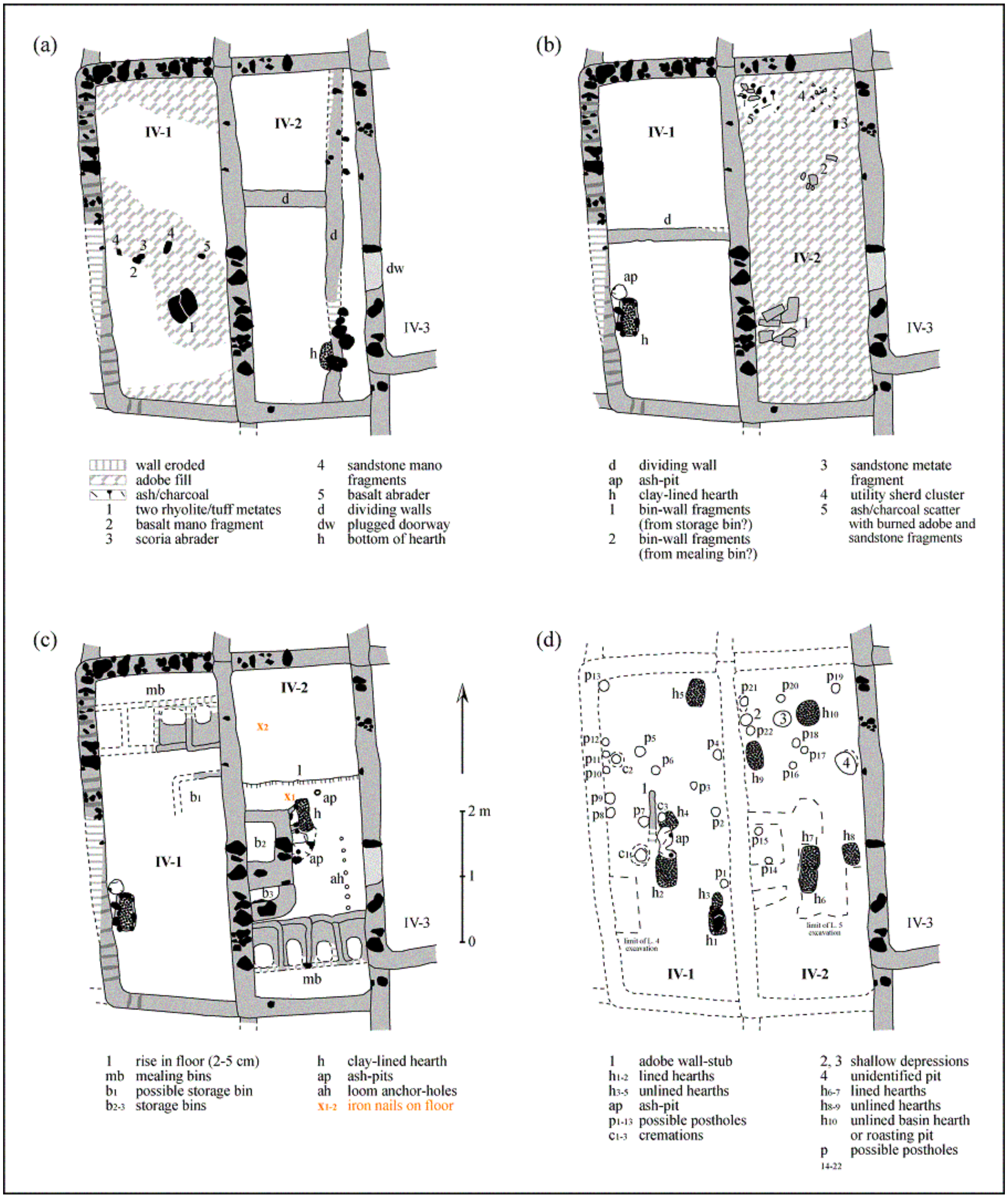

Fig. 8.42. East room block, Area IV, Rooms IV-1 and IV-2, spatial-stratigraphic sequence: (a) IV-1, Level 2; IV-2, Level 2, Floor 1; (b) IV-1, Level 3, Floor 1/1a (north/south); IV-2, Level 3; (c) IV-1, Level 3, Floor 1a; IV-2, Level 4, Floor 2; (d) IV-1, Level 4, Floor 2 (plaza); IV-2, Level 5, Floor 3 (plaza).

Below the Level 2 material, excavation of the room's southern part exposed a thin (2-3 cm) adobe floor (Level 3, Floor 1a) and the base of an adobe dividing wall located exactly on the room's east-west centerline (Fig. 8.42b). In the northern half of the room, two floors were encountered. The dividing wall had been set on top of the lower floor (Floor 1a). The upper floor (Floor 1) had been plastered over Floor 1a, an effort entailing demolition of a possible storage bin and a set of mealing bins associated with the lower floor. In the room's southern half, only Floor 1a was present. Aside from a rock- and clay-lined hearth and a small ash-pit, no features were uncovered in this part of the room. Hearth and pit abutted the west wall (Fig. 8.42c). Similar to a corner location, this is a placement that suggests colonial-period affiliation (Chapter 9).

Directly underlying Floor 1a was the pre-room plaza surface (Level 4, Floor 2). Though primarily a layer of compact sandy loam, patches of adobe plaster and a few apparently truncated features indicate that the plaza surface had at least partly been plastered before being leveled off during room construction. Some 20 features defined this surface. There were five hearths, 13 possible postholes, a large ash-pit, an adobe wall-stub, and two or three cremation burials (Fig. 8.42d). The latter consisted of burned organic matter that had been deposited in two posthole-like pits (c_1 and c_2 in Fig. 8.42d) and an unlined hearth (c_3 in h_4 in Fig. 8.42d). The features were not excavated, but burned/calcined bone fragments were seen in two of them (18 in c_1, eight in c_3). Four more cremations were found in a 2x5 m section outside the room in 2004, among them two in pits which also resembled postholes. This extension of the Room IV-1 excavation produced up to 13 postholes, four hearths (all near the room's west wall), and various other depressions, including a large, basin-shaped, refuse pit (Figs. 8.12, 8.43).

Fig. 8.43. East room block, Area IV, plaza features outside Room IV-1 (backfilled). The room's west wall is visible near the far edge of the excavation (T. O'Laughlin, 6/2004).

Compared to Room IV-1, the structure of Room IV-2 was a little more complex. Buried under sandy topsoil, a plane of compact silty loam (Level 2, Floor 1) stretched across most of the room. Soil density and the bases of two adobe walls suggest the plane had been a floor (Fig. 8.38a). Most striking about the room layout at this level was a wall that ran north-south at five degrees off the room's long axis. The discrepancy created a narrow, wedge-shaped, gap between this wall and the room's original east wall. North of the room's east-west centerline, a cross-wall abutted the offset north-south wall and the room's west wall. The lower part of an unlined hearth was found next to the north-south wall (Fig. 8.42a). Hearth and interior walls were resting on a layer of collapsed adobe and roofing material (Level 3). Two separate clusters of plastered adobe fragments were embedded in this level, as were the smashed remains (ash, charcoal, burned sandstone and adobe pieces) of a hearth, a batch of utility sherds, and a broken sandstone metate

(Fig. 8.42b). The adobe rubble was up to 25 cm deep and covered a thin (1-3 cm) adobe floor (Level 4, Floor 2). In the northern third of the room, the floor was raised up to five centimeters above the average floor level. On the floor, two iron nails were found (Figs. 8.42c, 8.44). Features included four mealing and two storage bins, a clay-lined hearth, two ash-pits, and a line of seven small holes in the floor. Alignment, spacing, and, vertical striations of two cords of c. eight millimeters in diameter identify these holes as anchor holes for a weaving loom (Figs. 8.42c, 8.45). Like Floor 1a in Room IV-1, Floor 2 in Room IV-2 had been spread over a compact, largely unplastered, plane with numerous pit features characteristic of a plaza surface (Level 5, Floor 3). Nine possible postholes, five hearths, two unidentified depressions, and a basin pit were exposed in the part of the room excavated to this level (Fig. 8.42d). No cremations were recognized in any of these features. The plaza levels documented in Rooms IV-1 and IV-2 belonged to the same pre-room use surface, into which had been dug shallow foundation trenches for the exterior walls of the two rooms.

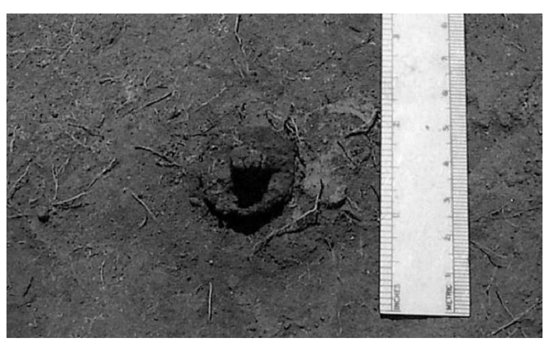

Fig. 8.44. East room block, Area IV, Room IV-2, Level 4, Floor 2, iron nail-head on floor (T. O'Laughlin, 8/2002).

Fig. 8.45. East room block, Area IV, Room IV-2, Level 4, Floor 2, loom-anchor holes. Floor plaster has been partly removed, revealing the top of a plaza feature (h_8 in Fig. 8.38d) under the second and third (from bottom) anchor holes. Visible in the background are the Floor 2 mealing bins (with metates missing) (T. O'Laughlin, 8/2002).

Rooms IV-3 and IV-4

Similar to Rooms IV-1 and IV-2, Rooms IV-3 and IV-4 were covered by topsoil of sand, sandy to silty loam, and gravel. In Room IV-3, this material was from five to 15 cm deep. Underneath the topsoil, silty loam, adobe rubble, and a number of rocks formed a compact Level 2. Excavation of this and subsequent levels was limited to the southern third of the room. In the southeast corner and adjacent portion of Room IV-4, part of the Level 2 fill and a section of wall had been disturbed. Close to the room's south wall, burned and plastered and unburned and unplastered adobe fragments in the fill probably came from an upper-story hearth and bin(s) (Fig. 8.46a).

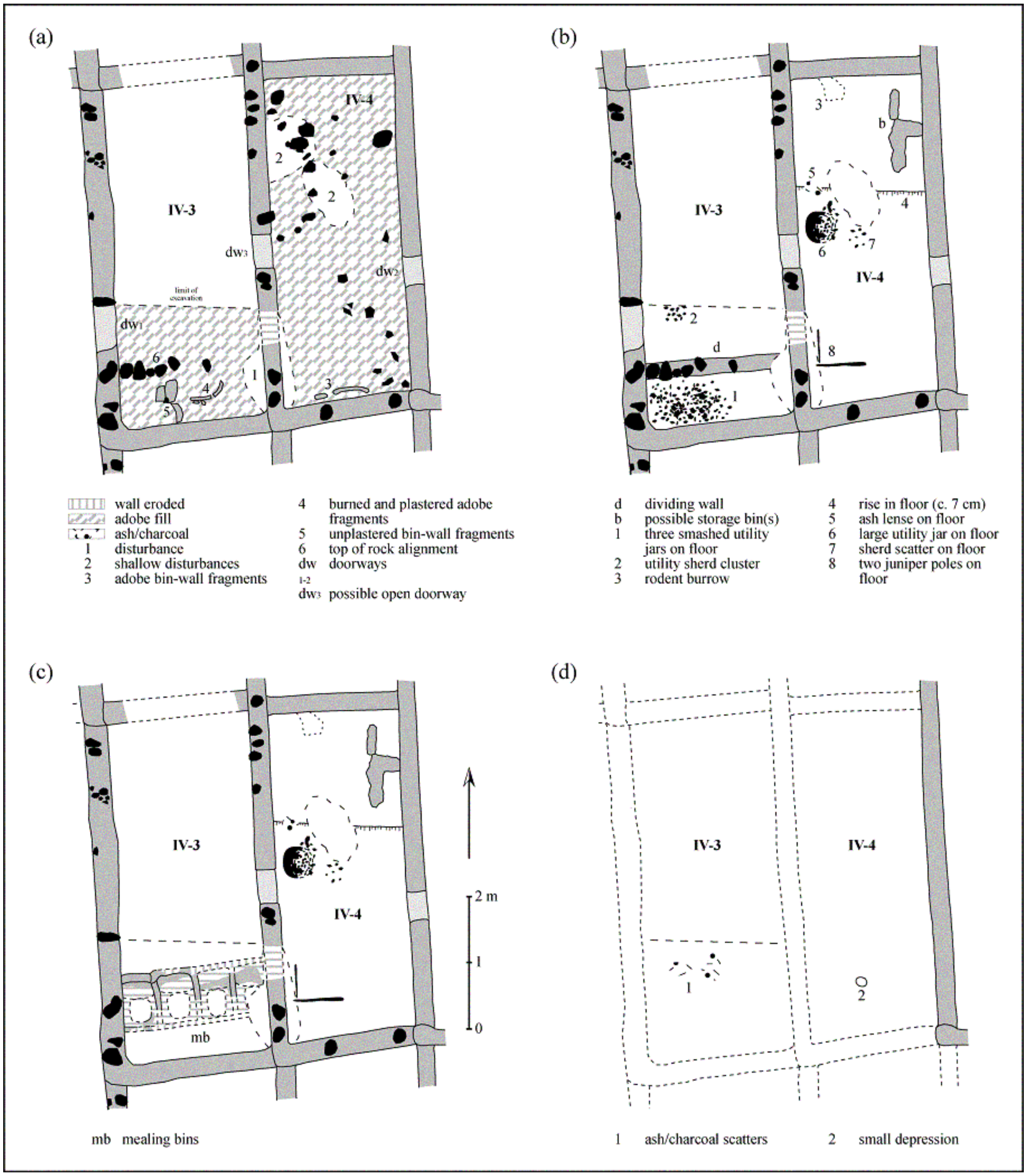

Fig. 8.46. East room block, Area IV, Rooms IV-3 and IV-4, spatial-stratigraphic sequence: (a) IV-3 and IV-4, Level 2; (b) IV-3, Level 3, Floor 1/1a (south/north of dividing wall); IV-4, Level 3, Floor 1; (c) IV-3, Level 3, Floor 1a; IV-4, Level 3, Floor 1; (d) IV-3 and IV-4, Level 4, Floor 2 (pre-room surface).

Excavation of Level 2 also revealed that a short rock alignment visible at the top of the level was part of an adobe wall that formed a narrow (70-80 cm) bin across the room. The wall rested on a smooth plane of hard-packed clay loam (Level 3, Floor 1a). Inside the bin, three smashed utility jars and part of a glazeware jar lay on a different floor (Floor 1). Sherds of another utility jar were scattered on Floor 1a north of the wall (Fig. 8.46b). Outside the bin area, the floor was noticeably more irregular than in the bin. Sub-floor testing showed that cross-wall and Floor 1 overlay four mealing bins (Fig. 8.46c) that had been knocked down and the floor around them rebuilt (to Floor 1). Floor and bin remnants were up to six centimeters thick and sat directly on top of the pre-room surface (Level 4, Floor 2). In contrast to Rooms IV-1 and IV-2, few features or artifacts were found on this surface (Fig. 8.46d). The room's exterior walls (which remained to a height of 51 cm) were slightly entrenched in the surface.

Room IV-4, unlike IV-3, was excavated in its entirety. Topsoil above the room was the same as in IV-3. A compact fill of silty loam, adobe rubble, and basalt cobbles (Level 2) was encountered c. 15 cm below the surface. Toward the center of the room, patches of burned reeds and grass were embedded in the fill (Fig. 8.46a). These patches and a piece of burned pole indicate a structure fire, but as there was little ash or charcoal such a fire cannot have been intense. In a few places, a thin (1-3 cm) layer of water-deposited clay (Level 2a) marked the bottom of the structural debris. The clay suggests that the room was abandoned and partly open to the elements when the rest of the roof burned and, with whatever superstructure it still supported, collapsed. A few plastered adobe bin-wall fragments near the south wall were the only remains of upper-story features seen in Level 2 (Fig. 8.46a).

Two disturbances in the room's northern half and one linked to the disturbance in Room IV-3 went through the Level 2 fill to a compact adobe floor (Level 3, Floor 1). Other than a ridge-like rise (6-7 cm) in the floor and two badly preserved bin walls in the northern third of the room, no structural features were exposed (Figs. 8.46 b, c). A large utility jar sat on the floor near the center of the west wall. It has the distinction of being the only half-intact vessel to be found during the five years of excavations at the site (Fig. 8.47). Close to the jar lay several sherds of a brownware bowl. Also found on the floor were two juniper poles and a small ash/charcoal scatter on part of the rise in the floor (Figs. 8.46b, c). Removal of the floor revealed the same pre-room surface as in Room IV-3, but even more so than in IV-3 this second surface (Level 4, Floor 2) had no definable features. In the entire room area, only one small depression was noted (Fig. 8.46d). The artifact assemblage for this level amounted to just a handful of sherds. As in Room IV-3, the surface was located at c. 85 to 90 cm below unit datum.

Fig. 8.47. East room block, Area IV, Room IV-4, Level 3, Floor 1, utility jar on floor (T. O'Laughlin, 6/2003).

Rooms IV-5 and IV-6

The Area IV bond-abut sequence identifies Rooms IV-5 and IV-6 as part of the earliest cluster of rooms in the area (Fig. 8.41). About half of each room was excavated. In Room IV-5, surface sediments of sand and sandy loam covered a relatively deep (30-40 cm) layer of collapsed adobe and sandy to silty loam (Level 2). As in Room IV-4, laminated silt and clay deposits near the center of the room (Level 2a) indicate that at least part of the roof had been removed before the structure caved in. A thin layer of ash below these deposits was the only concentration of burned matter in Level 2. Unlike in Room IV-4, little charcoal and no roofing material were found. Attached to the room's east wall and partly buried in the fill was a bin which contained a variety of stone tools. In the west wall, a doorway provided access to Room IV-4, but all that remained of it was the sill. In the room's southeast corner, a shallow disturbance extended into Room IV-6 (Fig. 8.48a).

Fill and bin walls rested on a thinly (1-3 cm) plastered adobe floor (Level 3, Floor 1). Floor features included a large clay-lined hearth that almost abutted the bin. It was filled with 21 basalt cobbles and two sandstone slabs. A smaller hearth was located near the southwest corner of the room, and a third, unlined, hearth north of the bin. Given their location and the fact that they had been capped with adobe, the latter two hearths could pre-date bin and rock-filled hearth. In the room's stratigraphic sequence, I assign both, therefore, to an early phase of floor usage (Floor 1a) (Figs. 8.48b, c)[9]. Immediately beneath floor and hearths lay the pre-room surface (Level 4, Floor 2). Except for a small ash/charcoal scatter, no features were uncovered at this level (Fig. 8.48d).

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[9] See note 6 above.

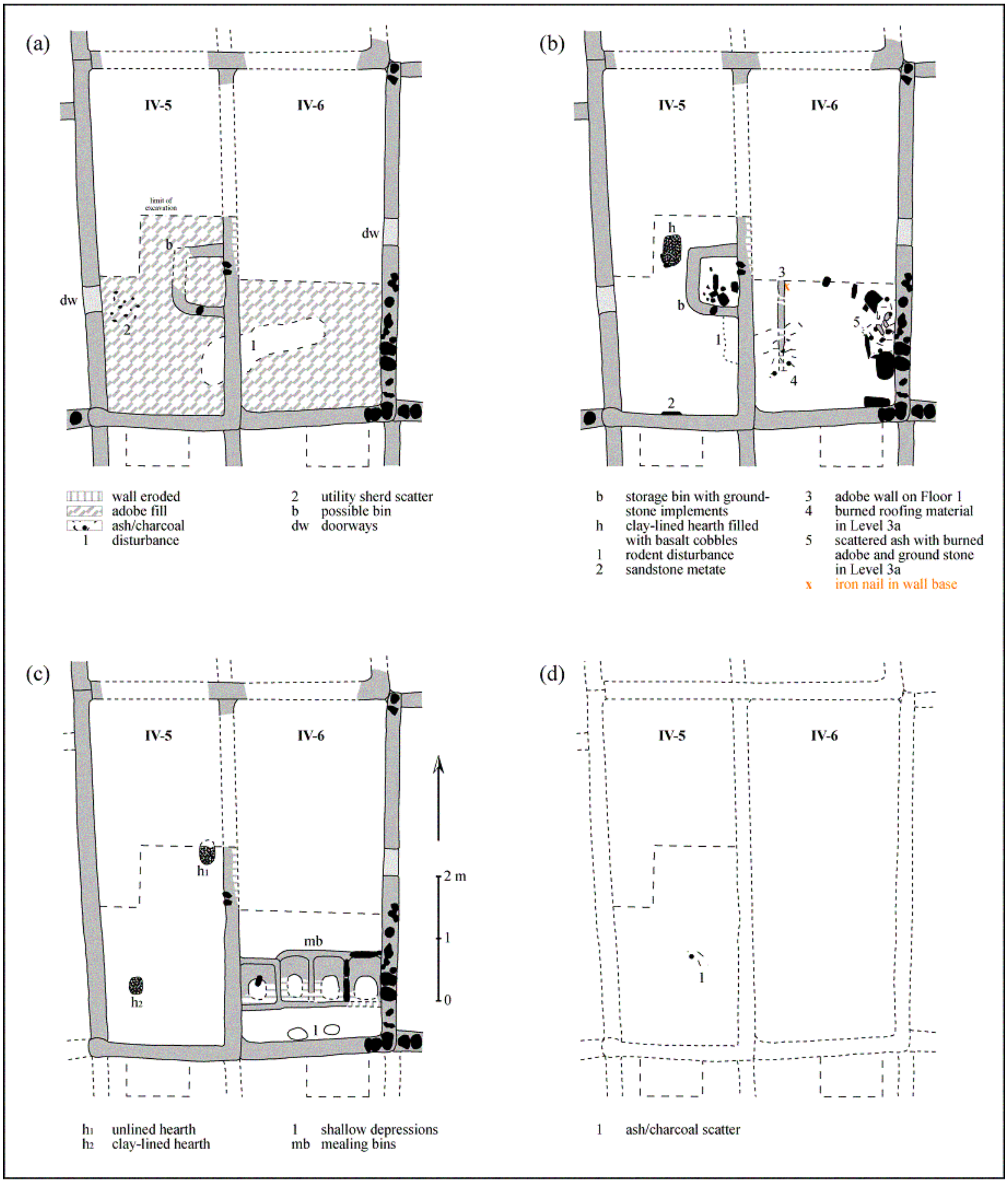


Fig. 8.48. East room block, Area IV, Rooms IV-5 and IV-6, spatial-stratigraphic sequence: (a) IV-5 and IV-6, Level 2; (b) IV-5 and IV-6, Level 3, Floor 1; (c) IV-5, Level 3, Floor 1a (this floor associated with h1/h2); IV-6, Level 4, Floor 2; (d) IV-5, Level 4, Floor 2 (pre-room surface).

In Room IV-6, topsoil was of the same kind of sand and sandy loam as in Room IV-5. Also as in IV-5, the level below the topsoil (Level 2) was mostly adobe rubble and compact sandy to silty loam (Fig. 8.48a). Toward the bottom of the level, patches of burned roofing material had been buried in the fill. A few pieces of juniper poles (diameter 3-4 cm) were oriented east-west, with reeds and grass lying at more or less right angles to the poles. Under the roofing material, the fill was less compact and contained less adobe. The level ended with a more compact soil and a north-south-running adobe wall (partly disturbed), which suggests this soil was a use surface (Level 3, Floor 1). Just south of the room's unexcavated portion, an iron nail was found embedded in the wall base (Fig. 8.48b). Wall and surface marked the top of another, less substantial (c. 10 cm thick), layer of structural debris (Level 3a), which included more roofing material and adobe. In the fill along the east wall, a cluster of ash, charcoal, burned adobe, basalt cobbles, and two worn sandstone metates (one burned) probably was what remained of a (partly) slab-lined upper-story hearth (Fig. 8.48b).

Further testing showed that the Level 3a fill covered a smooth adobe floor and the remains of four mealing bins (Level 4, Floor 2). While the fill had groundstone in it, none was in the bins. As with all mealing bins found at the site, the metates had been taken out of the basins (Figs. 8.48c, 8.49). This and the fact that the bins were somewhat reduced suggests planned leveling for Floor 1. As Level 3a contained few artifacts other than groundstone, remodeling may have included modification of upper walls and roof portions. As for Floor 2, this was at the same elevation as Floor 1/1a in Room IV-5. The underlying pre-room surface (Level 5, Floor 3) was not excavated, but most likely was similar in elevation to the Level 4 surface in IV-5 (Fig. 8.48d).

Fig. 8.49. East room block, Area IV, Room IV-6, Level 4, Floor 2, mealing bins (metates missing). The visible pieces of groundstone were part of the overlying Level 3a fill, but are shown here still *in situ* (T. O'Laughlin, 7/2004).

<u>Rooms IV-7 and IV-16</u>

In the Area IV wall sequence, Room IV-7 was the first room added to the east side of the initial cluster of Rooms IV-5, 6, 21, and 22. In 2004, six 1x1 m units were placed across the southern part of the room, followed in 2005 by nine units across its northern part. An 80 cm wide strip between the two segments was not excavated (Fig. 8.50). As the line of the room's west wall roughly coincided with the beginning of the steeper part of the mound's east slope (Fig. 8.5), chances were that some layers and features in the room had been substantially eroded. Already during wall-scraping, for example, it had become clear that the room's east wall was much more reduced than the west wall.

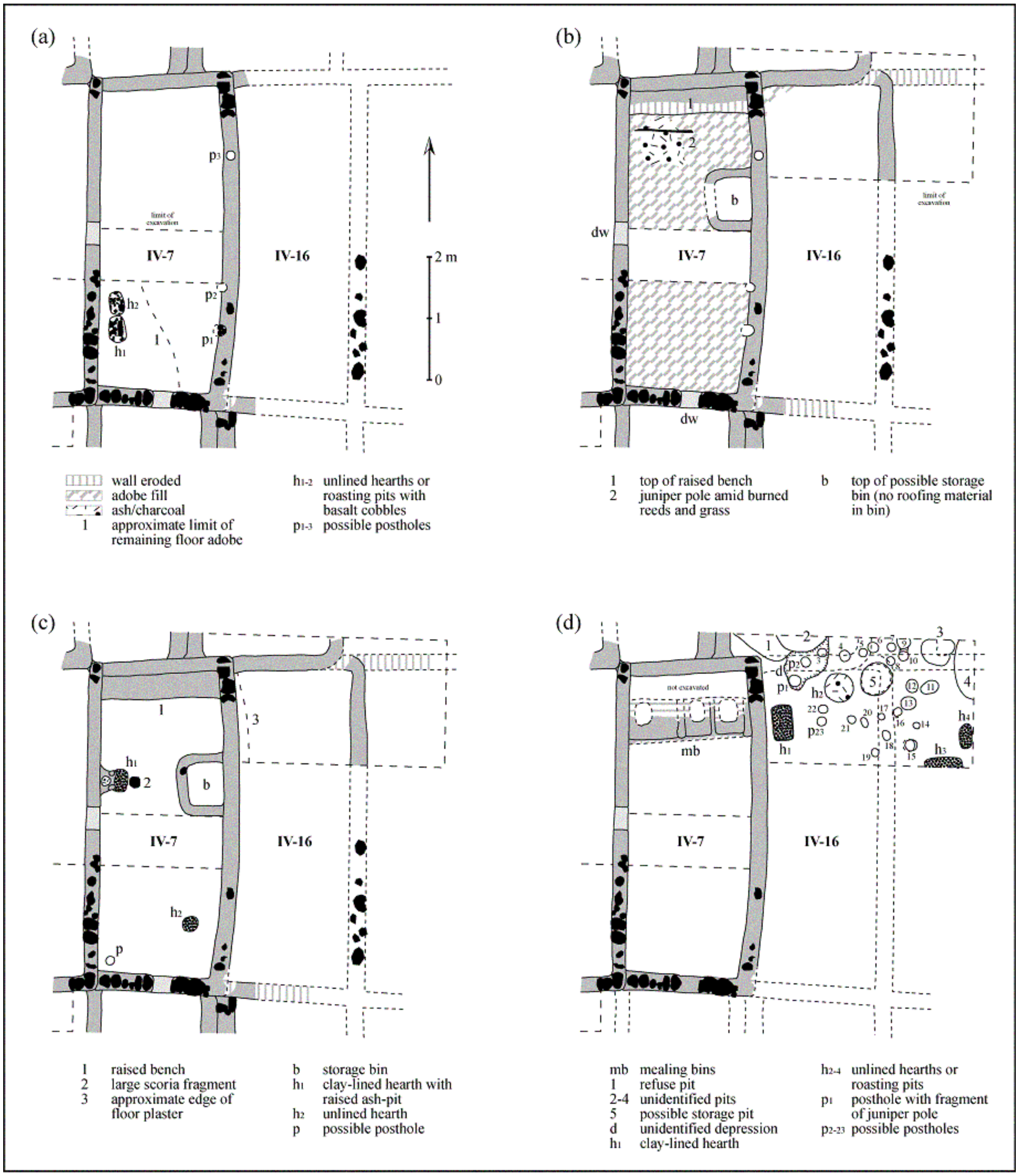


Fig. 8.50. East room block, Area IV, Rooms IV-7 and IV-16, spatial-stratigraphic sequence: (a) IV-7, Level 2, Floor 1; (b) IV-7, Level 3; IV-16, Level 2; (c) IV-7, Level 4, Floor 2/2a; IV-16, Level 3, Floor 1; (d) IV-7, Level 5, Floor 2a; IV-16, Level 4, Floor 2 (plaza).

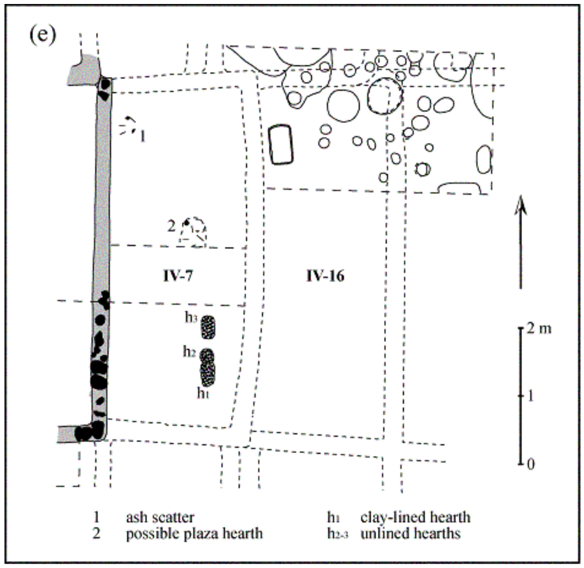


Fig. 8.50, continued: (e) IV-7, Level 6, Floor 3 (plaza).

The excavations in the room confirmed these early impressions. Topsoil (sand, sandy loam) varied in depth from less than five centimeters over the room's east wall to between 20 and 25 cm inside the west wall. In the room's southwest corner, it covered traces of a thin adobe floor (Level 2, Floor 1). Two unlined hearths or roasting pits, each oxidized and filled with basalt cobbles and fragments of groundstone, were associated with this floor, as were two holes, almost identical in depth and diameter, which had been cut into the east wall. Since the holes did not reach a lower floor, they were most likely postholes for the Floor 1 superstructure. In the northern part of the room, the Floor 1 level was not identified; however, another possible posthole was discovered in the east wall (Fig. 8.50a). Where the floor remained, it capped a compact level of adobe rubble between 20 and 30 cm deep (Level 3). Throughout much of the room, burned reeds, grass, and cornstalks were scattered from the middle to near bottom of this level. Close to the north wall, a juniper pole (4-5 cm in diameter) was found lying amid a patch of reeds and grass (Fig. 8.50b), much like the pole fragments and thatching in Room IV-6, Level 2. In the same area, laminated layers of silt and clay formed a distinct (3-5 cm thick) sub-level (Level 3a) below the roofing material. Overall, depositional context of Levels 2 and 3/3a was not unlike that of the structural debris in Rooms IV-4, 5, and 6. During the period represented by Levels 2 and 3/3a, Room IV-7 was abandoned, open to wind- and water-born sediments, and subject to fire and structural deterioration. Use of the room eventually resumed with the installation of Floor 1 (Chapter 9).

Two features associated with a lower floor emerged from the Level 3 fill in the northern half of the room: a storage bin along the room's east wall and a raised bench that paralleled the north wall (Figs. 8.50c, 8.51). The bench was the only such feature found at the site. Structurally, both bin and bench belonged to a well-preserved (3-6 cm thick) adobe floor (Level 4, Floor 2/2a). Identified subsequently as part of the floor were a large hearth abutting the west wall, an apparent posthole in the southwest corner, a small hearth near the east wall, and, possibly, two plugged doorways in the west and south walls (Fig. 8.50c). The bench had been built over three flattened mealing bins, and resurfacing (Floor 2) of the mealing-bin level (Floor 2a) was limited to the bins proper (Figs. 8.50c-d, 8.51). Work below floor level in the southern half of the room revealed a pre-room use surface (Level 6, Floor 3) with one clay-lined and two unlined hearths or roasting pits directly under Floor 2. This surface was located at c. 105 cm below unit datum. Although sub-floor testing did not extend to the northern part of the room, a small ash scatter and a possible hearth were noted during minor probing in the northwest room corner and around the storage bin (Fig. 8.50e).

Fig. 8.51. East room block, Area IV, Room IV-7, Level 4, Floor 2, bench (behind label board), storage bin (edge visible at lower right), and Level 5, Floor 2a, knocked-down mealing bins (T. O'Laughlin, 6/2005).

Much less remained of Room IV-16 than of IV-7. Testing in the northern third of the room revealed the topsoil to be so shallow that it could be swept off the underlying deposits. A short rock alignment outside the excavated area indicated the location of the east wall, but inside the area the same wall survived only as a low (1-2 cm) line of brittle adobe. A patch of irregular adobe in the northwest corner looked like residual adobe debris (Level 2), while traces of adobe plaster along the west wall may have been all that was left of an adobe room floor (Level 3, Floor 1) (Figs. 8.50b, c). Scattered ash and charcoal across the room probably came from one or more of a large number of pit features that marked a pre-room plaza surface (Level 4, Floor 2) (Figs. 8.50d, 8.52). This surface was one of the most notable discoveries in the east room block, on par with the double wall and annex of east-west-trending rooms. An area of c. 5.5 m^2 contained 23 possible postholes, one clay-lined hearth, three unlined hearths or roasting pits, five other pits, and one unidentified depression. Number and distribution of these features suggest temporal diversity in usage, but unlike, for instance, the plaza features in Room XI-9, few could be recognized as "early" or "late" by elevation or association with separate surfaces. A slightly u-shaped, east-west-trending, alignment can be made out among the recorded postholes and is the only pattern indicative of a structural feature (Figs. 8.50d, 8.52). Given the limited space exposed, the range of potential features is unknown, however. Nor is it known how far east the plaza extended. A few pits were cut by one of the Area VIII test-trenches (VIII-38), but they were large refuse-filled borrow pits which say little about plaza size and structure (see below). Average elevation of the plaza surface in Room IV-16 was 107 cm below unit datum.

Fig. 8.52. East room block, Area IV, Room IV-16, Level 4, Floor 2, plaza features (T. O'Laughlin, 6/2005).

Area VI Bond-Abut Patterns

Wall-scraping in Area VI had two primary objectives: defining the room-block periphery, especially toward the suspected plaza entrance, and establishing the sequence of interior rooms in the northern part of the room block. Neither goal was fully realized. The northern edge of the room block could be traced fairly easily. On the west side, however, plaza-fronting walls were largely gone. On the east side, only wall stubs remained of the east-west-aligned rooms abutting the double wall. Due to disturbances, erosion, and the vegetation between Areas IV and VI, interior alignments were difficult to follow. In all, only 20 of a projected 34 to 42 room corners could be identified (Figs. 8.12-8.14).

Based on recorded wall relationships, the first rooms built in Area VI were VI-4, 5, 9, 10, 15, and possibly VI-14 (Fig. 8.53). As Room VI-15 abuts Room IV-23, it is very likely that this group of rooms represents a first northward expansion from Area IV. Interestingly enough, of all Area VI rooms, the three eastern rooms (VI-5, 10, 15) in the early cluster were the only ones to have additional walls put up against an existing wall. Added to VI-4 and VI-9 were Rooms VI-3 and VI-8, but other than that the relationship between these rooms is not clear. Rooms VI-7 and VI-12 (plus IV-19) in all probability post-date VI-3 and VI-8. They definitely pre-date the four Rooms VI-1, 2, 6, and 11 to the west and north. The sequence of the latter rooms is VI-6, then VI-2, then VI-1. As no corner(s) and only traces of plaza-fronting walls were found between VI-6, VI-1, and VI-11, the position of VI-11 could not be established. On the other side of the area, Rooms VI-16 through 21 were additions to the double wall. All post-date the initial cluster of Area VI rooms. Not much else can be said about these rooms except that VI-16 and VI-17 were clearly built before Room IV-24 (Fig. 8.53).

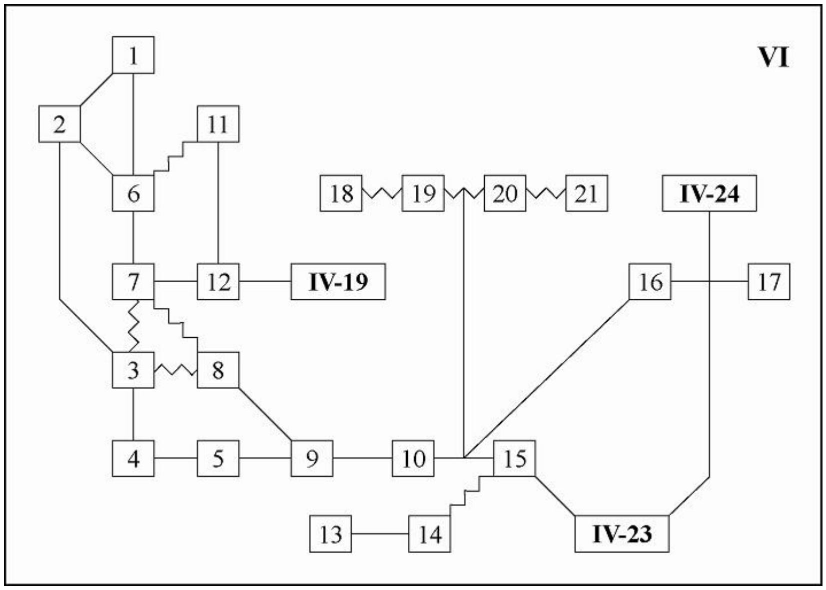


Fig. 8.53. East room block, Area VI, room sequence based on wall relationships.

Area VI Stratigraphies

<u>Room VI-2 and plaza entrance</u>

Initial testing in Area VI was carried out in 2002 and encompassed 17 1x1 m units. Most of the units were placed at the northern and eastern edge of the room labeled VI-2 and in the adjacent plaza area. The excavation proved that the area north of Room VI-2 was devoid of structural remains and thus indeed had been a ground-level plaza entrance, just as Marshall and Walt (1984: 194) had suspected. Except for the southeast corner and a stretch of the north wall, the exterior walls of Room VI-2 were all identified (Fig. 8.54a). Unlike the neighboring rooms, VI-2 was oriented east-west. Since this part of the room block was level with the plaza area and no walls were visible, the difference in alignment became apparent only after extensive wall-scraping.

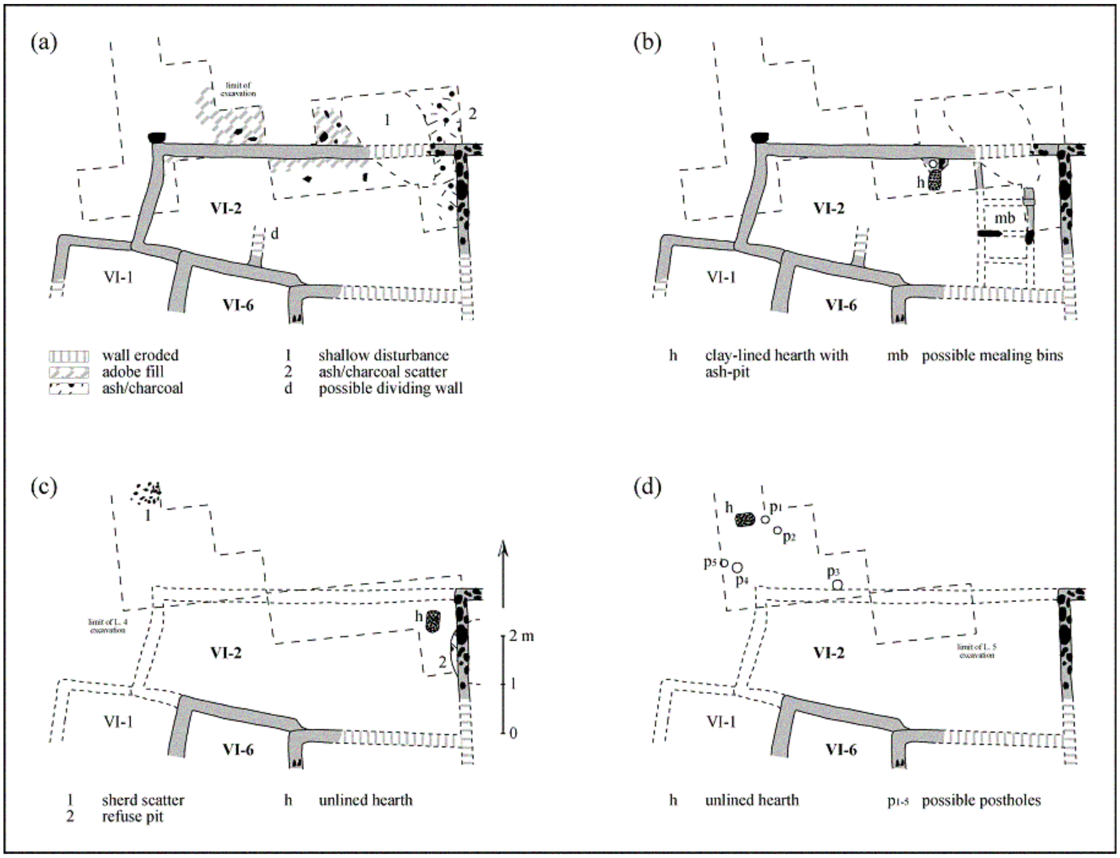


Fig. 8.54. East room block, Area VI, Room VI-2 and plaza entrance, spatial-stratigraphic sequence: (a) VI-2, Level 2; (b) VI-2, Level 3, Floor 1; (c) VI-2, Level 4, Floor 2 (plaza); (d) VI-2, Level 5, Floor 3 (plaza).

A lack of definition of structural remains and deposits was evident from the start of testing in Room VI-2. Topsoil of sand and sandy loam varying in depth from 10 to 20 cm covered patches (none more than five centimeters thick) of collapsed adobe, a large ash/charcoal scatter, and a shallow disturbance that went through part of the north wall. Though not a coherent layer, the material was designated Level 2 (Fig. 8.54a). Most of the adobe debris lay outside the room, indicating perhaps that the north wall had fallen into the plaza entrance. Partly buried by topsoil and partly by the Level 2 fill was a thin (maximum thickness two centimeters) adobe floor (Level 3, Floor 1). Two features were associated with this floor. The first was a clay-lined hearth with ash-pit located near the center of the north wall. During the project, several wall-abutting hearths were found in the west, east, and north room blocks, but this was the only hearth placed against a wall with its short side. Little survived of the second feature. Sections of narrow adobe/rock walls and a few patches of clay plaster suggest that the feature consisted of three or four mealing bins set up parallel to the room's east wall (Fig. 8.54b).

A thin (1-2 cm), discontinuous, layer of sandy loam, ash, and charcoal (Level 3a) separated Floor 1 from a lower adobe floor (Level 4, Floor 2). The connection between room and lower floor was at first unclear. The unusual location in the northeast corner of an unlined hearth pointed toward a pre-room surface, but as the room's walls went below the surface it could also have been part of the room. The discovery of a large ash-filled pit associated with Floor 2 and underlying the room's east wall finally provided the evidence necessary to identify the floor as a plaza surface (Fig. 8.54c). More than that, a closer check of the pit revealed another adobe floor (Level 5, Floor 3) below it. Two 1x1 m units in the room were excavated down to this last floor, without that any features or artifacts would have been found (Fig. 8.54d). The only observation of note was that small amounts of ash and charcoal (Level 4a) separated Floors 2 and 3.

The two plaza surfaces were also recorded in the plaza entrance proper. Similar to Floor 1 in Room VI-2, Floor 2 lay under up to 20 cm of sand and sandy loam.[10] A few lenses of dust and ash/charcoal separated Floor 2 from Floor 3. Floor 2 was between four and seven and Floor 3 between four and eight centimeters thick (Fig. 8.55). Except for a

[10] As Floors 2 and 3 were first recorded in Room VI-2, I retained the numbering in relation to the overlying room floor. The same applies to the nearly identical floor sequence in Room XI-9 (cf. Figs. 8.30b-d, 8.31).

scatter of utility and glazeware sherds, the extramural excavation of Floor 2 yielded little cultural material and no features (Fig. 8.54c). In this, Floor 3 proved different. Although a smaller area of Floor 3 than of Floor 2 was excavated, an unlined hearth and five possible postholes were all associated with the lower plaza level (Fig. 8.54d). The holes were between 10 and 15 cm in diameter and ranged from 28 to 43 cm in depth. Two of them contained fragments of juniper posts. Floor 2 adobe capped both hearth and holes.

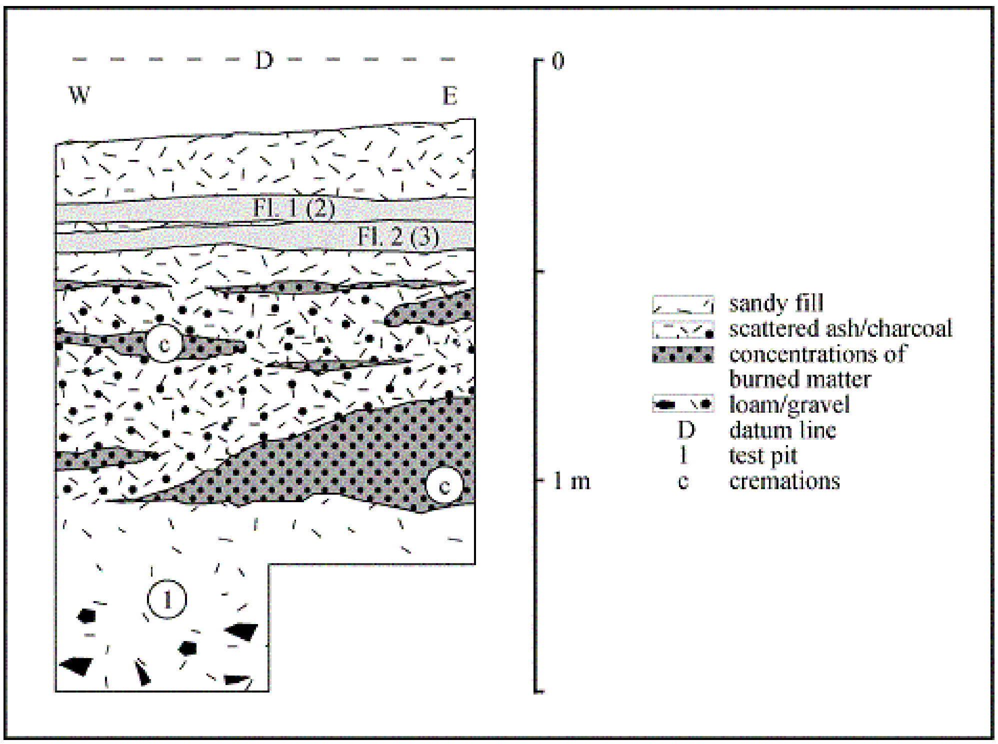


Fig. 8.55. East room block, Area VI, plaza entrance outside Room VI-2, Unit VI i, west-east stratigraphic sequence.[11]

[11] See note 10 above on the numbering of the two plaza surfaces.

In a deep test-pit excavated just outside Room VI-2, the lower plaza surface rested on top of a thin (5-10 cm) layer of sandy loam that ended abruptly with an accumulation of burned material. The latter included a number of discrete concentrations of charcoal, burned corn, and bone. In one of these concentrations, calcined human long-bone (fibula, tibia/ulna) fragments were visible. This was the first cremation burial recognized at Plaza Montoya. Further down the same layer, the test-pit cut the edge of a much larger deposit of burned material. The greatest exposed depth of this deposit was 25 cm, or about half the depth of the main layer (Fig. 8.55). Material excavated near the bottom contained six teeth (three incisors, one canine, two molars) and 35 mostly calcined bone fragments (femur/humerus, rib, possible clavicle, possible manubrium).

When bone fragments could be seen directly in the fill, the excavation was shifted away from the deposit. Brief examination of the remains showed that they came from at least two individuals, a child/sub-adult and an older adult. Subsequent analysis of flotation samples from the test-pit produced 1,096 small to very small bone fragments. So far as identifiable, they belonged to sub-adults or adults. The plaza-entrance deposit held by far the densest cluster of human remains encountered during the project (Chapter 9). In 2005, a test-trench (Trench VIII-35) excavated parallel to the northern plaza periphery (Figs. 8.14, 8.19) cut through a sizeable refuse pit in the middle of the plaza entrance. In the pit's 3.5 m long profile, a layer of dark organic material was exposed c. 2.5 m due north of the 2002 test-pit. Visible in the trench fill were more than a dozen calcined bone fragments. This and the fact that the 2002 test-pit had only grazed a bigger feature hint at a common depositional context and the presence of a substantial number of burials under the plaza entrance.

The layer of burned material in the test-pit ended at c. 90 cm below the modern surface. With increasing depth, sediments changed from loam to silt to gravel. All were sterile. Excavation of the test-pit was stopped at an elevation of 150 cm below unit datum (Fig. 8.55). The results of this and of work in Room VI-2 and Trench VIII-35 offer some insight into use of space in and around the plaza entrance. Prior to laying down the lower adobe surface, the pueblo's residents had used the area – extensively, it would seem – for refuse disposal and burying their dead. For a while during the Floor 3 occupation, a portion of the area may have been covered by a *ramada*-style structure. At the time of the following Floor 2 occupation, features were perhaps limited to the edges of the entrance, but whether the center of the entrance was kept entirely clear is not certain. The adobe floors were absent in the trench stratigraphy, and only a level of compacted soil could be tentatively marked as a surface. This made it difficult to identify possible open features in the plaza entrance in its final, most constricted configuration.

Rooms VI-6 and VI-7

Similar to Room VI-2, excavation of the northern half of Room VI-6 and of a small strip of the earlier Room VI-7 illustrated the lack of depth of structural remains in the western part of Area VI. A shallow (5-15 cm) layer of sandy topsoil covered an even shallower (3-6 cm) mix of sandy loam, ash, charcoal, adobe debris, and faunal remains (Level 2). In VI-6, a possible bin wall abutted the room's west wall. The latter survived only to a height of eight centimeters, but was sufficiently preserved to reveal a number of adobe bricks. In VI-7, a wider interior abutment probably belonged to a wall dividing the entire room. Disturbances from looting were visible in both rooms (Fig. 8.56a).

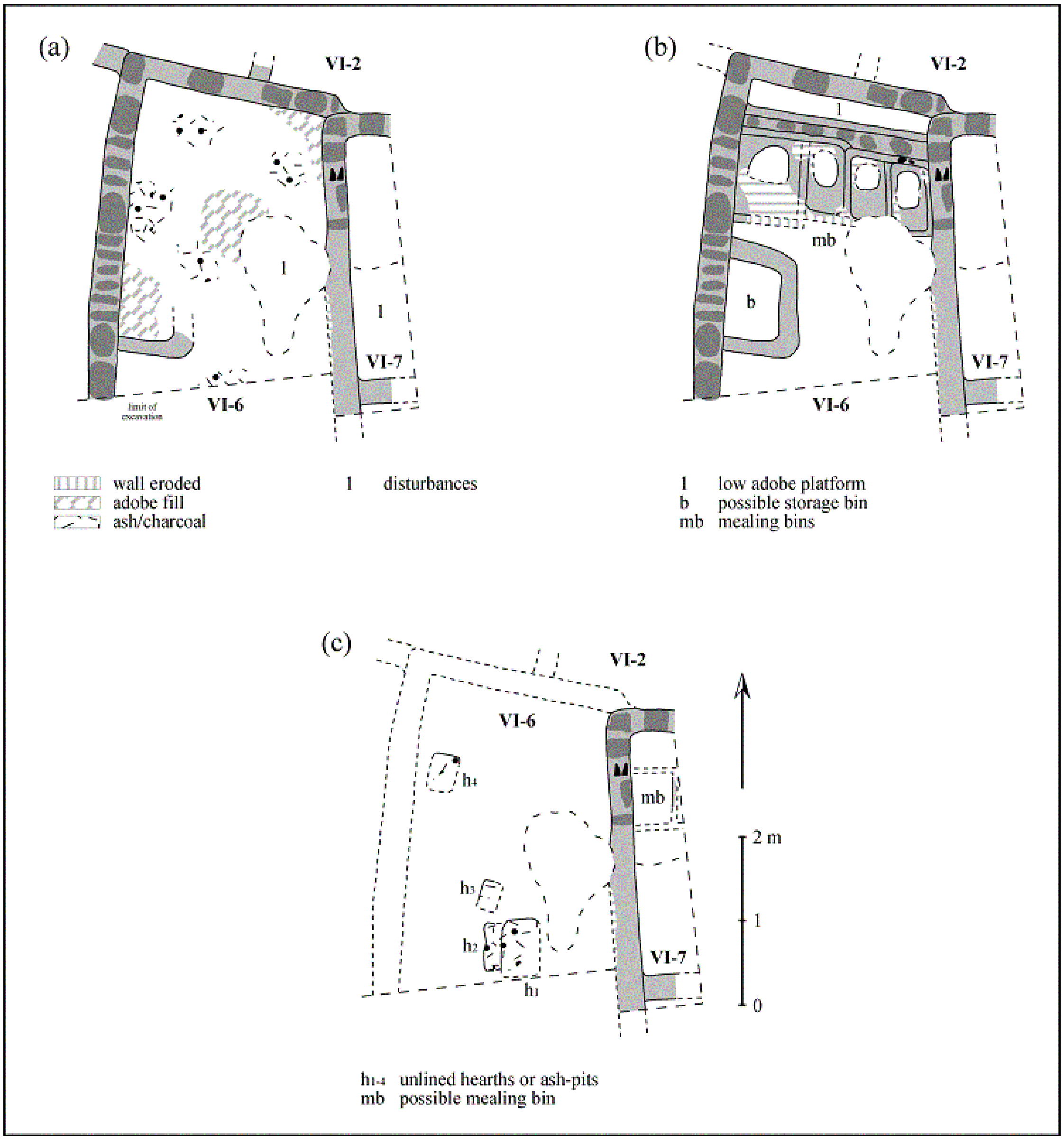


Fig. 8.56. East room block, Area VI, Rooms IV-6 and VI-7, spatial-stratigraphic sequence: (a) VI-6 and VI-7, Level 2; (b) VI-6 and VI-7, Level 3, Floor 1; (c) VI-6, Level 4, Floor 2 (plaza); VI-7, Level 4, Floor 2.

In VI-6 as well as in VI-7, an adobe floor (Level 3, Floor 1) lay below the Level 2 fill. A set of four mealing bins in the northern part of Room VI-6 and the west-wall bin first noted in Level 2 in the same room were the only features associated with the Floor 1 level (Fig. 8.56b). The level was not excavated in either room, but even so a few sub-floor features could be traced in places where little floor adobe remained (Fig. 8.56c). In Room VI-6, there were four unlined hearths or ash-pits that had been dug into a partly plastered plaza surface (Level 4, Floor 2). In VI-7, traces of a possible mealing bin found near the room's north wall were associated with a lower room floor, not a plaza surface. As in several other plaza-fronting and near-plaza rooms, this suggests that stratigraphic differences between neighboring rooms mainly reflect different positions within a room-block construction sequence (see below).

THE NORTH ROOM BLOCK

Area VII Bond-Abut Patterns

Erosion of peripheral rooms, large-scale disturbances (road cut, irrigation system), and a surface compacted by recent vehicular traffic combined to obscure many wall alignments in Area VII. While protracted wall-scraping in 2002 and 2003 exposed a number of interior rooms, few walls along the edges of the room block could be traced. As a result, descriptive structural statistics are skewed towards the room-block center. Recorded and projected rooms in Area VII may have been tied together by as many as 49 wall corners (Fig. 8.15). Defined completely were 21, and partly, four corners. That 22 of these 25 corners were located in the four interior rows running east from Rooms VII-23, 27, 28, and 29 underscores the link between location and differential preservation of rooms. The excavations in the area further confirmed the disparity. In Rooms VII-11 and VII-15, for example, deposits were deep enough to preserve several levels of fill and room floors with features. In plaza-fronting Room VII-17, by contrast, no fill and only a fraction of a room floor survived. Even the pre-room plaza surface had largely eroded away, taking with it long stretches of the room's wall foundations.

Through bond-abut analysis, four rooms – VII-15, 16, 23, and 29 – of a cluster of unknown size were isolated as the earliest rooms in Area VII. The bulk of the cluster was apparently located in the area destroyed by the graded road. Expansion from the cluster was south (i.e. toward the plaza) and east (Figs. 8.15, 8.57). The first rooms added on the south side were probably (as only the eastern corners could be found) Rooms VII-27 and VII-28. After that, the next rooms were VII-11 and VII-12, followed by Room VII-26 and what seems to have been a four-room unit consisting of Rooms VII-1, 2, 7, and 8. The last rooms built in this direction were the smaller plaza-fronting Room VII-17 and its nearly invisible neighbors, Rooms VII-18 and VII-19 (Figs. 8.15, 8.57). To the east of the initial room cluster, the first step in room-block expansion was construction of Room VII-22. As the room by itself would have protruded with its long axis from the core room block, it was most likely part of a group of rooms erected at more or less the same time. Bond-abut patterns for the rooms around VII-22 suggest that this group included Rooms VII-14, 10, 9, 13, and perhaps VII-21. All adjacent rooms to the south, north, and east were linked to it by abutments. Between Rooms VII-9/10 and the final plaza front, six rooms (VII-3 through 6, VII-20, VII-25) were loosely identified, as were three rooms (VII-24, plus two unnumbered ones) between VII-21/22 and the graded road. To the east, 24 rooms were recorded or projected in Area IX (Figs. 8.6, 8.15, 8.57).

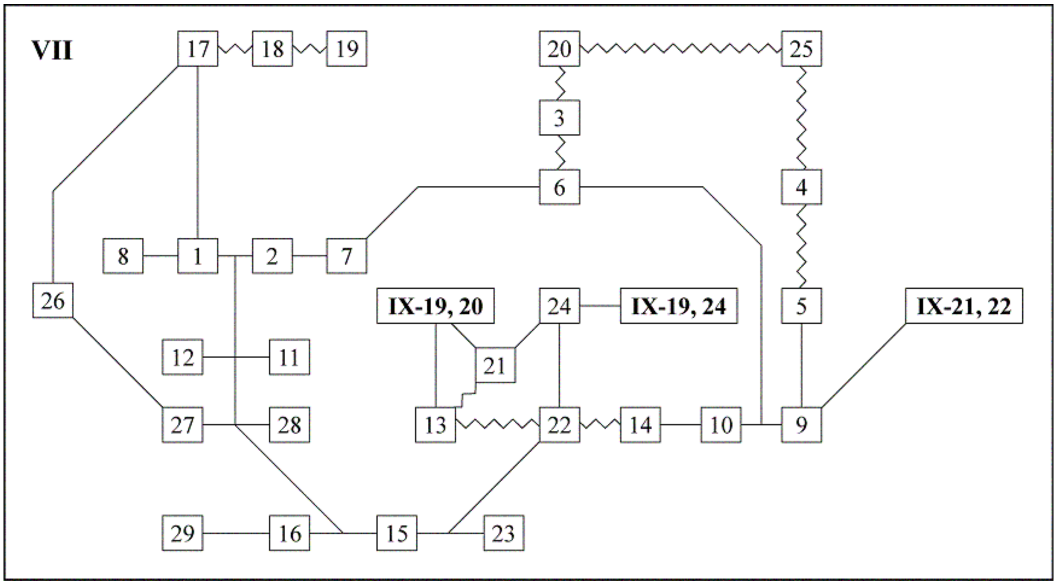


Fig. 8.57. North room block, Area VII, room sequence based on wall relationships.

Area VII Stratigraphies

Rooms VII-11 and VII-15

In the sequence of room-block expansion in the central part of the north room block, Rooms VII-11 and, especially, VII-15 represent early construction episodes. Identified wall relationships place VII-15 in a core room cluster that pre-dates all other rooms in Area VII. The two rooms were located in an area that connected the graded road to the two-track in the plaza and points south (Figs. 8.5, 8.6). Use by motor vehicles had compacted sediments in the area to such a degree that separating floor from fill levels proved tricky. Adding to the effect were disturbances that were difficult to follow. In Room VII-11, for instance, removal of a thin (0-10 cm) layer of topsoil (Level 1) and some adobe debris (Level 1a) exposed a weathered adobe floor (Level 2, Floor 1). Wall-scraping had shown the southwest corner of the room to have been extensively disturbed, and the excavation now revealed that the disturbance extended across the floor in the western part of the room, through the north wall, and on into Room VII-15 (Figs. 8.58a-c). The southern end was not located, but the disturbance was at least eight meters long and had a narrow, trench-like, profile suggesting use of a back hoe or similar machine. A second disturbance in the eastern part of the room also cut into Room VII-15, but was much shallower and appeared to be an old looters' pit (Fig. 8.58a).

Regardless of sediments and disturbances, two features, a broad dividing wall and a clay-lined hearth abutting the south wall, were uncovered at the Floor 1 level in Room VII-11. Directly below this level was another adobe floor (Level 3, Floor 2) with a clay-lined hearth in the center and four mealing bins at the east end of the room (Fig. 8.58b). Floor and bins had been heavily damaged, presumably during leveling for the Floor 1 surface. Floor plaster was mostly missing, particularly near the bins. In this area, five circular spots could be seen in an apparent sub-floor plane (Level 4, Floor 3). These turned out to be four likely postholes, arranged in a straight line, and an unidentified pit (Figs. 8.58b-8.59). The postholes measured between 10 and 17 cm in diameter. Two contained fragments of decayed wood and one (p_2/c_1 in Fig. 8.58c) a cremation burial. The rims of all four holes were compacted soil that had been tapped down against a pole and reinforced with adobe. Bottoms were slightly tapered, except for the hole with the cremation, which was bell-shaped. Ten more pits (seven possible postholes, two cist-like depressions, and one cremation) were subsequently recorded in the room (Fig. 8.58c). With a common elevation of 42 to 45 cm below unit datum and no evidence of another sub-floor level, all these features must have been part of the same plaza surface.

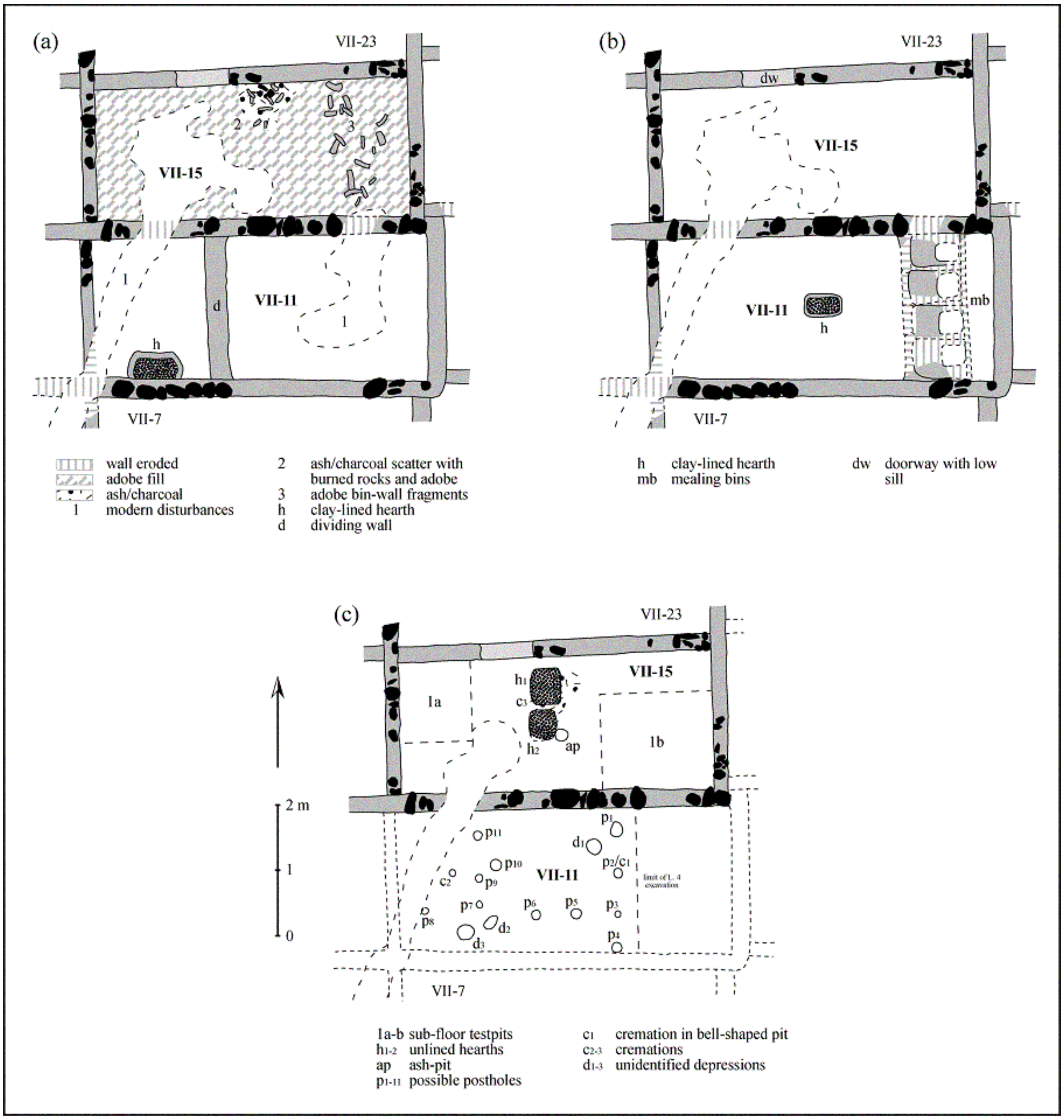


Fig. 8.58. North room block, Area VII, Rooms VII-11 and VII-15, spatial-stratigraphic sequence: (a) VII-11, Level 2, Floor 1; VII-15, Level 2; (b) VII-11, Level 3, Floor 2; VII-15, Level 3, Floor 1; (c) VII-11, Level 4, Floor 3 (plaza); VII-15, Level 4, Floor 2.

Fig. 8.59. North room block, Area VII, Room VII-11, Level 3, Floor 2, mealing bins, and Level 4, Floor 3, postholes and unidentified pit (second from right) in plaza surface. The hole above the inner two mealing bins contained a cremation burial. View is to the west (M. Bletzer, 7/2003).

Even more so than in Room VII-11, work in Room VII-15 was slowed down by the extremely compact makeup of deposits in the room. The first layer below the shallow (0-5 cm) topsoil was a dense accumulation of collapsed adobe (Level 2). Except for two disturbances it shared with Room VII-11, the entire room was filled with adobe to a depth of 15 to 20 cm. In the eastern part of the room, numerous plastered adobe pieces were found about two-thirds down the level, as was a concentration of ash, charcoal, and burned groundstone (basalt) and clay-lined adobe fragments near the center of the north wall (Fig. 8.58a). Judging by the amount of adobe rubble and the relative position within the layer of the two clusters of feature remains, it is very likely that the room had had a second story counterpart with a hearth and mealing and/or storage bin(s).

Throughout much of the room, the bottom of Level 2 was a broken adobe floor (Level 3, Floor 1). The elevation of this floor was c. 10 cm below that of Floor 1 in Room VII-11. In the northeast and northwest corners and in the eastern part of the room, floor adobe was between three and six centimeters thick. Near the east wall, a thin (1-2 cm) lens of silty clay (Level 2a) on the floor suggested that the room had been partly open to wind- and water-born sediments prior to collapse. A dip in the north wall, 90 cm wide, plastered separately, and of different texture than the nearby wall, possibly marked a low-threshold, Spanish-style, doorway (Fig. 8.58b) (Chapter 9). No other features and few artifacts were present at this level. Excavation beneath Floor 1 next uncovered a lower floor (Level 3, Floor 2) of hard-packed loam that had been coated with a fine (<1 cm) layer of clay. Two large unlined hearths were located in the middle of the earlier floor (Fig. 8.58c). While neither hearth was excavated, ash and charcoal that had spilled onto the surrounding floor contained calcined long-bone fragments, a rare occurrence of human remains in a room context (Chapter 9). This was the only cultural material associated with Floor 2. Average elevation of Floor 2 below unit datum was 41 cm, which matched the elevation of Floor 3 in Room VII-11. Two large test-pits (1a and 1b in Fig. 8.58c) were excavated to a depth of 40 cm below the floor in the northwest and southeast corners of the room, but merely encountered sterile layers of loam and silt.

<u>Rooms VII-5 and VII-9</u>

Aside from Room IX-10, Room VII-9 was the only room in the area of the old tree farm to be completely excavated. As wall-scraping did not adequately establish the connection between Rooms VII-9 and VII-5, a 2x1 m area in the northwest corner of the latter room was included in the excavation (Figs. 8. 15, 8.60). Unlike in Rooms VII-11 and VII-15, sediments in and around Room VII-9 were not compacted. Topsoil was loose sand, from 10 to 15 centimeters deep, which covered a thin (1-3 cm) adobe floor (Level 2, Floor 1). In the eastern half of the room, the floor was three centimeters higher than in the western half. Little remained of walls and features because of the grading of the area. Contours of four mealing bins could only just be traced in the southeast corner of the room – the result, to some extent, of a peculiar layout facing a long room wall, with an adobe divider separating bins from room (Fig. 8.60a). Unusual, too, was an adjoining storage bin with two walls. Near the center of the room's north wall, the truncated bases of a very large hearth and ash-pit were located. This showed that grading had stripped at least one floor. Between ash-pit, storage bin, and west wall, numerous small bones lay atop Floor 1. The same area yielded a small copper/brass object of unknown function. In the Room VII-5 test, Level 2 was a low (2-3 cm) accumulation of adobe rubble along the walls (Fig. 8.60a). Since the rubble was as shallow as neighboring Floor 1, the lack of a floor at this level appears to have contributed to its preservation.

In Room VII-9, Floor 1 had been laid over another thin (2-3 cm) adobe floor (Level 3, Floor 2). Features with this lower floor were four mealing bins, lined up more conventionally with the west wall, and a cross-wall in the eastern half of the room (Fig. 8.60b). The top of the cross-wall was visible in the higher section of Floor 1 and may have marked the level to which the latter floor was raised. As for the mealing bins, they had been practically obliterated in the construction of Floor 1. A centimeter or so of floor plaster had sufficed to conceal the bin remnants, which speaks to the thoroughness of the remodeling effort. Whether the storage bin in Floor 1 was in use during the Floor 2 occupation could not be determined. In VII-5, a plane of clay loam (Level 3, Floor 2) was discovered under a mix of adobe rubble and possible clay floor (Floor 1). Associated with this likely plaza surface were a posthole and a deep charcoal-filled pit. At the edge of the pit, two burned cranial fragments protruded from the charcoal fill (Fig. 8.60b). As the fill was not excavated, the amount of human bone in the pit remains unknown.

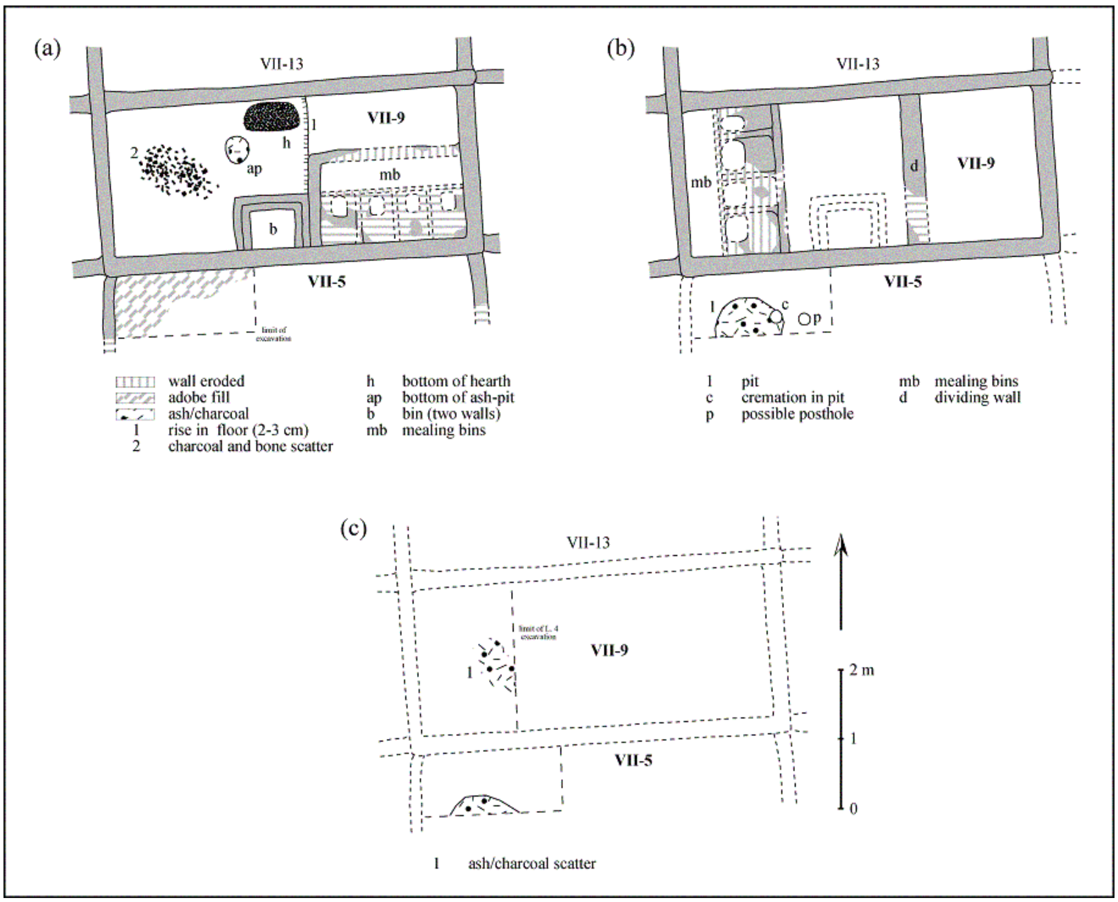


Fig. 8.60. North room block, Area VII, Rooms VII-5 and VII-9, spatial-stratigraphic sequence: (a) VII-5, Level 2 (Floor 1); VII-9, Level 2, Floor 1; (b) VII-5, Level 3, Floor 2 (plaza); VII-9, Level 3, Floor 2; (c) VII-9, Level 4; Floor 3 (pre-room surface).

Excavation below Floor 2 was limited to c. 3 m^2 along the west wall of Room VII-9. It revealed an ill-defined lens of ash and charcoal scattered over a moderately compact layer of silty loam (Level 4, Floor 3). Elevation of the latter was 24 cm below unit datum, close to a mean elevation of 22 cm for the Room VII-5 plaza surface. Texture and elevation of the layer point to a pre-room use area, but given a lack of formal features and artifacts it may not have been a regularly used plaza surface (Fig. 8.60c). In Room VII-5, sub-floor probing showed the edge of the charcoal pit to slant to a depth of 50 to 60 cm below Floor 1. As no other floor was found, Floor 1 remained the only use surface documented in this room (Fig. 8.60c). There doubtless had been at least one floor associated with the room itself, but like the uppermost floor(s) in Room VII-9 it was destroyed during grading.

Room VII-17

Of the five rooms (VII-17 through 20, VII-25) in the Area VII plaza front, Room VII-17 was the only one that could be broadly outlined by wall-scraping. Despite this, it was also evident that most of the room had been eroded. In the northwest corner, a thin (<5 cm) layer of sand covered a patch of weathered adobe floor (Level 2, Floor 1). Save for wall foundations, this was the room's only structural relic (Fig. 8.61a). In the rest of the excavated area, topsoil merged into an equally weathered surface of hard-packed loam (Level 3, Floor 2). Some ash and charcoal had been scattered on this surface next to the room's north wall. South of the scatter, three round depressions were located. The two smaller ones were 13 (p_1 in Fig. 8.61b) and 15 cm (p_2 in Fig. 8.61b) wide, and 20 (p_1) and 23 cm (p_2) deep. They resembled the postholes in the Room VII-11 plaza surface. The larger depression was c. 25 cm in diameter. Though not excavated, a probe of the upper 10 cm showed it to be bell-shaped and partly filled with charcoal and burned corn. The probe exposed a burned human incisor and several bone fragments (long-bone, rib, skull). Pits with similar characteristics were noted during wall-scraping in several nearby rooms (Chapter 9). Even with the lack of structural substance in Room VII-17, there can be no doubt that Floor 2 was a plaza surface. Whether it was the only one, or, as in Areas VI and XI, one of two distinct surfaces, could not be conclusively established, however.

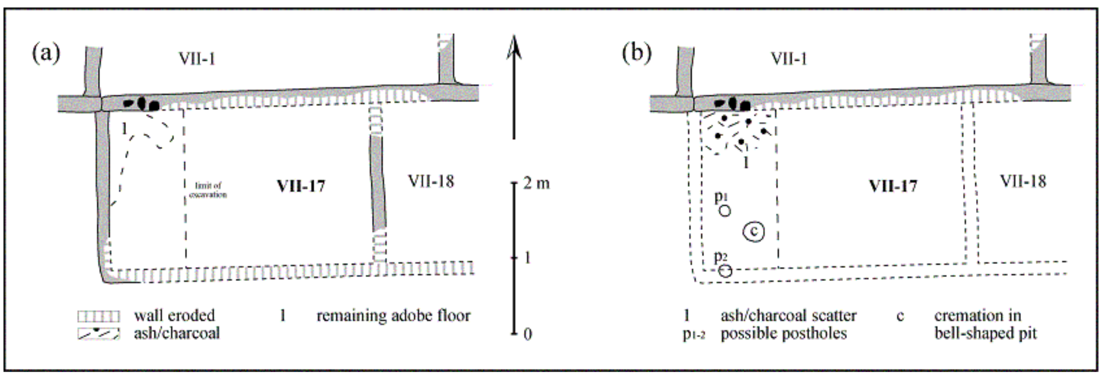


Fig. 8.61. North room block, Area VII, Room VII-17, spatial-stratigraphic sequence: (a) VII-17, Level 2, Floor 1; (b) VII-17, Level 3, Floor 2 (plaza).

Area IX Bond-Abut Patterns

The eastern periphery of the north room block is one of the least preserved parts of the pueblo. The large-scale grading in the area had pared most walls down to the lowest level of wall adobe. The presence of basalt cobbles in the rubble mounds at the east end of Area IX indicated something of the effect the grader had on the walls in uprooting rocks that may have been part of wall foundations. This probably explains why few foundation stones were found in the area and no alignments could be followed on the surface. As for scraping, this revealed only interior walls. With walls gradually petering out along the mound's slightly east-trending slope, the outer edge of the room block remains undefined (Figs. 8.5, 8.6, 8.16).

In the end, only a handful of rooms could be clearly placed in sequence. Rooms IX-9, 16, 20, and 21 were the earliest, forming a four-room unit abutting Rooms VII-9 and VII-13. Established and projected relationships between these and later rooms are shown in Fig. 8.62. The illustration reflects the lack of data for rooms outside the two rows east of VII-9 and VII-13. According to recorded wall patterns, Rooms IX-10, 11, and 15 were added en bloc to the unit of IX-9 and IX-16. The expansion seems to have included Rooms IX-12, 13, and 14, but not enough corners could be traced to define this cluster. All other identified walls abutted the two interior rows of rooms (Fig. 8.16).

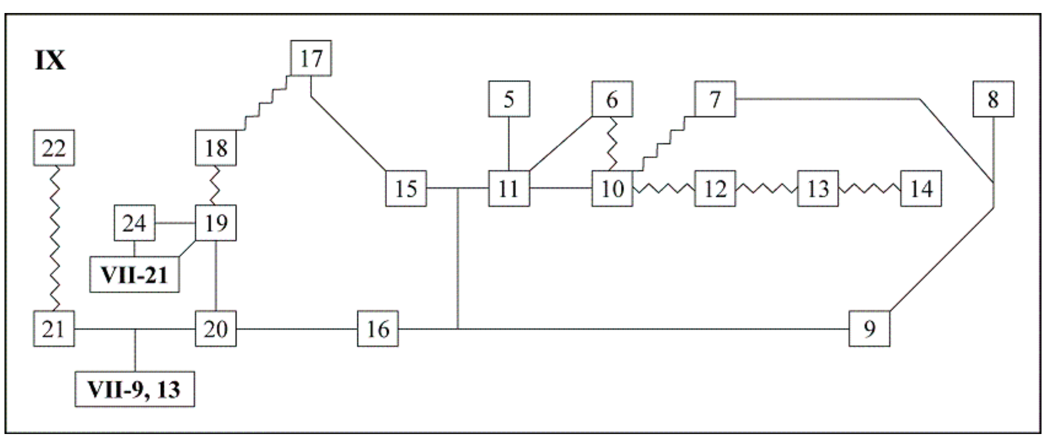


Fig. 8.62. North room block, Area IX, room sequence based on wall relationships.

Area IX Stratigraphies

Room IX-10

The easternmost room in the north room block that could be traced in its entirety was Room IX-10. Like Rooms VII-5 and VII-9, it was located in the area disturbed by grading. Maximum wall height was 10 cm, but there were long stretches with less than five centimeters of wall remaining. Removal of the shallow (<10 cm) topsoil exposed a weathered adobe floor (Level 2, Floor 1). Where floor plaster survived, it was up to three centimeters thick. At the east end of the room, the remains of four mealing bins were just barely recognizable (Fig. 8.63a). An unlined hearth had been placed west of the bins and near the center of the north wall. Further west and even closer to the wall was the lower portion of a larger hearth (h_2 in Fig. 8.63a) whose top had been cut by the grader. Similar to the Floor 1 hearth and ash-pit in Room VII-9, this partial feature must have been associated with an upper floor, now gone. No other structural features were identified with the floor, but there was also, in the room's southwest corner, a conspicuous, if shapeless, ash/charcoal scatter. Elevation of the floor ranged from 16 to 20 cm below room datum. It had been laid on top of a compact layer of sandy loam (Level 3, Floor 2). An ash-charcoal scatter extending under the north wall and a larger scatter in the southern part of the room and under the south wall characterized the layer as a pre-room surface (Fig. 8.63b). No features and few artifacts were encountered at this level. Sub-floor probing furnished no evidence of a possible earlier surface or additional cultural material. In view of these results, and considering the state of the room's structural remains, it was decided not to expand testing to other Area IX rooms.

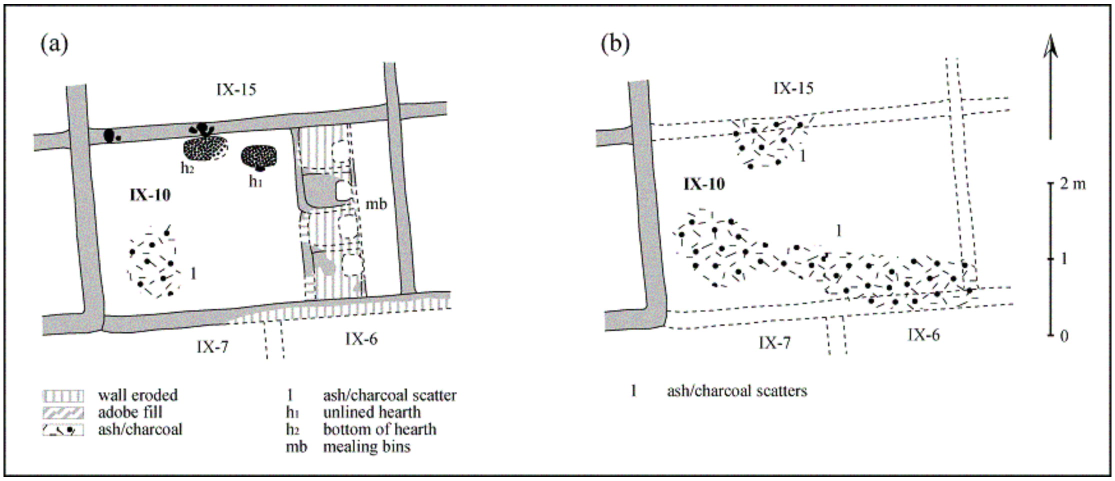


Fig. 8.63. North room block, Area IX, Room IX-10, spatial-stratigraphic sequence: (a) IX-10, Level 2, Floor 1; (b) IX-10, Level 3, Floor 2 (pre-room surface).

Area XII Bond-Abut Patterns

The main objective of wall-scraping in Area XII was to find out what remained of the room block on the north side of the graded road. This entailed an effort to identify outer rooms, something which had proved impossible in Areas VII and IX. The sequence of rooms as determined by bond-abut analysis is outlined in Fig. 8.64. Based on the only surviving corner of Room XII-7, all Area XII rooms appear to post-date this room. Rooms XII-6 and XII-5, for instance, were added to XII-7, while a block of Rooms XII-1, 2, 4, and probably XII-3 may have been added to XII-6 and XII-5. It is also possible, though, that the six rooms were built as one unit. Walls running west and north from XII-2 were a surprise discovery, but were much shallower than other walls and thus could be traced only in short sections (Fig. 8.18). That there were many more rooms than XII-9 through 12 is unlikely, however, as there were no artifacts on the surface.

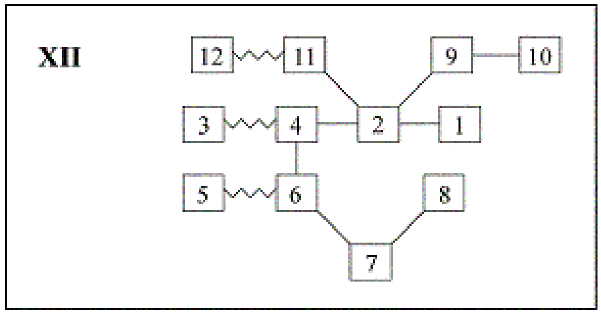


Fig. 8.64. North room block, Area XII, room sequence based on wall relationships.

Area XII Stratigraphies

Rooms XII-4 and XII-6

Aside from focusing on exterior walls, work in Area XII included a stratigraphic test of Rooms XII-4 and XII-6. Although spatially restricted, the room test established complete vertical sequences for both rooms. In the older Room XII-6, a 1x1 m unit was excavated in the northwest corner. Due to the overburden from the road, the topsoil (sand, sandy loam) was from 10 to 30 cm deep. Below this material was a layer of collapsed adobe (Level 2) between 30 and 35 cm thick and without artifacts or organic inclusions (Figs. 8.65a, 8.66. The adobe had accumulated over a well-preserved (except for minor root disturbance) adobe floor (Level 3, Floor 1). A depression capped with a rock was the only feature encountered in the test-unit. Roughly 20 cm wide and 23 cm deep, the feature may have been a posthole (Figs. 8.65b, 8.66). It had straight sides and a tapered bottom, but no wood fragments in its fill. Limited sub-floor testing showed that the wall between the two rooms rested on several basalt and rhyolite cobbles. Sub-floor deposits were loam, silty loam, and silty loam with gravel. All were sterile (Fig. 8.66).

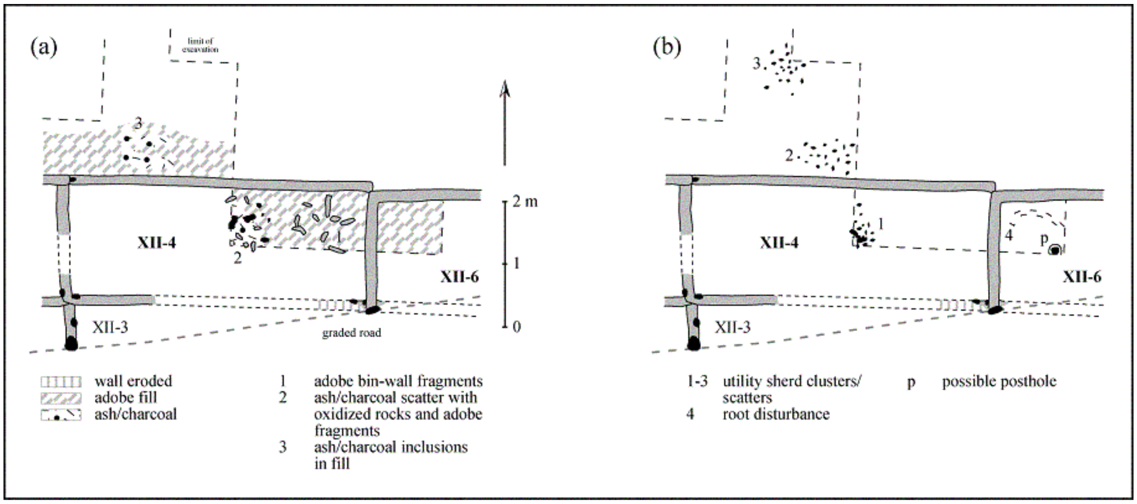


Fig. 8.65. North room block, Area XII, Rooms XII-4 and XII-6, spatial-stratigraphic sequence: (a) XII-4 and XII-6, Level 2; (b) XII-4 and XII-6, Level 3, Floor 1.

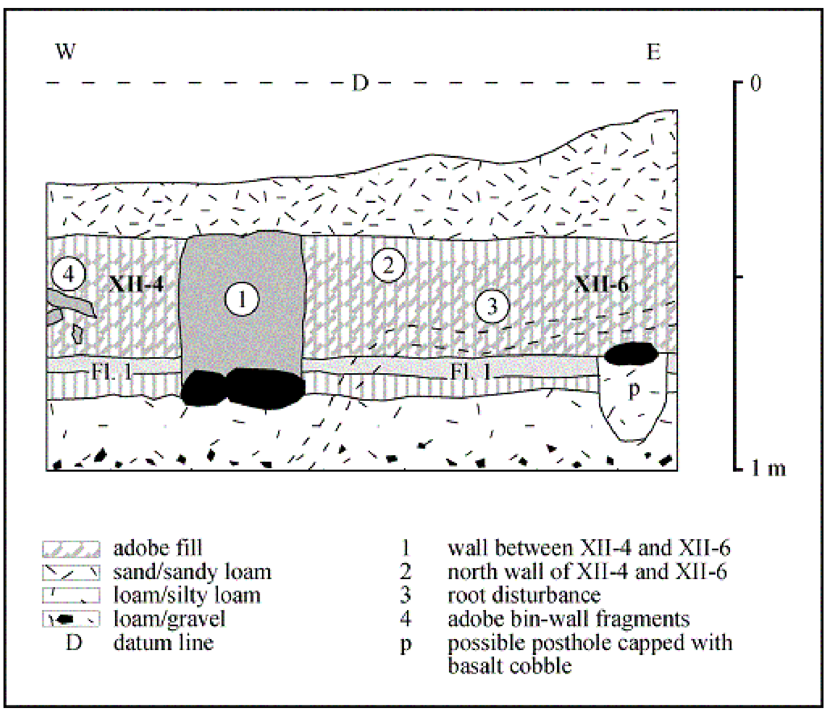


Fig. 8.66. North room block, Area XII, Rooms XII-4 and XII-6, north wall, partial east-west stratigraphic sequence.

The stratigraphy of adjacent Room XII-4 was very similar to that of XII-6. Sand and sandy loam covered a solid mass of adobe rubble (Level 2). Unlike in the Room XII-6 test, the rubble included plastered adobe fragments at the east end of the room and a concentration of ash and charcoal with some broken and burned basalt slabs and fire-reddened adobe fragments toward the room's center (Figs. 8.65a, 8.66). Size and shape of the unburned adobe pieces suggest they were parts of walls and bottoms of mealing bins that had been located in a second-story room. The ash and other burned material most likely came from a hearth in the same room. Level 2 was as deep as in XII-6 and had also piled up on top of an adobe floor (Level 3, Floor 1). A utility jar sitting on the floor had been crushed in the roof collapse, but otherwise no features were associated with the floor in the excavated area. Probing below the floor revealed the same sequence of sediments as under Room XII-6 (Figs. 8.65b, 8.66).

In addition to all this, work outside Rooms XII-2, 4, and 6 corroborated the initial identification, made during wall-scraping, of a recessed room front between Rooms XII-8 and XII-9 (Fig. 8.18). But while there were clearly no rooms north of XII-4 and XII-6, excavation of 10 extramural 1x1 m units revealed a layer of collapsed adobe with ash/charcoal inclusions along the outer face of the north wall of XII-4 (Level 2). Up to 25 cm deep near wall base, the adobe petered out within a meter or so from the wall (Fig. 8.65a). A dense layer of sandy loam was encountered below the adobe. Two separate utility sherd scatters and other artifacts found on this layer indicated that it had been an outside use surface (Level 3, Floor 1) (Fig. 8.65b). No hearths or other pit features were exposed in the excavated units, however. Average elevation of the surface (68 cm below unit datum) matched that of the Floor 1 level in Rooms XII-4 and XII-6 (Fig. 8.66).

PLAZA AND OFFSITE TESTS

Plaza and offsite locations were tested primarily to identify kivas and to assess use of plaza and offsite space. As summarized above, more than 40 test-trenches and test-pits were excavated outside the room blocks. While two smaller tests in the central plaza and west of the pueblo were designated Areas V and X, most trenches were subsumed under the Area VIII label. In-depth discussion of these proveniences adds little to the structural analysis of the room blocks and is thus beyond the scope of this study. At the same time, the distribution of diagnostic ceramics in plaza pits has chronological implications that may play a key role in identifying occupation patterns. This is a point I take up in the following chapter. Here, I briefly describe two Area VIII trenches, VIII-34 and VIII-38, to give an idea of the nature and extent of the plaza and offsite features.

Area VIII Stratigraphies

Trench VIII-34

Trench VIII-34 was a 1x2 m test-trench excavated in the central plaza about four meters east of Room I-19 (Figs. 8.6, 8.19). Its location was determined by a large depression exposed earlier in the excavation of Trench VIII-33. The size of the depression seemed sufficient for a kiva. Trench VIII-34 was laid out at nearly right angles to VIII-33 (Fig. 8.67). In the section cut by the test, the depression contained 10 layers (including topsoil) with cultural material to a depth of 1.4 m below the surface (Figs. 8.68, 8.69). Large amounts of organic material (ash, charcoal, corn) and artifacts were collected, including a copper rivet with stamped decoration that still held together three small patches of leather (Chapter 9). Features indicative of a kiva were not found.

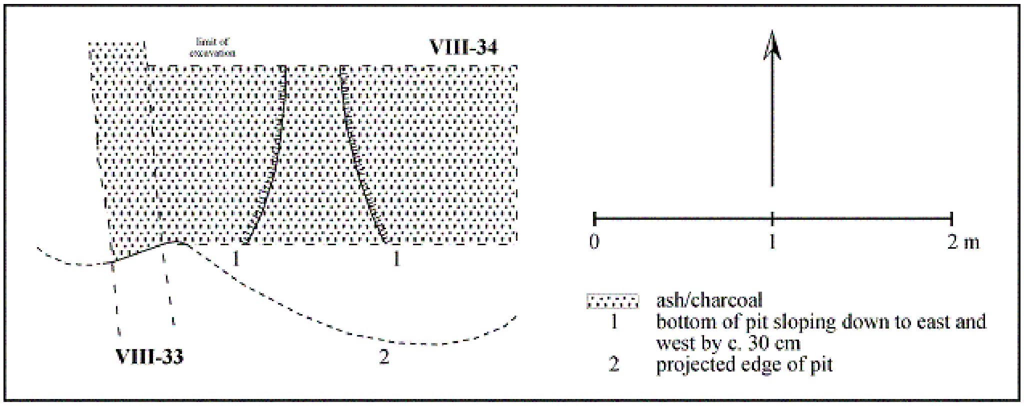


Fig. 8.67. Central plaza, Area VIII, Trench VIII-34.

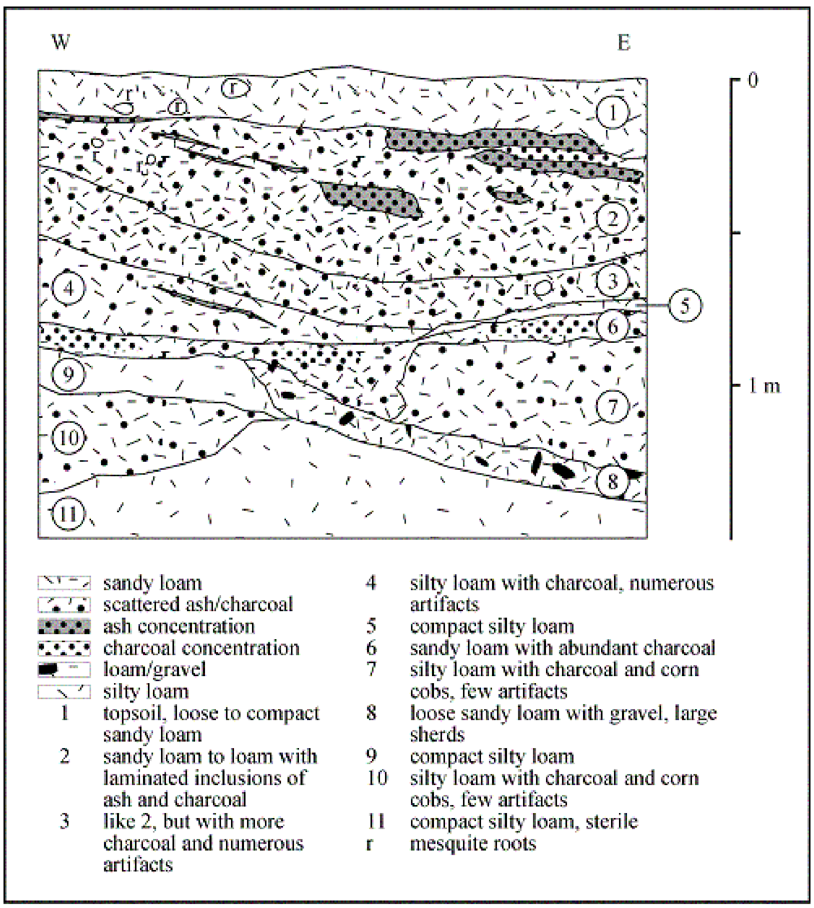


Fig. 8.68. Central plaza, Area VIII, Trench VIII-34, north wall stratigraphic sequence.

Fig. 8.69. Central plaza, Area VIII, Trench VIII-34, north wall (T. O'Laughlin, 7/2005).

<u>Trench VIII-38</u>

Trenches VIII-38 and VIII-39 were the only trenches placed east of the east room block (Fig. 8.6). Of the two trenches, only the former produced features and artifacts. Laid out c. 15 m from the Area IV/VI double wall, Trench VIII-38 was excavated for a distance of 21.4 m and to a depth of 75 to 95 cm. Like all mechanically excavated trenches, it was 30 cm wide. Running c. five degrees west of north, the trench cut through three features. From north to south, these were: (1) a large depression with unprepared sloping walls and laminated layers of gray soil, ash, and charcoal to a depth of at least 75 cm below surface; (2) a smaller and shallower (depth 33 cm) pit, also with sloping walls, filled with light gray soil and gravel; and (3) a straight-walled pit (depth >85cm) containing sand, ash, and charcoal (Fig. 8.70). Scattered artifacts were seen in all three depressions. Where it could be identified, the old plaza surface was a compact layer of sandy to silty loam. There were no hearths or other small features in the trench profile.

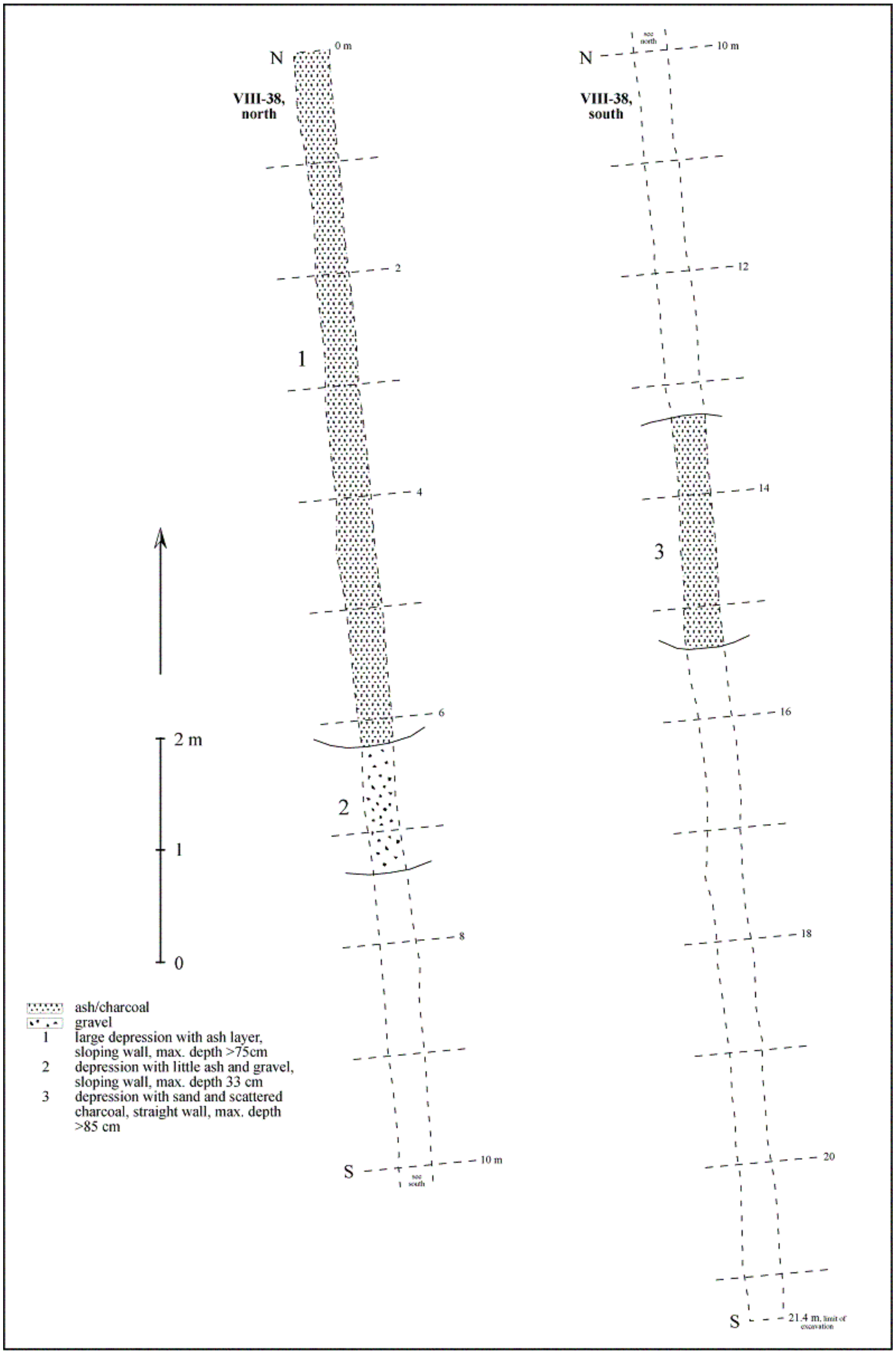


Fig. 8.70. East plaza, Area VIII, Trench VIII-38.

Summary

Comparative analyses of the architectural and stratigraphic data from Plaza Montoya reveal several basic trends in room-block expansion and overall site growth. In the largest room block, the north block, construction was based on a core group of rooms, located largely in the area of the road cut, from which construction went west-east in Areas VII and IX and east-west in Area XII. For the most part, rooms were added to the south or plaza side, but there may have been a small annex to the north of the western Area XII rooms. The gap of the road makes it impossible to reconstruct size and shape of the room block's initial core. Despite the road cut, however, it is clear that recorded Area VII rooms pre-date recorded Area IX rooms and that rooms toward the plaza are generally later than those toward the room block's outer periphery.

The excavation of Room VII-15 indicates that at least some interior rooms had a second story. Hearths, bins (storage/mealing), and utensils (pots, manos, metates) lodged in roof-fall above ground floors have long been recognized as evidence of rooftop use areas (Dean 1969; Ciolek-Torrello 1985; Creamer 1993: 28-30, 110-119). The problem is how to tell rooftop from upper-story room assemblages. At Grasshopper Pueblo, two-story rooms were defined as rooms "with a preserved height greater than the one-story maximum" (Riggs 2001: 95). This is a concept useful for rooms with standing walls as high as some of those encountered at Grasshopper, but when it comes to structures that are not preserved well enough to facilitate estimates of wall height the evidence is essentially limited to the remaining structural mass (cf. Barnett 1969: 47-49, 210-211; Hayes et al. 1981: 41-42; Creamer 1993: 20-21). In the case of Plaza Montoya, rooms with collapsed structural features in fill above floors were also the rooms with the deepest deposits of adobe rubble. The remains of such features were most often found toward the bottom of rubble layers. Large amounts of adobe had accumulated over the features, a depositional pattern more consistent with disintegrating upper-story walls than open rooftop areas. Historical clues to the existence of upper stories at Ancestral/Colonial Piro pueblos are the various references to two-story "houses" in the records of the Rodríguez-Chamuscado and Espejo-Beltrán expeditions (Chapters 6 and 7).

Broadly similar patterns can be identified for the east room block. Construction of Area IV rooms followed a north-south trajectory. Most rooms were added to the west side of existing rooms, i.e. toward the central plaza, though some were also built on the east side of the room block facing an open eastern plaza. At the north end of the room block (Area VI) expansion was east-to-west, except for the rooms east of the double wall. Abutments and alignments point out the latter rooms as additions to the nearest Area IV and VI rooms, but in the larger room-block sequence at least some of them (IV-24, VI-16, VI-17) seem to pre-date the rooms east and south of IV-27, 28, and 29 (Figs. 8.12, 8.14, 8.41, 8.50, 8.53). The earliest rooms in Area IV (IV-5, 6, 21, 22) were almost certainly part of the original room block, as were perhaps Rooms VI-13 and VI-14. This last association remains hypothetical, however, for walls and corners of the two Area VI rooms could not be traced.

As in the north room block, hearth and bin walls embedded in adobe debris above floors indicate that the rooms between IV-2 and IV-7 were multi-storied. In IV-4, 6, and 7 the rubble also contained roofing material such as grass, reeds, and fragments of small poles. The distribution of this material mostly in the lower parts of the adobe deposits again suggests upper-story rooms. In IV-2, 6 and 7, floors (in IV-7 with postholes) on top of adobe fill are evidence of rebuilding after roofs had collapsed, a point revisited in Chapter 9. The collapse need not necessarily have been due to normal structural decay. In the Hopi pueblos, roofs are known to have been cut and allowed to fall to help stabilize abandoned ground-floor rooms (Cameron 1991a: 91). Nor does the fact that the bulk of the material in the Area IV rooms was charred imply a catastrophic structure fire. Walls and fill were not oxidized, and there was not enough charcoal to suggest primary beams had burned (cf. Creamer 1993, Fig. 2.7). Whatever damaged the roofs, they collapsed after the silt/clay lenses in Rooms IV-4, 5, and 7 had been deposited. The presence of these fine-grained sediments shows that the rooms had been exposed to wind and weather for some time before roofs and upper structures came down.

Similar to the east room block, the bond-abut data for the west room block reveal a north-south pattern of expansion, with Area XI rooms being generally earlier than Area I rooms. Nine Area XI rooms were identified as the initial core room block, but as in the east block associations between these rooms are unclear. What is clear is a pattern of later rooms being added to the plaza side of earlier rooms. As in the east block, too, the southern edge of the room block could not be outlined, nor could most of the peripheral walls in Area I (eroded) or the westernmost walls in Area XI (vegetation). For example, excavation of two 1x1 m test-units just outside the projected southwest corner of Room XI-19 produced numerous small sherds and lithics, but no features or structural remains. Trenches VIII-40 and VIII-41, excavated mechanically west of Area I (Fig. 8.6), lacked features, artifacts, and organic material. There was nothing in the test-units and trenches that even remotely resembled a feature, let alone an exterior plaza or activity area like the one uncovered east of the east room block.

Second-story construction appears to have been limited to the northern half of the west room block. Near the highest part of the room-block mound, adobe fill covering the upper floors in Rooms XI-12, 13, and 16 was up to 30 cm deep. In the Room XI-13 test, the lower portion of the Level 2 fill contained a good number of sherds from a utility jar and the remnants of a hearth (Figs. 8.33a, 8.34). Viewed against the mound's profile, these observations indicate that the three westernmost rows in Area XI all had second-story rooms. If this is accurate, there would have been at least 12 second-story rooms, including nine above the earliest ground-floor rooms in the room block.

Structurally, the south room block is the least known of the pueblo's four room blocks. The ratio of identified to projected corners of labeled south-block rooms, for example, is only about 40%. For the west and east room blocks, it is at and above 60%. With a ratio of c. 45%, the graded part of the north room block (mostly Area IX) is close to the south room block. While only approximations, the ratios mirror other observations of surviving structural mass in each room block. Within the south block, Area II is particularly under-represented. Still, what bond-abut data there are suggest that the room block was built from east to west. East-west-trending Rooms III-12 and III-14 were shown to abut north-south-trending rooms in the east room block (Figs. 8.11, 8.12, 8.41), a pattern which together with the general orientation and lack of depth of the Area III rooms hints at an earlier construction date for east-block vis-à-vis south-block rooms. That Room II-1 abutted one or perhaps two west-block rooms (Fig. 8.11) points to a similar relationship between Area II and adjacent west-block rooms. In its final form, the south room block blocked off ground-level access to the plaza from the south.

As a whole, the pueblo proved to be larger than at first assumed. Best estimates based on wall-scraping and excavations are 60 ground-floor rooms for the west room block, 30 for the south block, 70 for the east block, and up to 100 for the north room block. There is evidence for upper-story rooms in the west, east, and north room blocks, but these rooms were probably not numerous. A ballpark figure is 50 second-story rooms for the entire site. The discrepancy in estimated versus documented size especially of the east and north room blocks is a clear reminder of the need for comprehensive testing at large, structurally reduced, sites, if local and regional assessments of settlement and population are to be at all reliable.

The basic pattern of room-block expansion at Plaza Montoya is one of additions to and changes within existing rooms. In Chapters 2 and 7, I looked at some of the quantitative aspects of household structure as they factor in local and regional population estimates and at qualitative aspects as they may relate to the physical development of a larger room block. Here, the focus is on the latter. Irrespective of the issue of household size, the functional association of living and storage rooms is of use in isolating trends in room-block expansion. Structural changes can be expected to reflect functional changes and thus directions of growth within a given room block. At Plaza Montoya, architecture and stratigraphic data point to expansion at or near the household level. The first floors of rooms added to older rooms most often had features associated with living/activity rooms, mainly hearths, mealing bins, and storage bins. As new rooms were constructed, existing living rooms were turned into storage rooms by leveling features and laying down new floors over the remains. Other than perhaps a partitioning wall or two, the remodeled rooms would lack structural features.

The Area IV excavations across the center of the east room block best illustrate the relationship between room construction and remodeling. After the final east-west expansion in Area IV, there were four rooms west of the early Room IV-5. Abutting IV-5, Room IV-4 had one floor (Level 3, Floor 1) and no features other than two possible bin walls. The presence of plastered bin-wall fragments in the rubble (Level 2) above the floor, however, leaves open the possibility that there was a second-story living/activity room (Figs. 8.46 a, b). In adjacent Room IV-3 (only partly excavated), four mealing bins were part of the first room floor (Level 3, Floor 1a). The bins had been razed, floored over (to Floor 1), and an adobe cross-wall had been built in their place. As in IV-4, the fill (Level 2) covering the floor contained plastered bin-wall fragments (Figs. 8.46a-c). Abutting Room IV-3, Room IV-2 had several features associated with the first room floor (Level 4, Floor 2): four mealing bins, two storage bins, a hearth, two ash-pits, and the unique loom-anchor holes. The fill (Level 3) above this floor contained two clusters of bin-wall fragments; a concentration of burned adobe, ash, and charcoal; and groundstone pieces. Assemblage and context indicate that these were the remains of a second-story living room. The later room floor (Level 2, Floor 1) had a cross-wall and a small hearth near the room's southeast corner. At this stage, the room was aligned more toward true north than during the occupation of the lower floor. Both realignment and Level 3 debris suggest a structural and occupational gap between the two floors (Figs. 8.42a-c). In Room IV-1, the first room floor (Level 3, Floor 1a) had a set of mealing bins, possibly a storage bin, and a hearth with ash-pit. In remodeling the north half of the room, the bins were destroyed and a cross-wall and new adobe floor (Floor 1) put in. The southern half with the hearth remained unchanged. The partition implies a joint storage/living room, apparently a not infrequent combination at the site (e.g. Rooms I-5, Level 2, Floor 1; I-13, Level 3, Floor 1; VII-9, Level 3, Floor 2; VII-11, Level 2, Floor 1; perhaps also VI-2, Level 3, Floor 1; and XI-12, Level 3, Floor 1). Given the relatively low depth (c. 10 cm on average) of Level 2 fill, a number of grinding stones in the fill probably came from rooftop rather than second-story room features (Figs. 8.42a-c).

The east side of the Area IV core room block reveals a similar pattern. The limited excavation in early Room IV-6 exposed four mealing bins at the lowest floor level (Level 4, Floor 2). The bins were buried under a layer of adobe rubble (Level 3a). With metates and other groundstone implements, roofing material, and the remains of a hearth embedded in the rubble, and with a depth of little more than 10 cm, it seems likely that during its early occupation the room had had a rooftop activity area, not a second story. Eventually leveled off and compacted, the top of the rubble layer became a floor (Level 3, Floor 1). A partly disturbed adobe wall may have been part of a bin, but there were no other features associated with this floor in the area excavated. The second layer (Level 2) of adobe debris in the room covered Floor 1. While remaining depth (c. 20 cm) and location of roofing material near the bottom hint at a second-story room, no remnants of features were identified in the debris (Figs. 8.48a-c). In the abutting Room IV-7, the only feature encountered at the first room-floor level (Level 5, Floor 2a) was a set of mealing bins. Flattened to nearly floor elevation, the bins were partly filled in (Floor 2) and partly covered by the bench against the room's north wall (Fig. 8.51). Associated with the bench were a large hearth with ash-pit, a storage bin, and a small hearth. This indicates that the room was subject to a functional shift within a domestic use-spectrum excluding primary storage. Eventually, the room's roof fell onto Floor 2/2a, though not before wind and water had deposited a thin layer of sediments (Level 3a) on the floor. Considering depth and stratigraphy of the Level 3 debris, the collapse almost certainly included a second-story room, but again the debris contained no identifiable features and few artifacts. At Level 2, Floor 1, the room was rebuilt, with two hearths or roasting pits suggesting use as a living room (Figs. 8.50a-d). There were no deposits attributable to final structural collapse, but with the slope of the mound this was to be expected. Of adjacent Room IV-16 nothing remained except wall foundations and a few centimeters of floor plaster along the room's west wall (Figs. 8.50b-c). As the room is close to the east-plaza front, it seems reasonable to assume that it had at least initially been a living/activity room with features reflecting its function relative to surrounding rooms.

Another aspect of room-block growth to emerge during the project was the use of plaza space. Except for Area III in the south and Area XII in the north room block, all excavated areas produced ample evidence that new rooms were built over outdoor use surfaces that ranged from intensively used plaza locations to what appear to have been sporadically used refuse dumps. In Area VII in the north room block, the four rows of rooms including and south of the row of Room VII-11 were all built over a plaza area with numerous pit features. Such features were also found below Room VII-5, but not in neighboring VII-9 or further east under Room IX-10. Traces of pre-room activities in these rooms were restricted to shallow refuse scatters (Figs. 8.58c, 8.60b-c, 8.63b). In Area I in the west room block, pre-room pit features were present below rooms up to the third row from the final plaza front (e.g. Rooms I-12/13) (Figs. 8.23c, 8.24, 8.26c). In Area XI, plaza-fronting Room XI-9 sat on top of two plaza surfaces with two distinct feature arrangements. No features, however, were encountered in tests below Rooms XI-

12, 13, 16 (Figs. 8.30c-d, 8.31, 8.33d). In the east room block, dozens of plaza features from postholes and small cremation pits to large pits used for storage and refuse disposal underlay Rooms IV-1 and IV-2. This density and variety stood in marked contrast to Rooms IV-3, 4, 5, and 6, where sub-floor tests uncovered only three minor ash/charcoal scatters (two below IV-3, one below IV-5) and a small, unidentified, depression (below IV-4) (Figs. 8.42d, 8.46d, 8.48d). East of IV-6, three, perhaps, four hearths, and a small ash scatter were part of the pre-room surface in Room IV-7, still a minor inventory when compared to the mass of features exposed in Room IV-16, which rivaled those under Rooms IV-1 and IV-2. More importantly, the IV-16 test showed that features extended north into Rooms IV-24 and projected IV-25, as well as east into a possible, as yet unnumbered, plaza-fronting room (Figs. 8.50d-e, 8.52).

The increase in features in pre-room levels from interior to exterior rooms at least partly mirrors a room-block expansion driven by construction of living/activity areas. The pattern of expansion and remodeling corroborates bond-abut data by identifying plaza-fronting rooms as late rooms. Position suggests shorter occupation spans for plaza-fronting rooms, which in turn would make these rooms less susceptible to remodeling and early abandonment. That they are among the least preserved rooms at Plaza Montoya is thus unfortunate – even more so because loss of structural remains also limits recognition of potentially late-occupied upper-story rooms. It is telling that three of only four living/activity rooms with no evidence of remodeling were plaza-fronting rooms (Rooms XI-9 and, possibly, I-5, VI-2). Data from these rooms are of particular interest in addressing the issue of structure abandonment (Chapter 9).

Patterns of room-block expansion at Plaza Montoya have parallels at pre- and post-contact pueblos from Grasshopper (e.g. Reid and Shimada 1982; Riggs 2001) and Arroyo Hondo Pueblos (Creamer 1993) to Pueblo del Encierro (Snow 1976a), Tonque (Barnett 1969) perhaps Pottery Mound (Ballagh and Phillips 2006), Pecos (e.g. Kidder 1926, 1958), Hawikuh (Smith et al. 1966: 52-96), Las Humanas (Vivian 36-49; Hayes et al. 1981: 13-49), Quarai (Baker 1936; Hurt 1990: 26-53; Wait and McKenna 1990), and Oraibi (Cameron 1991a: 186-205). The data from other Piro pueblos also show a few similarities. At Qualacú, the Prelude Midden underlying early-phase rooms included a number of pit features. In addition, construction of rooms during the three phases identified for the channel-cut test seems to have been largely by accretion (Fig. 5.18) (Marshall 1987: 27-53). At Pargas, the two northernmost rooms (4 and 5) overlay several large pit features, probably adobe borrow pits or mixing basins, while the southernmost room (1) may have been built over several smaller plaza pits (Fig. 5.15) (Marshall 1986: 12-27). At Bear Mountain Pueblo, the very limited test in the north room block opened a sub-floor pit in the northwest corner of plaza-fronting Room 2 (Fig. 5.25). Beyond this, there is no clear record of room or pre-room features for either Room 2 or Room 1 (Davis and Winkler 1960: 5, A-1 - A-9).

Regarding scale and rate of room-block expansion at Plaza Montoya, the available data suggest that original room blocks encompassed two or three rows of rooms varying in length between two and perhaps four rooms.[12] I briefly stated earlier in this summary that subsequent expansion was at or near the household level. The statement reflects one result of bond-abut analysis, namely that structural growth was chiefly by single rooms or

[12] The latter estimate is for the partly destroyed north room block. For the earliest identifiable room cluster in Areas VII and IX, bond-abut data suggest a minimum length, as well as depth, of three rooms.

units of two contiguous rooms. The largest units in the east room block had only three or four rooms (Area IV) (Figs. 8.41, 8.53). In the north room block, one unit may have comprised up to five (Area VII) and another up to six rooms (Area IX) (Figs. 8.57, 8.62, 8.64). Maximum size of west-block units was four rooms (Areas I, XI) (Figs. 8.22, 8.29). In the south room block, the largest unit also had four rooms (Area III) (Fig. 8.36). At all non-Piro pueblos considered here, patterns of expansion from one or more core room blocks have been documented, though with perhaps greater structural variance than at Plaza Montoya. At Arroyo Hondo, for instance, data from excavation and wall-scraping indicate that the bulk of the 24 Component I room blocks were built in little more than 15 years (c. 1315-30). Core blocks grew in size first through multi-room additions, then single- and double-room construction. By contrast, expansion of the 10 Component II room blocks, which dendro-dates places mostly in the 1370s and 80s, was primarily by single rooms or two-room units (Creamer 1993: 140-154). At Las Humanas, the late-phase Mound 7 went through 12 multi-room expansions (referred to as "room blocks" by the excavators) in a span of some 60 years (c. 1535/40-1600). Six (Room Blocks 5, 7-11) of seven contiguous room blocks had between eight and 11 rooms, one (Room Block 6) had 36. Based on recorded walls and room corners, it is nonetheless possible that room-block construction was more varied with some smaller units of rooms. The last addition in the late 1620s came as part of the room-block *convento* at the west end of the mound (Fig. 4.11). It comprised eight new rooms and included substantial remodeling of eight older adjacent rooms (Hayes et al. 1981: 26-36, Maps 5-6, Figs. 16c-h).

Compared to sites like Arroyo Hondo or Las Humanas, one of the most striking characteristics of the Plaza Montoya site is the lack of structural depth. Except for a slightly different alignment of the Room IV-2 east wall during the Floor 1 occupation (Figs. 8.42a-b), and perhaps a realignment of the wall between Rooms I-2 and I-5, no evidence of structural superpositioning has come to light during the project. At this point, the odds of an older structure lying somewhere under the pueblo (such as at the junction of the west and south room blocks, cf. Marshall and Walt 1984: 194) are remote at best. In rooms, lack of depth manifests itself both in terms of numbers of room floors as well as nature and extent of fill deposits. Of the total of 40 rooms tested, 22 either had or, as in the case of Rooms VII-9 and IX-10, revealed traces of more than one floor (including resurfaced floors). No room had more than three floors associated with it (excluding pre-room surfaces). Nor were there significant accumulations of refuse within rooms. Ash/charcoal and faunal/botanical remains were found in a few rooms, usually associated with features, but never in depth, and only occasionally in any density. Artifacts (intact or fragmented) were likewise rare in room contexts. All these are important observations to be addressed in detail in the next chapter.

Two aspects of room structure limit the analysis of the Plaza Montoya data. First, with the low profile of most remaining walls, extensive sections in every room block lack information on doorways. Wall openings were identified only in areas where walls stood highest, i.e. in Areas IV and XI. Archaeologists look at the distribution and condition (open/blocked) of doorways to identify households (Wilcox 1975; e.g. Cameron 1991a: 86-87; Creamer 1993: 121-133), but at Plaza Montoya insufficient wall height restricts such analysis. Another problem is the survival of wall plaster. For functional, aesthetic, and/or ceremonial reasons, rooms could be coated with gypsum- or clay-based plaster (Cameron 1991a: 89-90; cf. Mindeleff 1891; Hayden 1942). Structurally, adobe buildings benefit immensely from plastered wall faces (*PHA* 2003: 49-56). Even so, plastering was not automatically part of Pueblo room construction. At Hawikuh, some rooms had from 30 to 40 layers of plaster (one had 59), but others had none (Smith et al. 1966: 16-17). At Las Humanas, between one and 31 layers were recorded in those Mound 7 rooms in which plaster survived (69 of the 224-room total) (Hayes et al. 1981: 37). Wall plaster was "not common" at Arroyo Hondo and its use apparently varied considerably at other early Pueblo IV sites in the upper Rio Grande area (Creamer 1993: 17-18). At Plaza Montoya, the proportion of plastered walls to total recorded wall length was about 50%. Plaster was lacking in much of the west and south room blocks, but with few preserved walls especially in the south room block this may reflect deterioration rather than actual absence. Preservation was also an issue where plaster was found. It was only in a few places possible to discern multiple plaster layers. While up to eight layers were identified in Room IV-7, half or less than half that number seems to have been more common in other plastered rooms. If anything, the frequency of wall maintenance in IV-7 ties in with the relative complexity of the room's stratigraphy.

As for plaza and offsite proveniences, in the central plaza area testing exposed numerous pit features of varying sizes. Density of features was highest along the plaza fronts, areas traditionally utilized in a wide array of domestic activities (e.g. Reid 1973; Swentzell 1988; Rothschild 1991; Cameron 1996; Creamer 1993: 57-87; Dohm 1996; Lycett 2002). Most surprising about several features were the cremated human remains they contained. In the Southwest, cremations occur in fairly discrete spatial and temporal contexts (Chapter 9). Sizeable numbers of Pueblo IV cremation burials are so far known only from the Zuni and Salinas areas. Especially worth mentioning are the more than 100 cremations found in contact- and colonial-period proveniences at Las Humanas (Hayes et al. 1981: 173-176; Reed 1981: 75-76, Table 55). A first indication that the Piros cremated at least some of their dead were the four cremations in Room 2 at Las Huertas (Earls 1987: 57-59).

The lack of kivas was also surprising. Pits in Trenches VIII-25/35, 26, Feature 1 in Trench VIII-38, or the Area X depression were exposed for more than five meters in length and up to one meter and more in depth (Figs. 8.6, 8.19, 8.70). None had a formal wall or floor. With no structural remains, these pits appear to have been adobe borrow pits filled later with refuse and sediments. By comparison, two large circular depressions at Las Huertas very likely are kivas (Fig. 5.8). Half a dozen large Ancestral/Colonial Piro pueblos have similar depressions, most notably Sevilleta Pueblo (LA 774). Sites without them include San Pascual, Qualacú, and Las Cañas, but as these pueblos are heavily reduced kivas may be invisible on the surface. An example of such lack of visibility comes from Las Humanas. There, no trace of Kiva M, one of six or seven excavated kivas associated with the late occupation of Mound 7, remained on the surface and it was only discovered through excavation of a test-trench (Hayes et al. 1981: 54-60). Given known Franciscan efforts to stamp out native religious practices, the presence of kivas at mission pueblos and even in *conventos* presents a conundrum for which various explanations have been advanced (cf. Ivey 1988, 1998, 2005). As the examples from Las Humanas show, stratigraphic data are needed to assess time of use, abandonment, and possible post-abandonment use of a kiva. The excavations of late-phase kivas at Las

Humanas strongly suggest that most, if not all, were purposely razed, perhaps fired, and/or used for refuse disposal, a pattern which supports the record of Franciscan activities at the pueblo (Vivian 1964: 51-59; Hayes et al. 1981: 54-61; Ivey 1988: 157-200). This kind of potential archaeological information on the nature of native-Spanish relations has also driven the unsuccessful search for a plaza kiva at Plaza Montoya.

CHAPTER 9

THE PLAZA MONTOYA CASE STUDY, PART II: SITE OCCUPATION AND ABANDONMENT

Based on the structural and stratigraphic description in Chapter 8, this chapter focuses on archaeological patterning relevant to occupation and abandonment. Neither the general subject of site occupation nor the specific issue of abandonment is easily addressed. While enough architecture survives to supply basic data on room-block construction, there are gaps that limit the reach of structural analysis. For the most part, these gaps reflect the lack of permanence of the primary building medium, coursed and puddled adobe. Especially along the plaza front of each room block substantial sections of walls and floors have eroded away. Since bond-abut analyses indicate that plaza-fronting rooms tended to be late additions, the shortage of data for this class of rooms needs to be kept in mind when assessing structural and depositional patterns of abandonment behavior.

Dating presents another challenge. No provenience yielded wood specimens suitable for dendrochronological analysis. Instead, absolute dates come from a suite of 18 ^{14}C determinations of samples taken in various room-block and plaza proveniences. Supplementing these data are some of the marker artifacts described in Chapter 4. These are primarily glazeware ceramics, but there is also a small sample of foreign artifacts. Moreover, the presence (and absence) of certain structural and depositional features may carry more or less specific chronological implications. As resolution is an issue with all the chronological data available for Plaza Montoya, it is necessary to limit error margins by identifying areas of overlap between different data sets.

The first part of this chapter outlines the various data used for assessing the Plaza Montoya occupation sequence. Beyond establishing a general timeframe of occupation a key objective is to approximate the timing of site abandonment and place it within the context of the assumptions formulated earlier. The remainder of the chapter is an analysis of room and site use, and specifically architectural, depositional, and discard patterns reflecting potential abandonment processes. Results are compared with abandonment assemblages and behavioral inferences at other sites in the Southwest and elsewhere, and then discussed also in the context of prior assumptions of post-contact population and settlement trends.

Site Chronology

RADIOMETRIC DATES

Eighteen ^{14}C dates provide an absolute range for Plaza Montoya's occupation. Given the small number of such dates for the Piro area, a longer rather than shorter suite of dates was deemed useful.[1] In selecting sample proveniences, the main objective was to obtain samples from all room blocks and from some of the major features in the central plaza area. To minimize potential confusion due to the "old wood problem" (cf. Schiffer 1986; Killick 1996), preferred sample materials were to be weedy annuals and perennials. Judging by the dates obtained, however, sample separation was not always successful.

[1] In addition to the radiocarbon samples, several archaeomagnetic samples were taken from the plaza hearth in Room I-5, L. 4, Fl. 3 (see Fig. 8.24 [7]). No dates were obtained, however.

Table 9.1 lists all sample proveniences and characteristics; Fig. 9.1 shows the recalibrated two-sigma (95.4%) date ranges (based on the Oxford Radiocarbon Accelerator Unit's IntCal04 Northern Hemisphere Atmospheric Curve) for all samples.

While the general pros and cons of ^{14}C dating cannot be discussed here, some sample proveniences and their associated ^{14}C determinations need comment. In the west room block, the date range for the S1 sample from a plaza feature under Room I-1 agrees both with the Glaze E sherds that dominate Area I glazewares at all levels and with the room's relatively late position in the west-block sequence (Figs. 8.10, 8.22). By contrast, Sample S2 from structurally earlier Room I-6 falls within the early glaze period even at two-sigma range. Neither this nor any of the neighboring rooms produced a single early glaze sherd. Since S2 was collected from roofing material overlying the top room floor, it is possible that the sample contained charcoal from old (i.e. recycled) roof beams (a $^{13}C/^{12}C$ ratio of -24.3‰ points in this direction). Sample S8 from the upper-floor hearth (h_2) in Room I-5 (which abuts both I-1 and I-6) has a range similar to that of S1. Sample S5 was a mixture of organic matter collected from the lower part of the possibly later intrusive pit in the same room. Its range is earlier than that of S1 or S8, but there is substantial overlap between the three samples. For the only Area II sample (S3, from a pit probably underlying Room II-1) the date range suggests a pre-contact context. While erosion is a problem in the south room block, bond-abut data leave little doubt that the westernmost Area II rooms post-date the adjacent west-block rooms. In addition, Area II/III ceramics do not indicate pre-Glaze E use of the south-block area.

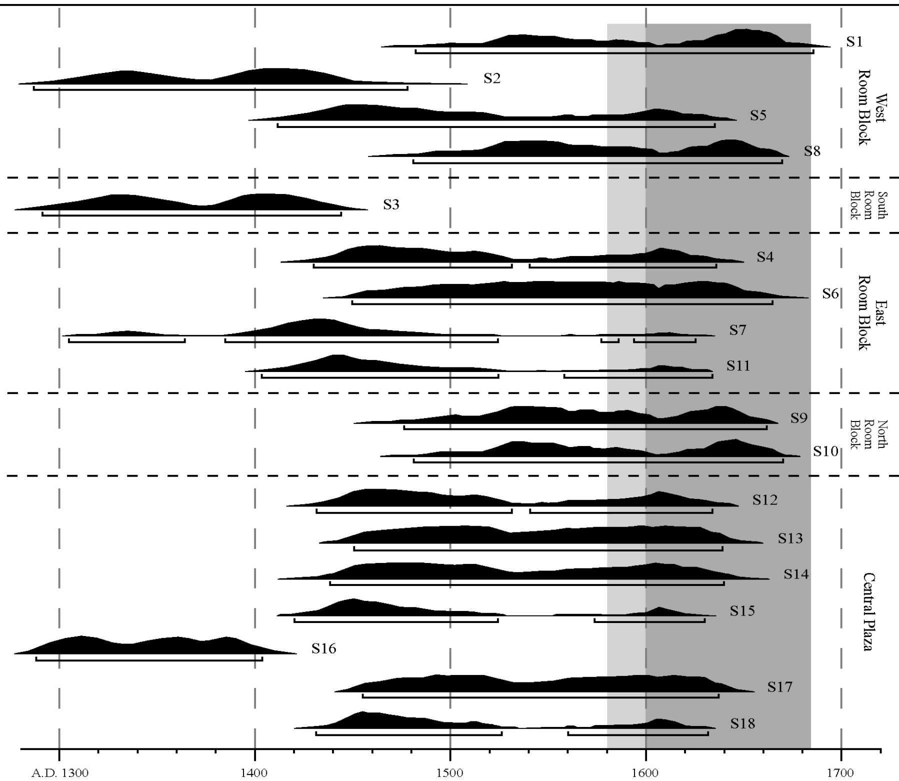
Table 9.1. Plaza Montoya radiocarbon sample proveniences and characteristics.

Sample no. and provenience	Sample characteristics
WEST ROOM BLOCK	
S1 Room I-1, L. 3, Fl. 2 (plaza pit [2], see Fig. 8.23c)	Corn cobs
S2 I-6, L. 3, Fl. 1 (burned roofing material on floor, see Fig. 8.23b)	Charcoal, reeds
S5 I-5, L. 3, Fl. 2 (intrusive pit, see Figs. 8.23a [5], 8.24 [4])	Charcoal, mixed organic material (taken from near bottom of pit)
S8 I-5, L. 2, Fl. 1 (hearth h_2, see Fig. 8.23a)	Charcoal
SOUTH ROOM BLOCK	
S3 II-1, L. 4, Fl. 2 (possible plaza pit [1], see Fig. 8.38c)	Charcoal, corn cobs (sample provenience much eroded)
EAST ROOM BLOCK	
S4 IV-2, L. 3 (roofing material from near southwest room corner, see Fig. 8.42b)	Charcoal, mixed plants
S6 IV-2, L. 5, Fl. 3 (plaza hearth h_{10}, see Fig. 8.42d)	Charcoal
S7 IV-2, L. 3 (roofing material from near southeast room corner, see Fig. 8.42b)	Charcoal
S11 IV-4, L. 3, Fl. 1 (roofing material from near southeast room corner, see Fig. 8.46b)	Charcoal, reeds (AMS date)
NORTH ROOM BLOCK	
S9 VII-5, L. 3, Fl. 1 (plaza pit [1], see Figs. 8.60b-c)	Charcoal, corn cobs (pit contained at least one cremation burial)
S10 VII-17, L. 3, Fl. 2 (ash/charcoal scatter [1] at plaza level, see Fig. 8.61b)	Charcoal (scatter contained several calcined bone fragments)
CENTRAL PLAZA (for trench locations see Fig. 8.6)	
S12 Tr. VIII-10, Feat. A_2 (feature is large [dia. c. 3.3 m, depth c. 50 cm] pit w. stratified fill, sample from lower half of pit)	Charcoal, corn cobs, misc. seeds
S13 VIII-1, Feat. A (feature is large [dia. c. 2.8 m, max. depth 95 cm] pit w. stratified fill, sample depth 87 cm)	Charcoal, corn cobs, misc. seeds

Table 9.1. (continued)

Sample no. and provenience	Sample characteristics
S14 VIII-2, Feat. A (feature is large [dia. c. 1.3 m, max. depth 73 cm] pit w. stratified fill, sample from lower half of pit)	Charcoal, corn cobs, misc. seeds
S15 VIII-25, L. 3, Feat. A (plaza hearth lined w. adobe bricks)	Charcoal, corn cobs
S16 VIII-25, L. 3, Feat. B (plaza hearth similar to Feat. A)	Charcoal, corn cobs
S17 VIII-25, L. 4, Feat. C (feature is large irregularly-shaped [dia. >3 m, max. depth 124 cm] pit w. layered fill, pit also intersected by Tr. VIII-6)	Charcoal, corn cobs
S18 VIII-25, L. 3, Feat. D (features is unlined, shallow plaza hearth)	Charcoal, corn cobs

For the east room block, there are three dates (S4, 6, 7) for Room IV-2 and one (S11) for IV-4. Stratigraphically, the Room IV-2 samples bracket construction and structural collapse, but exclude the final (re)construction episode. Sample S6 from pre-room hearth h_{10} has a range spanning the entire late glaze (i.e. D-F) spectrum, but a lack of glaze rims other than E/F suggests a date in the later 1500s. Samples S4 and S7 were taken from one context, roofing material overlying the mealing bins along the room's south wall. While the S4 range is comparable, if slightly earlier, than that of Sample S6, S7 has the widest range of all Plaza Montoya dates. With $^{13}C/^{12}C$ ratios of -26.1‰ (S4) and -21.6‰ (S7) indicating wood charcoal, the discrepancy might be due to old wood especially in the S7 sample. Sample S11 from Room IV-4 is similar in composition – burned roofing material ($^{13}C/^{12}C$ -24.5‰) – and range to S4 and S7 (Fig. 9.1).



Sample Provenience	Sample No.	Lab. No.	$^{13}C/^{12}C$	Conventional ^{14}C Age BP	Calibrated Age Range at 2 Sigma (95.4% probability)[1, 2]	Calibrated Age Range at 1 Sigma (68.2% probability)[1]	Calibration Intercept Date(s)
Room I-1, L. 3, Fl. 2 (plaza pit [2])	LA31744/S1	Beta-168764	-10.6‰	260±50 BP	Cal AD **1481-1684** (73.0%) Cal AD 1735-1805 (17.3%) Cal AD 1931-1954 (5.1%)	Cal AD 1521-1591 (27.9%) Cal AD 1620-1669 (28.6%) Cal AD 1780-1798 (9.2%) Cal AD 1944-1952 (2.4%)	Cal AD 1650
Room I-6, L. 3, Fl. 1 (burned roof mat.)	LA31744/S2	Beta-168765	-24.3‰	530±70 BP	Cal AD **1285-1480** (95.4%)	Cal AD 1316-1355 (25.8%) Cal AD 1388-1442 (42.4%)	Cal AD 1420
Room I-5, L. 3, Fl. 2 (intrusive pit)	LA31744/S5	Beta-168768	-23.3‰	420±60 BP	Cal AD **1412-1635** (95.4%)	Cal AD 1426-1517 (56.7%) Cal AD 1594-1618 (11.5%)	Cal AD 1450
Room I-5, L. 2, Fl. 1 (hearth h_2)	LA31744/S8	Beta-182107	-10.4‰	290±40 BP	Cal AD **1482-1666** (93.5%) Cal AD 1538-1634 (35.2%)	Cal AD 1520-1592 (46.4%) Cal AD 1594-1618 (14.4%)	Cal AD 1640
Room II-1, L. 4, Fl. 2 (poss. plaza pit)	LA31744/S3	Beta-168766	-18.7‰	550±60 BP	Cal AD **1295-1444** (95.4%)	Cal AD 1316-1355 (31.8%) Cal AD 1388-1430 (36.4%)	Cal AD 1410
Room IV-2, L. 3 (roof mat. SW corner)	LA31744/S4	Beta-168767	-26.1‰	400±50 BP	Cal AD **1428-1530** (60.2%) Cal AD 1538-1634 (35.2%)	Cal AD 1440-1518 (53.8%) Cal AD 1594-1618 (14.4%)	Cal AD 1460
Room IV-2, L. 5, Fl. 3 (plaza hearth h_{10})	LA31744/S6	Beta-178515	-10.0‰	320±60 BP	Cal AD **1447-1665** (94.4%) Cal AD 1785-1794 (1.0%)	Cal AD 1494-1602 (54.4%) Cal AD 1615-1642 (13.8%)	Cal AD 1530, 1560, 1630
Room IV-2, L. 3 (roof mat. SE corner)	LA31744/S7	Beta-178516	-21.6‰	480± 60 BP	Cal AD 1304-1364 (13.2%) Cal AD **1384-1522** (77.1%) Cal AD 1575-1583 (0.6%) Cal AD 1590-1622 (4.5%)	Cal AD 1330-1340 (3.9%) Cal AD 1396-1470 (64.3%)	Cal AD 1430
Room IV-4, L. 3, Fl. 1 (roof mat. SE corner)	LA31744/S11	Beta-182110	-24.5‰	430±50 BP	Cal AD **1405-1524** (79.4%) Cal AD 1558-1632 (16.0%)	Cal AD 1416-1490 (64.9%) Cal AD 1602-1610 (3.3%)	Cal AD 1445
Room VII-5, L. 3, Fl. 1 (plaza pit)	LA31744/S9	Beta-182108	-10.1‰	300±40 BP	Cal AD **1474-1662** (95.4%)	Cal AD 1520-1592 (49.3%) Cal AD 1619-1648 (18.9%)	Cal AD 1635
Room VII-17, L. 3, Fl. 2 (charcoal plaza level)	LA31744/S10	Beta-182109	-10.9‰	280±40 BP	Cal AD **1482-1669** (90.3%) Cal AD 1780-1798 (4.5%) Cal AD 1946-1952 (0.6%)	Cal AD 1521-1575 (36.8%) Cal AD 1582-1590 (3.7%) Cal AD 1623-1662 (27.7%)	Cal AD 1645
Trench VIII-10, Feat. A2, lower half	LA31744/S12	Beta-182111	-10.6‰	400±50 BP	Cal AD **1428-1530** (60.2%) Cal AD 1538-1634 (35.2%)	Cal AD 1440-1518 (53.8%) Cal AD 1594-1618 (14.4%)	Cal AD 1460
Trench VIII-1, Feat. A, near bottom	LA31744/S13	Beta-182112	-10.5‰	350±50 BP	Cal AD **1451-1642** (95.4%)	Cal AD 1473-1524 (28.3%) Cal AD 1558-1631 (39.9%)	Cal AD 1510, 1595, 1615
Trench VIII-2, Feat. A, lower half	LA31744/S14	Beta-182113	-11.1‰	380±60 BP	Cal AD **1438-1641** (95.4%)	Cal AD 1447-1522 (42.5%) Cal AD 1574-1626 (25.7%)	Cal AD 1480
Trench VIII-25, L. 3, Feat. A	LA31744/S15	Beta-204527	-9.1‰	420±40 BP	Cal AD **1420-1523** (78.7%) Cal AD 1572-1628 (16.7%)	Cal AD 1432-1491 (63.1%) Cal AD 1602-1610 (5.1%)	Cal AD 1450
Trench VIII-25, L. 3, Feat. B	LA31744/S16	Beta-204528	-9.8%	620±40 BP	Cal AD **1288-1404** (95.4%)	Cal AD 1297-1325 (26.0%) Cal AD 1344-1394 (42.2%)	Cal AD 1310, 1360, 1390
Trench VIII-25, L. 4, Feat. C	LA31744/S17	Beta-204529	-10.6‰	350±40 BP	Cal AD **1455-1637** (95.4%)	Cal AD 1475-1524 (29.2%) Cal AD 1558-1564 (3.0%) Cal AD 1570-1630 (36.0%)	Cal AD 1510, 1600, 1620
Trench VIII-25, L. 3, Feat. D	LA31744/S18	Beta-204530	-10.2‰	410±40 BP	Cal AD **1426-1524** (72.0%) Cal AD 1558-1632 (23.4%)	Cal AD 1437-1495 (58.7%) Cal AD 1602-1616 (9.5%)	Cal AD 1460

1 Calibration with the IntCal04 Northern Hemisphere Atmospheric Curve via the OxCal system at Oxford Radiocarbon Accelerator Unit (https://c14.arch.ox.ac.uk/oxcal/OxCal.html)
2 Two-sigma ranges post-dating AD 1700 not shown in graphs

Fig. 9.1. Plaza Montoya calibrated ^{14}C dates. The lightly shaded stripe marks the time of early Piro-Spanish contact, the darker stripe the colonial period up to the Pueblo Revolt.

Two samples (S9, 10) from the north room block came from two features in pre-room use surfaces. Due to its association with plaza-fronting Room VII-17, Sample S10 in particular was expected to provide a date range for late room-block expansion and occupation in this part of the site (Figs. 8.15, 8.57). As it turned out, the ranges for both samples are indeed among the latest, and internally least amorphous, for the site ($^{13}C/^{12}C$ ratios of -10.1‰ [S9] and -10.9‰ [S10] are consistent with weedy annuals/perennials). The S10 range is also slightly later than that of S9, a difference which ties in with the relative positions of the rooms overlying the sample proveniences.

There are seven ^{14}C determinations (Samples S12-18) for outside features, all located in the central plaza area. The features were pits (hearths, roasting pits, refuse pits) positioned on one of the three magnetometer transects across the plaza or uncovered during test-trenching (Fig. 8.19). The date ranges for the seven samples are very large, but with one exception (S16) all include the early colonial and mission periods (Fig. 9.1). Glaze rims associated with the features were predominantly E and E-related forms with some F's thrown in, which suggests that the features were used during the upper end of the ranges. The outlier, Sample S16 from a feature in Trench VIII-25, has a temporal range which is essentially limited to the 14th century. While a $^{13}C/^{12}C$ ratio of -9.8‰ gives no reason to suspect a wood-related problem, there are no ceramics that fit such an early date. In addition, of three adjacent features sampled (S15, 17, 18) none yielded a date range anywhere close to that of Sample S16.

Overall, the fact that the ranges of all but three samples (S2, S3, S16) extend into post-contact times supports the initial ceramics-based assumption of an occupation spanning the late pre-contact to early mission periods. Unfortunately, internal statistical spreads are largely too nondescript to indicate areas with higher probabilities of temporal association. Yet despite this, comparisons with other Ancestral/Colonial Piro sites stress the late position of Plaza Montoya Pueblo. Among ^{14}C determinations falling within the historically documented period of Piro occupation, only the Gold Station field-house site (LA 45885) has yielded a date potentially later than the latest dates from Plaza Montoya (Fig. 4.14, Table 4.5). Although the small number of dates for the Piro area as a whole limits the value of comparisons, and although most dates have ranges too large to suggest more than broad trends, the Plaza Montoya dates as a group point to a strong post-contact component – and all the more so if one considers the ceramic evidence.

CERAMICS

Native Ceramics

The excavated sample of decorated ceramics at Plaza Montoya consists almost entirely of late Rio Grande glazewares. Unlike most large Piro sites Plaza Montoya has so far produced hardly any early glaze forms. While the makeup of surface ceramics already pointed in this direction, the lack of Glaze A or Pueblo III whiteware sherds in even the lowest excavation levels is still striking. To recall, Marshall and Walt (1984: 326) listed only one Glaze A sherd in their surface sample, while the larger sample collected before and in the early stages of the excavations contained none. This formed the basis for the hypothesis that Plaza Montoya's occupation falls within the Glaze E spectrum, i.e. between c. 1540/50 and 1650/60. Table 9.2 now lists the totals of identified glaze rims and other diagnostic ceramics per excavated provenience (room or test-pit/test-trench).

Table 9.2. Diagnostic ceramics per excavated provenience.[2]

Provenience	**Early glazes (A-C)**	**Late glazes (D-F)**	**Other ceramics**
West room block, Area I			
Room I-1 (compl.)		2 E, 1 E/F	
I-2 (compl.)			
Plaza outs. I-1/I-2		1 D/E, 4 E, 1 E/F, 1 F	1 pw
I-5		2 E	
I-6			
I-7		1 E/F	
I-11		1 D/E, 1 E, 2 E/F	
I-12		4 E, 1 E/F	
I-13		2 E, 1 E/F, 1 F	1 pw
TOTALS		**2 D/E, 15 E, 7 E/F, 2 F**	**2 pw**
Area XI			
Room XI-9 (compl.)		1 D/E, 5 E, 6 E/F, 5 F	1 pw
Plaza outs. XI-9		1 D/E, 7 E, 9 E/F, 4 F	5 pw
XI-12		-	-
XI-13		1 E, 9 E/F, 3 F	6 pw
XI-16		1 E	4 pw
Test outs. XI-19		1 E,	
XI-20		5 E/F	6 pw
XI-28/29 (wall-scraping)		1 E/F	3 pw
TOTALS		**2 D/E, 15 E, 30 E/F, 12 F**	**25 pw**
South room block, Area II			
Room II-1		3 E, 2 E/F, 3 F	2 pw
II-2		2 E, 1 F	
II-4		1 E/F	
TOTALS		**5 E, 3 E/F, 4 F**	**2 pw**
Area III			
Room III-1		1 E/F	
III-4		2 E	
III-7			
Test outs. III-7		2 E	
III-19			
TOTALS		**4 E, 1 E/F**	

[2] Glazewares listed are bowl rims only. No ceramics were found in the Area X test-trench.

Table 9.2. (continued)

Provenience	**Early glazes (A-C),**	**Late glazes (D-F)**	**Other late ceramics**
East room block, Area IV			
Room IV-1 (compl.)		6 E, 3 E/F, 2 F	
Plaza outs. IV-1 (incl. IV-8)		3 E, 3 E/F	
IV-2 (compl.)		1 E/F, 1 F	
IV-3			
IV-4 (compl.)		1 E, 1 E/F	1 pw
IV-5		1 E, 3 E/F, 3 F	
IV-6		1 F	1 pw
IV-7		2 E, 1 E/F, 1 F	
IV-13			
IV-14		1 E	
IV-16			
Plaza (east) outs. IV-16			
TOTALS		**14 E, 12 E/F, 8 F**	**2 pw**
Area VI			
Room VI-2		2 E, 2 E/F, 2 F	
Plaza entrance outs. VI-2	2 A, 1 B, 1 C	1 D, 3 D/E, 13 E, 12 E/F, 4 F	1 Tab. B-on-w 6 pw
VI-6		1 E	
VI-7		1 E	1 rw
TOTALS	**2 A, 1 B, 1 C**	**1 D, 3 D/E, 17 E, 14 E/F, 6 F**	**1 Tab. B-on-w, 6 pw, 1 rw**
North room block, Area VII			
VII-5		2 E/F, 1 F	
VII-9 (compl.)		2 E, 2 E/F, 1F	
VII-11 (compl.)		1 E, 2 F	1 pw
VII-15 (compl.)		1 E/F	
VII-17			
TOTALS		**3 E, 5 E/F, 4 F**	**1 pw**
Area IX			
Room IX-10 (compl.)		1 E/F	1 pw
TOTALS		**1 E/F**	**1 pw**
Area XII			
Room XII-4		1 F	1 rw handle
Test outs. XII-2/XII-4		2 E/F, 1 F	1 pw, 1 rw
XII-6			
TOTALS		**2 E/F, 2 F**	**1 pw, 2 rw**

Table 9.2. (continued)

Provenience	**Early glazes (A-C),**	**Late glazes (D-F)**	**Other late ceramics**
Central plaza, Area VIII			
Trench VIII-1		1 D/E, 4 E, 4 E/F	2 pw
VIII-2		1 D	
VIII-3		1 C/D, 1 D/E	
VIII-4			
VIII-5			
VIII-6		1 F	1 Tab. B-on-w
VIII-7		1 D	
VIII-8			
VIII-9		1 C/D, 5 E, 4 E/F	1 Tab. B-on-w
VIII-10		2 C/D, 1 D, 10 D/E, 6 E, 1 E/F, 2 F	
VIII-11		2 D, 4 E	
VIII-12			
VIII-13			
VIII-14		1 D, 4 E, 3 E/F, 2 F	
VIII-15			
VIII-16			
VIII-17		1 E, 2 E/F	1 pw
VIII-18			
VIII-19		1 E	
VIII-20			
VIII-21		1 E/F	
VIII-22		1 E/F	
VIII-23			1 pw
VIII-24		1 E, 1 F	
VIII-25		1 D, 1 D/E, 7 E, 6 E/F, 2 F	
VIII-26		1 C/D, 3 E, 2 E/F, 1 F	1 pw
VIII-27		1 D/E, 5 E, 3 E/F	
VIII-28		1 E	1 Tab. B-on-w
VIII-29		2 D, 4 E, 1 E/F	1 ring-b.
VIII-30		1 D, 6 E, 4 E/F, 1 F	1 Tab. B-on-w
VIII-31			
VIII-32		1 D/E, 2 E	
VIII-33			
VIII-34		3 E	2 pw
VIII-35		3 E, 2 F	1 pw handle, 1 mya. (?)

Table 9.2. (continued)

Provenience	**Early glazes (A-C),**	**Late glazes (D-F)**	**Other late ceramics**
VIII-36		1 E, 1 F	
VIII-37		1 E	
TOTALS		**5 C/D, 10 D, 15 D/E, 62 E, 32 E/F, 13 F**	**8 pw, 4 Tab. B-on-w, 1 mya**
East plaza, Area VIII			
Trench VIII-38		1 E/F, 1 F	1 pw
VIII-39			
TOTALS		**1 E/F, 1 F**	**1 pw**
SITE TOTALS	**2 A, 1 B, 1 C**	**5 C/D, 11 D, 22 D/E, 132 E, 102 E/F, 52 F**	**49 pw, 3 rw, 5 Tab. B-on-w, 1 mya, 1 ring-b.**

(pw=non-utility plainware, rw=redware, Tab.=Tabirá, mya=mayólica, ring-b.=ring-based vessel).

Glaze E and related bowl rims (*n*=256) far outweigh other glaze forms (*n*=72) in all excavation areas. Glaze F (*n*=52) and non-utility plainware (*n*=49) rims occur with some frequency, mainly in upper room and plaza levels. While disturbances, spatial differences in excavation coverage, and possible differences in room function hamper statistical comparisons of the various room-block samples, the minuscule occurrence of early glazes is indisputable. The only Glaze A specimens found during excavation came from a pit under the late-phase plaza entrance and Room VI-2 (Fig. 8.55).[3] This pit, interestingly, is located just north of what bond-abut analysis suggests is the initial or core room cluster (Rooms IV-5, 6, 21, 22, VI-13, VI-14) in the east room block (Chapter 8).

[3] Aside from several late-glaze specimens, the pit contained two Glaze A rims, one B, and one C rim.

Matching the marked scarcity of early glazewares is a near-total lack of Pueblo III whitewares and textured utility wares. While plain utility grayware sherds represent roughly three-fourths of the Plaza Montoya ceramic assemblage, they include only a handful of textured sherds (mostly from one small vessel). Based on his excavations at Qualacú and Pargas and surface observations at other Piro sites, Marshall (1986: 52-53, 1987: 77-81) suggests that across the Ancestral/Colonial Piro continuum in the Rio Abajo Sequence the relative frequency of textured versus plain utility wares drops from c. 35% in Ceramic Group VIII (c. 1350-1400) to less than 5% in Group XI (c. 1500-1600), and to effectively zero in terminal Group XII (Fig. 7.1).

Native and Foreign Tradewares

Another characteristic of the Plaza Montoya ceramic sample is the limited occurrence of ceramics from outside the Piro area. This includes native trade wares from both within and outside the Rio Grande glazeware production-zone, as well as specimens of colonial origin, i.e. vessels of Spanish, Mexican, or East Asian manufacture. As noted in Chapter 4, detailed identification of glaze tradewares within the various basic “wares”, “types”, or “variants” remains somewhat problematic because of the lack of a more clearly defined Piro glazeware typology within the Rio Grande sequence. The problem can be approached reliably only through petrographic analysis, but this requires a representative number of samples per ware/type/variant and an equivalent mineralogical record of local clay and temper sources. Although neither yet exists for the Piro area, a petrographic test of 70 Plaza Montoya sherds indicates (1) a relatively low frequency of glazewares made outside the Piro area and (2) substantial variability in the use of local raw materials. In their mineralogical attributes the glaze sherds in the Plaza Montoya sample differ also from a smaller sample (*n*=10) taken from the 28 Pargas bowl rims shown in Figs. 5.16a-c, which suggests that the neighboring pueblos exploited different raw material sources at different points in time (Hill 2003, 2004, 2005; Bletzer 2004).

Decorated wares other than Rio Grande glazes occur only sporadically at Plaza Montoya (Table 9.2). They include a couple of Sankawi Black-on-cream sherds and five Tabirá whiteware specimens from various plaza contexts (adding to the sherd found on the surface in the south room block). None of the Tabirá pieces show any traces of polychrome paint, but they are too small to discount a possible Tabirá Polychrome affiliation. More ambiguous than the Tabirá presence is that of Salinas Red and non-utility plainware generally. While the excavations have produced far more slipped and unslipped red- and plain grayware bowl rims than other diagnostic non-glaze sherds, there are no whole vessels or partial refits and only few individual fragments of sufficient size to determine whether a given sherd comes from a "pure" red-/plainware bowl or a sparsely decorated Glaze E or, more frequently, Glaze F vessel. Even so, the distinction matters little here as both kinds of pottery imply a post-contact occupation. Indeed, with the exception of a single worked Chupadero Black-on-white sherd from Trench VIII-27, all diagnostic non-glaze wares in the Plaza Montoya sample have potential run times up to 1650 and beyond (cf. Hayes et al. 1981: 67-90; Wiseman 1985; Staski 1998; Ramenofsky and Feathers 2002; Ramenofsky and Vaughan 2003: 121-124).

Ceramics representing the Spanish colonial network form the smallest category in the Plaza Montoya ceramic assemblage. To date, only a possible fragment of mayólica, a ring-based grayware fragment, an unslipped redware handle, and a piece of a grayware handle have been found (Table 9.2). But while these pieces scarcely figure in the sum total of ceramics, it is easy to make too much of the discrepancy. From a strictly functional perspective, the Piros would have had little reason to obtain vessels of foreign make. Even if such vessels were valued for status reasons (and there is no evidence that they were), few reached New Mexican households, Puebloan or Spanish. Archaeological finds and contemporary sources indicate that missionaries and settlers relied on Puebloan expertise for their crockery, with some of the ceramics made by native potters merging native production techniques and European vessel forms (cf. Wiseman 1988; Capone 1995; Staski 1998; Carrillo 1997; Penman 2002). Yet hybrid vessels, too, seem to represent only a fraction of ceramic inventories at mission and *estancia* sites. In the Piro area, surface ceramics at the two likeliest Spanish-affiliated sites, Sevilleta and Estancia Acomilla, are basically Puebloan in composition with a smattering of morphologically and stylistically foreign sherds (see Chapters 4 and 5).[4]

OTHER CHRONOLOGICALLY SENSITIVE MATERIALS/FEATURES

Metal and Glass

Wall-scraping and excavation produced 33 metal pieces/fragments representing perhaps 17 different objects, plus a seemingly worked glass sherd. Seventeen fragments and the glass sherd came from the east room block, including 11 amorphous fragments in Room

[4] Even native potters in central Mexico remained "responsive to indigenous tastes and domestic needs" for a long time before adopting foreign forms (Zeitlin and Thomas 1997: 13).

IV-5, a nail and a nail head in IV-2, and two pieces of a nail and a bit of sheet iron in IV-6 (Table 9.3). Metal-detector sweeps of all but the most densely overgrown parts of the site turned up "modern" refuse only (barbed wire, shotgun shells, bottle caps). Except for four or five nails, function can only be assumed even for the more "complete" pieces in the sample. An example of this is a decorated copper/bronze rivet punched through three layers of leather, which may be associated with horse gear (e.g. a saddle or saddle bag), a *petaca* (cowhide traveling chest) (cf. Simmons and Turley 1980, Pl. 37), or perhaps with one of those leather jerkins *(cueras)* Spanish horsemen across the northern frontier used for armor (Fig. 9.2). A special case is a lead ball found in the plaza entrance outside Room VI-2. With a diameter of 11 mm the ball seems to fall outside "standard" caliber sizes of pre-cartridge Anglo-American firearms used in New Mexico, but it was located only in structural debris just below the present surface.[5]

The example of the lead ball underscores the importance of stratigraphic context as an indicator of whether an object may be related to Plaza Montoya's occupation (Table 9.3). A small iron disk and a steel ball found near the surface east of the plaza entrance are thus unlikely to be associated with the pueblo, and not just because they look "more recent". On the other hand, the fact that the rivet was found near the bottom of a 1.4 m deep refuse pit (Trench VIII-34) (Figs. 8.68, 8.69) containing a number of late glaze sherds (Table 9.2) places the object firmly within the Plaza Montoya occupation sequence. This is also true of the iron bolt found under Room XI-9 (Figs. 8.30d, 8.31b, 8.32) and of various nail fragments from the middle and lower levels of Area IV rooms.

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[5] The Socorro area saw much military activity in the 19th century, especially during the Civil War. The battle of Valverde (21/22 February 1862) was fought just north of Black Mesa (Taylor 1999).

Table 9.3. Metal and glass from Plaza Montoya.

Object	Provenience
Iron disk w. center hole, dia. 27 mm (hole 3 mm) (button?)	Swale s. of Area IX, near surface
Steel ball, dia. 39 mm	Swale s. of Area IX, near surface
Frgm. of sheet copper, 19x13x2 mm	West room block, Room I-13, Level 3, Floor 1, westernmost mealing bin
Iron bolt, 57x(max.)18 mm, heavily corroded (Fig. 8.32)	West room block, Room XI-9, Level 4a, fill between two plaza surfaces
Bronze/brass rings, three frgms. (mail?), max. dia. 8 mm (Fig. 9.3)	South room block, Room II-1 (sqs. b-c), Level 2, Floor 1, or Level 3 (sub-floor)
Iron nail, 34x8 mm (shank), 14x7 mm (head)	East room block, Room IV-2 (sq. o), Level 4, Floor 2, n of hearth
Iron nail, 13x9 mm (shank frgm.), 25x9 mm (head) (Fig. 8.44)	East room block, Room IV-2 (sq. w), Level 4, Floor 2, nw room corner
Glass, worked triangular piece, 22x 18x17 mm	East room block, Room IV-5 (sq. aag), Level 1
Eleven irregular iron frgms., largest frgm. 39x27x4 mm, curved	East room block, Room IV-5 (sq. aae), Level 2
Iron nail, two frgms., 16x9 mm (shank), 10x16 mm (head), and 13x 8 mm (shank), shank bent 90º	East room block, Room IV-6 (sq. aam), Level 3, Floor 1
Frgm. of sheet iron, 36x12x2 mm, function unknown	East room block, Room IV-6 (sq. aam), Level 3, Floor 1
Lead ball, dia. 11 mm, poss. impact mark, heavily pitted	East room block, plaza entrance outs. Room VI-2 (sq. o), Level 2
Copper object w. lead core, broken eye, 39x12x8.5mm; perhaps weight, clapper, pendant (from horse gear?)	North room block, Room VII-9, Level 2, Floor 1, southwest room corner
Iron nail, three shank frgms., 23x5, 11x5, 17x4.5 mm	North room block, Room VII-11, Level 2, Floor 1, near center of dividing wall
Iron frgm., 28x13x17 mm, heavily corroded, amorphous	Central plaza, Trench VIII-26, Feat. A1
Iron nail, 32x10 mm (shank), 15x23 mm (head), triangular head	Central plaza, Trench VIII-26, Feat. A1
Copper rivet with stamped rosette design, three layers of leather, dia. of top 12 mm, from saddle, vest/ jacket (armor), or chest? (Fig. 9.2)	Central plaza, Trench VIII-34, near bottom of refuse pit
Iron nail, two shank frgms., 15x2 and 10x2 mm, possibly same nail	Central plaza, Trench VIII-35, near pit underlying Room VI-2

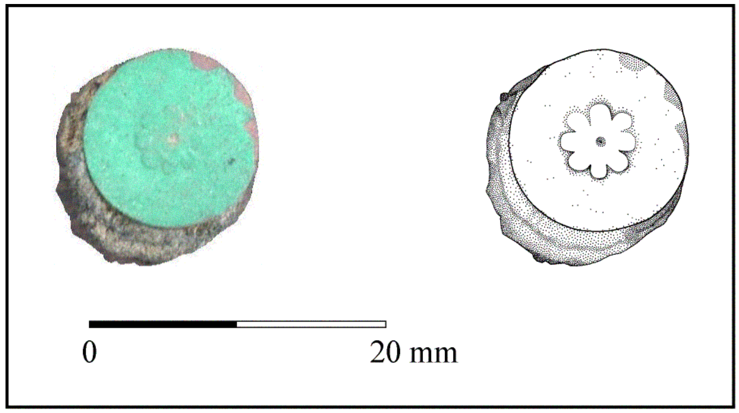

Fig. 9.2. Central plaza, Trench VIII-34, near bottom of refuse pit, rivet with flower decoration, still holding together three layers of leather (M. Bletzer, 5/2007).

Fig. 9.3. South room block, Area II, Room II-1, Level 2, Floor 1, bronze/brass ring fragments (scale in mm) (M. Bletzer, 2/2005).

Size and makeup of the metal/glass sample indicate that Plaza Montoya was occupied after such materials became available, but when or how the nails and other objects came into the pueblo cannot be established. From Diego Pérez de Luján comes the image of Piros helping themselves to iron objects brought by the Espejo-Beltrán party of 1582/83 (Hammond and Rey 1966: 173). "Theft" is of course only one of several activities (loss, trade, gift, etc.) that in time could have led to the depositioning of these objects at Plaza Montoya (see Chapter 4). But regardless of activity, archaeologically more significant is stratigraphic context. The iron bolt beneath Room XI-9, for instance, means that this room and all contemporaneous and later (i.e. bonded and abutted) rooms were built after the bolt had been discarded. A similar argument can be made for Room II-1 and the bronze/brass ring fragments found there, though in this case the picture is less clear as erosion has removed a large portion of room floor and features.

Faunal and Botanical Remains

Compared to ceramics and metal objects, faunal and botanical remains are less indicative of Spanish influence at Plaza Montoya. While some material still requires analysis, dozens of macro-faunal/botanical and flotation samples have so far yielded no conclusive evidence of foreign domesticates. This is particularly evident in the botanical sample. Maize is the most common food plant, followed by a variety of other native species, both domesticated and wild (e.g. squash [*Cucurbita* spp.], juniper [*Juniperus* spp.]; mesquite [*Prosopis* spp.], cacti [*Opuntia* spp.], pinyon *[P. edulis]*, plus sundry reeds and grasses [found mainly in contexts suggesting roofing material]). The range of identified species is similar to that at other Piro sites not only in its roster of native plants, but also a lack of Old World specimens, especially fruits like peach, melon, apple, or cherry (O'Laughlin 2001-8; cf. Earls 1985; Toll 1986b: 69, 1987a: 105, 1987b; Clary 1987: 122).

Faunal remains are dominated by small mammals (Rodentia [especially *Neotoma* sp.] and Lagomorpha), which make up about half of the overall bone sample. Species diversity is high, ranging from bony fish (Osteichthyes), amphibians, and reptiles to medium- and large-sized mammals to raptors, waders, and other birds. Among large mammals, native Artiodactyla like pronghorn *(Antilocapra americana)* and deer (*Odocoileus* sp.) are most common, but there are also two dozen bone fragments of goat *(Capra hircus)*, cattle *(Bos taurus)*, sheep *(Ovis aries)*, and horse *(Equus caballus)*. While MNI for each domesticate is just one, several morphologically indistinct fragments may represent more individuals, especially in the category *Bos.* Most of the fragments were found in upper- to mid-level proveniences in the west room block (Rooms I-1, I-13, XI-16, plaza north of Room XI-9) and the central plaza area (Trenches VIII-25, 28-30, 35) (O'Laughlin 2001-8).

Architecture

Potential chronological implications of architecture at Plaza Montoya derive from structural mass (indicating relative time of occupation) and the existence of features that may reflect Spanish influence (relative/absolute time). Inevitably, such implications are only approximations. The problem of estimating length of site use from site size/depth has been discussed at various points in Chapters 2 and 7. Studies of large Pueblo sites in particular show the relationship between scale of architecture and scale of occupation to be rarely a linear one (e.g. Reid and Shimada 1982; Crown 1991; Creamer 1993; Schlanger and Wilshusen 1993; Adler 1996; Varien 1997; Varien and Wilshusen 2002; Lyons 2003). From the excavations at Las Humanas (Vivian 1964, Hayes 1981; Hayes et al. 1981) to Cameron's (1991a) analysis of architectural change at Oraibi, there is much evidence that *a priori* assumptions of residential stability at sites known to have been occupied, overall, for several centuries can be misleading.

At Plaza Montoya, the initial assumption (as based on the surface ceramics) of a relatively late occupation also carried with it the notion of a relatively brief occupation. That there was little in the way of visible structures seemed to support the idea of a shorter occupation than one might assume, for example, for the more "massive" (and ceramically more varied) sites of Las Huertas and Qualacú. But given the depositional fragility of Plaza Montoya's adobe room blocks, the discrepancy could possibly also reflect (at least in part) a loss of structural mass due to erosion. The excavations indicate both. While room-block peripheries are generally more reduced than room-block interiors, the floor sequences of interior rooms reveal little remodeling or repair (i.e. re-flooring and re-plastering) work (Chapter 8 and below). The lack of structural depth at Plaza Montoya stands out especially when compared to the room-block sequence at Qualacú. While none of the rooms excavated in the Qualacú south plaza complex had more than three floors, refuse layers frequently separated multiple floors (Marshall 1987: 25-53). Together with the existence of two differently aligned room-block structures, this has no parallels at Plaza Montoya. Considering Qualacú's size and distribution of surface ceramics, the limited south-plaza stratigraphy doubtless represents only part of a more complex site sequence. At Plaza Montoya, few rooms have as many as three floors, there are no significant refuse/debris layers between floors, and evidence of structural super-positioning is limited to the upper levels of several east-block rooms.

Also in contrast to Qualacú, some architectural features independently suggest a late occupation for Plaza Montoya. Like the faunal data, they indicate only a general colonial-period context, but in this fit in well with the site chronology. They include adobe bricks in different parts of the site, a possible low-threshold doorway, and a number of wall-abutting hearths. The bricks were most visible in the foundations of Room I-12 (Figs. 8.7, 8.9). Given their uniform size (c. 25x15x8 cm) (Fig. 9.4), they were probably made in a mold, an unusual method at the time among the Pueblos. There is evidence that Ancestral Puebloan builders knew how to make bricks long before the arrival of the Spaniards (e.g. Fewkes 1910; Morris 1944; O'Rourke 1983; Johnson 1992), but in many regions – the Rio Grande Valley included – use of bricks at Puebloan sites seems to have remained minimal into the 1600s (Michael P. Marshall, personal communication, June 2003; cf. Smith eat al. 1966: 17-18; Hayes et al. 1981: 31).

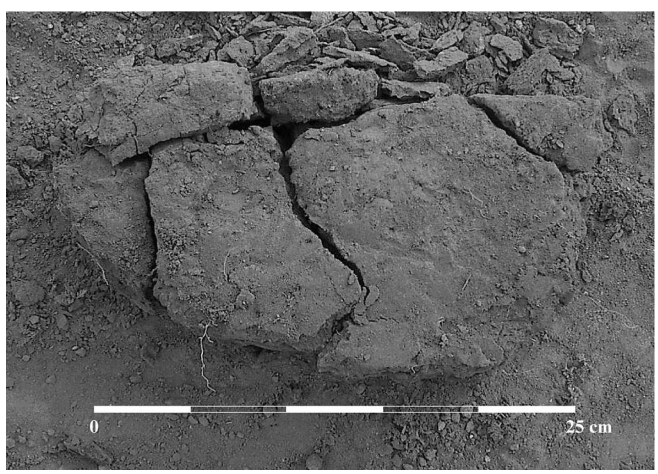

Fig. 9.4. West room block, Area I, Room I-12, adobe brick (M. Bletzer, 2/2003).[6]

[6] Brick cracked as shown when taken out of wall. Tempering material (grass) seems to have been used only sparingly (cf. Rojas Bravo 1984).

Doorways are one of the more under-represented architectural features at Plaza Montoya. As the "standard" Puebloan doorway rarely reached to floor level (Vivian 1964: 39; Hayes et al. 1981: 39-41; Creamer 1993, Tables 2.4, 3.5; Riggs 2001: 62-75), this is a clear indication of the structural attrition of the site (similar to Pueblo del Encierro, cf. Snow 1976a, Table A27). Doorways could be identified only in those west- and east-block rooms where walls survived to the height of doorsteps. A possible exception is a 90 cm long section in the north wall of Room VII-15 (Fig. 8.58b). The adobe in this section is different in color and much harder than the abutting wall ends (Fig. 9.5). While width and an elevation of only five centimeters above floor level approximate Spanish doorways at Las Humanas (Figs. 4.12, 4.13) (Hayes et al. 1981: 31-35), the compactness of what would have been the sill may indicate the impact of traffic through the opening.

Fig. 9.5. North room block, Area VII, Room VII-15, north wall, possible low-threshold doorway (M. Bletzer, 7/2003).

The distribution within rooms of hearths/fireplaces more vaguely points also to a late occupation of Plaza Montoya. At some prehistoric sites, hearths tend to be near the center of rooms, so at Grasshopper Pueblo (Riggs 2001, Tables A.8, A.11, A.14) and in Component I rooms at Arroyo Hondo (Creamer 1993: 26-30). At Pueblo del Encierro (Snow 1976a: A 8-A 93) or in the Component II part of Arroyo Hondo (Creamer 1993: 48-49), however, location varies considerably, as it does at Hawikuh, and not only in pre- but also in post-contact levels (Smith et al. 1966: 22-96, Fig. 4). Despite this, there seems to be a tendency at post-contact sites toward wall and, occasionally, corner spots. At Las Humanas, for instance, most hearths uncovered in the late-phase rooms of Mound 7 (55 of 62 hearths in the latest floors) and Mound 10/House A (8 of 10 hearths) are located next to long room walls, but corner hearths suggesting possible Spanish influence are rare outside the San Isidro mission compound (Vivian 1964: 42; Hayes et al. 1981: 43). For Plaza Montoya, the sample of hearth locations is limited as most of the rooms tested were only partly excavated. Of 20 in-room hearths, four were found in open central locations. Sixteen abutted walls (e.g. Fig. 8.35), including four whose placement against bin walls put them near the center of their respective rooms. The upper-floor hearth in Room VII-11 is near but not in the southwest room corner (Fig. 8.58a). This is the closest any of the documented hearths comes to being a corner fireplace.

Also to be briefly revisited here is the kiva issue. There is no evidence that any of the plaza proveniences uncovered during testing may have been a kiva. It is possible that the test-units were simply in the wrong locations, but the difficulty of the search contrasts with the ease with which kivas can be identified at other sites. It is tempting to view this as an indicator that kivas in their most visible form did not exist at Plaza Montoya. Given the pueblo's occupation span, one can perhaps speculate about potential Franciscan attempts to curb kiva ceremonialism, perhaps along the lines of known efforts at Senecú, Sevilleta, and elsewhere (Scholes 1937, 1942; Garner 1974; Ivey 1988, 1998; Rodríguez 1991). Such a scenario could account for the loom-anchor holes in Room IV-2 (Figs. 8.42c, 8.45), for weaving was a kiva-based activity and loom anchors are regular kiva features (Kidder 1958; Snow 1976a, Figs. A 19-36; Hayes et al. 1981: 50-58; Creamer 1993: 92-106). Room IV-2 thus may have been a ceremonial room at some point during its use. While ceremonial rooms in room blocks are not an exclusively post-contact phenomenon, Hayes et al. (1981: 47-48) point out – with reference to Las Humanas, where several such rooms co-occur with kivas – their "concealed" nature. For a kiva group facing a zealous missionary, obscurity must have been an easily appreciable attribute.

Cremations

Burials form the final category of physical data relevant to site chronology. All human remains found at Plaza Montoya were cremated. Most were located around the central plaza and under plaza-fronting rooms in large "refuse"-filled depressions or in small bell-shaped and posthole-like pits (Fig. 9.6).[7] For the later Pueblo IV/V period, cremations are known only along a line from the Zuni to the Piro to the Salinas area. A second-hand account of the Coronado expedition describes a Zuni cremation (Tello 1891, 2: 251-252), but how long the custom persisted is not clear from archaeological contexts, and it has been argued that the missionaries would have tried to suppress it (Toulouse 1944; Smith

[7] No cremations were purposely excavated, but in a few cases depositional context and bone fragmentation were such that cremations were recognized only during analysis of flotation samples.

et al. 1966; Hayes et al. 1981: 175-176). At Las Humanas, all 149 cremations found in and around Mound 7 came from late proveniences (as did 314 inhumations) and there is no doubt that some post-date the founding of the Franciscan mission (a *visita* from c. 1630 to 1660) (Hayes et al. 1981: 36, 168-176). Between two and four cremations and six inhumations are known from Las Huertas (Earls 1987; London 1987). Ceramics and ^{14}C dates suggest these cremations were prehistoric, but context is ambiguous (see Chapter 5). At Plaza Montoya, the only two Glaze A rims found during the excavation came from a plaza pit (outside/under Room VI-2) containing burned/calcined human bone fragments. Most cremations, however, were associated with late glazewares. In addition, a ^{14}C sample (S9) taken from another pit (under Room VII-5) with burned bone produced a calibrated two-sigma date range of 1480-1660 (Fig. 9.1).

SUMMARY: COMPARATIVE SITE CHRONOLOGY

Individually and as a group, the various categories of chronological data for Plaza Montoya support the initial assumption of a substantial post-contact occupation. The problem of chronological resolution is to some extent mitigated by different temporal parameters. This means that *terminus post quem* comparisons such as time of appearance of Glaze E ceramics versus that of metal objects or Spanish vessel forms can help narrow down possible date ranges for proveniences with such (or other) specimens/ attributes. If low frequencies or uncertain context leave little room for addressing data limitations, regional comparison may offer a wider perspective for evaluating site-specific patterns.

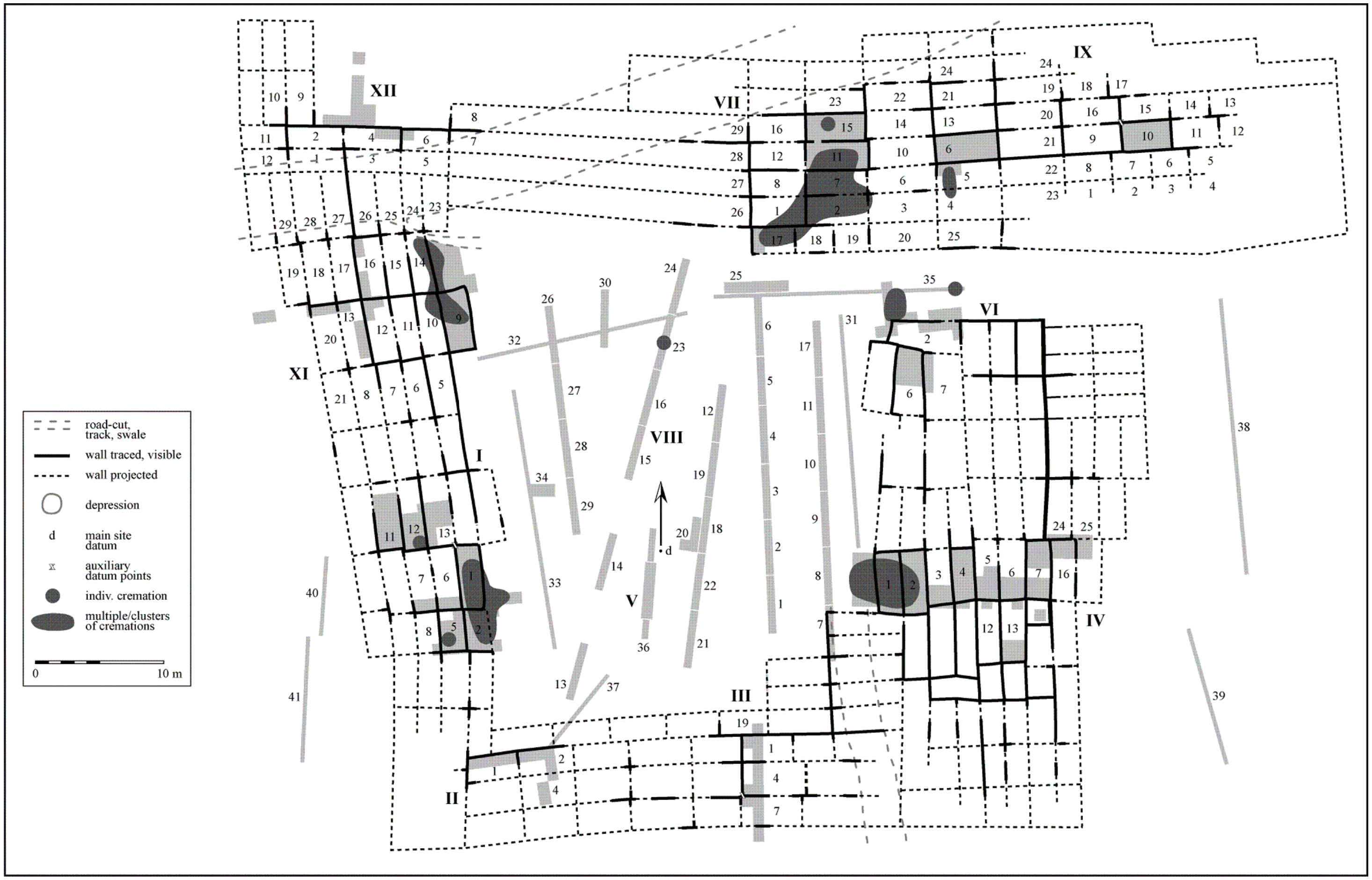

Fig. 9.6. Areas with identified and probable cremation burials (as of 7/2005).

Even though the basis for comparison is limited in the case of the Piro area, the radiometric, ceramic, and other relevant data from Las Huertas (LA 282), Pargas (LA 31746), and Qualacú (LA 757) highlight the late position of Plaza Montoya. The comparison is especially intriguing as the first two pueblos are Plaza Montoya's nearest neighbors west of the Rio Grande. Despite differences in quantity and quality, the data from these sites suggest that (1) Plaza Montoya was established later than both its neighbors and Qualacú, (2) its occupation falls within a shorter timeframe, and, (3) there was no contraction of occupied space on a scale comparable to that at Las Huertas or Qualacú. But even if those two pueblos went into decline much earlier than Plaza Montoya, the presence at either site of late glaze ceramics indicates terminal occupations and residual site use which, however diminished, may have continued just as long as (or perhaps even longer than) at Plaza Montoya.

Outside the Piro area, the closest parallel to Plaza Montoya in terms of general site structure is Pueblo del Encierro. Aside from being arranged in a similarly compact, plaza-centered layout (cf. Figs. 7.5 and 8.2), the majority of rooms at Pueblo del Encierro also had only one or two floors and none had more than five (Snow 1976a: A 8-A 93A, Table A1). Although Pueblo del Encierro's occupation very likely did not extend into the contact period, a series of tree-ring dates buttresses ceramic data and provides tighter chronological control than is possible for Plaza Montoya. Bracket dates for Pueblo del Encierro are 1350 and 1530, the latter marking the approximate end of a limited late occupation of some 50 years. In all, the pueblo's primary occupation (not counting the handful of Pueblo III/IV pit houses preceding the pueblo proper) may have lasted a little longer than a century (Snow 1976a: A 158-A 187).

Probably closest in time to Plaza Montoya are the late Mound 7 and Mound 10 occupations at Las Humanas. Documents, tree-ring dates, ceramics, and colonial-period artifacts and features alleviate somewhat the utter lack of data from Piro mission pueblos. The Mound 7 data reveal structural patterns for an occupation that may not have lasted much longer (in absolute terms) than that of Plaza Montoya (or that of Pueblo del Encierro) (cf. Hayes et al. 1981: 26-61). Despite difficulties in tracing successive floor levels, two or three floors were noted in 65 of the 180 late-phase rooms, with only one room reported as having four floors. Roofing material overlay a number of top floors, but there was too little debris to suggest upper-story rooms (Hayes et al. 1981: 42). This applies also to nearby Mound 10, where 35 of 37 rooms had only one floor (Vivian 1964: 39). Given the historical context, relative proximity to the Piro area, and scale of research, the Mound 7/10 data form an important record of reference for evaluating Plaza Montoya's own late occupation.

Site Occupation and Abandonment

Together, the above data indicate that Plaza Montoya may have been occupied for the better part of 100 years during the 16th and part of the 17th century. Construction sequence and room-block stratigraphies suggest that the pueblo grew in size over much of this period. The location of some diagnostic artifacts leaves little doubt that room-block expansion carried over into the post-contact period. Regarding the timing of Plaza Montoya's abandonment, however, ambiguity persists. Despite the fit between survey and excavation chronology, the latter only strengthens the likelihood of an early colonial/mission-period occupation. If radiometric dates, ceramics, metal objects, etc.

combine to make a robust case for a general colonial context, they still leave a substantial window of time within which the pueblo could have been abandoned. Given this, the chronological data as such are of secondary consequence in assessing the abandonment scenarios laid out in Chapter 7. Instead, one must rely primarily on analysis of patterns of structural growth, maintenance, and decay, plus patterns of artifact use and discard, to identify likely abandonment context(s).

SITE STRUCTURE AND OCCUPATION

Scale, Direction, and Implications of Site Growth

Analysis of structural and chronological data reveals a number of growth-related changes within rooms and suites of rooms in every room block. As described in Chapter 8, sets of contiguous core rooms mark the beginning of each of the four main room blocks. While the core rooms of the west, east, and north room blocks were physically detached from each other, the data for the south block are unclear on this. While it is possible that the earliest definable rooms in the south-block sequence (Rooms III-1, 2, 4, and probably 3) were initially separated by a narrow passage from adjacent east-block rooms, they could also have been part of a larger group of core rooms that were attached to the east room block in the area now disturbed by the north-south running two-track (Figs. 8.11, 8.36). Regardless of this, location, internal structure, and stratigraphy suggest that the south room block was the last of the four room blocks to be built. Prior to its construction, the central plaza was open to the south, which means that the site layout then probably resembled an inverted U (similar to Las Huertas).

Overall, bond-abut data, depth of deposits, and the unique occurrence of Glaze A-C rims beneath Room VI-2 and the late-phase plaza entrance point to the likely east-block core of Rooms IV-5, 6, 21, and 22 as the oldest part of the site (Figs. 8.12, 8.14, 8.41, 8.53). How much time separates those rooms from the core rooms in the west and north room blocks can hardly be estimated, however. In the west room block, the iron bolt under Room XI-9 places construction of this plaza-fronting room after Spanish contact. A Glaze D/E rim from beneath the same room is most consistent with a contact-period (i.e. 1540-98) date. That only Glaze E and F forms were found in interior rooms may further limit the Room XI-9 date range to the period of Spanish exploration between 1581 and 1598. The west-block core is perhaps not much earlier than Room XI-9, but how much is anyone's guess. As vague as this is, it is more than can be said about the missing core rooms of the north room block (Figs. 8.6, 8.15).

Ethnographic observations (especially among the Western Pueblos, cf. Mindeleff 1891) and evidence from sites like Grasshopper Pueblo suggest that closely spaced core room blocks reflect ethnic/social affinity between their occupants (cf. Cordell 1994, 1996; Crown et al. 1996; Adler 1996; Rautman 2000; Adams and Duff 2004). Spatial distance, by contrast, reflects social distance. Grasshopper grew from eight discrete core room blocks into three large blocks, a pattern which to Riggs (2001: 123) "suggests the presence of different social or ethnic groups in the founding population of the community" (cf. Reid 1973; Graves et al. 1982). Riggs (2001: 118-124) sees two basic patterns of later expansion. In the western part of the site, "the seemingly deliberate" plaza-centered layout of rooms "suggests a strong cooperative element between residents of the community and newly arriving immigrants", while elsewhere smaller construction units points to a change from early migration-driven growth to slower (biological) growth of local households as chief engine of expansion. For Arroyo Hondo, patterns (described briefly in the previous chapter) are similar (Creamer 1993: 140-154). At Pueblo del Encierro, the early south and west room blocks started with eight and six rooms, respectively, and the later east, north, and northeast room blocks with nine, 14, and probably 26 (Fig. 7.5). This suggests two episodes of rapid aggregation later in the pueblo's occupation. Beyond these core blocks, expansion was mainly by single and double rooms (Snow 1976a). At Las Humanas, the late-phase occupation of Mound 7 began around 1540 with the construction of three contiguous core room blocks (totaling 46 rooms) at the mound's western end and a single block (22 rooms) some 50 m to the east. To the latter, 15 more rooms were added singly and in pairs. Tree-ring dates indicate that this was soon after the building of the larger room block. Subsequent expansion up to c. 1600 filled the gap between the core blocks, with construction units ranging from eight to 36 rooms (though according to the bond-abut data there may have been smaller units). Given the overall spatial and temporal structure of Las Humanas, the Mound 7 pattern likely represents residential shifts within the pueblo, presumably by different kin groups (Hayes et al. 1981: 26-36, Figs. 16c-h).

If one associates spatial with social distance at Plaza Montoya, there may have been three founding groups for the eastern, western, and northern parts of the site. In addition, even if the southern core rooms seem too close to the east room block to be indicative of "social distance", the south block's spatial-stratigraphic position between the east and west room blocks still hints at group-level aggregation. A similar argument could perhaps be made for the room cluster attached to the double wall in Area VI, but too little remains to pursue the issue further (Fig. 8.14). Considering these observations and the structural and chronological differences between Plaza Montoya and neighboring Las Huertas and Pargas, the establishment of core room blocks at Plaza Montoya possibly benefited at least in part from population movements within the local site cluster (Fig. 8.4). If the latest pueblo in the cluster was growing in size while occupied space at Las Huertas, Pargas, and probably Las Cañas Pueblo was contracting, some sort of population reshuffle may well have contributed to the disparity. But as stated in Chapters 7 and 8, without spatially more varied data from Las Huertas and with no structural data from Las Cañas the potential donor role in this migration hypothesis remains entirely conjectural.

Following the founding of core room blocks, expansion at Plaza Montoya was by single-, double-, and – more rarely – multi-room units (of perhaps up to half a dozen rooms). The state of many walls made it difficult to establish definite wall relationships and thus chart clusters of rooms built at the same time. As noted in Chapter 8, peripheral rooms in particular are under-represented in the bond-abut database. The deficit is most obvious for the south (Areas II/III), east (Area VI), and north room blocks (Areas IX/XII). As far as room-block growth can be traced through bond-abut patterns, in the west room block initial expansion from the nine possible core rooms in Area XI was by one, two, and three rooms. While later additions may have included an intermediate four-room unit (Rooms XI-25 through XI-28), there was clearly a final unit comprising Rooms XI-5, 9, 10, 14, and probably 1. These rooms were built *en bloc* and formed the final plaza front (Figs. 8.10, 8.29). In Area I, single and a few double rooms were the most common additions. An exception could be a unit with Rooms I-8, 9, 10, 18, and perhaps an unnumbered room west of the latter, but with only six of 11 prospective corners identified this is little more than an assumption (Figs. 8.7, 8.22). For the south room block, the data are even patchier. While nothing can be said about Area II, in Area III expansion seems to have been by double rooms, though some of these could also have formed two four-room units (Figs. 8.11, 8.36). By contrast, in adjacent Area IV of the east room block rooms were built in ones and twos throughout the sequence. There is only one possible exception, a three- or four-room unit of Rooms IV-14, 30, 36, and perhaps 35 (Figs. 8.12, 8.41). North of Area IV, expansion was more varied. While the last Area VI additions toward the central plaza and plaza entrance were single rooms, earlier expansion included one three-room unit (Rooms VI-7 and VI-12, plus IV-19) and a large unit of five or six rooms (Rooms VI-4, 5, 9, 10, 15, and perhaps 14), whose eastern edge was marked by the unique double wall. On the other side of that wall, the annex of east-west-trending rooms may also represent one construction episode, but aside from the different alignment and regular spacing of wall abutments no structural data are available (Figs. 8.14, 8.53). In the case of the north room block, bond-abut data are especially patchy owing to the recent disturbances and erosion of peripheral walls. Where walls could be outlined in Areas VII and IX, they suggest expansion of interior rooms by pairs of rooms and larger (perhaps up to five/six rooms) units. Peripheral rooms seem to have been added individually or in pairs, though there are exceptions like an apparent four-room unit of Rooms VII-1, 2, 7, and 8 (Figs. 8.15, 8.16, 8.57, 8.62). For Area XII, the bond-abut data suggest mostly double-room expansion, with one larger unit consisting of Rooms XII-1, 2, 4, and possibly 3 (Figs. 8.18, 8.64).

The nature of these observations necessarily limits generalizations about the demographic processes behind Plaza Montoya's expansion. Still, the prevalence of one- and two-room units broadly suggests that demand for living space was driven primarily by internal (i.e. household) growth. Other than maybe the northeastern part of the east room block (Area VI), units with three or more rooms seem too scattered to reflect a possible influx of larger groups of outsiders. Of course, as it is all but impossible to assess time of construction of an abutting room vis-á-vis its earlier neighbor(s), episodic additions of more sizeable units than indicated by the bond-abut data cannot be ruled out (here the lack of tree-ring dates is again acute). Nor can potential "small-scale" aggregation be discounted. A few colonial-period references hint vaguely at kin ties and individual movements between Piro pueblos (San Pascual-Senecú, Sevilleta-Alamillo) (Chapter 6), and there is no reason to doubt that similar ties did not also exist between Plaza Montoya and Las Huertas or Pargas. Isolating the structural "footprint" of this kind of aggregation with the existing data is difficult, however. Some of the two-, three-, or four-room additions in the north room block (Areas VII/IX) seem about the right size for one or more "new" nuclear families, but whether the association is valid, and whether such families may have come from other villages or were locals relocating under descent-based residence rules (similar perhaps to the matrilineal/matrilocal pattern Cameron noted for Oraibi, see Chapter 2) cannot be known.

Whatever the specific implications of double- and multi-room expansion at Plaza Montoya, there is nothing to suggest that the general process of expansion was spatially or temporally discontinuous. From a structural-stratigraphic perspective, there is no evidence of a post-contact break in site growth. The iron bolt from between the two plaza surfaces under Room XI-9 provides a general contact-period *terminus post* for the construction of the final west-block rooms fronting the northwest plaza corner. In the south room block, the three bronze or brass ring fragments found in Room II-1 may have come from a pre-room refuse scatter, but with the erosion of much of the overlying room floor they could also be associated with the room. Ring and wire diameter indicate links from a piece of mail armor (Table 9.3, Fig. 9.3).[8] Stratigraphically more secure than the ring fragments is a plainware Glaze F-type rim found in a small sherd and ash scatter under the north wall of Room XII-4. The material with the rim sherd seems to have slid into the wall's foundation trench from a larger ceramic scatter outside the new room before the first course of adobe was laid. A fortuitous discovery, the sherd places the construction of Room XII-4 and all rooms built with it or later within Glaze F times, i.e. no earlier perhaps than c. 1625. For the site as a whole, the clearest sign of uninterrupted occupation is the extremely limited occurrence of refuse within rooms. This and other aspects of refuse deposition are examined later; here it suffices to say that few floors (early or late) produced appreciable quantities of ceramics, lithics, or organic remains.

In general outline, the demographic implications of all this seem relatively straightforward. Following construction of core rooms first, probably, in the east and then in the north and west room blocks, scale and direction of room-block expansion suggest that the number of residents increased steadily through biological growth and perhaps limited immigration from surrounding pueblos. With the three room blocks arranged in a plaza-centered layout, the pueblo gradually assumed the shape of a south-facing U. Eventually, the opening of the U was closed with the construction of the south

[8] In manufacturing mail, armorers often used bronze or brass rings to trim the sleeves and/or necklines of mail shirts (e.g. Thordeman 1939: 98-112; Schmidtchen 1990: 138-141).

room block. Bond-abut data and general lack of depth of all south-block rooms suggest that this room block was built up rapidly from east to west, a pattern possibly reflecting the arrival of an outside group or groups. Another late(r) development is the eastern plaza as defined by the outward orientation of peripheral rooms in the east room block and the long eastward extension of the north room block. In view of the multi-room unit and annex of rooms in Area VI, and given the apparent lack of outward-facing rooms in the west and south room blocks, the structural expansion that delineated this second plaza may also reflect a period of population aggregation. But as grading and erosion have erased all traces of the outermost peripheral rooms in the eastern part of the north room block, no structural data for these final rooms exist. If the late rooms on the other end of the room block (Area XII) are any indication, eastern peripheral rooms were perhaps built in pairs, but this is only speculation.

Converting structural patterns to actual population figures is less straightforward. None of Fekri Hassan's (1978: 56) six structural-chronological variables outlined in Chapter 7 can be narrowly defined for Plaza Montoya. Assumptions made in interpreting structural data are augmented by assumptions on specific population variables such as number of rooms and residents per household – Creamer's (1993: 152) "multiple levels of assumptions". As different values/formulae can produce a wide range of estimates, expectations are best limited to identifying a range of most likely figures. Narroll's constant (10 m^2 roofed space per person), for instance, supplies a figure of 270 residents for Plaza Montoya (total roofed area c. 2,700 m^2). An offshoot of Narroll's constant is Bullard's (1962: 123) sleeping-space parameter of 1.5 m^2 per person. Its application depends critically on the proportion of sleeping space to roofed domestic space. In a comparative population estimate for Pueblo del Encierro, David Snow (1976a: A 223-A 227, Table A 38) used Bullard's parameter with an arbitrary sleeping-space ratio of two-thirds of roofed space. The same ratio for Plaza Montoya produces a figure of 1,200 residents, but if the ratio is reduced to one third population drops to 600. Moving from space- to room-based estimates, a figure of c. 600 residents derives from Pierson's (1949) "traditional" (as applied originally to Chacoan sites) figure of 1.9 persons/room. If one uses household size and the structural-functional unit of one living and one storage room (cf. Creamer 1993: 152), and assumes between four and six persons per household (cf. Schlanger 1985: 133-136), population ranges from 600 to 900 residents (based on the estimate of 250 ground-floor and 50 second-story rooms). If household size is increased to three rooms to account for potentially larger households (cf. Cameron 1991b: 79-80), population bottoms out at 400 residents. The same calculations with only three persons per household (cf. Wetterstrom 1986: 43) provide margins of 450 and 300. Wilcox's (1992: 10) variables discussed in Chapter 7 (4.33 rooms per household/*casa*, eight persons per household) give a total of 550 residents. All totals are for a 100% maximum occupation of domestic space/rooms/households at Plaza Montoya. Historically, though, full occupation has been rare among Puebloan communities. Structural and other data (as on carrying capacity, cf. Wetterstrom 1986) permitting, archaeologists therefore tend to assume occupation rates of 75%, sometimes higher (Creamer 1993: 152-153). Given all this, a probable best-estimate range for Plaza Montoya at the height of its occupation runs from 300 to 500 persons.

Structure Use, Remodeling, Maintenance

Room Function and Household Structure

As at other Puebloan sites, the occupants of Plaza Montoya can be assumed to have built their rooms to fit a variety of needs. Yet as at other sites, too, those rooms were discrete components of walled and roofed space that probably had little or "no meaning in the systemic context" (Reid 1973: 107). A hallmark of pueblos and similar settlements elsewhere is the integration of rooms and outdoor space (plaza, *ramada*, rooftop) into functionally inclusive domestic units or households (Creamer 1993: 110-133; Riggs 2001: 166-185; cf. Jorgensen 1975; Reid and Whittlesey 1982; Adams 1983; Netting et al. 1984; Dohm 1990, 1996; Rothschild 1991; Lowell 1991; James 1994, 1997; Coupland and Banning 1996; Allison 1999; Varien 2002; Cutting 2006). From Spanish explorers to the first "proto"-anthropologists, many early observers of Puebloan life were impressed by the array of domestic activities carried out within the confines – interior as well as exterior – of households. Such structural-functional variability and complexity require archaeologists to look closely at and beyond rooms for patterns indicative of the workings of a household "system". Key in this is the recognition of structural features and other potentially diagnostic attributes, for example, deposits of primary refuse. Table 9.4 lists features and functional associations common to large Puebloan sites. Due to the low height of surviving walls at Plaza Montoya, I have limited the list mainly to floor features. Most of these features reappear in Table 9.5, which records inferred function per floor level for all Plaza Montoya rooms described in Chapter 8.

Table 9.4. Floor features and room function at large Puebloan sites.[9]

Floor features	**Room function**
Hearth Wall plaster Sooted wall/floor areas Undivided floor area Niches/small storage bins/benches/shelves Mealing bins Evidence of food preparation Cooking vessels (burned/sooted)	Living room
Mealing bins Storage bins Groundstone implements (manos, metates) Unprepared corn kernels	Mealing room
Storage bins/dividing walls Few other features Tool caches Unprepared plant remains Storage vessels (utility jars)	Storage room
Hearth(s) Wall plaster (decorated) Niches/storage bins/benches Loom-anchor holes Large size Mealing bins Ceremonial objects	Ceremonial room/"room-block" kiva
Prepared plaza surface(s) Hearths/roasting pits Storage pits Grinding basins/mealing bins Posthole alignments Jacal walls Evidence of tool manufacture/food processing Turkey pens Borrow/refuse pits Burials	Plaza front/*ramada*

(Based on Dean 1969; Adams 1983; Ciolek-Torrello 1985; Creamer 1993; Riggs 2001).

[9] Owing to the low wall height at Plaza Montoya, I have largely limited the list to floor features in ground-floor rooms.

Table 9.5. Feature distribution and inferred room function per room and floor level.[10]

Room	Level, floor	Features, room function
West room block, Area I		
Room I-12 (Fig. 8.26)	L. 2, Fl. 1	None, **storage room?**
	L. 3, Fl. 2	Ash-pit in SE room corner (w. cremation), **storage room?**
	L. 4, Fl. 3	Refuse pit, **plaza surface**
I-13 (Fig. 8.26)	L. 3, Fl. 1	Mealing and storage bins, **mealing/ living room**
	L. 4, Fl. 2	Clay-lined/unlined hearths, ash-pit, refuse pit, **plaza surface**
I-11 (Fig. 8.26)	L. 2, Fl. 1	Clay-lined hearth, **living room?**
	L. 3, Fl. 2	Ash/charcoal scatter, **pre-room surface**
I-1 (compl.) (Figs. 8.8, 8.23)	L. 2, Fl. 1	Mealing and storage bins, hearth, **mealing/living room**
	L. 3, Fl. 2	Refuse pits, **plaza surface**
I-5 (Figs. 8.23-8.25)	L. 2, Fl. 1	Mealing and storage bins, hearth, **mealing/living room** (intrusive pit with cremation post-room use?)
	L. 3, Fl. 2	Mealing bin, clay-lined hearth, **mealing/living room**
	L. 4, Fl. 3	Clay-lined hearth, **plaza surface**
I-2 (Fig. 8.8)	L. 2, Fl. 1	Hearths, pit features, **plaza surface** (this may be plaza space only)
Area XI		
Room XI-13 (Fig. 8.33, 8.35)	L. 3, Fl. 1	None, **storage room?**
	L. 5, Fl. 2	Clay-lined heart, **living room?**
XI-12 (Fig. 8.33, 8.34)	L. 3, Fl. 1	Storage bin(s), **storage room?**
	L. 5, Fl. 3	None, **storage room?**
XI-16 (Fig. 8.33)	L. 3, Fl. 1	Mealing bins, **mealing/living room**
XI-9 (compl.) (Figs. 8.30, 8.31)	L. 3, Fl. 1	Mealing and storage bins, hearth, **mealing/living room**
	L. 4, Fl. 2	Clay-lined hearth, refuse pits, post-holes, ***ramada*/plaza surface**
	L. 5, Fl. 3	Unlined hearth, cremation, post-holes, ***ramada*/plaza surface**

[10] Rooms are listed in sequence from early to late as indicated by the bond-abut/stratigraphic data for each excavation area.

Table 9.5. (continued)

Room	Level, floor	Features, room function
South room block, Area II		
Room II-2 (Fig. 8.38)	L. 3, Fl. 1	Clay-lined heart and pit, unlined hearth, **living room?** (features may be associated with plaza surface)
	L. 4, Fl. 2	None (see above), **plaza surface**
II-1 (Fig. 8.38)	L. 3, Fl. 1	Poss. mealing bins, ash-pit and other pit features, **mealing/living room?** (some features may be part of pre-room surface)
	L. 4, Fl. 2	Unlined pit and poss. features from upper level, **plaza surface**
II-4 (Fig. 8.38)	L. 3, Fl. 1	Ash/charcoal scatter (poss. part of pre-room surface)
	L. 4, Fl. 2	See above, **pre-room surface**
Area III		
Room III-1 (Fig. 8.39)	L. 3, Fl. 1	Mealing bins, **mealing/living room**
	L. 4, Fl. 2	None, **pre-room surface**
III-4 (Fig. 8.39)	L. 3, Fl. 1	None, **storage room?**
		Ash/charcoal scatter, **pre-room surface**
III-7 (Fig. 8.39)	L. 2, Fl. 1	None, **storage room?**
	L. 3, Fl. 2	Ash/charcoal scatter, **pre-room Surface**
East room block, Area IV		
Room IV-5 (Fig. 8.48)	L. 3, Fl. 1/ 1a	Clay-lined hearth, storage bin, **living/storage room**
	L. 3, Fl. 1a	Clay-lined and unlined hearths, **living room**
	L. 4, Fl. 2	Ash/charcoal scatter, **pre-room surface**
IV-6 (Figs. 8.48, 8.49)	L. 3, Fl. 1	Narrow adobe wall and floor on top of burned roofing material (L. 3a), **post-abandonment reoccupation?**
	L. 4, Fl. 2	Mealing bins, **mealing/living room**
IV-4 (compl.) (Figs. 8.46, 8.47)	L. 3, Fl. 1	Poss. storage bin, large utility jar on floor, partly raised floor, **storage room**
	L. 4, Fl. 2	Shallow depression, **pre-room surface**

Table 9.5. (continued)

Room	Level, floor	Features, room function
IV-3 (Fig. 8.46)	L. 3, Fl. 1/1a	Storage bin, utility jars on floor, **storage room**
	L. 3, Fl. 1a (bin area)	Mealing bins, **mealing/living room**
	L. 4, Fl. 2	Ash/charcoal scatters, **pre-room surface**
IV-2 (compl.) (Figs. 8.42, 8.45)	L. 2, Fl. 1	Hearth, dividing walls at different angle than room overlying adobe rubble, **post-abandonment reoccupation?**
	L. 4, Fl. 2	Mealing and storage bins, hearth, ash-pits, loom-anchor holes, **mealing/living/ceremonial room** (loom holes probably predate other features)
	L. 5, Fl. 3	Clay-lined and unlined hearths, poss. roasting pits, postholes, cremations, ***ramada*/plaza surface**
IV-1 (compl.) (Figs. 8.42, 8.43)	L. 3, Fl. 1/1a	Dividing wall, hearth, ash-pit, **living/storage room**
	L. 3, Fl. 1a (n. half of room only)	Mealing bins, poss. storage bin, **mealing/living room**
	L. 4, Fl. 2	Clay-lined and unlined hearths, poss. roasting pits, postholes, cremations, ***ramada*/plaza surface**
IV-7 (Figs. 8.50, 8.51)	L. 2, Fl. 1	Unlined hearths/roasting pits, poss. postholes overlying adobe rubble and roofing material, **post-abandonment reoccupation?**
	L. 4, Fl. 2	Clay-lined and unlined hearth, ash-pit, storage bin, bench, poss. post-hole, **living room**
	L. 5, Fl. 2a	Mealing bins, **mealing room**
	L. 6, Fl. 3	Clay-lined and unlined hearths, ash-scatter, **plaza surface**
IV-16 (Figs. 8.50, 8.52)	L. 3 Fl. 1	None (room mostly eroded)
	L. 4, Fl. 2	Clay-lined and unlined hearths, poss. roasting pits, postholes, misc. pits, ***ramada*/plaza surface**

Table 9.5. (continued)

Room	Level, floor	Features, room function
Area VI		
Room VI-7 (Fig. 8.56)	L. 3, Fl. 1	None, **storage room?**
	L. 4, Fl. 2	Poss. mealing bins, **mealing/living room**
VI-6 (Fig. 8.56)	L. 3, Fl. 1	Mealing bins, storage bin, **mealing/ living room**
	L. 4, Fl. 2	Unlined hearths or ash-pits, **plaza surface**
VI-2 (Figs. 8.54, 8.55)	L. 3, Fl. 1	Mealing bins, clay-lined hearth, ash-pit, **mealing/living room**
	L. 4, Fl. 2	Unlined hearth, refuse pit, **plaza surface**
	L. 5, Fl. 3	Poss. postholes, ***ramada*/plaza surface**
North room block, Area VII		
Room VII-15 (compl.) (Fig. 8.58)	L. 3, Fl. 1	None, **storage room**
	L. 4, Fl. 2	Two unlined hearths (one with cremation), ash-pit, **living room?**
	L. 4, sub-fl. testpits	None, **pre-room surface**
VII-11 (compl.) (Figs. 8.58, 8.59)	L. 2, Fl. 1	Clay-lined hearth, dividing wall, **living/storage room?**
	L. 3, Fl. 2	Mealing bins, clay-lined hearth, **mealing/living room**
	L. 4, Fl. 3	Postholes, cremations, ***ramada*/ plaza surface**
VII-9 (compl.) (Fig. 8.60)	L. 2, Fl. 1	Mealing bins, storage bin, bottom of hearth and ash-pit (from missing upper floor), charcoal/bone scatter, **mealing/living room**
	L. 3, Fl. 2	Mealing bins, dividing wall, **mealing/storage room**
	L. 4, Fl. 3	Ash/charcoal scatter, **pre-room surface**
VII-5 (Fig. 8.60)	L. 2 (Fl. 1)	None, **storage room?**
	L. 3, Fl. 2	Large pit (w. cremation), posthole, ***ramada*/plaza surface**
VII-17 (Fig. 8.61)	L. 2, Fl. 1	None (room mostly eroded)
	L. 3, Fl. 2	Ash/charcoal scatter, poss. post-holes, cremation, ***ramada*/plaza surface**

Table 9.5. (continued)

Room	Level, floor	Features, room function
Area IX		
Room IX-10 (compl.) (Fig. 8.63)	L. 2, Fl. 1	Unlined hearth, bottom of clay-lined hearth (from missing upper floor), mealing bins, ash/charcoal scatter, **mealing/living room**
	L. 3, Fl. 2	Ash/charcoal scatters, **pre-room surface**
Area XII		
Room XII-4 (Fig. 8.65)	L. 3, Fl. 1	Utility jar on floor, **storage room?**
	L. 4, Fl. 2	Ash/sherd scatter (not shown in Fig. 8.61), **pre-room surface**
XII-6 (Figs. 8.65, 8.66)	L. 3, Fl. 1	Poss. posthole, **storage room?**

Room and plaza proveniences at Plaza Montoya produced a wide range of floor features, but given the limited testing in many rooms more features no doubt remain in the ground. Especially mealing bins must be considered under-counted, even though 68 were identified or projected in the rooms tested. With two exceptions, all rooms with mealing bins had them lined up against a short end wall (Table 9.6). Rooms lacking mealing bins are mostly those where test units were placed near the room center or at only one end (e.g. Rooms I-11, I-12, IV-5, XI-12, XI-13, XII-4, XII-6), which leaves the possibility that bins may yet exist in unexcavated room parts. Despite such limitations, floor-feature inventories suggest that most rooms at one point were mealing/living rooms (Table 9.5). Less frequently, the presence of hearths and dividing walls on some late floors (Rooms IV-1, IV-5, VII-11) indicates that rooms at times were altered to provide a combination of living and storage space.

Table 9.6. Ground-floor rooms with mealing bins.[11]

Room	Number/location of mealing bins
West room block, Area I	
Room I-13	**4**/ L. 3, Fl. 1, south wall
I-1 (compl.)	**3**/ L. 2, Fl. 1, south wall
I-5	**1**/ L. 2, Fl. 1, sw corner
Area XI	
Room XI-9 (compl.)	**4**/ L. 3, Fl. 1, south wall
XI-16	***3***/ L. 3, Fl. 1, north wall
South room block, Area II	
Room II-1	***3***/ L. 3, Fl. 1, east wall
Area III	
Room III-1	***3***/ L. 3, Fl. 1, east wall
East room block, Area IV	
Room IV-6	**4**/ L. 4, Fl. 2, south wall
IV-7	**3**/ L. 5, Fl. 2a, north wall
IV-3	**4**/ L. 3, Fl. 1a, south wall
IV-2 (compl.)	**4**/ L. 4, Fl. 2, south wall
IV-1 (compl.)	***4***/ L. 3, Fl. 1a, north wall
Area VI	
Room VI-7	***4***/ L. 4, Fl. 2, north wall
VI-6 (compl.)	**4**/ L. 3, Fl. 1, north wall
VI-2 (compl.)	***4***/ L. 3, Fl. 1, east wall
North room block, Area VII	
Room VII-11 (compl.)	**4**/ L. 3, Fl. 2, east wall
VII-9 (compl.)	***4***/ L. 2, Fl. 1, south (long!) wall
	4/ L. 3, Fl. 2, west wall (top floor missing)
Area IX	
Room IX-10	**4**/ L. 2, Fl. 1, east wall (top floor missing)

[11] Rooms listed as per n. 10. Where not fully preserved, visible remains and room width were used to estimate the number of bins (shown in *italics*).

Beyond the multi-functional makeup of likely living-room floors, bond-abut data, floor sequences, and differences in feature distribution also suggest functionally related groups of rooms. At the ground-floor level, the basic arrangement is that of the living/mealing and the storage room. Together, the two rooms represent the smallest structural combination for a functional household. As Snow (1976a: A 159-A 182) noted for Pueblo del Encierro, the "primary domestic unit" consists of a plaza-fronting room with hearth and often other features (storage or mealing bins, cists, etc.) to which was usually connected by a doorway a back room whose lack of floor features suggests use for storage. The same pattern applies to most "residence units" at Arroyo Hondo, though there is some evidence of larger units. As at Pueblo del Encierro, living rooms were generally part of a plaza front or else were second-story rooms, while storage rooms were located toward the room-block interior (Creamer 1993: 150-151).

Both historical and archaeological data indicate some variability in the number of rooms used by Puebloan households in the post-contact period (Dohm 1990; Cameron 1991a, 1991b; James 1994). In the six contact-/colonial-period room blocks excavated at Hawikuh, for instance, most households are estimated to have utilized from two to four (maximum seven) rooms. Based on feature distribution, 45% of recorded rooms are considered storage rooms (no hearths or other features), 31% "sleeping" rooms (hearths only), and 24% "everyday living and working quarters" (hearths, other features). Details on locations of different rooms are scarce, but it appears that the interior-exterior pattern of storage versus living rooms also prevails at Hawikuh (Smith et al. 1966: 13-85). At Pecos, Kidder (1958: 121-124) originally perceived a "standard" domestic/residence unit of six or seven rooms on as many as four stories. Cameron (1991b: 79), however, points out that fourth-floor rooms at Pecos are conjectural and that many of the lowermost interior rooms were – as Kidder (1958: 122-123) himself described them – so filled with debris/refuse as to be uninhabitable. For these reasons, two living rooms and one storage or sleeping room seem a more plausible combination for Pecos (Cameron 1991b: 79-80).

At Las Humanas, the physical correlates of Mound 7 households are not explicitly discussed, though the identification of 61 living and 104 storage rooms for late/terminal occupation levels (Hayes et al. 1981: 46-47) gives a ratio roughly the reverse of that which Cameron projects for Pecos. Beyond this, the Mound 7 data also illustrate the dubious value of doorways as indicators of household size. Open and blocked doorways have been found at many sites connecting rooms associated with living and storage space. Postulated functions range from temporary construction access to more permanent traffic corridors within households, to combinations of these and other (e.g. refuse disposal) factors (Snow 1976a: A 159-A 182; Cameron 1991a: 86-87; Creamer 1993: 22-28, 45-47, 151; Riggs 2001: 62-75, 174-176). Especially the blockage of doors is often hard to date precisely, and this limits the accuracy with which change in household structure can be outlined (Riggs 2001: 71; cf. Creamer 1993: 123-128). At Las Humanas, 154 of 208 Mound 7 doorways were found blocked when excavated, i.e. were also blocked at the time of abandonment. The largest "unit" accessible via open doorways had six rooms, but the vast majority of rooms could then no longer be entered at ground level. Whether blockage of formerly open doorways reflects the loss of households near the end of the Mound 7 occupation or perhaps some sort of structural reappraisal driven by a desire to limit accessibility (for defensive purposes?) is unclear (Hayes et al. 1981: 38-41).

Numerically at least doorways are a minor problem at Plaza Montoya, for only eight have been identified so far (Table 9.7). Except for the possible Spanish-style low-threshold doorway in the north wall of Room VII-15 (Fig. 9.5), all doorways are located in areas of the west and east room blocks where walls are still high enough to reveal the sills of traditional narrow, high threshold doorways (Fig. 9.7). Most doorways had been blocked with adobe; the doorway between Rooms XII-12 and XII-16 also had a bin wall placed against it (Figs. 8.33, 8.34). Although the limited exposure/preservation of walls makes it impossible to compare the distribution of doorways across the site, the doorways identified in Area IV suggest that the wider Puebloan pattern of connecting living and storage rooms holds also at Plaza Montoya. Given this, it was probably the structural-functional reorganization of rooms/room floors during room-block expansion that governed the treatment of doorways.

Table 9.7. Rooms connected by doorways.

Rooms connected	**Condition (open/blocked)**
West room block, Area XI	
Rooms XI-13/XI-12 (Fig. 8.33)	Blocked
XI-12/XI-16 (Fig. 8.33)	Blocked, short end wall (Fig. 8.34)
East room block, Area IV	
Rooms IV-6/IV-7 (Figs 8.48, 8.50)	Blocked
IV-5/IV-4 (Fig. 8.48)	Blocked
IV-4/IV-3 (Fig. 8.46)	? (Fig. 9.7)
IV-7/IV-14 (Fig. 8.50)	Blocked, short end wall
IV-3/IV-2 (Figs. 8.42, 8.46)	Blocked (?)
North room block, Area VII	
Rooms VII-15/VII-23 (Fig. 8.58)	Open (?), possible low threshold door-way (Fig. 9.5)

Fig. 9.7. East room block, Area IV, sill of doorway between Rooms IV-4 and IV-3 (northern half of Room IV-4 still unexcavated) (T. O'Laughlin, 6/2003).

Also difficult to evaluate at Plaza Montoya is the extent to which upper-story rooms and rooftops may have helped define household space. While one can assume on the strength of ethnographic, historical, and archaeological comparisons (e.g. Ciolek-Torrello 1978, 1985; Adams 1983; Cameron 1991a; Rothschild 1991; James 1994, 1997; Dohm 1996) that domestic areas were not limited to ground level only, Plaza Montoya's reduced state has kept expectations of finding traces of upper-story rooms or rooftop features low. In part this pessimism stems from problems the same issue has posed at better-preserved sites like Grasshopper Pueblo or Las Humanas. Even in places where large sections of walls survive, these seldom reach beyond the first-floor ceiling line, which leaves the fragmented remains of walls, roofs, and features as the only tangible evidence of upper-story rooms or rooftop activity areas. With the debris volume of a two-story structure potentially twice that of a single-story building, large accumulations of building stone or adobe rubble, plus the presence in the debris of bin-wall fragments, ash/charcoal lenses, burned rocks, groundstone, etc., likely represent collapsed upper rooms. By contrast, broken features and artifact scatters in fill contexts lacking structural debris point to activity areas atop single-story roofs (Barnett 1969: 20-40; Hayes et al. 1981: 41-47, Fig. 65; Creamer 1993, Fig. 2.13, Tables 2.6, 6.2, 6.3; Riggs 2001: 84-98).

Based on these criteria, there is evidence at Plaza Montoya for 13 second-story rooms and for four rooms with rooftop features (Table 9.8). As the room descriptions show, the former are located mostly in the best-preserved parts of the west and east room blocks. A rough estimate of 50 second-story rooms for the site takes into account fill volume in excavated rooms, mound height, and location (plaza-fronting rooms are unlikely to have had a second story). Once again, however, differences in preservation are a concern. While the possible existence of second-story rooms in the central (Room VII-15) and western parts (Rooms XII-4, XII-6) of the north room block suggests that at least some of the core rooms between Areas VII and XII may also have had a second story, most of those rooms were located where the graded road now runs. Perhaps even spottier is the survival rate of roof-top assemblages. Aside from the impact of disturbances or erosion in the north and south room blocks and in peripheral rooms generally, there is the possibility – considered in more detail below – that tools like grinding stones were taken from rooftop locations during structure abandonment. This means that some of the most durable/recognizable components of rooftop features may not have ended up in room fill.

Table 9.8. Possible second-story and rooftop proveniences.

Room	Upper story	Rooftop work area
West room block, Area I		
Room I-13	Hearth	
Area XI		
Room XI-9 (compl.)		Hearth
XI-13	Hearth, utility vessel	
XI-12	*	
XI-16	*	
South room block, Area II		
Room II-2		Mealing bin?
II-1		Hearth?
East room block, Area IV		
Room IV-6	* (L. 2); hearth (L. 3a)	
IV-5	Utility vessel	
IV-7	* (but likely single-story reoccupation)	
IV-4	Storage bin?	
IV-3	Hearth, storage bin (?)	
IV-2 (compl.)	Hearth, storage bin (?), utility vessel, mealing bin (?), metate	
IV-1 (compl.)		Metates (fire-cracked, from hearth?), manos
North room block, Area VII		
Room VII-15 (compl.)	Hearth, mealing bin (?)	
Area XII		
Room XII-4	Hearth, mealing bin (?)	
XII-6	*	

(Asterisks indicate deep [c. 30+ cm] adobe deposits only, without evidence of collapsed features. Adobe debris was generally spread across rooms and in some cases overlay or included remains of roofing material).

Room Remodeling and Maintenance

The structural-functional dimensions of household organization at Plaza Montoya become clearer when one looks at patterns of room remodeling. Changes in distribution of features in existing rooms floors were linked primarily to new room construction. As room blocks were enlarged, new rooms generally seem to have assumed the function of the rooms to which they were appended. For the most part, this is reflected in the destruction and resurfacing of mealing bins and hearths in the older rooms, and the installation of the same features in new adjoining rooms. The floor-feature sequences per room summarized in Table 9.5 indicate a basic pattern of mealing/living rooms being turned into storage rooms while new plaza-fronting and, in some areas, second-story rooms would assume the older rooms' previous function. As a result, late activity/living rooms tend to concentrate along plaza peripheries and storage rooms in room-block interiors. Similar patterns of expansion and change have been noted for Grasshopper Pueblo (Reid 1973; Reid and Shimada 1982; Reid and Whittlesey 1982; Ciolek-Torrello 1978, 1985; Graves et al. 1982; Riggs 2001) Arroyo Hondo (Creamer 1993; Creamer and Thibodeau 1993), Pueblo del Encierro (Snow 1976a), Las Humanas (Vivian 1964; Hayes et al. 1981), and a host of other sites (e.g. Kidder 1958; Barnett 1969; Cordell 1975, 1977; Adams 1983; Anyon and LeBlanc 1984; Nelson and LeBlanc 1986; Crown 1991).

In the preceding chapter, I sketched out the process of expansion and remodeling for the sequence of rooms in the east room block (Area IV). Although excavation coverage is less extensive for the other room blocks, the process appears to have been the same across the site. Mealing bins are the best indicators of this relative uniformity of change. Of the 10 ground-floor rooms with more than one floor for which mealing bins have been recorded, only Rooms I-5 and VII-9 deviate from the general pattern of mealing-bin location and remodeling (Tables 9.5, 9.6). Room I-5 is unique in that it has only a single bin, which is laid out parallel to (not against) the room's short south wall and probably associated with two successive floors (Figs. 8.23, 8.24). Room VII-9 is unique because of two consecutive sets of four mealing bins. The earlier set parallels the long (!) south wall in the room's eastern half, while the later bins were more typically built against the short west wall. Though the later bins were part of the uppermost floor recorded during the excavation, the presence of truncated features (hearth, ash-pit) shows that there had been at least one further floor (Fig. 8.60). Clearly, that floor was destroyed during grading for the tree farm once planned in the eastern part of the north room block (Chapters 7 and 8).

Other than these structural differences, room remodeling at Plaza Montoya seems to have varied only in scale. While the contemporaneity of features associated with a floor is often assumed rather than established, remodeling of whole floors was apparently common. At the same time, remodeling might also target parts of rooms or individual features only. Fig. 9.8 illustrates the partial remodeling of Room IV-3, which involved demolition of the Floor 1a mealing bins, their resurfacing (Floor 1), and the subsequent construction of a dividing wall in the resurfaced area (Figs. 8.46b-c). Another example may be the construction of the Floor 2 bench over the Floor 2a mealing bins in Room IV-7. In this case, however, it is also possible that the effort included installation of the clay-lined hearth, ash-pit, and storage bin associated with Floor 2a (Figs 8.46c-d, 8.47).

Fig. 9.8. East room block, Area IV, Room IV-3, Level 3, Floor 1 (south of dividing wall) and 1a (mealing-bin remains under and north of dividing wall), evidence of remodeling (cf. Figs. 8.46b-c) (T. O'Laughlin, 6/2003).

Regardless of such variations in scale of room remodeling, all recorded structural alterations were carried out within the parameters of the original room layout. With only one possible exception, the top floor (Level 2, Floor 1) in Room IV-2 (see below), none of the identified remodeling episodes included room realignment and thus rebuilding of exterior walls. From this it follows that remodeling efforts generally did not affect room size or layout. The implications of such structural intransience are potentially far-reaching. In her Oraibi study, Catherine Cameron (1991a: 149-264) noted that after the Oraibi split a number of families remaining at the pueblo took advantage of newly vacant rooms to redraw the physical boundaries of their households. Rather than build new rooms, they chose to remodel existing nearby ground-floor rooms, usually by replacing original wall alignments with new ones and changing access patterns by opening new or blocking old doorways. At Plaza Montoya, there is evidence only of the latter, but – as wall/floor relationships particularly in Areas IV and XI suggest – in context of structural growth and household formation, not retrenchment and residual household expansion.

As far as can be established, room size seems to vary little overall. Fig. 9.9 shows the size distribution for a sample of 87 rooms defined through excavation and wall-scraping. At full square-meter intervals, the sample approximates a normal distribution, with most rooms clustering around an arithmetic mean of 9.9 m^2, though from a statistical perspective the sample's usefulness is limited. Above all, there is the issue of sample selection. As I explain in the review of fieldwork at Plaza Montoya, in each room block the decision where to excavate was driven by the need to establish internally coherent vertical and horizontal stratigraphies. This precluded selection of excavation units through random sampling. Next, there is the pervasive problem of preservation. If interior rooms are comparatively well preserved, peripheral rooms are not. As a result, the room-size sample may not only represent just about a third to half of the total number of ground-floor rooms at Plaza Montoya, but it is also strongly biased in favor of interior rooms. A related problem is how to tell end and cross/dividing walls apart in areas with missing wall sections. Good examples of this are the plaza-fronting rooms in Area VII (plus nearly all rooms in Area IX). Compared to the excavated rooms in the west- and east-block plaza fronts (e.g. Rooms I-1, XI-9, IV-1, VI-2, perhaps VI-6), Rooms VII-17 through 20 are much smaller. While size differences could reflect functional differences, advanced erosion of large wall segments may have led to misidentification of cross walls as end walls and therefore miscalculation of room size. The four Area VII rooms represent half of the projected "small" rooms (i.e. the category 7-7.99 m^2) in the sample. Again, these are peripheral rooms and thus likely late additions to the room block.[12]

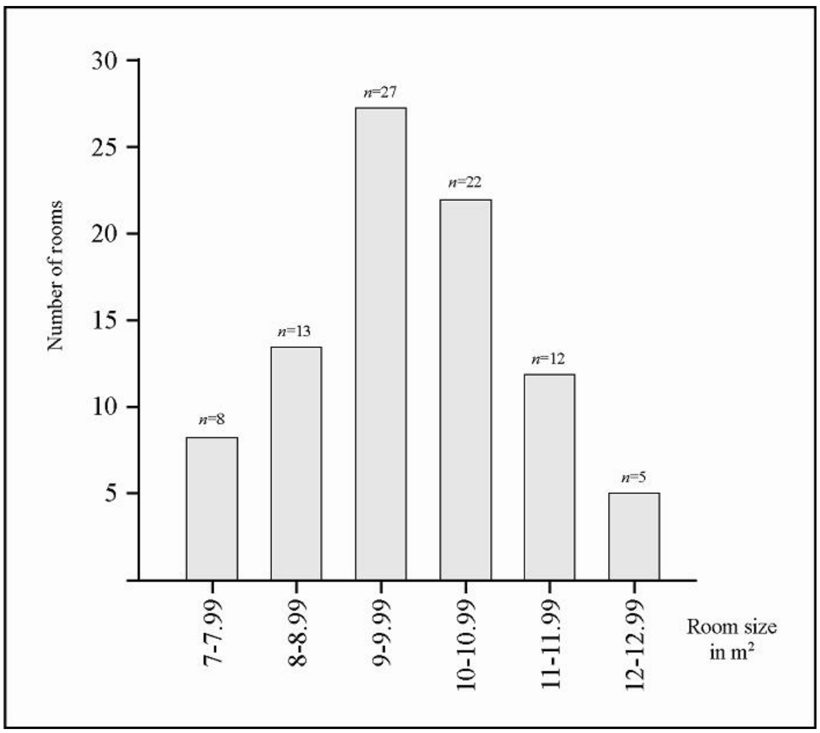

Fig. 9.9. Room-size distribution at Plaza Montoya.

[12] The 87 rooms represent a sub-sample of the sample of 102 rooms for which dimensions could be measured or approximated. The difference in sample size reflects a lack of clarity in 15 rooms as to what were end walls and what cross walls. This resulted in uncertain measurements, which are excluded here.

As for room maintenance, materially this is effectively a form of remodeling. To do maintenance is to preserve/restore structural and functional integrity of one's domicile. Fig. 9.10 recaps the processes of natural deterioration, described briefly in Chapter 3, affecting adobe buildings. As Plaza Montoya was built entirely of adobe, room and room-block maintenance must have been standard chores. Given the state of the pueblo's structural remains, however, evidence of structural maintenance is limited. One likely exception is the long double wall on the east side of the east room block. Room corners show that this wall was actually a series of room-length wall sections propping up the original east walls of rooms on the inside (Figs. 8.12, 8.14). Such modifications to some of the earlier east-block rooms hint at stability problems along the slope leading down to the east plaza area (Fig. 8.5).

Another possible sign of maintenance work is the presence of burned and/or unburned roofing material in Rooms IV-4, 6, and 7, and in Room XI-13. "Un-roofing" of structures by cutting primary beams and letting the remainder of the roof fall into the room below was one way of filling disused ground-floor rooms to provide stability for upper-story construction. Controlled burning of roofs might serve the same purpose, but could also be done for reasons as diverse as combating insect infestation or achieving ritual "closure" of a structure (Cameron 1991: 91; Schlanger and Wilshusen 1993: 93-94). Since late-floor contexts and evidence of reoccupation suggest a "peri-abandonment" affiliation of the Area IV and XI roof deposits, they are discussed in the section on terminal structure decay below.

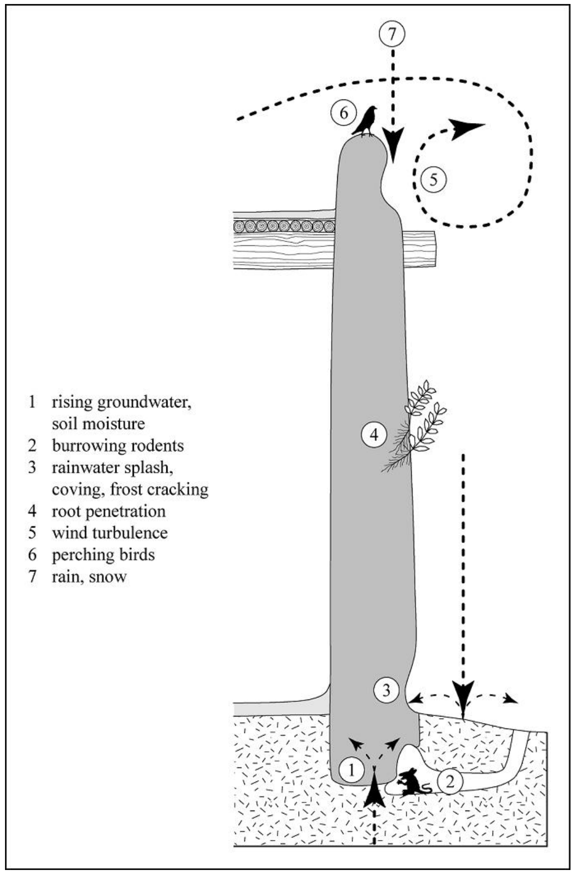

Fig. 9.10. Natural causes of adobe deterioration (adapted from *PHA* 2003: 53).

The most common indicator of maintenance work at Plaza Montoya is wall plaster. As mentioned in Chapter 8, about half the walls traced overall, and a higher ratio in the better-preserved parts of the west, east, and north room blocks, retained one or more layers of plaster. Multiple layers could be identified only in a few places (e.g. eight in Room IV-7, the high for the site). A variable mix of clay, ash, and probably lime or gypsum, plaster ranges in color from light gray to buff. It was used also to pave room floors in all four room blocks, including successive surfaces in the northwest plaza corner (around Room XI-9) and the area of the plaza entrance (around Room VI-2). Remnants of (re-)plastered walls in peripheral rooms such as Rooms VI-2, IX-10, and XII-4 indicate that maintenance efforts were not relaxed during Plaza Montoya's later occupation. In general, apart from reinforcing some east-block rooms, maintenance seems to have entailed little more than refuse removal and periodic plastering. Most importantly, there is nothing to suggest that some rooms were maintained while others were allowed to deteriorate. This is consistent not only with the structural sequence in each room block, but also with the distribution of refuse deposits across the site.

General Patterns of Refuse Deposition

<u>In-Room Deposits</u>

Similar to patterns of structure use and remodeling, depositional data from rooms suggest that Plaza Montoya was more or less fully occupied up to the time of abandonment. Few of the excavated/tested rooms featured materials resembling primary or secondary (abandonment) refuse on floors or in fill. Those that did include Room I-5, whose upper (Level 2, Floor 1) and lower (Level 3, Floor 2) floors were separated in places by thin (<5-10 mm) lenses of ash/dust (Figs. 8.23a-b, 8.24); and Room VII-9, where a charcoal and bone (mostly small mammals) scatter was found on the upper remaining floor (Level 2, Floor 1) (Fig. 8.60a). Beyond that, the only deposits indicative of intentional material discard were the fills of hearths such as in Rooms I-2, VII-11, and IX-10. In the latter two rooms, hearths contain not only organic remains (ash, charcoal, bone fragments), but also broken manos, metates, and comales, and – in the case of the Room IX-10 hearth – a number of utility sherds (Figs. 9.11, 9.12).

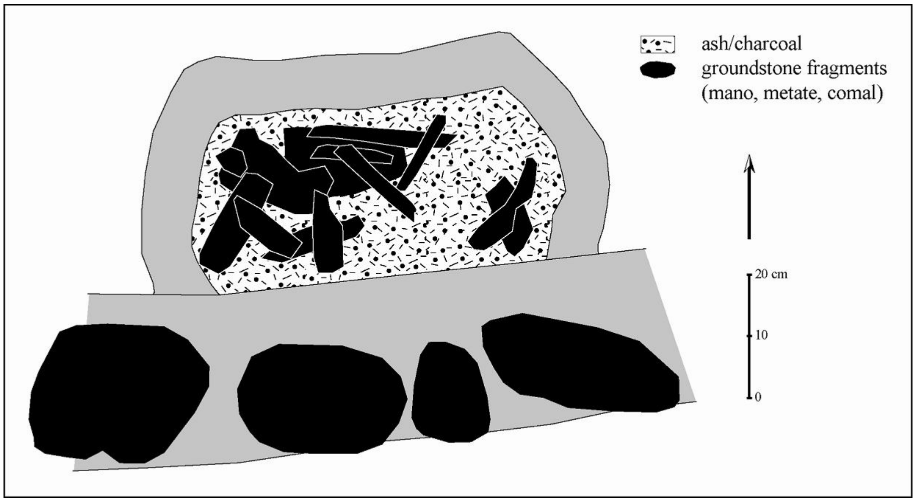

Fig. 9.11. North room block, Area VII, Room VII-11, Level 2, Floor 1, hearth filled with groundstone fragments (M. Bletzer, 12/2006).

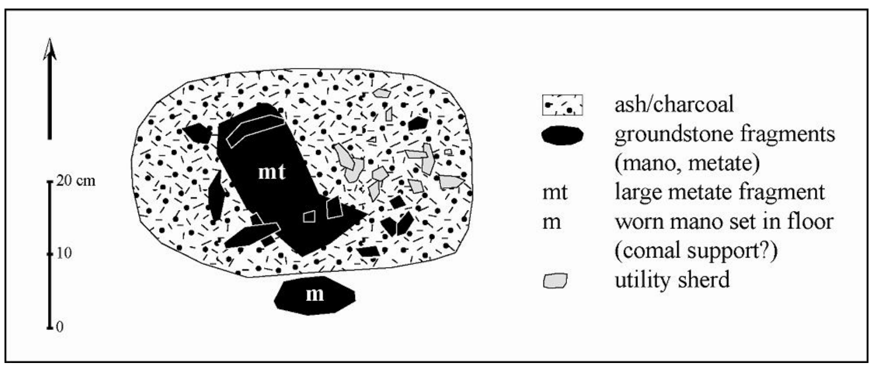

Fig. 9.12. North room block, Area IX, Room IX-10, Level 2, Floor 1, unlined hearth (h_1) filled with groundstone fragments and ceramic sherds (M. Bletzer, 12/2006).

Much the same in Room I-2: metate, mano, and comal fragments "stuffed" into a hearth together with some unworked basalt cobbles. Owing to erosion of floor and walls, however, it is not certain whether Room I-2 was in fact a room or a plaza alcove (perhaps covered by a ramada). Irrespective of this, the depositional pattern observed here and in Rooms VII-11 and IX-10 also applies to several similar outdoor features. A case in point is a plaza hearth just east of potential Room I-2, which was filled with, among other things, half of a two-hand mano, a small abrader, and 49 plain grayware and decorated sherds (Fig. 9.14). The grayware sherds are from a single utility jar, the decorated sherds from a Glaze E jar. Later analysis of a flotation sample of fill matrix (primarily ash) produced 110 mostly calcined human bone fragments (size 3-26 mm) belonging to a sub-adult or older individual (O'Laughlin 2001-8). At that point in the project (2001/2), a cremation burial in a "regular" hearth still seemed an unusual association. Subsequent work revealed similar hearth-deposited cremations in plaza contexts, but only one in a room-hearth (c_1 in h_1/h_2 in Room VII-15, Level 4, Floor 2) (Fig. 8.58c).

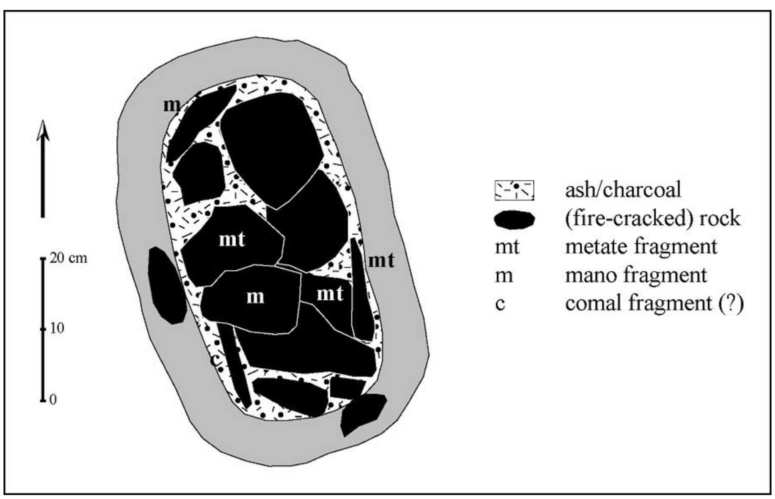

Fig. 9.13. West room block, Area I, Room I-2, Level 2, Floor 1, hearth filled with groundstone fragments (M. Bletzer, 10/2004).

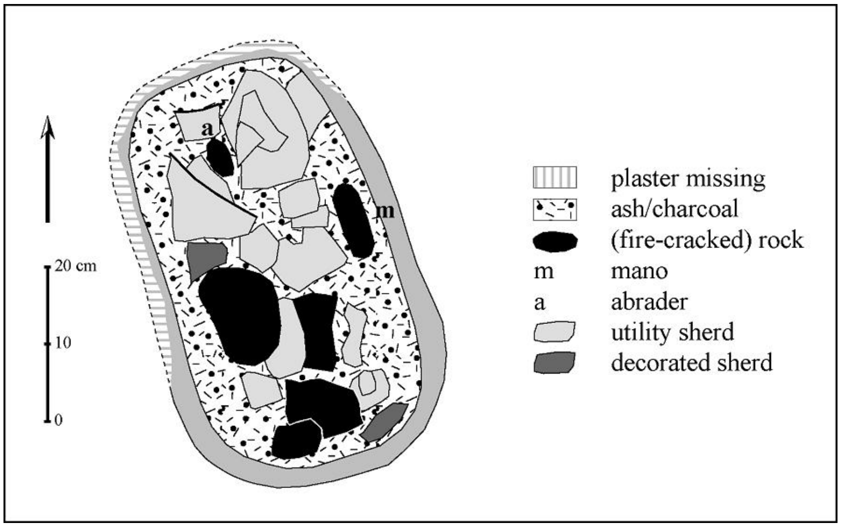

Fig. 9.14. West room block, Area I, plaza outside Room I-2, Level 2, Floor 1, hearth filled with fire-cracked rocks, groundstone fragments, and ceramic sherds (M. Bletzer, 10/2004).

As regards cremations, two unusual in-room deposits must also be mentioned here. The first is the ash-pit in the southeast corner of Room I-12 (Level 3, Floor 2) (Fig. 8.26b). Embedded in the ash was the projectile point shown in Fig. 8.27. By far the largest of a dozen points found at Plaza Montoya, size and morphology suggest Archaic origins. The ash was collected for flotation analysis; this surprisingly yielded 660 small (4-16 mm), burned (15%) and calcined (85%) human bone fragments representing a sub-adult individual or individuals (age c. 6-10 years) (O'Laughlin 2001-8). It is the only instance of a "ground-level" cremation burial at Plaza Montoya. I am not aware of a single similar burial at another Puebloan site. While this leaves little room for interpretation, Elsie Clews Parsons (1939, 1: 331-333) in her *Pueblo Indian Religion* relates that projectile points were valued as charms or amulets. An example from Isleta is particularly intriguing here. Notes Parsons (1939, 1: 332): “At Isleta a stone point is passed over walls and door in the house of the dead; [and] with a point a line is drawn around the grave to keep away witches (Taos practice too)”.

The second unusual deposit/feature is the intrusive pit in Room I-5 (Figs. 8.23-8.25). The pit had been dug into the upper room floor (Level 2, Floor 1) to a depth of c. 50 cm below floor level and initially looked like a recent disturbance (i.e. looters’ pit). Excavation, however, showed the pit fill to be interspersed with ash, charcoal, burned corn, and small bone fragments. Organic and inorganic (mostly utility sherd fragments) materials were more abundant near the bottom, but no overt concentrations were visible. Radiocarbon analysis of a mixed organic sample (S5) provided a calibrated two-sigma date range of 1410-1640 (Table 9.1, Fig. 9.1). As in the case of the Room I-12 ash-pit, flotation analysis led to the identification of calcined bone fragments (*n*=113, size 4-22 mm). The fragments belong to a sub-adult or older individual or individuals (O’Laughlin 2001-8). This cremation is atypical in that no other intrusive features with burials in room contexts were encountered at the site.

Outdoor Deposits

Other than the described in-room deposits, accumulations of organic/inorganic remains suggesting deliberate deposition were found in outdoor/pre-room contexts only. No middens like the one at Pargas (Marshall 1986: 25-29) were identified, though it is possible that such middens once existed but have since eroded away.[13] Features used for

[13] Scatters of mostly utility ceramics were found west of Rooms XI-19/20 and north of (and under) Room XII-4. No pit features could be identified. Although erosion may have reduced these scatters, material accumulation seemed too light and uniformly ceramic to suggest general midden areas.

refuse disposal range from shallow hearth-like pits to large, mostly circular to ovoid depressions measuring more than five meters in diameter and up to 1.5 m in depth (Figs. 8.19, 8.20). Size and shape of depressions like the one intersected by Trenches VIII-33 and VIII-34 (Figs. 8.67-8.69) at first suggested a context similar to the refuse-filled (and apparently intentionally razed) kivas associated with the late-phase Mound 7 occupation at Las Humanas (cf. Hayes et al. 1981: 54-61). None of the depressions had any formal walls, floors, or other structural features, however.

Like the vast majority of refuse deposits at Plaza Montoya, large depressions are mainly located in the central plaza area. The pattern is a common one at Pueblo IV/V plaza-type settlements, and especially at sites where old adobe borrow-pits could be used as refuse dumps. Abandoned kivas often served the same purpose (e.g. Kidder 1958; Snow 1976a; Hayes et al. 1981: 50-61; Creamer 1993: 61-87; Rautman 1995, 2000). But as testing at Plaza Montoya was more limited along outer room-block peripheries, buried deposits undoubtedly remain. The discovery of several large pits in Trench VIII-38, located some distance east of the east room block, highlights this caveat (Figs. 8.6, 8.70). Refuse density in the Trench VIII-38 pits is lower than in those in the central plaza, but what material there is occurs in layers as it does in most other large plaza pits. Even the densest accumulations like that under the plaza entrance and Room VI-2 consist of well-defined lenses or clusters of organic/inorganic matter separated by sediments containing visibly less cultural material (Figs. 8.55, 8.68, 8.69, 9.15).

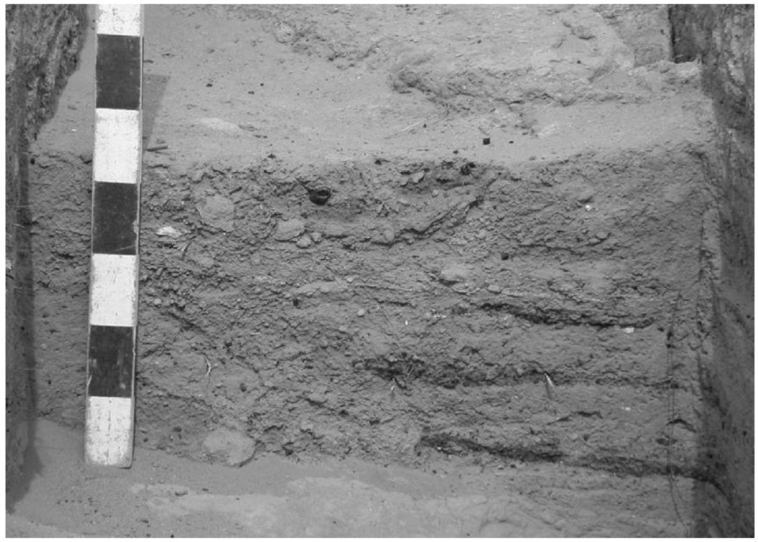

Fig. 9.15. Central plaza, Area VIII, Trench VIII-25, Level 4, Feature C, basin-shaped deposit above multiple refuse layers (T. O'Laughlin, 6/2004).

In all, more than 90% of cultural material at Plaza Montoya came from outdoor (pre-room/plaza) deposits. The ratio is highest for organics; apart from the fill of various hearths, in-room deposits of faunal and botanical remains were extremely rare. To some extent this reflects a lack of destruction "horizons" such as may result when a site is damaged or destroyed by fire, but the pattern goes further and includes the distribution of artifacts like glazeware bowl rims. Though here the spatial discrepancy is not quite as pronounced, more rims were found in pre-room/plaza-fronting or plaza proveniences than room fill or on room floors (Table 9.2). The rims also indicate another pattern: a lack in all proveniences of complete, let alone intact, artifacts. The vast majority of sherds are "orphans"; refits are uncommon. Indeed, a high degree of fragmentation characterizes the Plaza Montoya assemblage as a whole.

STRUCTURE AND SITE ABANDONMENT

Terminal Structure Decay

At the point where its occupants decide to end all maintenance efforts, a structure becomes subject to unmitigated deterioration. This is especially true of maintenance-intensive dwellings such as any that incorporate adobe walls. Decay rates, though, can fluctuate greatly not only because of different natural factors (see Chapter 3), but also as a result of human activities during and after abandonment. While the most extreme result of such activities is a fire of sufficient magnitude to destroy the structural integrity of an entire building, there are other, more subtle, activities that can influence the way/rate in which an adobe structure disintegrates. Tree-ring analyses of roof beams *(vigas)* at many Puebloan sites show that recycling/scavenging of beams figured prominently in both new construction and the rebuilding of existing structures. Clearly, good-quality beams were prized for their re-use value, and not only in areas lacking trees suitable for construction timbers (e.g. Dean 1969; Hayes et al. 1981: 26-56; Graves et al. 1982; Crown 1991; Cameron 1991a: 149-264; Schlanger 1985; Schlanger and Wilshusen 1993; Riggs 2001).

There is no evidence that fire caused or contributed significantly to structural decay at Plaza Montoya. Burned roofing material overlay upper floors in several rooms in the west and east room blocks, but there were no oxidized walls or floors indicative of the kind of intense fire that could have destroyed a whole room or suite of rooms. The observation is important, for it suggests that neither warfare nor ritual “termination” by fire, nor a chance conflagration (domestic mishap, lightning strike) played a direct role in the disintegration of the pueblo’s room blocks (cf. Schlanger and Wilshusen 1993; Haas and Creamer 1993, 1996; Verhoeven 2000; Palka 2001; Webb and Hirth 2003).

Comparisons of fill levels and debris formation/distribution in different rooms indicate that most ground-floor walls melted naturally, while upper-story walls caved in after load-bearing beams were removed. In areas of probable single-story construction such as plaza-fronting Rooms XI-9 or IV-1, or the rooms in the south room block, structural debris was spread unevenly across upper fill levels. In Room XI-9 melted adobe was deepest (up to 15 cm) along the west wall, but formed only a “coating” (1-2 cm) in near the room’s center. This coating was augmented by solid chunks of adobe interspersed with remnants (ash, charcoal, burned cobbles, broken and burned metates) of an apparent rooftop hearth (Fig. 8.30a, Table 9.8). Similar the situation in Room IV-1: minor accumulations of melted adobe along the room’s north and south walls; pieces of adobe rubble with fire-cracked metates and other groundstone objects (not fire-cracked) elsewhere (Fig. 8.42a, Table 9.8). In Rooms III-1 and III-4, melted adobe was only two centimeters deep along walls and quickly petered out toward the rooms’ centerline (Figs. 8.39a, 8.40). Beyond this, structural debris was limited to small adobe pieces without any associated artifacts.

Rooms with likely second-story deposits best illustrate differences in composition and deposition of melted and fragmented adobe. In Room XI-13, for instance, melted wall adobe partly overlay the deep (up to 30 cm) Level 2 fill of adobe chunks (Fig. 8.33a). Along the room’s east wall, wall adobe had accumulated to a depth (5-10 cm) and consistency not unlike that of a formal floor. This contrasts with the Level 4 fill in the same room, which consisted mostly of large, compacted adobe fragments and partly burned roofing material (reeds, grass), but lacked accumulations indicating a melting wall (Figs. 8.33b-c). It thus appears that the wall had remained intact after deposition of the

Level 4 fill. Along with the presence of roofing material, this suggests replacement of a second-story room and roof at a rate fast enough that ground-floor walls did not deteriorate. For the upper fill layer, the inference is the opposite: the collapse that deposited the adobe fill was terminal; deterioration of walls then ensued. The sequence of structural decay seems to have been similar in adjoining Rooms XI-12 and XI-16 (Figs. 8.33, 8.34), though less debris in the latter room perhaps reflects single-story construction only.

Common to fill deposits in the three rooms was a lack of roofing material other than reeds and grass. The same is true of rooms in all excavation areas except Area IV. In Room IV-4, a burned juniper pole in Level 2 fill and perhaps two unburned juniper poles on the underlying Floor 1 were part of the roof construction (Figs. 8.46b-c). So were the fragmented juniper poles in the Level 2 fill in Room IV-6 (Fig. 8.48a), and the juniper pole in the Level 3 fill in Room IV-7 (Fig. 8.50b). This last specimen was the largest piece (diameter 4-5 cm) of wood found at Plaza Montoya and associated with reeds, grass, and corn stalks. With diameters between three and five centimeters, the pole fragments appear to be from *latillas*, smaller joists that were laid crosswise over the main *vigas*. The fact that the poles, some of the reeds and grass with which they were covered, but no *viga* fragments have survived, points to extensive beam removal at the time of or after abandonment. The pattern is very different, for example, from that prevailing at Las Humanas, where both Mound 7 and Mound 10 rooms contained large sections of roofs that made it possible to measure beam spacing and identify the types of wood used in roof construction (Vivian 1964: 41; Hayes et al. 1981: 41-42).

Terminal Refuse Deposition

The earlier observation that outside of formal features (hearths, ash-pits) excavated/tested rooms at Plaza Montoya were generally devoid of organic or inorganic material applies especially to late floors. None of the identified floors produced any deposits that might suggest discard of primary/secondary refuse in abandonment context. More importantly, few artifacts that might be called de facto refuse were associated with top floors or upper fill levels. The following describes makeup and distribution of the two main classes of de facto refuse introduced in Chapter 2: intact/restorable ceramic vessels and groundstone tools. Also discussed briefly are other potential high-value items whose deposition might throw some light on abandonment behavior at Plaza Montoya.

Ceramics

Aside from the almost total lack of early glaze- and whitewares, the most striking aspect of Plaza Montoya's ceramic assemblage is a shortage of complete or near-complete vessels. Neither room-block nor plaza/offsite proveniences produced so much as one whole decorated bowl. The most "complete" glazeware vessel to be recovered so far is a Glaze-on-red E/F bowl, of which 28 sherds were found on the floor (Level 2, Floor 1) of Room I-1. The sherds represent c. 75% of the whole vessel, enough to reveal an interior decoration of a feathered mask done in dark red paint. Except for a single small sherd, the rim portion is missing (Figs. 9.16, 9.17, Table 9.9). About half of a Glaze-on-red E bowl also came from the Level 2 fill in Room IV-5 (Table 9.9).[14] Other than these two Glaze-on-red bowls, the excavations produced multiple sherds of only one more

[14] As only the south half of Room IV-5 was excavated, more sherds belonging to this vessel perhaps remain in the fill in the northern part of the room.

glazeware bowl, a small Glaze-on-cream E vessel from a pit in Trench VIII-25 (Fig. 9.17). How the first two bowls came to be where they were found is not entirely clear. While the Room I-1 sherds lay in a relatively tight cluster on the room floor (Fig. 9.16), those in Room IV-5 were lodged partly in the fill. Traces of drilling at the base of the neck and the fact that only one rim sherd was found perhaps indicate that the bowl in Room I-1 had broken during repair. Judging by its stratigraphic position, the second bowl was on the floor of a second-story room when that room collapsed into Room IV-5. Given the thin lenses of silt and clay (Level 2a) between the Level 2 fill and upper floor level (Level 3, Floor 1) (see Chapter 8), Room IV-5 must have been to some degree open to the elements before the final disintegration of the second-story superstructure.

Fig. 9.16. West room block, Area I, Room I-1, Level 2, Floor 1, painted bowl on floor (T. O'Laughlin, 6/2001).

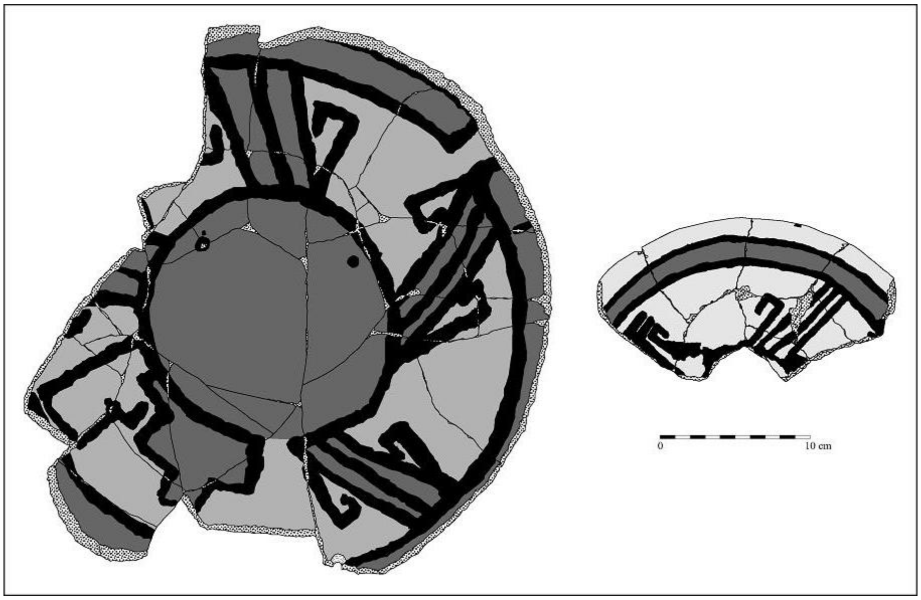

Fig. 9.17. West room block, Area I, Room I-1, reconstruction of Glaze E/F bowl (glaze-on-red) from Level 2, Floor 1 (single rim sherd not shown); and central plaza, Area VIII, Trench VIII-25, partial reconstruction of small Glaze E bowl (glaze-on-cream) from Level 4, Feature C (both drawings to same scale) (M. Bletzer, 1/2004 and 1/2006).

There are no decorated jars anywhere near as "complete" as the three bowls just described, but utility jars are represented in the ceramic sample with at least 10 restorable vessels (Table 9.9). Sherds of four jars were found in Room IV-3 inside the Floor 1 bin and on Floor 1a outside the bin (Fig. 8.46b). The largest jar in the sample (and the only one still mostly intact) sat on Floor 1 in adjacent Room IV-4 (Figs. 8.46b, 8.47). In Room XI-13, one jar was embedded in the Level 2 fill and another lay on the underlying floor of packed earth (Level 3, Floor 1) (Figs. 8.33a-b). Further north, Room XII-4 contained a smashed jar on the room floor (Level 3, Floor 1) and the sherds of two more were scattered over the old use surface (Level 3, Floor 1) outside the room (Fig. 8.65b).

Table 9.9. Ceramic vessels and groundstone implements in late room (floor/fill) contexts at Plaza Montoya and Las Humanas.

	Plaza Montoya	**Las Humanas, Mound 7**	**Las Humanas, Mound 10**
Rooms excavated	13 (plus 27 tested)	180 (late phase)	37
Intact/restorable ceramic vessels Decorated	1 Glaze E bowl, 1 Glaze E/F bowl	9 Glaze E bowls (1 on floor) 39 Glaze F bowls 28 Salinas Red (18 from floor/upper fill contexts) 126 Tabirá B-on-w (incl. 39 ollas, 37 from floor/upper fill contexts) 3 "exotic" vessels (incl. 1 Kapo Black on floor)	"Few restorable" late glaze vessels 1 Tabirá B-on-w bowl, plus several ollas 1 Tabirá Plain indet. (Spanish vessel form)
Utility	10 jars (min.)	47 jars	Not spec.
TOTALS	**2 (dec. only)** **12 (min.)**	**>200 (dec. only)** **>250**	**?**
Groundstone	6 metates (all fill) 3 slab/two-hand manos 15-20 one-hand manos No comales	158 metates 158 slab manos (29 room floors, 10 roofs, 119 fill) 9 basin manos 22 trough manos 319 one-hand manos 19 comales	78 metates (76 in room fill, 2 on room floor) 7 comales, 7 "griddles" Manos "in the majority"
TOTALS	**20-30**	**685 (min. est.)**	**285**

(Las Humanas data after Vivian 1964 and Hayes et al. 1981; listed are only specimens labeled complete/restorable. For decorated ceramics from Plaza Montoya, however, the label applies to "relatively" [i.e. 50% and more] complete/restorable specimens).

Groundstone

In size and form, groundstone objects from Plaza Montoya fall within different functional categories such as one- and two-hand manos, metates, comales (griddles), abraders, and shaft straighteners. In terms of deposition and residual utility, however, they vary little. Significantly, no complete implements were found in what might be called primary use locations. This is most obvious in the case of the 68 mealing bins located during the excavations (Table 9.6). Metate imprints were visible in nearly all bins, but not one bin still had a metate *in situ* (e.g. Figs. 8.28, 8.45). For lower floors, the pattern is consistent with remodeling efforts: removal of metates, leveling of bins, and installation of new or recycled metates elsewhere.

A total of six unbroken metates were found in late fill levels; none on late floors (Table 9.9). The six specimens were worn, partly oxidized, sooted, and/or fire-cracked, all of which points to secondary use as liners in rooftop/second-story hearths. Some of the "generic" burned rocks associated with ash/charcoal scatters and oxidized adobe fragments in various upper fill contexts (e.g. in the west room block in Rooms I-13, Level 2 [Fig. 8.26a]; and XI-9, Level 2 [Fig. 8.30a]; in the south room block in Room II-1, Level 2 [Figs. 8.37, 8.38a]; in the east room block in Rooms IV-2, Level 3 [Fig. 8.42b]; and IV-6, Level 3a [Figs. 8.48b-c, 8.49]; and in the north room block in Rooms VII-15, Level 2 [Fig. 8.58a]; and XII-4, Level 2 [Fig. 8.65a]; Table 9.8) may have started out as metates, but were too fragmented to allow for clear identification. Exhausted metates may also have seen re-use as comales, but fragmentation again can make it difficult to trace such change in function. Recycling probably accounts to some extent for the high ratio of one-hand versus unbroken two-hand manos (Table 9.9). While this is not the place to delve into potential functional differences between different types of manos (cf. Hayes et al. 1981: 116-120), many cracked/broken two-hand manos were doubtless re-used as one-hand manos. Uneven edges may indicate smoothing of breaks, but where repairs of such sort cannot be identified it is hard to verify modified tool use. Usually easier to spot are one-hand manos that were recycled into hammerstones, pestles, abraders, or other second-use tools (Table 9.10) (Hayes et al. 1981: 108-122).

Aside from the six metates/hearth liners in late fill levels, groundstone objects occurred only rarely on upper floors or in room fill. Table 9.10 lists tools/tool fragments for several early/late room levels and plaza features. Clearly, fragments in pit features in both room and plaza contexts outnumber those in fill levels. The pattern is particularly striking in the area of the plaza entrance, where the easternmost 6.5 m of Trench VIII-35 cut across several pits sealed by two adobe surfaces. The 112 fragments from this trench segment are more than twice the combined total for all other proveniences shown in Table 9.10. It is the highest tally of groundstone fragments for one provenience at Plaza Montoya. Other plaza pits also contained fragments in numbers matched by few in-room features, early or late (Figs. 9.11-9.14). Late room features with multiple tools/fragments include only one non-hearth feature, the Floor 1 storage bin in Room IV-5, which yielded several tools in its fill (Fig. 8.48b; Table 9.10). Spatial distribution of groundstone thus tilts strongly toward plaza deposition, though the fact that the last floors of many late rooms are gone restricts the interpretive value of this pattern. Still, at least in the eastern part of the north room block sample inspections of cobbles in the grader/bulldozer push-piles revealed no noticeable metates/metate fragments that might have been dislodged from use locations in the disturbed Area VII and IX rooms.

Table 9.10. Groundstone totals for selected room and plaza proveniences.

Provenience	Associated groundstone
West room block, Area I Room XI-9, Level 2 fill (Fig. 8.30a)	2 poss. basalt metate frgms. 1 poss. rhyolite metate frgm. 2 poss. sandstone mano frgms. 12 misc. burned rocks (basalt, rhyolite)
East room block, Area IV Room IV-6, L. 3a, (fill above L. 4, Fl. 2) (Figs. 8.44b, 8.45)	2 sandstone metates, partly oxidized, heat flaking 1 basalt metate (associated with Fl. 2?) 1 basalt two-hand mano frgm. 1 rhyolite one-hand mano 1 sandstone comal frgm.
IV-5, L. 3, Fl. 1, fill in storage bin (Fig. 8.48b)	1 basalt two-hand mano 2 basalt one-hand manos 7 sandstone abraders
IV-1, Level 2 fill (Fig. 8.42a)	2 rhyolite/rhyolitic tuff metates, partly oxidized 1 basalt mano frgm. 1 vesicular basalt mano (two-hand) frgm. 1 sandstone mano (two-hand) frgm.
North room block, Area VII Room VII-15, L. 2, Fl. 1, hearth fill (Fig. 9.11)	2 basalt metate frgms. 1 rhyolite metate frgm. 2 basalt manos 3 basalt mano frgms./hammerstones 4 sandstone comal frgms. 1 basalt metate/comal frgm.
Central plaza, Area VIII VIII-35 (easternmost 6.5 m)	24 basalt metate frgms. 18 rhyolite metate frgms. 27 sandstone metate/comal frgms. 17 basalt manos/mano frgms. 3 rhyolite mano-hammerstones 4 vesicular basalt (two-hand?) mano frgms. 5 limestone (two-hand?) mano frgms. 11 sandstone comal frgms. 3 basalt comal frgms.

The small collection of tools in the bin in Room IV-5 represents the only instance of likely deliberate storage/caching of groundstone artifacts at Plaza Montoya. Similarly, the three utility jars on the floor of the storage bin in Room IV-3 are the only examples of multiple ceramic vessels left in what appears to be primary context. Table 9.9 illustrates the low incidence at Plaza Montoya of potential de facto refuse in the form of intact/ restorable ceramics and groundstone tools. Summary inventories given in the same table for these artifact classes at Las Humanas Mounds 7 and 10 further underscore the general pattern. Simple extrapolation of artifact totals indicates the relative insignificance of decorated vessels and groundstone tools of all kinds in the Plaza Montoya assemblage. In addition, the *in-situ* association of mealing bins and grinding tools shown in Fig. 9.18 for a late-phase Mound 7 room gives a good idea of what mealing bins at Plaza Montoya might look like if metates and manos were still in or near primary use locations.

Fig. 9.18. Las Humanas, Mound 7, Room 157, mealing bins with manos and metates (Hayes et al. 1981, Fig. 60).

Other Materials

The lack of intact/restorable specimens of ceramic vessels and groundstone implements extends to other artifact classes at Plaza Montoya. From projectile points to bone beads and shell pendants, few artifacts are represented by more than a handful of whole (broken or unbroken) pieces. The one exception are worked ceramic sherds, almost half of which (*n*=54 of 114) are intact. Functions may range from spindle whorls, loom weights, or pendants (drilled sherds) to gaming pieces (undrilled sherds) (cf. Hayes et al. 1981: 158-161). Also largely absent from the site assemblage (apart from two bone flutes and a whistle [Fig. 9.19]) are objects of potential ritual significance. Altogether, this further reduces the likely pool of useable, "high-value" objects classifiable as de facto refuse.

Post-Abandonment Site Use

A basic characteristic of Plaza Montoya's site structure as indicated by horizontal and vertical stratigraphies and distribution of artifacts in each room block is the absence of structural gaps that might reflect major breaks or shifts in site occupation. Comparative data for Piro sites are limited, but indications are that in this Plaza Montoya contrasts significantly with its neighbors to the north (Las Huertas) and south (Pargas), as well as with the Qualacú site. Despite this, it is conceivable that parts of Plaza Montoya may have been used after the main abandonment "event" for anything from agriculturally-related seasonal reoccupation to scavenging of residual materials to ritual incorporation into an ancestral communal landscape (cf. Cameron 1991a, 1993; Schlanger and Wilshusen 1993; Montgomery 1993; Verhoeven 2000; Inomata and Webb 2003).

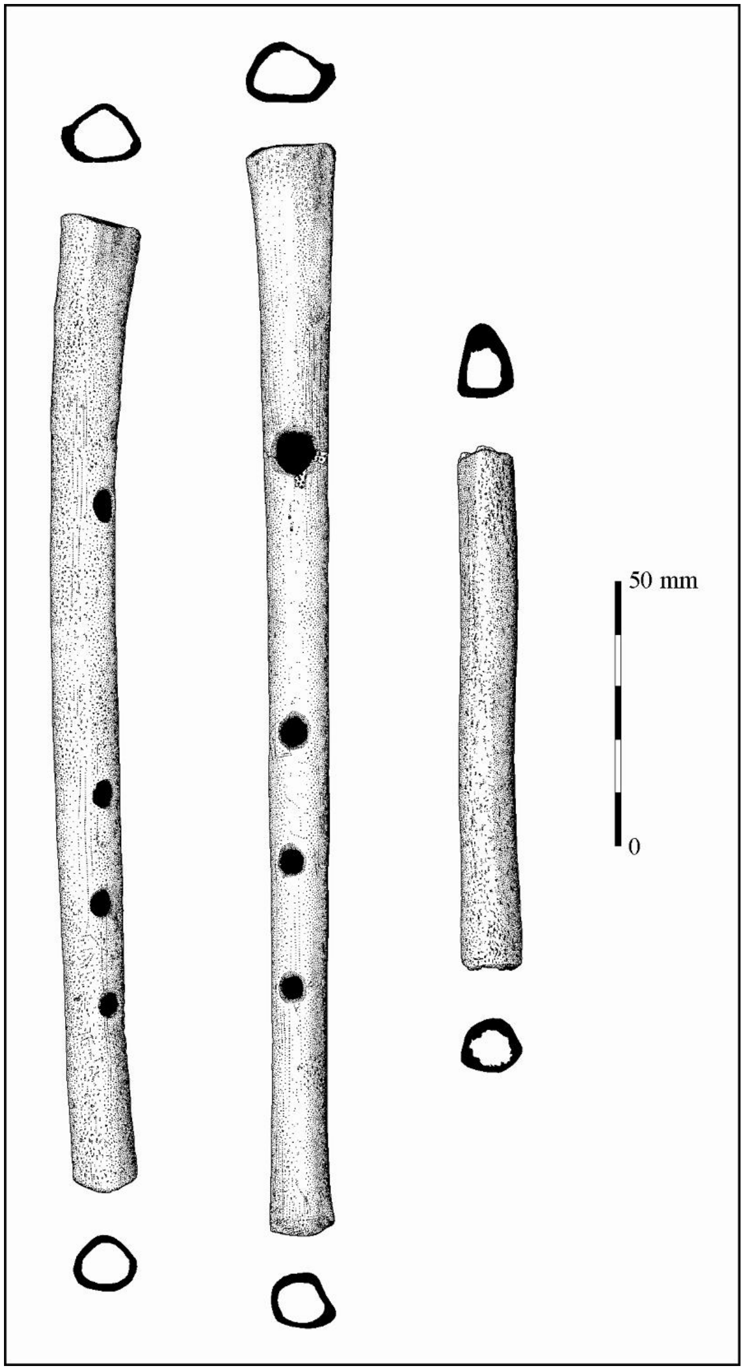

Fig. 9.19. Left to right: east room block, Area IV, Room IV-30, flute from near surface; Room IV-5, Level 2, flute from upper room fill; Room IV-3, Level 3, Floor 1, turkey bone whistle (drawings to same scale) (M. Bletzer, 3/2007 and 1/2008).

Possible evidence of structural remodeling tied to post-abandonment use or re-use at Plaza Montoya comes from three rooms in the east room block: Room IV-6, adjacent Room IV-7 (fronting the east plaza), and Room IV-2. In Room IV-6, it is a barely perceptible level of compacted fill (Level 3, Floor 1) which divided an upper layer (depth c. 20-25 cm) of mostly adobe rubble with some roofing material (Level 2) from a less substantial (c. 10 cm) lower layer of similar material (Level 3a, this also included a collapsed hearth [Table 9.8]). Identification of the floor rested chiefly on the presence of the narrow north-south adobe wall that contained one of the iron nails found at Plaza Montoya. No function can be inferred for the wall, nor were there other features in the excavated portion of the room. Similarly, no artifacts other than the nail could be safely associated with the floor (Figs. 8.48a-b).

In neighboring Room IV-7, structural remains indicative of reoccupation are more complex. The latest floor (Level 2, Floor 1) consisted of thinly (1-2 cm) plastered adobe, laid over the deep Level 3 rubble. Compared to most other plastered surfaces, the floor looked improvised and could not be found in much of the room. The two hearths or roasting pits associated with this floor were located next to each other. Two of three possible postholes were set partly, the third fully into the room's east wall (Figs. 8.50a-b). In contrast to Room IV-6, very little debris covered the floor. This suggests at most a late single-story construction (Table 9.8). The presence below the Level 3 rubble (burned roofing material included) of substantial deposits of laminated silt and clay (Level 3a) is similar to Rooms IV-4 and IV-5 (less so IV-6) and shows that roofing material had been removed long enough for sediments to build up prior to the likely second-story collapse and later reoccupation.

In Room IV-2, the main attribute of the final occupation surface (Level 2, Floor 1) is the realigned east wall. Compared to the original east wall, the new wall is about five degrees nearer to true north. A cross-wall abutting the new wall and the original west wall showed that the latter had not been replaced/realigned, a discrepancy resulting in a slightly trapezoidal layout (Figs. 8.42a-b). The new east wall seems to have been built in more cursory fashion than the original walls, for there was no evidence of a foundation trench. Like the cross-wall abutting it, the new east wall sat on top of the packed soil surface of Floor 1, which in turn marked the top of the Level 3 adobe rubble with its embedded roofing material and collapsed rooftop features (hearth, storage and/or mealing bin[s], utility vessel[s]). The shallow hearth hugging the east wall near the (new) south-east room corner also appeared to be somewhat crude or makeshift, at least when compared to the majority of hearths found in room contexts, including the Floor 2 hearth in the same room (Figs. 8.42a, c).

A brief comparison with "regularly" remodeled rooms in the west room block helps clarify the singular nature of the late structural modifications in the Area IV rooms. In Rooms XI-12 and XI-13, the upper of two room floors (Level 3, Floor 1) consisted of tamped-down fill at the upper limit of a debris layer (Level 4) that covered a lower adobe-plastered room floor (Level 5, Floor 2). A doorway at one point connected both rooms, but had been plugged, presumably with the installation of the upper floor. Another doorway connecting Room XI-12 with later room XI-16 was closed off at the latest in the construction of a bin wall against it (Figs. 8.33, 8.34). Floor 1 in both Room XI-12 and XI-13 was similar in appearance to the same floor level in Room IV-6 and, in places, Room IV-2. Stratigraphic context, however, was different in that in Rooms XI-12 and XI-13 the upper floor was 10 to 15 cm lower than in adjacent Room XI-16. Overall, floor sequence, floor/wall features, and wall relationships suggest that the Room XI-12/13 Floor 1 level was laid in a remodeling effort tied to the construction of neighboring Rooms XI-16 and, perhaps, XI-15 (cf. Figs. 8.10, 8.29).

While structural changes during reoccupation are apparent in the three east-block rooms, debris volumes covering reoccupation levels likely reflect different reconstruction efforts. In Room IV-6, for instance, depth of the adobe rubble above Floor 1 suggests that walls remained at – or were rebuilt to – single-story height. Even some second-story restoration/re-use cannot be ruled out categorically. In Room IV-7, the lack of adobe rubble atop Floor 1 implies a different scenario involving perhaps a more ephemeral jacal construction. Though the low fill volume may be partly due to location on the mound's east slope, the three potential postholes in the room's east wall indicate a jacal-based or wooden superstructure which could have been fastened to the standing/rebuilt east wall of Room IV-6. For Room IV-2, the picture is less clear. Here, the last floor was neither buried under adobe debris, nor was there any evidence of postholes at floor level. Yet considering the room's sloping position close to the central-plaza front, erosion could have reduced whatever adobe rubble may once have covered Floor 1.

Functional variability is only vaguely evident in the terminal levels of the three rooms. A central problem for interpretation is a lack of artifacts associated with the reoccupation floors. Except for a few small sherds (mostly utility grayware), the floors were largely devoid of artifacts and macro-organic remains. Features other than hearths/ roasting pits (Rooms IV-2, IV-7), a cross-wall (IV-2), an indeterminate adobe wall (IV-6), and possible postholes (IV-7) could not be identified. None of the excavated floor areas revealed structural arrangements suggesting mealing or storage bins, benches, or other features. This and the general depositional patterning in the three east-block rooms hint at a basic, probably sporadic, short-term reoccupation. Observations based on a three-room sample obviously call for cautious interpretation, especially if much of the sample population is in such a reduced state as are most late rooms at Plaza Montoya. Even so, it is difficult to see at present anything other than limited, perhaps seasonal, post-abandonment re-use of parts of the pueblo. Nothing indicates that reoccupation was substantial either in number of people involved or in structural-functional organization. Given all this, the most likely scenario among those described in Chapter 7 seems to be the "field-house model". As both regional context and site data are most consistent with a planned abandonment and short-distance move of Plaza Montoya's residents (see below), traditional patterns of land tenure may well have persisted for some time after the pueblo's abandonment. With continued use of fields in the nearby Rio Grande bottomlands, restoration of individual structures to accommodate a limited agricultural workforce could account for the kind of structural evidence seen in the east room block. In this context, parts of Plaza Montoya would have assumed the function of field houses. In their structural and depositional makeup, the reoccupied floor levels certainly appear closer to field-house sites in the Piro area (Hogan and Winter 1981; Oakes 1986) and elsewhere (e.g. Biella and Chapman 1977; Chapman et al. 1977; Kulisheck 2001b, 2005) than to the earlier floors in the same rooms.

Abandonment at Plaza Montoya – Timing, Process, Regional Implications

The data from Plaza Montoya suggest that a large portion of the pueblo was occupied during the crucial pre- to post-contact transition in the Piro area. This confirms the initial assumption, based on the distribution of surface ceramics, of a relatively (i.e. relative to the nearby pueblos of Las Huertas, Pargas, and Las Cañas) large and late occupation. A near-absolute lack of early ceramics (Glaze A-C, Pueblo III whitewares) characterizes all excavation levels. Metal objects were found in deep plaza proveniences and in all four room blocks, including sub-floor contexts in the west, east, and possibly south room blocks. Fifteen of 18 ^{14}C samples extend, at two-sigma range, into Pueblo V/Colonial Piro times (Fig. 9.1). While the ratios of different glaze forms place Plaza Montoya within the final ceramic group-complex (XII) of Marshall's (1987: 77-81) Rio Abajo Sequence (Fig. 7.1), the limited presence of the "middle" glaze forms C and D, plus the long run time of Glaze E and wide standard deviations of the ^{14}C determinations indicate a founding date in the mid-1500s.

The spatial distribution of diagnostic glazewares is consistent across the site in that Glaze E, F, and intermediate forms occur in every room block. Identified structural and stratigraphic patterns reveal no major gaps in or shifts during the occupation. While differences in excavation coverage and purposive placement of test units, combined with the loss of peripheral rooms, preclude statistical comparisons of ceramic densities, the concentration in the east room block of the only early glaze forms found so far points to that area as the earliest part of the pueblo. At Qualacú, and to a limited extent at Las Huertas, the pattern is markedly different. Differential surface distribution of early and late glazewares makes it relatively easy to identify major changes in site occupation.

This is true especially at Qualacú (Chapter 5). There, the known distribution of surface ceramics indicates that the post-contact occupation was limited to parts of the north-plaza area. The structural-stratigraphic data of Marshall's (1987) channel-cut excavations support the surface pattern, revealing depth of occupation layers and a complex sequence of occupation shifts around the largely pre-contact south-plaza area. In view of the small amount of space covered by the excavations, overall site structure and occupation patterns can be expected to be even more complex.

For Las Huertas, Earls' (1985, 1987) work indicates that this pueblo, too, was occupied only partly into post-contact times. Structural-stratigraphic data are more limited than for Qualacú, and ceramic distribution is a little ambiguous. Earls (1987) suggests an early/late glaze ratio of 2:1 in the excavated sample, which is reportedly less skewed in favor of early forms than the surface sample. Most telling, perhaps, is the lack of non-native artifacts and features that might place the site more securely into an early colonial- or mission-period context. Neither metal nor other artifacts of likely Spanish origin, nor remains of introduced domestic animals or plants, were found in secure stratigraphic association (cf. Earls 1985, 1987). As Plaza Montoya's nearest neighbor, Las Huertas no doubt played an important role in the post-contact history of the Plaza Montoya-Las Huertas-Las Cañas-Pargas site cluster (Fig. 8.4). The existing data offer a glimpse of variability in population and settlement development within the cluster. Without more and better information on site structure and occupation, however, interpreting Las Huertas' relationship with Plaza Montoya will be more speculative than factual.

Comparison with non-Piro sites further illustrates the “compactness” of Plaza Montoya’s structural-stratigraphic sequence. Gaps and shifts in room-block structure and cultural deposits have been recorded at many of the sites mentioned in this study. Two of the most conspicuous examples are Arroyo Hondo and Las Humanas (Chapters 5 and 7). At early Pueblo IV Arroyo Hondo, Component II room blocks are much smaller than their Component I predecessors. Stratigraphy and tree-ring dates reveal a hiatus of some 50 years between early and late occupation (Creamer 1993). At Las Humanas, structural superpositioning, ceramics, and tree-ring dates not only reflect two major breaks in the Mound 7 sequence, but also residential movements from early (Pueblo IV) to late (Pueblo IV/V) room blocks within the pueblo as a whole (Vivian 1964; Hayes 1981; Hayes et al. 1981). Similar gaps and shifts seem to define the occupation histories of Quarai (Baker 1936; Reed 1939; Ivey 1988; Hurt 1990; Wait and McKenna 1990; Spielmann 1994) and Abó (Dutton 1981, 1985; Trott and Nordby 1981; Baldwin 1988, n.d. b; Ivey 1988), though the archaeological documentation for these Salinas pueblos is much more limited than for Las Humanas. At Pueblo del Encierro, the situation is different in that there is no evidence of major interruptions in the overall site occupation. At the same time, tree-ring dates and the differential distribution of glazewares suggest a long demographic decline ending with a remnant population in a largely abandoned pueblo during early Glaze E times (Snow 1976).

Since Plaza Montoya’s occupation lies essentially within the Glaze E-F spectrum, ceramic run-time overlap can potentially mask temporal variability in the abandonment of different parts of the pueblo. Although structural and depositional data balance out some of the resulting uncertainty, lack of resolution remains a problem. At what point structural expansion ended and the process of decline began cannot be determined with the ceramic and other chronologically relevant data. In conjunction with known historical context and site-specific patterns of artifact deposition and structure decay/maintenance, however, it is possible to narrow down the temporal and processual scope of possible abandonment scenarios.

As discussed in Chapters 2 and 7, different kinds of settlement abandonment can leave different archaeological traces. Rate and finality of the abandonment process, distance of move, plus material and emotional value/utility and portability of items are all variables that influence what and how material enters the archaeological record. From Chernobyl to the decades-long depression of former mining or manufacturing centers, the modern world offers countless examples of people needing or choosing to abandon entire towns. Even a cursory review of recent instances of demographic change and settlement decline reveals the variability and complexity of cause and effect in abandonment processes. Case studies in contexts ranging from urban areas to rural environments all over the world have enabled archaeologists to isolate basic links between behavioral and material trends in structure abandonment, and define patterns of abandonment-related as opposed to "normal" discard and maintenance behavior (e.g. Nissen 1968; Lange and Rydberg 1972; Wilk and Schiffer 1979; Murray 1980; Schiffer et al. 1981; Stevenson 1982, 1985; Hayden and Cannon 1983; Rathje and Ritenbaugh 1984; Kent 1987; Gould 1988; Rathje and Murphy 1992; Staski and Sutro 1991; Cameron 1991a, 1996, 2003; Cameron and Tomka 1993; Cooper 1994; Schiffer 1996; Creighton and Segui 1998; LaMotta and Schiffer 1999; Shahack-Gross et al. 2003).

For a site like Plaza Montoya, built and maintained by a group of (primarily but not exclusively) subsistence farmers, analysis of discard behavior centers around the assumption – supported by ethnoarchaeological work among similar groups – that items not normally discarded while still useable include indispensable domestic implements. In the case of a Puebloan group like the Piros such items were mainly ceramic vessels and the grinding kits of manos and metates. Due to their value/utility, intact/restorable vessels and groundstone tools tend to appear as de facto refuse only in contexts suggesting rapid/unplanned abandonment in which the departing population was unable to take these items with them or recover (scavenge) them in a later visit to the site (cf. Brooks 1993; Graham 1993; Joyce and Johannessen 1993; Tomka 1993). In gradual site abandonment, vessels and groundstone implements usually turn up as broken or exhausted specimens in primary or secondary (including abandonment) refuse deposits. In such cases, items classifiable as de facto refuse left in floor proveniences may indicate the last abandoned rooms (Schlanger 1991; Schlanger and Wilshusen 1993; Diehl 1998; Billman et al. 2000).

Based on the correlation between time/planning of abandonment and distribution of de facto and abandonment refuse, archaeologists can (especially in the Southwest) use the relative room abandonment measure and similar statistical comparisons to distinguish early from late abandoned rooms (e.g. Reid 1973; Schiffer 1973, 1989; Ciolek-Torrello 1978; Seymour and Schiffer 1987; Montgomery 1993; Lightfoot 1993; Schlanger and Wilshusen 1993; Diehl 1998; Riggs 2001). At Plaza Montoya, such methods are impractical, not only because of the nature of the site sample, but also because of the lack of potential de facto refuse on room floors and the general absence of in-room deposits of abandonment refuse. The Plaza Montoya assemblage, it is safe to say, not even remotely reflects the systemic inventory of its residents' material culture. This becomes especially obvious if one compares it to sites with fuller material inventories that can be used as "yardstick cases" (Diehl 1998: 621). Relative proximity, contemporaneity of occupation, and the fact that its 17th-century demise is known in broad outline make Las Humanas Pueblo the most useful "yardstick case" for Plaza Montoya. During the crisis years of the 1660s, contemporary sources indicate that Las Humanas suffered immensely from drought and Apache attacks. Population losses were apparently dramatic, see fray Juan Bernal's note that more than 450 people perished at Las Humanas in 1668 (Hackett 1923-37, 3: 272-273; Ivey 1994).[15] The pueblo remained occupied for a few more years, but was abandoned in the early 1670s, with at least some survivors moving to Abó. When that pueblo was abandoned in 1673, these survivors could have accompanied fray Gil de Ávila to Senecú. Those who managed to weather the last tumultuous years of Senecú's existence may well have ended up among the Piros taken to El Paso by the Spaniards in 1680/81 (Fig. 6.6) (Bandelier 1890-92, 2: 273; Ivey 1988: 229-240; Bletzer 2005: 53-55).

A period of decline lasting several years and culminating in the relocation of a physically weakened residual population first to Abó (c. 40 km away) and then to the Rio Grande Valley thus forms the historical context of Las Humanas' abandonment. The remains of the late occupations of Mounds 7 and 10 most likely represent the material legacy of this process of attrition. Timing and finality of abandonment, as well as distance of relocation, must have rendered return visits by former residents unlikely. It is in this context that one must view the list in Table 9.9 of intact/restorable ceramic vessels

[15] Fray Juan Bernal to the Holy Office of the Inquisition in Mexico City, Santo Domingo, April 1, 1669.

and groundstone tools in late room (floor/fill) proveniences at Las Humanas and Plaza Montoya. Even if one considers the larger sample of excavated Mound 7/10 rooms and the possibility that some late rooms/floors at Plaza Montoya may not have been as empty as those excavated, the differences in numbers are staggering: more than 200 decorated vessels for Mound 7 versus two for Plaza Montoya, and those were not even complete. Similar the discrepancy in manos/metates: a minimum of 685 for Mound 7 (plus 285 for Mound 10), including158 metates (plus 78 for Mound 10), versus 20 to 30 specimens (including only six metates) that might be deemed useable for Plaza Montoya. Unlike at Plaza Montoya, a number of metates at Las Humanas were still in or near use locations (Fig. 9.18). The disparities clearly suggest for Plaza Montoya an abandonment scenario in which the key variables time, planning, distance of move, and possibility of return connected rather differently than at Las Humanas. Also, given the lack of evidence for early abandoned rooms, changes in refuse deposition, and contraction of occupied space, the percentage of residents involved in final site abandonment seems to have been higher (in proportion to the occupation maximum) at Plaza Montoya than at Las Humanas.

Comparisons of artifact deposition at Plaza Montoya with other Piro sites are necessarily limited. Despite this, a few observations can be made. For Las Huertas, the documentation is largely silent on the presence/distribution of metates and other groundstone tools (cf. Earls 1985, 1987). In the case of Pargas, the data are simply insufficient (Elyea 1986). At Qualacú, however, 60% of groundstone objects (plus 70% of large choppers and cores) were found in refuse deposit within and beneath rooms. Though only summary frequencies are reported, the pattern suggests repeated clean-ups of activity areas with spent tools being dumped in disused rooms (Elyea 1987: 85-91).

Such accumulation of abandonment refuse ties in well with the differential structural overlap of early and late rooms, and the gradual spatial decline in site use as indicated by the limited distribution of late glazewares. Although the very limited horizontal exposure of room floors at Qualacú prevents any detailed comparisons with Plaza Montoya, similar deposits of abandonment refuse were not found in the excavated rooms at Plaza Montoya.

The sum total of archaeological patterns relating to site structure, occupation sequence, and discard behavior offers sufficient information to reduce the range of possible abandonment scenarios for Plaza Montoya. At some point later rather than sooner after Spanish contact, the pueblo was abandoned in what must have been an orderly enough process for its residents to take their most precious belongings with them. As those obviously included heavy domestic equipment like metates, it is unlikely that their owners moved very far. A short-distance move would also have allowed people to return (perhaps quite frequenly) to the site to scavenge for tools and materials (such as *vigas*) left behind during abandonment. In these circumstances it was probably possible to continue working fields in the bottomlands near the pueblo. What may have prompted Plaza Montoya's abandonment cannot be inferred from the archaeological data alone. It is impossible to establish at what point occupation went from expansion to stasis to decline/abandonment. The only thing that can be said is that the process of expansion seems to have lasted very long, certainly into the contact- and possibly the early colonial period. As a result, potential periods of stasis and decline may have been quite short. Another pointer in this direction is the persistent refuse deposition in plaza pits/features while very little material was discarded inside rooms.

In terms of historical evidence, the years after 1630 can be identified as the period during which Piro population and settlement were sent on the downward spiral that would culminate in the abandonment of the entire Piro province. Several "events" should be recalled here. First, there is fray Alonso de Benavides and the founding in the mid- to late 1620s of permanent missions at Pilabó (Socorro), Senecú, and Selocú (Sevilleta) (and a few years later at Alamillo), at a time when fourteen Piro pueblos were reportedly still occupied. Second, there is the case of Selocú/Sevilleta. Its residents had abandoned the pueblo due to conflict prior to Benavides' arrival and were resettled in what was in effect a *reducción* settlement. Third, there is the appearance among the Piros of the first Spanish settlers by c. 1630 at the latest. Fourth, there is fray Juan de Prada's 1638 reference to an epidemic or epidemics carrying off one-third of New Mexico's baptized Puebloan population. If the reference is accurate, the Piros can hardly have escaped unscathed. And finally, there is the establishment of the Luis López *estancia/hacienda.* When this occurred is nowhere recorded, but it is tempting to place the event after Plaza Montoya's abandonment, when native claims of land tenure may have been relaxed and the empty pueblo may still have offered useable construction materials.

Lack of detail in the sources renders those inferences more or less conjectural, but when viewed against the Plaza Montoya site sequence there can be little doubt that the kind of abandonment process indicated by the structural and depositional data must have played out after a permanent Spanish presence had been established. Where, then, could the population of a large Piro pueblo have gone and what does the likely destination reveal about the abandonment process? Historically and archaeologically, only one scenario seems to account for all the patterns mentioned above: a planned *reducción* move to the pueblo of Pilabó/Socorro. Discussed as a potential abandonment scenario at several points in this study, the excavation record, particularly as it relates to refuse deposition, supports the assumptions made there. A Socorro destination is indicated by geography (just 10 km to Plaza Montoya), history (mission *cabecera*), and archaeology (no Colonial Piro site close to Plaza Montoya that could have accommodated such a population transfer). Concerted relocation to Socorro could only have been carried out under Spanish auspices and would have been for the missionaries at Socorro to instigate. Though explicit references to official *reducciones/congregaciones* in New Mexico are scarce, for the Piro area (especially Sevilleta and Senecú) some clues exist to suggest that the Spaniards had few qualms about moving people if it suited spiritual or material goals. As for the timing of Plaza Montoya's abandonment, the approximate *terminus post* provided by the Piro pueblo figure in Benavides' 1630 *Memorial* and the 1638 Prada disease reference, supported by the surface ceramics, is further supported by structural-stratigraphic data (sub-floor occurrence of metal artifacts, lack of plaza kivas) and the excavated ceramic sample. The very low incidence of foreign domesticates could mean that abandonment occurred while missionaries and settlers were not yet ensconced long enough for the pueblo's residents to get hold of or adopt the new plants and animals.

Not surprisingly, uncertainties remain. This is partly due to the limitations of Plaza Montoya's archaeological record such as the loss of both core rooms (in the north room block) and, above all, late rooms and room floors (room-block peripheries and the entire eastern third of the north room block). More acute, though, is the lack of data from other Piro sites. For the cluster of settlements around Plaza Montoya, surface data and the limited excavation records for Las Huertas and Pargas Pueblos hint at decidedly uneven developments during the contact- and early colonial periods. Differences in ceramic distribution suggest that growth at Plaza Montoya came at the expense of the neighboring communities. How much the latter may have been affected by out-migration of residents to Plaza Montoya is unknown. Nor is there any direct evidence why Plaza Montoya should have developed differently. More uncertainties revolve around the roles in the post-contact settlement landscape of the smaller late-glaze sites along the Rio Grande (Upper Las Cañas [LA 31698]) and Nuestra Señora [LA 19266]) and the two upland pueblos of Magdalena and Bear Mountain. These and other questions give something of an idea of the amount of work needed to bring the Piro area out of archaeological (and historical) obscurity.

CHAPTER 10

SUMMARY AND CONCLUSIONS

Analysis of excavation data from Plaza Montoya shows that this Piro pueblo was occupied during the crucial pre- to post-contact transition of the late 1500s and early 1600s. The extreme scarcity of early glaze forms and Pueblo III whitewares, and the concomitant predominance of Glaze E and F forms indicate a founding date perhaps nearer to 1550 than 1500. Given Plaza Montoya's size, it could not at first be ruled out that parts of the pueblo might be older than the ceramics indicated, but as it turned out the uniform makeup and distribution of diagnostic glazeware bowl rims was consistent with the lack of structural-stratigraphic depth across the site. Even in the deepest areas of the west (Area XI) and east (Area IV) room-block mounds no rooms had more than three occupation levels or floors. Cultural deposits in those areas consisted largely of compact adobe rubble suggestive of second-story construction.

Length of occupation at Plaza Montoya likewise can only be approximated. From the beginning, historical references to the Piro pueblos and comparisons of ceramics with samples from colonial-period sites like Sevilleta or (in the Salinas area), Las Humanas, Abó, and Quarai, pointed to a post-contact occupation that could have lasted into the early mission period (1626-c. 1640-50). Aside from generating a much larger sample of late glazewares, the excavations yielded materials (metal/glass, Puebloan trade ceramics) and features (adobe bricks, low-threshold doorway, cremations) in sufficiently secure contexts to support the assumed occupation span. The apparent lack of plaza kivas is also intriguing, but whether this may reflect Spanish influence is unclear. It is an interpretive problem symptomatic of all chronological data from Plaza Montoya. The argument that Plaza Montoya was abandoned some time between c. 1630 and 1650 may be a fairly strong one, but a more precise determination within that period remains elusive.

Work at Plaza Montoya was guided by the necessity to trace as much of the occupation sequence in each room block as possible. One reason for this was the overall lack of archaeological work in the Piro area (cf. Marshall and Walt 1984; Marshall 2005) and, more specifically, the limited coverage of Earls' (1985, 1987) work at Las Huertas and Marshall's salvage excavations at Qualacú and Pargas (1986, 1987). In addition, the record of archaeological research at non-mission pueblos is generally limited. As noted in Chapters 1 and 7, this is unfortunate. Given what is known about Spanish responses to native population decline elsewhere (Chapter 6), it is the non-mission pueblo that can be expected to provide important clues relevant to post-contact changes in the Puebloan settlement landscape and, by extension, demographic structure. Another reason was the kind of information needed for examining the general course of occupation and the question of abandonment at Plaza Montoya. Experience has shown that especially at Puebloan sites extensive structural remains do not automatically imply extensive or continuous occupations (Cordell 1994: 80-81). As a key objective was to verify the presence/absence of stratigraphic gaps indicative of possible occupation breaks, plus changes in refuse deposition indicative of abandonment-related behavior, a spatially and stratigraphically representative excavation sample was essential.

In view of all this, random sampling of excavation units was deemed impractical. Placement of units instead followed surface observations such as mound height, visible wall alignments, and areas of disturbance. The results of wall-scraping and excavation bear out this choice, not least because they demonstrate the extent to which visible structural remains can misrepresent a site's structural complexity. It is possible that Plaza Montoya may have had up to 50% more ground-floor rooms than Marshall and Walt (1984: 194-195) could reasonably estimate from their surface observations. The discrepancy is particularly obvious along room-block peripheries and in the eastern half of the north room block, where extensive sub-surface foundations were recorded. While such discrepancies are not uncommon (cf. Riggs 2001), the extent of buried walls at Plaza Montoya was surprising. Also unexpected was the discovery of a plaza area east of the east room block. This east plaza was identified through excavation of the easternmost Area IV rooms and adjacent areas, and through the excavation of Trench VIII-38.

In its final layout, Plaza Montoya comprised four large room blocks around a central plaza and an eastern plaza open to the south and east (Figs. 8.5, 8.6). Bond-abut data and room stratigraphies suggest that room-block expansion was primarily by single and double rooms. For the most part, new rooms seem to have been added on the plaza-side of existing rooms, that is, were built over existing plaza space. Posthole alignments in the west, east, and north room blocks suggest conversion of *ramada*-type structures into fully enclosed rooms. Maximum plaza-side expansion from initial core rooms as indicated by the extent of sub-floor features was up to four or five rows of rooms in the central portions of the east and north room blocks. Full enclosure of the central plaza area was achieved by the (possibly rapid) construction of the south room block, which filled the space – apparently left open up to that point – between the west and east room blocks. Lack of structural superpositioning or realignment, plus a lack of refuse deposits or natural sediments separating structural layers is evidence that the process of expansion continued without major interruptions throughout most of the occupation sequence.

Viewed against structural patterns and interpretations of demographic growth at better documented sites such as Grasshopper Pueblo (Reid 1973; Reid and Shimada 1982; Reid and Whittlesey 1982; Ciolek-Torrello 1978, 1985; Riggs 2001), Pueblo del Encierro (Snow 1976), Arroyo Hondo (Dickson 1979; Wetterstrom 1986; Creamer 1993), and others (e.g. Vivian 1964; Hayes 1981; Hayes et al. 1981; Barnett 1969; Cordell 1975, 1977), the Plaza Montoya data best fit a model of gradual growth at the household level. Among identified room additions outside core room blocks, only the south room block (possibly), the plaza front in Area XI, and the sector inside the double wall in Area VI include units of up to six rooms. Their construction would have involved more people than are usually associated with single households. Different alignment indicates the same for the rooms abutting the double wall in Area VI, but number and construction sequence cannot be established. Where the people to occupy those units may have come from can only be guessed at. As ceramic distributions indicate a contraction of occupied space at the neighboring pueblos of Las Huertas, Las Cañas, and Pargas, a possible influx into Plaza Montoya of small groups from these pueblos seems a feasible assumption. What may have triggered such episodes of limited aggregation is unknown.

In contrast to its neighbors and to the pueblo of Qualacú, there is no noticeable evidence of a declining occupation in the form of a spatially limited occurrence of late-glaze ceramics. This is not to say that over the long run-time especially of Glaze E forms

Plaza Montoya's occupation could not also have contracted to some extent. The combination of structural and chronological data, however, points to continued near-capacity occupation at a time when Las Huertas may have been occupied by a fraction of its original population and Pargas perhaps already been abandoned.

Against this pattern, the question (posited in Chapter 6) of whether Plaza Montoya may be the historically recorded first Socorro, Teypana Pueblo, arises again. Though data from Plaza Montoya alone cannot resolve this question, the relative prominence of the pre-mission Socorro in documents from the Oñate years, and the differences in material patterning within the local site cluster (Fig. 8.4), make Plaza Montoya the likeliest candidate identified so far. But even if there can be little doubt that Plaza Montoya reached its peak occupation at a later point than the surrounding pueblos, it is difficult to know how unique this disparity may have been. What is lacking here are (more) comparative data from other Piro sites with surface ceramics indicating similarly late occupations. Such sites include not only neighboring Las Huertas and Las Cañas, but also the mission pueblo of Sevilleta, and the upland pueblos of Magdalena and Bear Mountain. On the surface, the last two sites most closely resemble Plaza Montoya in size and ceramic assemblage (cf. Marshall and Walt 1984).

Beyond these vitally important observations on site chronology and occupation, analysis of the structural-stratigraphic data from Plaza Montoya has focused on specific contexts of refuse deposition and structure maintenance. Based on the fundamental premise that different "types" of abandonment behavior have different kinds of material correlates, identification of specific depositional patterns should enable one to define (or at least narrow down) – against the known historical background – the abandonment process(es) at work at Plaza Montoya. This would be a first step towards assessing the rate of change in local/regional settlement and its potential demographic implications. As described in Chapter 2, both recent events/developments and actualistic studies reveal both the prospective range of abandonment behavior and the key impact the related factors time and degree of planning, plus distance of move, value/utility and portability of objects, and anticipation/possibility of return, have on the quantitative and qualitative dimensions of abandonment assemblages. Although extreme "disaster movie" scenarios that might produce (near-)complete systemic inventories of abandoned materials are rare (cf. Cameron 1993: 3), events like the Chernobyl catastrophe seem to shape popular notions of settlement abandonment. Nonetheless, the well-documented socio-economic and demographic changes in industrialized societies since World War II provide many examples of how long- and short-term push-pull processes can affect both individual communities and entire regions (e.g. Ingold 1988; Teaford 1993; Dubarle 2002; Bartholy et al. 2004; Dublin and Licht 2005; Müller et al. 2005; Rothenbacher 2005).

From an archaeological angle, it is this variability that best illustrates the potentially complex interplay of factors influencing the deposition of material remains in structure/site/regional abandonment. Not surprisingly, much research relevant to the issue of abandonment has focused on historic and modern patterns of refuse deposition and structure maintenance/decay in both urban (e.g. Schiffer et al. 1981; Wilk and Schiffer 1979; LaMotta and Schiffer 1999; Stevenson 1982; Rathje and Ritenbaugh 1984; Rathje and Murphy 1992; Knapp et al. 1998) and non-urban/rural communities (e.g. Nissen 1968; Lange and Rydberg 1972; Murray 1980; Stevenson 1982; Hayden and Cannon 1983; Horne 1983, 1994; Deal 1985; Deal and Hagstrum 1995; Gould 1988;

Staski and Sutro 1991; Cameron 1991a, 1991b, 1996; Tomka 1993; Graham 1993; Joyce and Johannessen 1993; Rothschild et al. 1993; Cooper 1994; Creighton and Segui 1998; González Ruibal 1998; Shahack-Gross et al. 2003; Hauser 2006). Applied to primarily archaeological (i.e. prehistoric) contexts in the Southwest (e.g. Seymour and Schiffer 1987; Schiffer 1989; Lightfoot 1993; Montgomery 1993; Schlanger and Wilshusen 1993; Hegmon et al. 1998; Nelson and Hegmon 2001; Nelson and Schachner 2002) – especially at Grasshopper Pueblo (e.g. Reid 1973; Reid and Whittlesey 1982; Ciolek-Torrello 1978; Graves et al. 1982; Riggs 2001) – and to similar contexts in other regions (e.g. Verhoeven 2000; Palka 2001; Inomata and Webb 2003; Hardy-Smith and Edwards 2004), the resultant methods and models have shown to be valuable tools for evaluating abandonment processes at individual sites. A representative body of data on site abandonment in turn offers an opportunity to re-assess, adjust, and refine existing models of population trends at larger regional or trans-regional scales.

At Plaza Montoya, analysis of refuse deposition and structural layers has revealed several patterns, which within the larger historical context allow one to limit the range of possible abandonment scenarios. Lack of refuse deposits within rooms in all room blocks suggests that discard behavior did not appreciably change over time and that plaza pits continued to be used for refuse deposition throughout the pueblo's occupation. It also suggests that none of the rooms in the excavated sample were abandoned early enough to be used as refuse dumps. No doubt related largely to site abandonment is the lack in all late floor/fill proveniences of intact/restorable ceramic vessels and useable grinding stones – artifacts classified as de facto refuse, i.e. items which could be expected, abandonment conditions permitting, to have been saved or salvaged for use elsewhere.

Comparison of the Plaza Montoya ceramic and groundstone assemblage with that of the Salinas mission pueblo of Las Humanas, a site known to have been in decline in the 1660s and abandoned in the early 1670s, shows how under-represented potential de facto refuse is at Plaza Montoya. Structurally, it should also be pointed out that none of the excavated rooms yielded any evidence of large-scale deliberate or accidental destruction. Remains of roofs were found in a number of rooms, but the largest elements, load-bearing beams *(vigas)*, were nowhere in evidence. Floor levels of a possible post-abandonment reoccupation were identified in three east-block rooms. The nature of these floors and associated floor features, plus the general lack of artifacts associated with them, suggest only temporary, perhaps seasonal occupation.

Depositional and structural patterns indicating that Plaza Montoya remained more or less fully occupied until abandonment, and that its residents had the time and capacity to relocate with valuable – and in the case of metates not necessarily handy – items are most consistent with a high degree of planning, sufficient time to do so, relatively speedy movement, and a destination not too far away to prohibit transfer of heavy objects. With this and with what is known about Spanish reorganization of native settlements in New Spain and elsewhere, a scenario in which Plaza Montoya's residents were methodically resettled at the Socorro mission pueblo is most plausible. This points to a *terminus post* for the pueblo's abandonment of c. 1630, but the process may have been triggered by population losses in the epidemic(s) of the mid- to late 1630s. As noted in Chapters 6 and 7, among primarily sedentary groups the colonial authorities often used *reducciones* as a means to consolidate surviving populations in fewer settlements. If this was the fate of Plaza Montoya and other pueblos in the Socorro area still occupied at that time, the existing *cabecera* of Pilabó/Socorro (the *"cabeça"* of the entire Piro province according to Alonso de Benavides [Ayer 1917: 97]) doubtless would have been the focus of such a resettlement effort. Even in this most likely scenario with its combination of factors, however, abandonment behavior may have been more diverse. One unknown variable is the potential movement of people to other sites, particularly to more remote sites in the western uplands (Pueblo Magdalena, Bear Mountain Pueblo) and in the Chupadera Basin. This is an issue that would require information about these sites comparable to the Plaza Montoya data. Still, at least in terms of assemblage composition at Plaza Montoya, it is unlikely that long-distance movement, if it occurred, was substantial; otherwise a few pieces of de facto refuse should be left at the site. It is also unlikely that the Spanish authorities, religious as well as civil, would have permitted any overt relocation of a kind that would have made it more difficult to exert control and collect tribute and services.

And so much remains hypothetical. On the ground, it is not even certain that the excavated sample is representative of most late rooms at Plaza Montoya. Here the problem of preservation emerges again. While there is little evidence of looting, erosion and construction work have taken a toll especially on late rooms and room floors. But despite this, research results do bear out Charles Riggs' (2001: 194) comment (made with reference to Grasshopper Pueblo) on the "absolute necessity of representative excavation data for making inferences about ruined architecture". Not only the Piro area but New Mexico in general and other parts of the Spanish Americas could well do with more such data, generated in problem-oriented research, to address the many unresolved questions concerning post-contact developments among the Pueblos and other groups with similar colonial histories (cf. Lycett 1995, 2002; Preucel 2002; Kulisheck 2005).

In sum, then, the excavations at Plaza Montoya Pueblo have created an extensive material database relating to a period when overwhelming pressures from outside were beginning to disrupt established patterns of Piro settlement. Structural, stratigraphic, and depositional data indicate a pronounced level of variability in pre- to post-contact Piro population and settlement trends than were previously apparent. Plaza Montoya's 40-room excavation sample represents more than twice the combined number of rooms tested at Las Huertas, Pargas, and Qualacú. From this and from the 42 test trenches in plaza and offsite locations emerges a general pictures of how the pueblo was built, occupied, and abandoned. It is a picture that differs sufficiently from other area sites to suggest more complex changes in population and settlement than were previously apparent. With this, the study sustains the principal assumption of differential persistence of population and settlement in the post-contact Piro area.

The surface has literally only just been scratched even with the data from Plaza Montoya. In appraising the balance of research assumptions and the results of this study, limitations are obvious. Lack of chronological resolution and loss of late rooms/ occupation surfaces in particular call for interpretive caution at the site level. Regional implications require still more caution due to lack of comparative data. While the Plaza Montoya record may support the interpretation that the pueblo was abandoned as part of a *reducción*-type relocation, the pueblo's general position within the regional settlement landscape is still obscure. Clearly, a great deal of effort needs to be devoted to archaeological groundwork throughout the Piro area before assessments of regional significance can advance beyond conjecture. This means that the regional relevance of the Plaza Montoya data may only become apparent in the future. With more information from other Piro sites, large and small, located in the Rio Grande Valley and outside of it, and with more data from other Puebloan sites, a better understanding of the demographic consequences of the colonial encounter in New Mexico seems possible. But as is true of this kind of research generally, there is “no quick and easy route” (Chamberlain 2006: 4) to reliable conclusions.

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